ALASKA

All-Hazard Risk Mitigation Plan

State of Alaska

Department of Military and Veteran Affairs

Prepared By

Division of Homeland Security & Emergency Management

October 2007

STATE OF ALASKA

ALL-HAZARD RISK MITIGATION PLAN

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STATE OF ALASKA

ALL-HAZARD RISK MITIGATION PLAN

This Plan will be reviewed annually and revised as necessary.

RECORD OF CHANGES

CHANGE NUMBER	DATE	SUBJECT	ENTERED BY

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EXECUTIVE SUMMARY

This document is the culmination of a cooperative partnership between local government, Alaska Division of Homeland Security & Emergency Management (DHS&EM), other State and Federal Agencies, and the Federal Emergency Management Agency (FEMA). This plan meets the requirement for a State Hazard Mitigation Plan under the Stafford Act. It is a living document and will be refined and updated on a periodic basis. DHS&EM would like to acknowledge the critical review and comments provided by many local communities and governmental agencies during the development process. Where possible, we have made every attempt to incorporate their comments in the final document.

It is vital for Alaska to have a proactive, unified approach to mitigation. Mitigation measures save lives, reduce injuries, and prevent or decrease financial losses from the many hazards in Alaska. These measures include a range of techniques from public education, changes in land-use, revised building construction practices, and changes in fiscal policy. All of these techniques are discussed throughout the plan where appropriate.

DHS&EM formed the State Hazard Mitigation Advisory Committee (SHMAC) to thoroughly research the State's mitigation needs and provide technical expertise to the State Hazard Mitigation Officer (SHMO). This committee was an invaluable resource during development of this plan. DHS&EM will use this committee while implementing mitigation strategies in Alaska. For mitigation to work, public officials at State and local levels must make a commitment to mitigation; public officials, emergency managers, planners, and civic groups must convince the public of the value of mitigation; and the public must accept mitigation measures as opportunities to sustain the economic well being of the State.

Overall, the plan addresses the risks associated with hazards in Alaska, discusses hazard mitigation implementation for the State, satisfies the Federal requirement for hazard mitigation funding planning, and identifies and prioritizes State-level mitigation activities. The plan introduces the hazards in Alaska, governmental coordination activities, and the State's mitigation strategy. Each hazard specific subsection contains more detailed information about each hazard's risk analysis, vulnerability assessment, existing mitigation programs, successful mitigation actions, and both short and long-term mitigation goals.

This planning process resulted in many short and long-term goals that can be grouped into the following categories:

- Hazard mapping projects – to identify hazard prone areas.
- Land-use planning and building codes – to encourage reducing vulnerability to hazards through active planning and using effective construction standards.
- Education – to teach Alaskans about hazards and hazard mitigation.
- Improve assistance and provide incentives to local and tribal communities – to support local efforts in their attempts to make their communities safer.
- Pursue additional mitigation funding.

Local communities identified many of the goals in this plan. It is not the State's intent that these goals be unfunded mandates. They are opportunities to protect our population and infrastructure. However, the Federal government passed legislation in 2000 requiring States, local communities, and tribal governments to have mitigation plans in place by November 1, 2004 to be eligible for

mitigation funding. DHS&EM will make every attempt to identify funding sources and possible alternatives for accomplishing this daunting task.

1.0 INTRODUCTION

Mitigation Defined

Hazard mitigation is any action taken to reduce or eliminate the long-term risk to human life and property from natural and Human-caused hazards.

1.1 Purpose

The Alaska State All-Hazard Risk Mitigation Plan's purpose is to fulfill the requirements set forth in the 44 CFR 201.4 DMA 2000 legislation, identify hazards, complete a risk assessment and vulnerability analysis, and identify and coordinate needed mitigation efforts with State, Federal, and local partners.

1.2 Assumptions

We should expect a devastating naturally occurring event, technological incident, or terrorist attack to occur without warning and at the worst possible time.

- Mitigation financial assistance for the State and local / tribal governments and communities will only occur from a Presidentially Declared Disaster program like the Hazard Mitigation Grant Program or through another Federal mitigation assistance program like the Pre-Disaster Mitigation Grant Program, or the Flood Mitigation Assistance Program.
- Mitigation occurs at the local government level. Local governments know what is best for their location or population.
- State agencies and commercial professionals are the subject matter experts available for consultation and verification of potential project success. For example, the Alaska Department of Transportation & Public Facilities would be able to review and validate the quality of a road or irrigation project design.
- Certain facilities are critical for the survivability of Alaskans. These facilities must be identified, risk assessments conducted, and vulnerability analysis completed to determine what actions should be taken to ensure their post-disaster operability.
- Alaska can expect to stand alone for at least 72 hours before assistance will be able to arrive because of its isolation from the lower 48 states and the challenges presented by Alaska's weather.

1.3 Authority

The State of Alaska Hazard Mitigation Plan, Aug 6, 2002, meets the requirement of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act) for a 409 plan. It is intended that this plan further fulfills the Disaster Mitigation Act of 2000 (DMA 2000), Section 322 (a-d) plan requirements. Section 322 of the Act requires mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identify and prioritize mitigation actions, encourage the development of local mitigation and provide technical support for those efforts. In addition, the Act requires local and tribal governments to also have mitigation plans.

1.3.1 State Assurances

The State supports 44 CFR 201.4 (c)(7), and assures compliance with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding. The State Hazard Mitigation Officer, with assistance from the SHMAC, is responsible for monitoring, evaluating, and updating The State All-Hazard Risk Mitigation Plan in accordance with 44 CFR §201.4(c)(5)(i). The SHMO will monitor the plan continually, evaluate the plan yearly, and update the plan every three years, or within 90 days of a Presidential Declared Disaster (*if required)*, or as necessary to reflect changes in State or Federal law. The State All-Hazard Risk Mitigation Plan Annual Progress Report and State All-Hazard Risk Mitigation Plan Annual Evaluation Form, located in Appendix 18, are used for the evaluation. The SHMO will document evaluation findings, record the actions in a report, submit to DHS&EM Managers for review and approval. The SHMO determines when significant changes warrant an update prior to the scheduled date.

1.4 A Guide to this Plan

This plan will provide a focus on mitigation as part of the State's emergency management efforts. The plan contains five sections:

1.0: Introduction to the plan.

2.0: The Hazard Mitigation Strategy

3.0: Planning, Monitoring, and Maintenance

4.0: General Hazard-Analysis and State Capabilities.

5.0: Detailed Hazard Vulnerability Analysis (HVA), Mitigation Successes, Goals, and Local Summary by Hazard.

The plan:

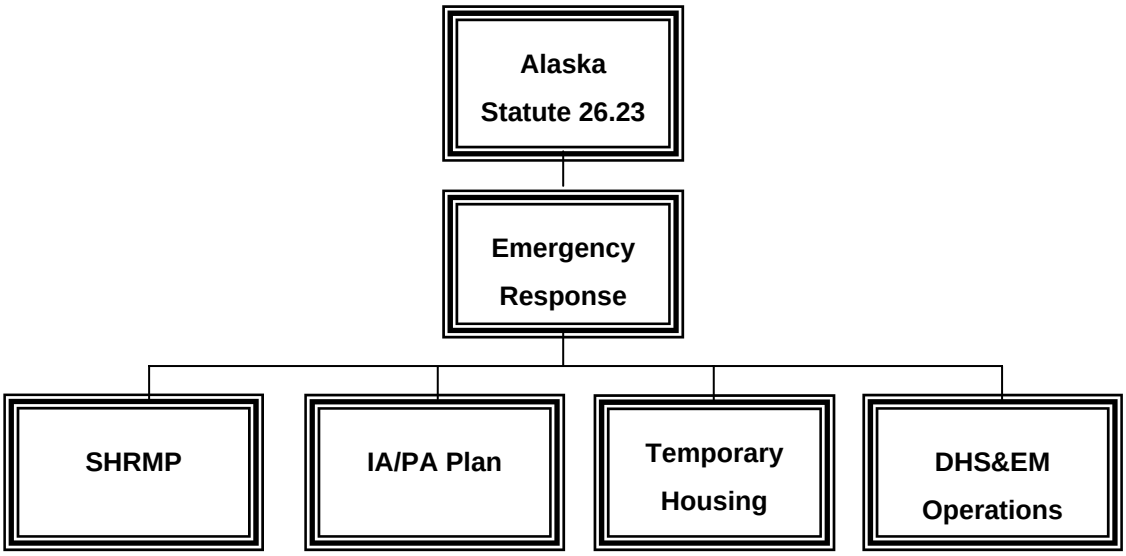
- Introduces the risks associated with many of the hazards that occur within Alaska.
- Addresses hazard mitigation implementation for the State.
- Meets the requirements for hazard mitigation funding programs.
- Identifies and prioritize State-level mitigation activities.

Relationship of the

State All-Hazard Risk Mitigation Plan (SHRMP)

and the

State's Emergency Management Authority



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1.5 Alaska Background Information

Alaska's population is 663,661. Alaska covers 656,425 square miles with a land area of 570,374 square miles making it the largest of the 50 states. Alaska is 1/5 of the size of the lower 48 States. It is larger, therefore, than the next three largest states (Texas, California, and Montana) combined or larger than the smallest 26 states combined. If Alaska was divided in half, Texas would be reduced from the second to the third largest State.

The State's constitution establishes a policy of maximum self-government for the people. Its 16 existing boroughs are each larger than Rhode Island and are not the equivalent of county governments in the emergency management context. Only four of the boroughs and municipalities have a government-run emergency management system similar to county style agencies. The other 12 boroughs have area-wide powers focusing on education, land-use planning, and tax assessment and collection. The boroughs cover approximately 38% of the land mass and encompass 86% of the population; the remaining 14% of the population resides in a vast, sparsely inhabited area called the "Unorganized Borough." The State's "Unorganized Borough" is not politically subdivided and is managed by the State's Legislature in accordance with the Alaska State Constitution article 10 Subparagraph 6. For the most part, emergency services are provided by scattered, independent, highly decentralized service areas throughout the State.

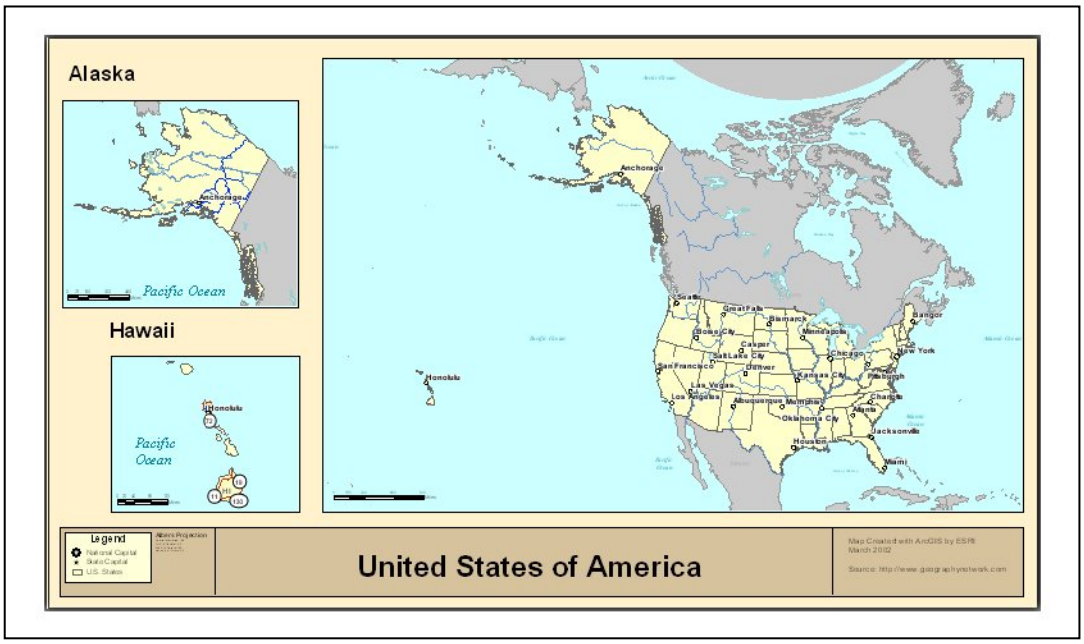
1.6 Alaska's Structure

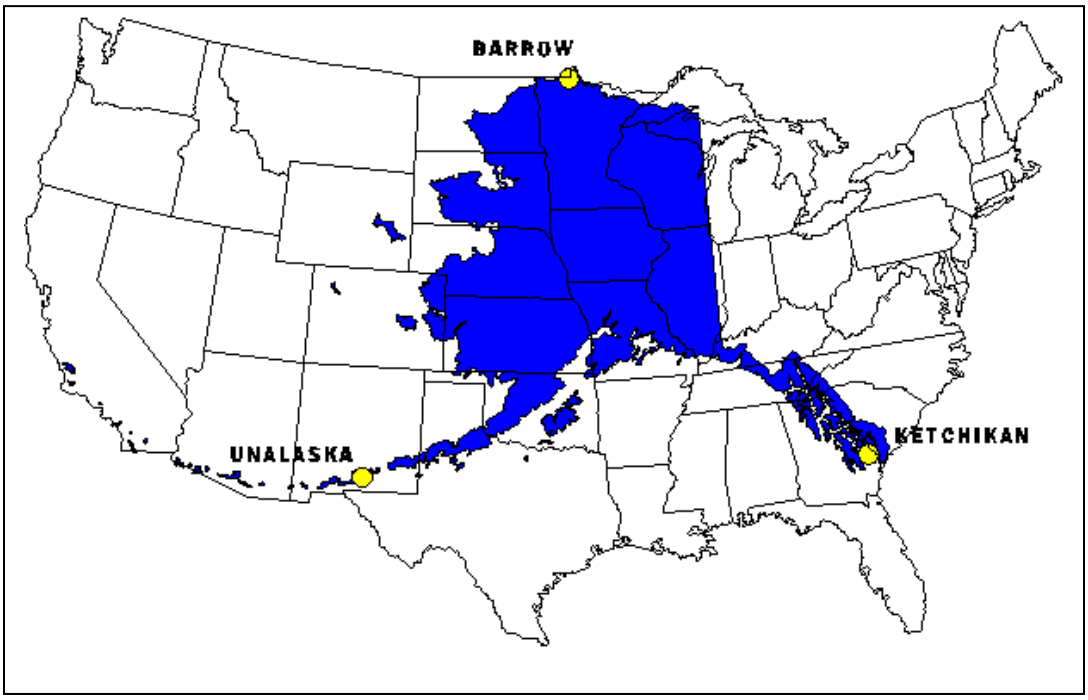
The distinct features of five different regions must be considered due to the extreme variations that exist with respect to climate, terrain, and economics. However, we will look at the Borough/REAA structure for this mitigation plan. The older 2004 version of the plan used Borough Census area divisions.

1.7 General Facts

- **Population:** Alaska's 2005 population estimate is 663,661 is about 0.1% of the U.S. total of 299,837,980.
- **Land Area:** Alaska is geographically separated from the contiguous U.S. by Canada and is about 20% as large as the rest of the U.S., or larger than the states of Texas, California, and Montana combined.
- **Geographic Center:** The Geographic center of Alaska is located approximately 60 miles NW of Mt McKinley 63° 50' north latitude, 152° west longitude.

- **Water Area**: 86,051 square miles of Alaska are covered by water.
- **Highest Point**: The highest point in Alaska is Mr. McKinley (Denali) at 20,320 feet above sea level. In fact, Mt. McKinley is the highest point in North America.
- **Lowest Point**: The Lowest point in Alaska is sea level where at, the state meets the Pacific Ocean, the Bearing Sea and the Arctic Ocean
- **Mean Elevation**: The Mean Elevation of the State of Alaska is 1,900 feet above sea level.
- **Major Rivers**: Yukon River (longest river in Alaska; 1,875 miles.), Kuskokwim River, Colville River and Copper River.
- **Major Lakes**: Iliamna Lake, Aleknagik Lake, Becharof Lake, Clark Lake, Minchumina Lake (Alaska has over 3 million lakes that are more than 20 acres in size.)
- **Geographic Extent:** The picture below confirms how removed Alaska is from the contiguous 48 states and Alaska is not just large, it is also far-flung, with the Southeast "panhandle" and Aleutian Chain extending it's geographic scope. From north to south, it measures 1,420 miles, or about the distance between Denver and Mexico City, and from east to west it measures nearly 2,500 miles, or about the distance from Savannah, GA to Santa Barbara, CA. The map on the following page compares Alaska and the "Lower-48" illustrating the three most distant maintenance stations employed by the Department of Transportation.





- **Land Ownership:** Including Federal and State land ownership, nearly 90% of the land in Alaska is publicly owned.
- **Population Density:** Alaska has the lowest population density of all states with only one person per square mile. The U.S. average is 74 persons per square mile.
- **Rural Myth:** Contrary to widely held perceptions, Alaska's population is decidedly urban. In 1995, 71% of Alaskans lived in cities of over 2,500 people as depicted in the following table.

COMMUNITY	CURRENT Certified Population 2005	Population 2003	LAND
Anchorage	276,241	274,003	1,697.2
Fairbanks North Star Borough	87,650	82,214	7,366.2
Juneau	31,193	31,283	2,716.7
Kenai Peninsula Borough	51,268	51,220	16,013.3
Matanuska-Susitna Borough	74,041	67,473	24,681.5
Totals	520,393	506,193	52,474.9
Total State of Alaska	663,661	648,818	
Population Percentage	78.41%	78.02%	
Total Land Area in Square Miles			586,400
Area Percentage			8.95%

The population table is based on information located at Alaska Division of Commerce, Community and Economic Development's (DCCED) web site. It contains information from the 2000 census and information from the 2007 State Demographer.

1.8 Land Transportation

- **Road Density:** Alaska has one mile of road for every 42 square miles of land area. The U.S. average is one to one and the next lowest state is Nevada with one to 2.5
- **Road Miles per Capita:** Alaska has nearly 23 road miles per 1,000 population. This is 50% more than the U.S. average of 15 road miles per 1,000 population.
- **NHS Mileage:** Alaska's total National Highway System mileage is a significant share of the nation's total. NHS has 158,000 route miles in the United States, Alaska's has approximately 2,000 miles or 3.33 NHS route miles per 1,000/population. The U.S. average is much less at 0.6 miles per 1,000/population.
- **Connectivity:** Nearly 30% of Alaska's population is **not connected** by road or ferry to the continental road network.
- **Pavement:** Less than 20% of Alaska's roads are paved whereas 91% of roads are paved in the other 49 states.
- **Vehicles and Drivers:** Alaska has 820 vehicles per 1,000 population while the U.S. ratio is

750 vehicles per 1,000 population. Alaska has 738 drivers per 1,000 population while the U.S. ratio is 670 drivers per 1,000 population.

- **VMT:** Alaskans often travel by air and ferry, consequently the VMT (vehicle miles traveled) represents only 0.17% of the U.S. total.

1.9 Air Transportation

- **Commuter Air Travel:** Alaska's population comprises only 0.2% of the U.S. population yet Alaskans utilize 13% of all commuter airline and air taxi trips in the U.S. This means Alaskans use commuter airlines 65 times more often than the average U.S. citizen.
- **Seaplane Bases:** Alaska not only has the largest seaplane base in the world, Lake Hood, it also has 102 seaplane bases, far more than any other state.
- **Air Freight:** Alaska's Ted Stevens International Airport, located in Anchorage, has been number one in the U.S. for total air freight weight for the past seven years. About 50 wide body freighters land at Ted Stevens International Airport every day.
- **Pilots and Aircraft:** It's estimated that Alaska has about six times as many pilots per capita and 16 times as many aircraft per capita as the rest of the U.S.
- **Commercial Service Airports:** Alaska has 76 commercial service airports (2,500+ enplanements annually) of the 570 such airports in the U.S. This is 13% of the national total.

1.10 Waterborne Transportation

- **Ferries:** Alaska's ferry system is unique among the fifty states, operating eight 24 hour/day long haul vessels that include restaurants, lodging, and lounges. The total route structure

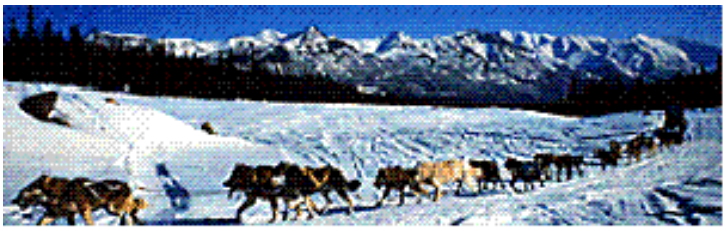
covers 3,500 miles and includes ocean passages of the storm tossed Gulf of Alaska.

- **Ports:** Of the 177 major ports in the U.S., Alaska has eleven, or 6% of all such ports in the U.S.
- **Coastline:** Alaska has more than 50% of the entire coastline in the U.S.
- **Fishing:** Kodiak and Unalaska hold the top two spots in the U.S. for volume of fish landed annually.

1.11 Space Transportation

- **Space Launches:** Kodiak Island is a launch site for low-earth-orbit satellites. The Alaska Aerospace Development Corporation development efforts this new spaceport and test flights have commenced.

1.12 Winter Transportation



- **Trails:** Winter dog sled and snow machine trails are a historically important transportation system utilizing the long, cold, grip of winter to provide a solid surface where wet ground and water surfaces exist in summer. The department continues to mark many of these trails. These trails form an important element of the rural transportation system in areas lacking roads and highways.

- **Ice Roads:** A few areas of Alaska utilize ice roads to traverse rivers and normally soft ground. In some areas these roads require little more than blading to keep the snow clear and in other areas water is pumped and spread on the road to build up structural strength. The ice roads are an acceptable alternative to the damage caused by permanent roads in sensitive landscapes. These roads are commonly used in other high-latitude countries such as Canada and Russia

2.0 MITIGATION STRATEGY

2.1 Mitigation Defined

***Hazard mitigation* is any action taken to reduce or eliminate the long-term risk to human life and property from natural and Human-caused hazards.**

Awareness, education, and preparedness, coupled with prediction and warning systems can reduce the disruptive impacts of natural and human caused disasters on communities. Mitigation measures save lives, reduce injuries, and prevent or decrease financial losses attributed to damage from floods, wildland fires, earthquakes, avalanches, landslides, debris flows, erosion, tsunamis, volcanoes and other natural, technological, Human-caused, or economic hazards. Mitigation measures employed can vary from public education, to land-use and building construction practice changes, to in fiscal policy development.

Many communities resist adopting mitigation measures because they are seen as restrictive, costly, without immediate tangible benefits, or are incompatible with community development. However, effective mitigation measures are designed with the future in mind. Consequently, the State is committed to convincing its constituents to view mitigation as an opportunity to provide sustainable economic development that improves the economic value and quality of life for the State, its communities, and residents.

Alaska Mitigation Goals and Objectives

The primary goals of hazard mitigation are to:

- ***A.*** *Minimize loss of life and injuries,*
- ***B.*** *Minimize damages,*
- ***C.*** *Restore public services,*
- ***D.*** *Promote economic development.*

To attain these goals, the State All-Hazard Risk Mitigation Plan shall include measures to:

1. *Save lives and reduce injuries;*
2. *Prevent or reduce property damage;*
3. *Assist local communities with preparing a Local All-Hazard Risk Mitigation Plan*
4. *Reduce economic losses;*
5. *Minimize social dislocation and stress;*
6. *Maintain critical facilities in functional order;*
7. *Protect infrastructure from damage; and*
8. *Protect legal liability of government and public officials.*

Three major criteria must be met for mitigation strategies to be adopted and successful:

1. Public officials at State and local levels must make a commitment to mitigation.
2. Public officials, emergency managers, finance and insurance specialists, engineers, planners and architects, civic groups, marketing specialists, educators, and researchers are key groups that must convince the general public to buy-in to mitigation.
3. Present and accept mitigation measures as opportunities to sustain the economic well being of the State.

The State of Alaska must be prepared to capitalize on opportunities to minimize the impact of future disasters through mitigation. Every community in Alaska, whether incorporated or unincorporated, is encouraged to develop a Local/Tribal All-Hazard Mitigation Plan to guide them toward reducing the impacts of disasters. The question for many Alaskan communities should be:

Mitigation Strategy

How can the impacts to the people and the community be minimized when the next disaster strikes? Community responses to this question may take the form of any or all of the following strategies:

1. Incorporate both structural and nonstructural mitigation measures in new development.
2. Examine ways to reduce the vulnerability of existing structures.
3. Develop and conduct mitigation training with support from the Federal Emergency Management Agency (FEMA), Alaska Division of Homeland Security & Emergency Management (DHS&EM) and other governmental entities.
4. Foster cooperation among Federal, State, and local agencies to reduce or eliminate redundancy of effort or questions of jurisdiction.
5. Ensure that community integrity is maintained in the event of a disaster.

The physical impacts of hazard occurrences can be reduced in many ways including educating those who will be in harm's way, placing structures and functions away from hazards, and strengthening structures to reduce or eliminate damage when a hazard occurs. The State of Alaska must revise existing statutes and pursue processes to:

1. Expand the State's existing programs to develop hazard maps in and near urban areas at scales appropriate for land-use planning. Types of maps needed include: active faults, earthquake soil class or site amplification, liquefaction susceptibility, landslide hazard, coastal and riverbank erosion, snow avalanche hazard, floodplains, and tsunami inundation areas. Identifying, mapping, and evaluating hazards are crucial when developing hazard mitigation strategies.
2. Protect critical facilities including schools and hospitals. New structures should be located away from high hazard areas and existing structures surveyed to determine if the structures are disaster resistant. Require facilities, and infrastructures constructed with public funds, be built to minimize impacts from natural or human caused disasters. Where appropriate develop and apply hazard specific building codes and standards.
3. Protect cultural facilities and historic sites. Identify and protect libraries, monuments, historic sites, and other cultural resources through local actions and the Alaska Historic Preservation Office.
4. Incorporate mitigation in new development during platting. Revise Alaska Statutes to require that development and residential subdivisions are located to withstand natural disasters. Require land-use plans addressing hazard mitigation as part of the community comprehensive plan. Retain public ownership of land in floodplains and other natural hazard areas that have a high value for recreation, fish and wildlife reserves, open space, or community use.

2.2 Mitigation Measures

A multi-objective planning process for hazard mitigation may help a community find the specific mitigation measures that will yield benefits across the widest range of goals.

Communities should develop and adopt policies with respect to hazard mitigation and risk reduction. The measures taken need to be suitable for the hazards addressed. Understanding the nature of hazards, as well as what is vulnerable is vital to developing effective mitigation measures.

Mitigation measures can be grouped into three main categories:

- Protective
- Preventive
- Educational

2.2.1 Protective

Protective measures strive to protect a structure or facility from damage during a hazard event. They might not be able to completely eliminate damage but they can minimize it.

Protective mitigation measures:

- Reduce exposure to hazards
- Facilitate restoration of facilities
- Preserve functionality of facilities

An example of a protective mitigation measure is seismically upgrading a bridge to withstand an earthquake.

Culverts

Structural/Community Protective Works: These measures control the hazard and restrict the exposed area. Examples include dams, levees, and landslide/avalanche containment structures.

The measures can be very expensive as they usually involve constructing an engineering work, require maintenance to keep their effectiveness, and have the potential to make things worse in the long run. For example, if a flood exceeds the design standard of the levee, the damages incurred may be greater than if the levee never existed in the first place.

Retrofitting or Rehabilitation: Retrofitting or rehabilitating existing structures and facilities can protect against future damage. The costs associated with these activities can be quite high and not be cost effective. In some cases, the work can be done incrementally or as part of routine maintenance.

Protection of Critical Facilities: The protection of critical facilities is important because these facilities are vital during the response and recovery phase of a disaster. Critical facilities include, but are not limited to, hospitals, schools,, transportation routes, and water treatment systems. Communities should establish policies regarding the placement and design of future facilities.

2.2.2 Preventive

Preventive mitigation measures potentially limit the exposure to hazards. For example, a preventative measure might be relocating homes away from an avalanche area. Communities have many tools available to implement preventive mitigation measures. These are the mostly commonly used tools:

Land-Use Planning: Developing comprehensive land-use plans, capitol improvement plans, or transportation plans to guide development away from hazard prone areas.

Zoning: Dividing a community into areas with defined or established development criteria for each area. It can:

- Prevent new development in hazard prone areas.
- Preserve or establish low densities in hazardous areas.
- Provide incentives to retrofit structures (density bonuses).
- Control changes in use and occupancy of existing structures in hazard prone areas.
- Establish performance standards.
- Require special use permits.

Preservation of wildlife habitat

National Flood Insurance Program (NFIP): The NFIP is a Federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance provides an insurance alternative to disaster assistance to meet the escalating costs of repairing flood damaged buildings and their contents.

Participation in the NFIP is an agreement between local communities and the Federal Government. The agreement states that if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

Subdivision Regulations: These regulations determine how a parcel of land is divided into smaller parcels. It is wise to incorporate mitigation measures into subdivision regulations before dividing a parcel of land, as this allows for a wider variety of options. Mitigation measures may require configuring lot arrangements differently or clustering housing units closer together or further apart to dramatically reduce damage or loss from a disaster.

Preservation of Open Space: Communities should try to preserve existing open space in hazard prone areas. This prevents construction in high risk areas.

Acquisition, Relocation, or Elevation: These measures are extremely effective in removing individuals from harm and reducing repetitive loss. *Land acquisition* usually requires government entities to buy the land and convert it to open space for perpetuity. *Structure relocation* moves the existing structure(s) to safer areas. *Elevating structures* above the base flood elevation (BFE) can protect them from future floods. There are special National Flood Insurance Program (NFIP) provisions and several possible funding sources for these mitigation measures.

Building Codes: A compilation of laws, regulations, ordinances, or other statutory requirements, adopted by a government legislative authority relating to the physical structure of buildings. Their purpose is to establish the minimum acceptable requirements to preserve public health, safety, and welfare as well as to protect property in the developed environment. Building codes are based on minimum requirements for the physical

properties of construction materials, natural scientific laws, the hazards of climate, geology, and use of a structure.

Building code enforcement is important to ensure that mitigation measures are implemented correctly. It is easier and cheaper to incorporate mitigation into new structures than to retrofit existing ones.

The Division of Fire Prevention reviews and adopts building codes every three years. The Division makes necessary changes to tailor the code to Alaska's conditions. Building codes are enforced by the Division of Fire Prevention and apply to all new construction, repair, remodel, addition, or change of occupancy of any building/structure or installation or change of fuel tanks, except for residential housing that is a triplex or smaller. Some jurisdictions, namely Anchorage, Juneau, Fairbanks, Kenai, Seward, Kodiak, Sitka, and Soldotna have the ability to adopt and enforce their own building codes provided they are at least as restrictive as the State adopted code.

Capital Improvement Programs (CIP): Programs that guide community funding for physical improvements over a given time period. Funding allocation can affect what is at risk. For example, the CIP can allocate funds to replace or strengthen vulnerable or critical facilities such as hospitals. The community can restrict future development, or choose not to invest, in hazard prone areas.

2.2.3 Education

Educating people about hazards and what can be done to protect themselves and their property is an important component to any mitigation strategy.

Outreach: The process of educating people about mitigation, hazard prevention, and protection. Examples include but are not limited to:

- Community meetings
- School activities and presentations
- "Quake Cottage" earthquake simulations
- Earthquake Resistant Model Home Demonstrations
- Inserts into utility bills
- Ads in the media
- Workplace training
- Booths at fairs and home shows
- Brochure and pamphlet distribution

The "Quake Cottage" at the Kodiak Crab Festival

Technical Assistance: There are several programs at various agencies available to assist communities with hazard mitigation activities. These programs provide help to local communities lacking the capability to undertake risk assessments, cost-benefit analysis, etc. For example, FEMA publishes technical documentation about hazard resistant construction practices. Another program is the Department of Commerce, Community and Economic Development's (DCCED) Division of Community & Business Development's (DCBD) Floodplain Management Program. Its mission is to reduce public and private

sector losses and damage from flooding and erosion by providing coordination, funding, and technical assistance to NFIP communities. The DCBD serves as the Governor's appointed State coordinating agency for the NFIP and the Flood Mitigation Assistance Program (FMA). FEMA regulates both programs.

Disclosure Requirements: These requirements inform people of possible hazard exposure before they purchase a piece of property. This enables purchasers to make informed, rational decisions based on known risks associated with the property.

3.0 PLANNING, MONITORING, & MAINTENANCE

3.1 State Coordination

Hazard mitigation activities in Alaska are coordinated at the State, local, tribal, and Federal levels. All levels of government need to be working toward a common goal to maximize the benefits of hazard risk mitigation.

The State All-Hazard Risk Mitigation Plan and all related documents will become part of the statewide system that includes the Alaska Emergency Response Plan, Standard Operating Procedures for the State Emergency Coordination Center (SECC), and the Department of Homeland Security and Emergency Management's (DHS&EM) Strategic Plan's Critical Facility and Vulnerability Analysis and the DHS&EM Buffer Zone Protection Plan. The goal is to standardize emergency management activities at the State level, ensuring activities and information are coordinated and efficient providing standardized support for communities.

Hazard risk mitigation projects have a significant beneficial impact on communities where disasters occur, making coordination essential among State, local, and tribal governments. This Plan outlines statewide hazard risk mitigation goals. These goals are not intended as unfunded mandates. Individual communities should decide for themselves, with assistance from State, Federal, local, and tribal governments and other agencies, what mitigation measures are most appropriate. Local circumstances determine the most beneficial risk mitigation measures. Developing a local Hazard Mitigation Plan (LHMP) enables each community to clearly state and quantify their mitigation goals and identify tools they can use to achieve those goals for State and local planning. Land-use planning, zoning ordinances, and capital improvement projects are good examples of the types of tools available. Local mitigation planning enables communities to address any concerns or identify competing interests when projects are being considered by other organizations, including State agencies. The local plan update is an opportunity for communities to assess where additional attention is addressed due to new or changing hazard identifications. The State will continue to assist communities with funding (when available) and technical assistance for updating plans. (See Appendix 15)

State and Federal assistance programs may be available for mitigation efforts acknowledging that communities have limited resources. The Federal share of FEMA approved HMGP or PDM projects are between 75% and 90% of project costs. The State, local, or tribal government or other qualified applicant must fund the remaining 10% to 25%. This is negotiable and is addressed within each program's Grant Agreement. Historically the State of Alaska has absorbed the applicant's share requirement. For examples, during two previous Presidential declared disasters, the State of Alaska absorbed over 7.3 million dollars of non-federal share. In many other states the local government covers these costs. Other cost-sharing programs are also available. Appendix 5 and 6 documents many of the available funding sources. Complete local control is not always possible, as local communities must meet program specific criteria to qualify for assistance programs. Alaska's Home Rule Statutes dictate the levels of governmental responsibility.

3.2 People Involved in Planning

3.2.1 State Hazard Mitigation Officer (SHMO)

The State Hazard Mitigation Officer (SHMO) implements and manages the State's mitigation program activities, including the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation Grant Program (PDM), The State All-Hazard Risk Mitigation Plan, The Tsunami and Earthquake Mitigation Programs, and other all-hazard risk mitigation activities.

The SHMO provides mitigation expertise, guidance, advice, and assistance to State, Federal, local and tribal governmental agencies, and the private sector. The SHMO implements mitigation activities by helping lead agencies identify, coordinate, and obtain technical and financial resources. Additionally, the SHMO establishes requirements, determines entitlements for several grant programs, and manages progress and financial reports for program activities and planning efforts.

3.2.2 State Hazard Mitigation Advisory Committee (SHMAC)

The State Hazard Mitigation Advisory Committee (SHMAC) assists with developing the State All-Hazard Risk Mitigation Plan (SHRMP) and is consulted concerning mitigation activities. The committee, chaired by the State Hazard Mitigation Officer, provides ideas and information through its 50 geographically separated members representing State, local, tribal, and Federal agencies, businesses and organizations throughout the public and private sector.

The SHMAC includes Subject Matter Experts (SME) for their agencies, event types, and/or locations and is a vital statewide partnership. Each committee member has delegated authority for making policy decisions for their agency, or has ready access to the appropriate authority. Appendix 11 contains an updated membership and organization list. Their input and participation is essential for providing advice concerning community "experiences," developing State and local hazard risk mitigation plan elements and strategies, and selecting proposed mitigation projects. The State is committed to reviewing the SHMAC membership to ensure coordination among agencies during the planning and grant program project prioritization process. The SHMAC members bring a wealth of knowledge to the revision process that is invaluable.

3.2.3 Purpose of the SHMAC

The SHMAC is directly involved with all phases of the State All-Hazard Risk Mitigation Plan and other State-level mitigation activities. However, the SHMAC does not review local Hazard Mitigation Plans.

The SHMO relies heavily on technology for conducting business; primarily teleconferencing and internet technology for the majority of the SHMAC information coordination process. Technology efficiently allows SHMAC members easy access to all materials before, during, and after a meeting, which encourages program participation.

The Division of Homeland Security & Emergency Management (DHS&EM) receives all initial mitigation project applications received as a result of a presidentially declared disaster. DHS&EM identifies SHMAC member agencies to review and prioritize these potential projects in accordance with the SHRMP's goals.

Potential project applications include a narrative that describes the project's life-cycle cost, the value of the property it will protect, documented damage that has occurred in past disaster events, an estimate of damage, and associated information showing the project would prevent future damage or loss over its useful life and a complete benefit/cost analysis (BCA). A benefit-cost worksheet must be complete that shows total project costs, project life (in years), effectiveness of the project, repair costs to pre-disaster conditions, annual maintenance costs, total of all past disaster related costs, displacement costs, and frequency of occurrence of the recent disaster event. Currently the State is reviewing all BCA's for accuracy and completing many as a time saving service to the applicant. A sample of a BCA and instructions for completing a BCA are located in Appendix 31.

The BCA, the applicant's past involvement and success with projects, reporting, and the life safety aspect of potential projects are considerations during the project evaluation and prioritizing process. Other criteria considered in the evaluation are risk level and, repetitive loss.

A summary of project proposals, spreadsheets, and other pertinent information is distributed via e-mail for review prior to a scheduled teleconference. The teleconference is organized to confer, make decisions, and formalize recommendations for the Governor's Disaster Policy Cabinet (DPC). Each member evaluates the proposed projects and provides feedback to include their experience with the submitting communities or agencies. Member feedback is invaluable during the project selection process.

Based on the committee's prioritized recommendations, the SHMO will make final adjustments and present the SHMAC's prioritized recommendations to the DPC for further guidance.

The SHMO contacts applicant of DPC approved projects and forwards the completed applications to FEMA Region X for content review, environmental review, and funding.

The prioritization process can be challenging. Having a number of important potential projects makes prioritization a justification tool. Gathering needed information for the review process is essential to the overall outcome of the funding decision. The compiled information can be subjective which leads to the SHMAC's role being an important part of the overall process. It would be easy to make the decision to fund projects with the best BCA, however, the additional criteria make for successful projects that otherwise may be overlooked.

3.3 Governor's Disaster Policy Cabinet (DPC)

The DPC was originally described in the State Emergency Operations Plan on May 6, 1994 and activated September 20, 1995. Its mission – to provide recommendations to the Governor for the following:

- Policy direction on response and recovery operations, which are coordinated and/or implemented by the State's emergency management system.
- Ensure cooperation and coordination among State departments and agencies involved in the State's emergency response and recovery efforts.

- Issues related to ongoing State operations, which might be impacted by activating the State's emergency management system.
- Policy guidance related to potential requests for a State or Presidential Disaster Declaration.
- Considering HMGP project priority recommendations from the SHMAC and providing a final approval.

The members of the DPC are the commissioners of the following departments, or as stated:

- Military and Veterans Affairs (chair)
- Environmental Conservation
- Natural Resources
- Public Safety
- Transportation and Public Facilities
- Administration
- Community and Economic Development
- Health and Social Services
- Law
- Director, Office of Management and Budget
- Representative, Governor's Office

Other departments or agencies participate as required based on the nature of the disaster emergency.

3.4 Monitoring Mitigation Measures and Project Closeouts

The process includes tracking action items identified in both the State All-Hazard Risk Mitigation Plan and local All-Hazard Mitigation Plans. The SHMO is responsible for monitoring identified SHRMP project implementation and reviewing local government progress of FEMA funded activities. The Department of Commerce, Community and Economic Development (DCCED) manages the Flood Mitigation Assistance program.

Alaska Division of Homeland Security & Emergency Management (DHS&EM) is responsible for day-to-day project implementation, monitoring, and mitigation project closeout as the grantee for FEMA mitigation project funding. This is a required activity for FEMA funded HMGP and PDM Grant programs. The HMGP Administrative Plan describes this process in detail and is updated yearly or reviewed and updated as required during every presidentially declared disaster event. Two important changes in the 2007 HMGP Administrative Plan are: *1*. the ability for DHS&EM to place special conditions or restrictions on grants to "high risk" sub grantees, as defined in 44 CFR §13.12 and; *2*. the clarification of the quarterly reporting process and consequences if a jurisdiction does not comply with the reporting process. The 2007 updated Administrative Plan is located in appendix 33. The two grant programs require

submitting quarterly reports to DHS&EM that document project and financial progress in implementing mitigation projects and confirming their completion. DHS&EM is responsible for developing and submitting project grant closeout reports to FEMA. The Division will:

- Examine progress concerning the State Plan's Mitigation Strategy and goals within agency appendices.
- Identify implementation problems (technical, political, legal, and financial) and, as appropriate, develop recommendations and strategies to overcome them.

Outside of the traditional FEMA mitigation grant programs, State and local governments identify and periodically implement mitigation measures using local capabilities, good business practices, and resources. This includes the developing and adopting local ordinances and regulations that include a hazard mitigation component, mitigation codes and standards as part of ongoing transportation and public works programs, and hazard-related components to local comprehensive land-use plans. Mitigation projects are planned, funded, and implemented with great success due to the internal monitoring in place to comply with 44 CFR §201.4(c)(3)(iii). Occasionally a grant will be terminated due to the applicant not complying with the Division's grant agreement or grant program's guidelines. This rarely occurs due to the State's monitoring activities. While it may not be possible to track and report on every mitigation accomplishment in State and local mitigation plans, communities will see the positive cumulative impacts of these efforts in reduced disaster losses. The State encourages the seamless integration of mitigation activities into the day-to-day operations of State and local government programs.

3.5 State & Local Hazard Mitigation Planning

The State All-Hazard Risk Mitigation Plan is implemented through State and Federal agencies and adds impetus for developing local Hazard Mitigation Plans. Hazard mitigation planning is essential at the local and tribal level. Without community support, the success of any mitigation program is limited. Many mitigation measures can only be implemented at the local level. Measures include, but are not limited to, controlling and regulating development and policies regarding infrastructure provisions and standards. Although the State has little regulatory authority to impose these regulations they are encouraged and become a condition for grant funding when applicable. It is vital to tailor mitigation priorities and measures to meet local conditions. What works in one community might be unsuitable or impractical for another community. One issue that needed attention was how unincorporated communities within the State's Unorganized Borough, such as Tok or Hyder, can adopt, implement, and enforce a hazard mitigation program. The State has received approval from FEMA HQ allowing those communities to use the State All-Hazard Risk Mitigation Plan as a qualifying document when applying for federal mitigation grant program funding. These qualifying communities are required to work with the State to develop a community specific hazard description, and work toward developing community specific risk assessment and vulnerability analysis.

The Disaster Mitigation Act of 2000 (DMA 2000) required State, local, and tribal governments to have a community adopted and FEMA approved All-Hazard Mitigation

Plan by November 1, 2004 to be eligible for any mitigation programs after that date. FEMA has emphasized the State plan is required to qualify for ***any*** disaster assistance or Pre-disaster Mitigation Program funding, including Public and Individual Assistance Programs associated with future disasters. The State is further required to update the plan every three years. Failing to meet these requirements restricts the State's disaster assistance eligibility to receiving only emergency disaster assistance and funding.

The FEMA Region X Director may grant an exception to the local plan requirement in extraordinary circumstances.

44 CFR §201.6 states that local/tribal governments ***must*** have a community adopted, FEMA approved All-Hazard Mitigation Plan by November 1, 2004 to be eligible to participate in the any of FEMA's Mitigation Grant Programs. Lack of plan development, funding, and other extenuating circumstances may hamper a community's ability to develop an all-hazard mitigation plan. Consequently, the community would not be able to participate in any of FEMA's mitigation grant programs. Under §201.6(a)(3) if a disaster were to occur, the FEMA Region X Director may grant "an exception to the plan requirement in extraordinary circumstances, such as in a small and impoverished community when justification is provided," to enable the community to apply for HMGP disaster funding with a stipulation that a community adopted, and FEMA approved, plan is completed within 12 months of the award of the project grant. If the community fails to complete the plan as stipulated, FEMA would then terminate the grant and no reimbursement will be issued for costs incurred after the notice of termination was issued by FEMA.

A small and impoverished community is a community of 3,000 or fewer residents; identified by the State as a rural community; and is not a remote area within the corporate boundaries of a larger city; is economically disadvantaged due to an average per capita annual income not exceeding 80 percent of national per capita income; the local unemployment rate exceeds the most recently reported average yearly national unemployment rate by one percentage point or more; and any other factors identified in the State Plan where the community is located. Please see the 2000 census based information and a listing of the 201 Alaska communities meeting these criteria. *Located in Appendix 9*.

FEMA gives tribal governments the opportunity to fulfill the requirements of §322 as either a grantee (directly through FEMA as a sovereign nation) or sub grantee (through the State's application process). The tribal government as a grantee must meet State level responsibilities; to include developing a State level all-hazard risk mitigation plan and pay the non-Federal share for any funded projects. Tribal governments may apply as sub-grantees through the State, and meet the same local government or sub grantee responsibilities as non-tribal communities.

Multi-jurisdiction plans may be acceptable provided each participant has taken part in the planning process and has officially adopted the plan. FEMA does not allow adoption of the State plan as a multi-jurisdiction plan except as noted above for the unorganized Borough.

Some of the criteria for local and tribal plans, as contained in the implementation guidance for DMA 2000 are:

- Documentation of the planning process.
- A Risk Analysis which includes:
    - A description of previous hazard events.
    - A description of the type, location, and extent of all hazards that can affect the jurisdiction.
    - A description of the jurisdiction's vulnerability to hazards.
- A mitigation strategy.
- A plan maintenance strategy.
- Formal adoption by the governing body of the jurisdiction.

The State is also required to coordinate local mitigation plans with the State plan.

Many communities may need assistance in developing hazard mitigation plans. DMA 2000 authorizes up to 7% of available HMGP funds for developing State, local, or tribal government mitigation plans. Additionally, planning activities may also fall under the HMGP's 5% discretionary project category. Communities and local jurisdictions with the highest risks, repetitive disasters, intense development pressures, demonstrated cooperation in completing initiatives, and participation in the mitigation process are more likely to receive planning project grants.

Multi-jurisdictional utility private non-profit (PNP) entities, including Rural Electric Cooperatives (RECs), which sometimes span several counties, are eligible sub-applicants for assistance under the HMGP. Their infrastructure often sustains damage from severe snow and ice storms, and they frequently seek HMGP funding after disaster declarations from these storms to mitigate future similar losses.

RECs are treated as PNPs for the purposes of disaster assistance provided by FEMA under the Stafford Act. They are not considered local governments. This distinction is important, because current regulations provide only for local governments, not PNPs, to meet the planning requirement, by submitting a local mitigation plan (LMP) and having it approved by FEMA.

For PNPs such as RECs or other multi-jurisdictional utilities, FEMA is identifying two ways in which RECs may meet the mitigation planning requirement of Section 322 of the Stafford Act, as implemented at 44 C.F.R. Part 201, to ensure that projects funded by the HMGP are consistent with the mitigation strategies of the State, tribal, and/or local jurisdiction in which the project is located.

(1) <u>The local jurisdiction(s) within which the REC mitigation project is located have FEMA approved LMPs.</u>

As FEMA has previously established (through FAQs) addressing PNPs and the mitigation plan requirement for HMGP project grants, FEMA strongly encourages PNPs in general, especially those that may be eligible sub-applicants for mitigation

projects, such as RECs, to participate in the development of local mitigation plans.

In order for a REC project application to be approved, the following conditions must be met:

1. Each jurisdiction in which the project is located must have an approved plan, and
2. The project must be consistent with the plan's goals and objectives.

Therefore, RECs applying for HMGP funds for a project located within jurisdictions that have a FEMA-approved mitigation plan must provide written documentation that the project is consistent with the goals and objectives of the plans of the jurisdiction(s) in which the project is located.

(2) The FEMA approved State Mitigation Plan addresses RECs.

FEMA acknowledges the critical function of multi-jurisdictional RECs, and the impact of the loss of that function on States and on communities within a State. (Other multi-jurisdictional utility PNPs may or may not be classified as critical by a State). Thus, the State may prepare an annex to its SMP specific to RECs and/or other multi-jurisdictional utilities that provide a critical function. This will enable these entities to be eligible sub-applicants for HMGP project funds if the project area is not addressed by approved LMPs. The RECs and similar entities must participate with the State in the development of this annex, specifically in the identification of hazards potentially affecting their infrastructure, assessment of the vulnerabilities of the infrastructure to these hazards and identification of mitigation measures to reduce these vulnerabilities. The level of detail of the risk assessment and mitigation strategy of the annex must follow the requirements for local plans (§201.6(c)(2) and (3)), rather than the requirements for Standard State plans, in order to provide site-specific information. Coordination with local jurisdictions within which REC infrastructure is located must be documented in the annex, whether or not they have FEMA approved LMPs. Coordination with these jurisdictions will help ensure that the mitigation measures identified in the plan will be acceptable, and not in conflict with development or other plans of these jurisdictions. The Annex must be approved by the State and FEMA, and the REC must participate in future updates of the Plan with respect to the Annex.

The State of Alaska is committed to supporting local efforts in several ways including funding, technical support, and training. The Pre-Disaster Mitigation Grant Program (PDM), the Hazard Mitigation Grant Program (HMGP), NFIP, and State Flood Mitigation Assistance Program provide funding (when available) see Appendix 15. A listing of additional funding sources is located in Appendix 5 and 6. Mitigation personnel provide technical support through a number of collaborative tools: a local Hazard Mitigation Plan template; the State All-Hazard Risk Mitigation Plan is downloadable from the internet or available on CD and the State purchased V-Risk's MitigationPlan.com®, an interactive internet tool, to assist communities with their mitigation planning efforts. This tool is available and will provide an interface for on-line data input with the capability for integrating LHMP's with the SHRMP. Additionally, DHS&EM staff and the DCCED/DCA Floodplain Manager provide Mitigation Plan development training to local communities.

This interaction enhances a coordinated local and State planning effort. The State can provide a list of resources to communities needing assistance finding a contractor to provide expertise with the completion of the LHMP. The SHMO reviews all information contained in LHMP's for developing the State's mitigation strategy, goals, and objectives.

44 CFR §201 (c)(4)(ii) requires local hazard mitigation plans to be coordinated with other plans, business practices, and governmental operations. Local communities should incorporate mitigation concepts and goals into their community plans: comprehensive plan, transportation plan, and capital improvement program, and any other plans to ensure a comprehensive planning approach. Mitigation requires a refined decision process for a long-term commitment toward disaster loss reduction.

3.6 Local Plan Approval Process

A draft local All-Hazard Mitigation Plan is submitted to the State for review by the State mitigation staff, using FEMA's evaluation sheet developed from the DMA 2000 legislation. The SHMO will review and approve the local and tribal All-Hazard Mitigation Plans then submit them to FEMA Region X for review and comment. When FEMA determines the local or tribal plans meet minimum criteria it will be returned to the State, the SHMO will then contact the community to request the community complete the formal adoption process. After the community formally adopts their plan, the SHMO will forward it to FEMA Region X for final approval. DHS&EM uses local mitigation plan information to enhance the State plan. DHS&EM will incorporate newly approved local mitigation plans into the State plan periodically, as described in the State planning process flowchart. The jurisdictions will be encouraged to make changes to reflect the local priorities for future mitigation efforts as future disasters effect local changes in vulnerability. The present goal is to assist and encourage communities with understanding the benefit to completing a local All-Hazard Mitigation Plan. Currently twenty (20) communities have approved local All-Hazard Mitigation Plans and an additional twenty-six (26) are working toward completion. The communities are identified in Appendix 20. *See the local Jurisdiction All-Hazard Planning Process Flow Chart.*

3.7 State Plan Development & Maintenance

The State Hazard Mitigation Plan originated as a Robert T. Stafford Act, §409 Plan which was completed and promulgated on August 6, 2002. The Mitigation staff continued to develop the SHMP to fulfill DMA 2000, §322 requirements as described in the "Process of the SHMAC" section, and depicted on the Alaska State All-Hazard Risk Mitigation Plan Planning Process Flow Chart.

The State is committed to maintaining and using the SHRMP as a living document. The State supports 44 CFR §201.4 (c)(7), and assures compliance with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding. The Plan's development included, agency capability assessment questionnaires, comment opportunities from the public via the web site, and through community outreach activities during the development stage. The SHMAC had monthly meetings (some months varied due to scheduling difficulties) subsequently posting the

plan and meeting minutes on the DHS&EM website. A list of public participation events and SHMAC meetings are located in appendix 10. The SHMAC, DHS&EM Managers, and the Commissioner of the Department of Military and Veterans Affairs review the plan prior to submission to the Governor for promulgation.

The plan maintenance process involves three steps, *monitoring, evaluating,* and *updating*. *Monitoring* is a continual process ensuring that mitigation activities coincide with SHRMP goals and objectives. The SHMAC monitors the Plan; via e-mail, teleconference, video teleconference (VTC), or meetings, and activities outlined in "Process of the SHMAC" section. The State of Alaska is two and one half times the size of Texas, so electronic communication methods are used most frequently due to the geographical dispersion of the SHMAC membership throughout the State. The SHMO *evaluates* the Plan to determine the current applicability and viability of the information. *Updating* is the process of making the appropriate changes, ensuring public involvement, and following the regulatory processes for formalization through the Governor and FEMA.

The DHS&EM is tracking all tasks in a grant funding and responsibilities living document. This tool is used by all mitigation staff for quick reference to project status. See Appendix 25 for more details.

The State Hazard Mitigation Officer, with assistance from the SHMAC, is responsible for monitoring, evaluating, and updating the State All-Hazard Risk Mitigation Plan in accordance with 44 CFR §201.4(c)(5)(i). The SHMO will monitor the Plan continually, evaluate the Plan yearly, and update the Plan every three years, or within 90 days of a Presidential Declared Disaster (*if required)*, or as necessary to reflect changes in State or Federal law *(refer to Update Cycle Chart and Alaska State All-Hazard Mitigation Plan Planning Flow Chart).* The State All-Hazard Risk Mitigation Plan Annual Progress Report and State All-Hazard Risk Mitigation Plan Annual Evaluation Form, located in Appendix 18, are used for the evaluation. This Annual Progress Report is a helpful tool in the evaluation process and will continue to be used for evaluation in the next three years. The revision process is an opportunity for the State to assess the changes in hazard identification and jurisdictional growth. This method of gathering information has proven to be a benefit to the State revision process. The largest change element is seen with the additional mitigation staff working on-going with the SHRMP. Additionally the staff member will be a benefit to local communities who are completing and updating LHMP for State and FEMA approval. The SHMO will document evaluation findings, record the actions in a report, submit to DHS&EM Managers for review and approval. The SHMO determines when significant changes warrant an update prior to the scheduled date. Early updates will not restart the clock for the update cycle. The SHMAC is a vital partner during all phases of the Planning process.

Update Cycle Chart

Monitor	**Evaluate**	**Update**
Continuous	*By October 2008/yearly* *Or as the SHMO deems necessary* *Or to comply with a change in State or Federal law*	*By October 2010/Every three years* *Or within 90 days of a Presidential Declared Disaster* ***if required*** *Or as the SHMO deems necessary* *Or to comply with a change in State or Federal law*

3.7.1 Planning Process

DMA 2000 Plan Development: Previous drafts of the Alaska State Hazard Mitigation Plan were reviewed and reworked into the new format. Additionally, documents from FEMA and other sources provided guidance about desired plan contents. This process served to identify what components of the plan already existed and what needed to be developed.

Staff drafted subsections for the hazards representing the greatest threat (flood, wildfire, snow avalanche, volcano, earthquakes and tsunami & seiches) lists of appendices developed and drafts reviewed within DHS&EM and FEMA Region 10 Mitigation staff. The review process further necessitated creating the State Hazard Mitigation Advisory Committee (SHMAC) (See Appendix 11). Committee members were selected to represent their State, local, tribal, federal agencies, local businesses, and other organizations that influence mitigation efforts within the State. Committee members reviewed drafts of the plan, provided feedback and solicited support within their organizations.

SHMAC membership developed various plan subsections, provided guidance regarding implementing the State Hazard Mitigation Plan (SHMP), as well as identifying and prioritizing potential mitigation projects. The Committee is continually consulted concerning HMGP project prioritization and Plan review requirements.

3.7.2 Update Procedure Accomplishments Revision 2007

The DHS&EM mitigation team reviewed the 2004 SHMP in its entirety and evaluated required changes identified in FEMA's November 2006 Standard Plan Update Guidance document. The 2007 review crosswalk was incorporated into the tools used for completing the revision along with a scope of work. The SHMO and staff developed and set-in-motion a manageable timeline for completing the update.

The State Hazard Mitigation Advisory Committee (SHMAC) list was updated and a letter requesting or confirming participation sent to all SHMAC members. Please refer to Appendix 10 for additional information. Available members participated in the

teleconferences for the 2007 plan revision. The agency members reviewed and updated their 2004 hazard sections and appendices. The members reviewed and defined their accomplishment toward completing their 2004 goals and objectives. Additional SHMAC evaluation is gathered from email and phones calls. (See Appendix 11)

The name of the State mitigation plan has officially changed to the "Alaska State All-Hazard *Risk* Mitigation Plan" (SHRMP) reflecting the intent of the Plan. The idea of mitigation is to reduce the "risk" to people and infrastructure and to make the hazard less harsh or hostile. Therefore including "Risk" within the title defines the intent to reduce the risk, not to reduce the natural processes that create a risk to the State.

In Section 1.3.1 State Assurances are added to satisfy the 44 CFR §201.4 (c) (7) as a stand alone section. This makes the perquisite for adoption clear and concise.

Section two has no revisions needed as the information is accurate and complete.

Section three is really the living part of the plan as it will be continually changing. The planning process is in the body of the section from its previous location as appendices 10. Moving this into its own section will satisfy 44CFR 201.4 (b). Additionally the plan revision has a section that will document all update procedural accomplishments. Therefore all current and future revisions and updated information will be easily identified within this section.

All LHMP's were reviewed so the revision of the State plan is consistent with local jurisdiction goal and objectives.

The hazard analysis section is updated with current State facilities information and previous occurrences for all hazards. The hazard and vulnerability matrix and the previous occurrences of hazards matrix are updated to represent the borough and REAA areas within the State from the previous categorization of borough and census area. The planning team made a decision for the 2007 review to align area references to the standard that is used when declaring a disaster to create consistency.

Additionally Section 4.02 and 4.03 is the vulnerability analysis and risk assessment sections in the SHRMP. The State is concerned with the population growth and the vulnerability that it creates in jurisdictions. The State is committed to helping local and tribal jurisdictions complete hazard plans for FEMA approval. The State recognizes the potential risk involved and is actively participating with communities to maximize the efforts put forward to limit loss in all jurisdictions.

The remaining sections are divided into specific hazards identified in the State of Alaska. SHMAC participation is a great benefit to revising the hazards present in the State. The individual goals are reviewed and updated for completion and accuracy with the State and local potential risks. Newly identified information on all hazards is in the 2007 revision of the SHRMP. An updated VRisk analysis with the existing programs and strategies are completed and placed in this revision.

Appendices were revised to reflect relevance to specific sections and support documents. Each appendix is accurate and relevant dates added to show the current year for revision verification.

3.8 Goal Development

The SHMAC will participate in developing the Hazard Mitigation Goals. These goals will align with the mitigation measures as Prevention, Protection, or Education. They will also reflect the priorities of Life/Safety (High), Planning/Education (Medium) and other good mitigation (Low). Each goal will be in the following format:

1. Description of Mitigation Goal:
Mitigation Measure:
1.1. Objective:
1.1.1 Action:
Lead:
Support:
Timeline:

The format shows, the mitigation goal, mitigation measure sited, lead agency or agencies, support agencies, and timelines for progress. Following the goal will be objectives that list the reason(s) for meeting the goal, and finally, action items or tasks that accomplish each goal and objective. One mitigation goal may have many objectives and respective actions. The goals, objectives, and actions, were updated during the plan update cycle with impute from the SHMAC, mitigation staff and interested parties.

Specific 2004 goals which are completed are noted within the goal action. Several completed or accomplished goals are placed as current success stories within the hazard section. The goals which have longer time estimates are considered by the State and the SHMAC to be accurate and will continue to be accomplished in the next three years. A small number of goals determined to be off track, inaccurate, or unobtainable by the lead and support agencies for the coming years are either stated or removed within the goal action.

3.9 Local Plan Maintenance

Local All-Hazard Mitigation Plan maintenance is the responsibility of the point of contact for each Community's plan. Communities with approved LHMP's will provide a letter documenting they reviewed their LHMP to the SHMO within 30 days of the anniversary date of their Plan's approval by FEMA. Communities will use the process described under Section 2, "local Plan Approval Process" for comprehensive updates to their plans.

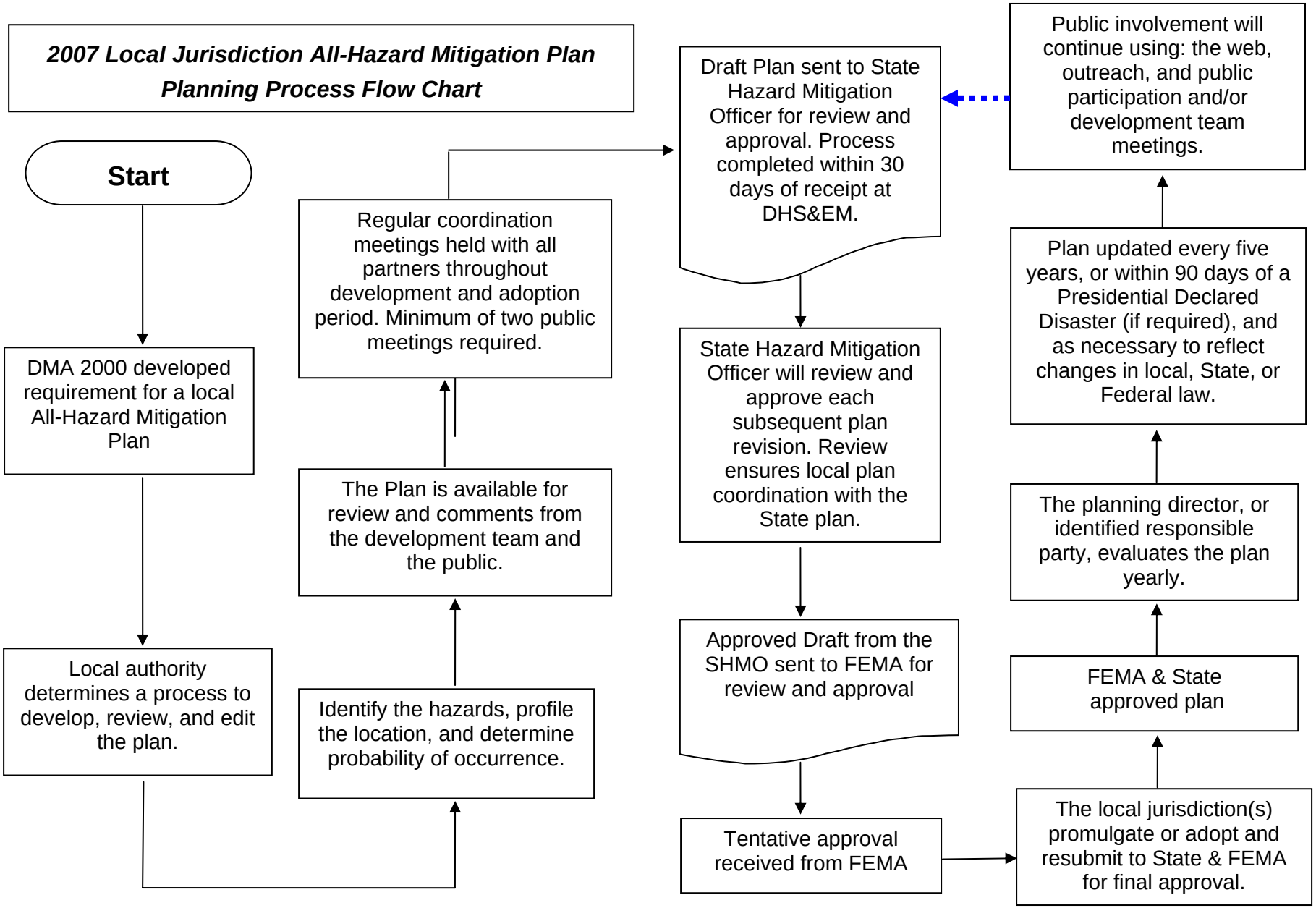
3.10 Local Plan Integration into the State Plan

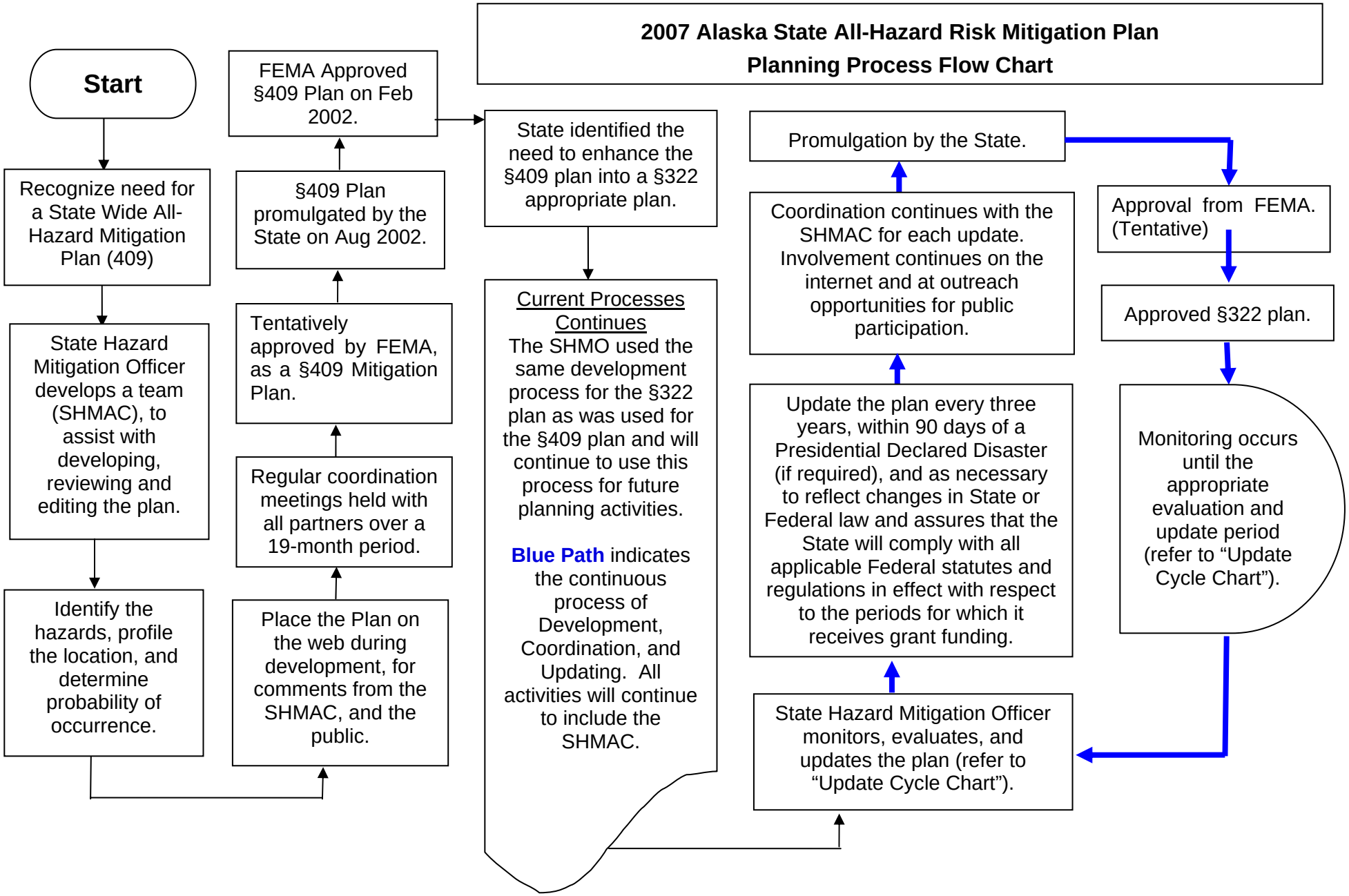
In Section 1.1's population graph, Anchorage, Fairbanks North Star Borough, Juneau, Kenai Peninsula Borough and Matanuska-Susitna Borough comprise 80% of the population of the State of Alaska inhabiting only 20% of the land area. Three of these boroughs and seventeen (17) communities have completed local All-Hazard Mitigation Plans (LHMP). Currently there are twenty-six (26) communities developing LHMPs. The local strategies and goals will be reviewed and incorporated into the State plan after analyzing the effectiveness of their mitigation proposals. The State will work with the communities with approved and adopted LHMPs to select the most worthwhile projects that are sustainable and cost effective. These projects are listed in Appendix 16. This

process provides a method for incorporating local plan information into the State plan providing local jurisdictions assistance in helping local communities implement effective mitigation initiatives.

FEMA Headquarters has granted permission for the Unincorporated Communities or Villages located within the State's Unorganized Borough to use the State All-Hazard Risk Mitigation Plan as the basis for their local Mitigation Plans. The State will assist these communities with compiling all community specific components of a typical local Hazard Mitigation Plan. These activities will fulfill the intent of the local planning requirement under DMA 2000.

LHMPs are incorporated into the State plan after they are adopted by the local community and approved by the State and FEMA. Their plans may provide a detailed analysis of the potential loss to their jurisdictions. At this time FEMA has no requirement for local jurisdictions to estimate the potential dollar losses to vulnerable structures or to identify the types and number of infrastructure or critical facilities. The State will provide an overview analysis of losses to vulnerable population and structures in the next revision or when they become widely available. A short summary of local capabilities, policies, and goals will be located in Section 5.0. This information is based on the most current information available. For detailed information, please refer to appendix 20.


2007 Local Jurisdiction All-Hazard Mitigation Plan
Planning Process Flow Chart
Start
DMA 2000 developed requirement for a local All-Hazard Mitigation Plan
Local authority determines a process to develop, review, and edit the plan.
Identify the hazards, profile the location, and determine probability of occurrence.
The Plan is available for review and comments from the development team and the public.
Regular coordination meetings held with all partners throughout development and adoption period. Minimum of two public meetings required.
Draft Plan sent to State Hazard Mitigation Officer for review and approval. Process completed within 30 days of receipt at DHS&EM.
State Hazard Mitigation Officer will review and approve each subsequent plan revision. Review ensures local plan coordination with the State plan.
Approved Draft from the SHMO sent to FEMA for review and approval
Tentative approval received from FEMA
The local jurisdiction(s) promulgate or adopt and resubmit to State & FEMA for final approval.
FEMA & State approved plan
The planning director, or identified responsible party, evaluates the plan yearly.
Plan updated every five years, or within 90 days of a Presidential Declared Disaster (if required), and as necessary to reflect changes in local, State, or Federal law.
Public involvement will continue using: the web, outreach, and public participation and/or development team meetings.


2007 Alaska State All-Hazard Risk Mitigation Plan
Planning Process Flow Chart
Start
Recognize need for a State Wide All-Hazard Mitigation Plan (409)
State Hazard Mitigation Officer develops a team (SHMAC), to assist with developing, reviewing and editing the plan.
Identify the hazards, profile the location, and determine probability of occurrence.
Place the Plan on the web during development, for comments from the SHMAC, and the public.
Regular coordination meetings held with all partners over a 19-month period.
Tentatively approved by FEMA, as a §409 Mitigation Plan.
§409 Plan promulgated by the State on Aug 2002.
FEMA Approved §409 Plan on Feb 2002.
State identified the need to enhance the §409 plan into a §322 appropriate plan.
Current Processes Continues
The SHMO used the same development process for the §322 plan as was used for the §409 plan and will continue to use this process for future planning activities.
Blue Path indicates the continuous process of Development, Coordination, and Updating. All activities will continue to include the SHMAC.
State Hazard Mitigation Officer monitors, evaluates, and updates the plan (refer to "Update Cycle Chart").
Update the plan every three years, within 90 days of a Presidential Declared Disaster (if required), and as necessary to reflect changes in State or Federal law and assures that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding.
Coordination continues with the SHMAC for each update. Involvement continues on the internet and at outreach opportunities for public participation.
Promulgation by the State.
Approval from FEMA. (Tentative)
Approved §322 plan.
Monitoring occurs until the appropriate evaluation and update period (refer to "Update Cycle Chart").

4.0 HAZARD ANALYSIS

The goal of mitigation is to reduce the future impacts of hazards including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on risk assessment.

Risk assessment is measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure, and people. It identifies the hazards characteristics, potential consequences, and its impact on community assets.

Hazard Analysis consists of three components: Hazard Identification, Vulnerability Analysis, and Risk Assessment. Technically, these are three distinctly different items, but the last two components, Vulnerability Analysis and Risk Assessment, are frequently interchanged incorrectly.

4.0.1 Hazards Identification

The first step in conducting a Hazard Analysis is to identify and profile hazard events and their effect on the jurisdiction. A hazard does not always affect the entire jurisdiction equally, so it is important to determine the hazard's effect on different areas. Hazard maps showing the spatial extent are invaluable; however, very few communities have this capability. Local GIS mapping will be a great benefit in identifying each jurisdiction's greatest risk locations and will greatly benefit the State's hazard analysis. The State is actively working with all agencies to acquire GIS maps and metadata as it becomes available.

The following two matrices identify the hazards found in each borough or REAA with their occurrence probability, if known. The ratings are low, moderate, or high, and indicate the number of previous occurrences. This information came from the DHS&EM information and borough Emergency Operations Plans (EOP) or Hazard and Vulnerability Analyses (HVAs). A summary of community EOPs and HVAs were used for census areas. The data for the Previous Occurrences Matrix came from the DHS&EM Disaster Cost Index. It includes data from 1978 to present. This matrix also includes large events prior to 1978, such as, the 1964 Earthquake, 1958 Lituya Bay landslide and tsunami, and the 1946 Unimak Island tsunami. For additional information on a specific event, the Disaster Cost Index is located in Appendix 6.

2007 Hazard and Vulnerability Matrix

	Flood	Wildland Fire	Earthquake	Volcano	Snow Avalanche	Tsunami & Seiche	Weather	Ground Failure	Erosion	Technological	Economic
Alaska Gateway (REAA)	Y	Y	Y	N	Y-L	N	Y	Y	Y	U	U
Aleutians East Borough	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
Aleutian Region (REAA)	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
Annette Island (REAA)		Y-L	Y	N	Y-M	Y	Y	Y	Y	Y	Y
Bristol Bay Borough	Y	N	Y	Y	Y	N	Y	N	N	Y	Y
Bering Strait (REAA)	Y	Y	Y-M	N	Y-M	N	Y-H	Y	Y	Y	Y
City & Borough of Juneau	Y-M	Y-M	Y-M	U	Y-H	Y-L	Y-H	Y-M	Y-L	Y-M	U
City & Borough of Sitka	Y	Y	Y-H	Y	Y-H	Y-H	Y	Y	Y	Y	U
City & Borough of Yakutat	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U
Chatham (REAA)	Y	Y	Y-M	N	Y-H	Y	Y	Y	Y	Y	Y
Chugach (REAA)	Y-H	Y	Y-H	U	Y	Y	Y-M	Y-L	Y	Y	Y
Copper River (REAA)	Y-M	Y	Y	Y	Y-H	N	Y-M	Y	Y	Y	U
Denali Borough	Y	Y	Y	U	Y	N	Y	Y	N	Y	U
Delta/Greely (REAA)	Y	Y	Y	U	Y-H	N	Y-H	Y	Y	Y	U
Fairbanks North Star Borough	Y-M	Y	Y	Y	Y	N	Y	N	Y	Y	U
Haines Borough	Y-M	Y-M	Y-H	Y-L	Y-H	Y-L	Y-H	Y	Y	Y-H	Y
Iditarod Area (REAA)	Y-H	Y	Y-L	N	Y-L	N	Y-H	Y	Y	Y	Y
Kashunamiut (REAA)	Y-H	Y-L	Y-M	N	N	N	Y-H	N	Y-M	Y	U
Ketchikan Gateway Borough	Y	Y-L	Y	U	Y	Y	Y	Y	N	Y	U
Kodiak Island Borough	Y-H	Y-M	Y-H	Y-H	Y-L	Y-M	Y-H	Y-H	Y-M	Y-H	Y
Kenai Peninsula Borough	Y-H	Y-M	Y-H	Y-H	Y	Y-M	Y-H	Y	Y	Y-L	Y
Kuspuk (REAA)	Y-H	Y	Y-M	N	N	N	Y-H	N	Y	Y	Y
Lower Kuskokwim (REAA)	Y-H	Y	Y-M	N	N	N	Y-H	N	Y-L	Y-M	Y
Lake & Peninsula Borough	Y-M	Y-M	Y-H	Y-H	Y	Y-M	Y-H	Y	Y	Y-H	U
Lower Yukon (REAA)	Y-H	Y-H	Y-M	N	N	N	Y-M	N	Y	Y	Y
Municipality of Anchorage	Y-M	Y	Y	Y	Y	N	Y-M	Y	N	Y	U
Matanuska-Susitna Borough	Y-H	Y-H	Y-H	Y-H	Y-M	N	Y-M	Y	Y	Y-H	Y
Northwest Arctic Borough	YY	Y	Y-M	N	N	N	Y-H	N	Y	Y	Y
North Slope Borough	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U
Pribilof Island (REAA)	Y-L	N	Y-M	N	N	Y	Y	N	Y	Y	U
Southeast Island (REAA)	Y	Y	Y-M	U	Y-H	Y	Y-M	Y	Y	Y	Y
Southwest Region (REAA)	Y	Y	Y-M	U	Y-M	Y-L	Y-H	N	Y	Y	Y-M
Yukon Flats (REAA)	Y-H	Y	Y-M	N	Y-M	N	Y	N	Y	Y	Y
Yukon-Koyukuk (REAA)	Y-H	Y	Y	N	Y-M	N	Y	U	Y	Y	Y
Yupiit (REAA)	Y-H	N	Y-M	N	N	N	Y	N	Y	Y	Y

Key:

Y: Hazard is present in jurisdiction but probability unknown

Y – L: Hazard is present with a **low** probability of occurrence within the next ten years. Event has up to 1 in 10 years chance of occurring.

Y – M: Hazard is present with a **moderate** probability of occurrence within the next three years. Event has up to 1 in 3 years chance of occurring.

Y – H: Hazard is present with a **high** probability of occurrence within the calendar year. Event has up to 1 in 1 year chance of occurring.

N: Hazard is not present

U: Unknown if the hazard occurs in the jurisdiction

Previous Occurrence of Hazards Matrix from 1978 to present

Note: Items in the Earthquake and Tsunami reflect information from the 1964 Earthquake

	Flood	Wildland Fire	Earthquake	Volcano	Snow Avalanche	Tsunami & Seiches	Weather	Ground Failure	Erosion	Technological	Economic
Alaska Gateway (REAA)	2 L	1 L	1 L							1 L	
Aleutians East Borough					1 L		2 L			2 L	1 L
Aleutian Region (REAA)							1 L	1L			
Annette Island (REAA)							2 L			1 L	1 L
Bristol Bay Borough	2 L				1 L		3 L				
Bering Strait (REAA)	1 L	3 L					17 L		1 L	3 L	2 L
City & Borough of Juneau	1 L						1 L		1 L		
City & Borough of Sitka	1 L						2 L		1 L		
City & Borough of Yakutat											
Chatham (REAA)	2 L	3 L				1 L	3 L	1 L	1 L	6 L	1 L
Chugach (REAA)	3 L				1 L		2 L	1 L			1 L
Copper River (REAA)	4 L		1 L				3 L				
Denali Borough	2 L		1 L		1 L		1 L				
Delta/Greely (REAA)	2 L	2 L	1 L								
Fairbanks North Star Borough	3 L	1 L	1 L		1 L		1 L				
Haines Borough	4 L						1 L		2 L	2 L	1 L
Iditarod Area (REAA)	5 L	2 L							1 L		
Kashunamiut (REAA)											
Ketchikan Gateway Borough										1 L	
Kodiak Island Borough	2 L				1 L		6 L	1 L		1 L	1 L
Kenai Peninsula Borough	9 L			3 L	2 L		5 L			1 L	3 L
Kuspuk (REAA)	8 L	1 L								2 L	1 L
Lower Kuskokwim (REAA)	9 L	1 L					4 L		2 L	2 L	1 L
Lake & Peninsula Borough	2 L	1 L			1 L		4 L				
Lower Yukon (REAA)	8 L	4 L					3 L		1 L	1 L	
Municipality of Anchorage	5 L		1 L	2 L	1 L		4 L				2 L
Matanuska-Susitna Borough	6 L	1 L	1 L	2 L	1 L		5 L		2 L		2 L
Northwest Arctic Borough	6 L						8 L		1 L	1 L	
North Slope Borough		2 L					3 L				
Pribilof Island (REAA)							1 L				
Southeast Island (REAA)	2 L	1 L					3 L	2 L		2 L	2 L
Southwest Region (REAA)	1 L	1 L					4 L			2 L	3 L
Yukon Flats (REAA)	6 L	2 L								2 L	1 L
Yukon-Koyukuk (REAA)	8 L		1 L				1 L				1 L
Yupiit (REAA)	1 L						1 L				
Statewide	1 L	10 L					3 L				8 L

Extent **Z** - Zero - Used for historical information. An event occurred but may not have caused damage or loss.
L - Limited – Minimal through maximum impact to part of community. Falls short of the definition for total extent.
T -Total – Impact encompasses the entire community.

Number Occurrences

4.0.2 Vulnerability Analysis

Step two is to identify the jurisdiction's vulnerability (the people and property that are likely to be affected). It includes anyone who enters the jurisdiction including employees, commuters, visitors, shoppers, transient or seasonal workers, and others. Populations with special needs such as hospitals, prisons, or areas with large non English-speaking populations also need to be considered because they can be more vulnerable to hazard events. Inventorying the jurisdiction's assets to determine the number of buildings, their value, and population or human capacity, in hazard areas can also help determine vulnerability. Identifying hazard prone critical facilities is vital because survival of these facilities is essential for response and recovery activities.

Critical facilities include:

- Essential facilities, which are necessary for the health and welfare of an area and during response to a disaster. (hospitals, schools, and police and fire stations)
- Transportation systems. (airways, highways, railways, and waterways)
- Lifeline utility systems. (water treatment plants, waste water treatment plants, power generation plants, and communication systems)
- High potential loss facilities. (dams or military installations)
- Hazardous material facilities.

Other items to identify include economic elements; areas that require special considerations; historic, cultural, and natural resource areas; and other jurisdiction-determined important facilities.

The Municipality of Anchorage made up 45 percent of the states growth, while the Matanuska-Susitna Borough experienced a 36 percent gain. The Matanuska-Susitna Borough remains the fastest growing area of the state since 1990. During the 2000 to 2006 period, it grew at an average annual rate of 4.2 percent, compared to its 4.0 percent annual growth rate during the 1990s. These increases were due to a mix of natural increase and migration.

In the more recent 2005-2006 period, Anchorage gained 4,833 people, while the Matanuska-Susitna Borough gained 3,163 people in total. Therefore Anchorage had 3,048 natural and 1,785 migrant increases compared to the Matanuska-Susitna Borough's 767 natural and 2,396 migrant increases.

The Kenai Peninsula Borough grew mainly through natural increase (2,072) as opposed to net migration (413).

In 2005-2006, only Haines Borough (35) and Ketchikan Gateway Borough (59) had slight gains in the Southeast. Departure migration was greater than natural increase in all areas of the Southeast except Haines.

These areas are only a small sample of the growth within the state. The following table shows the rank according to which area increased the most numerically per geographic area from 2005 to 2006.

Ranked by largest change per area population	Geographic Area	Population Estimates		Change, 2005 to 2006	
Number		Jul-06	Jul-05	Number	Percent
1	Matanuska-Susitna Borough	80,480	76,112	4,368	5.7
2	Anchorage Municipality	278,700	275,474	3,226	1.2
3	Kenai Peninsula Borough	52,304	51,766	538	1
4	Alaska Gateway Borough	6,773	6,488	285	4.4
5	Ketchikan Gateway Borough	13,384	13,263	121	0.9

Flood and weather hazards affect these geographical areas most often. The risk will increase throughout the jurisdictions as population and construction increases.

DEVELOPMENT IN THREE FASTEST GROWING COMMUNITIES IN AK							
New Construction	Mat-Su Borough		Mun. of Anchorage		Kenai Pen. Borough		
Building Type	2005	2006	2005	2006	2005	2006	Totals
Residential Housing/Cabins	1388	1367	NA	NA	658	959	4372
Detached Garages	151	138	NA	NA	NA	NA	289
Trailers	2	1	NA	NA	NA	NA	3
Duplexes	50	29	NA	NA	NA	NA	79
Multi Family Dwellings	42	26	NA	NA	2	8	78
Units in Multi Dwellings	137	153	NA	NA	NA	NA	290
Commercial Buildings	155	115	NA	NA	NA	146	416
House Starts <30% complete	4	137	NA	NA	54	33	228
Comm Starts <30% complete	0	2	NA	NA	NA	4	6
Well & Septic	54	53	NA	NA	417	540	1064
Total	1983	2021	NA	NA	1131	1690	6825

Source: Area Tax Assessor

4.0.3 Risk Assessment

The next step is to calculate the potential losses to determine which hazard will have the greatest impact on the jurisdiction. The Risk Assessment must be a multi-hazard approach to mitigation. Developing a composite loss map showing areas that are vulnerable to multiple hazards is essential. For example, there might be several schools exposed to one hazard, but one school may be exposed to four different hazards. Only a multi-hazard approach reveals this and helps show where to target mitigation efforts.

The State has not completed a statewide, systematic risk assessment at this time. Appendix 7 contains information about critical facilities as part of an informal risk assessment. Information from local risk assessments are incorporated as the data becomes available. The State will ensure the local risk assessments complement the State's risk assessments for action continuity during the local plan review process. The State will compare what risks are currently identified at the state level to ensure the risk is included with the LHMP. If the State is able to identify local risks that have not been addressed at the State level during evaluation and review the additional risks will be noted and added during the next revision.

It is estimated that more than 46 local and multi-jurisdiction hazard mitigation plans will be completed and approved providing adequate information to influence future Hazard Profiles providing a more systematic statewide Risk Assessment for the 2010 State All-Hazard Risk Mitigation Plan update.

The State is in the early stages of collecting GIS data for precise statewide risk identification. The State will utilize the information collected to identify the most hazard prone locations and work toward developing potential mitigation projects as GIS mapping becomes available. This will provide a focus toward decreasing statewide risk and vulnerability throughout the most hazard prone areas.

Contact the Alaska State Hazard Mitigation Officer for assistance with un-included data.

4.1 Hazards in Alaska

This section serves as an introduction to many of the hazards that can occur in Alaska. The information is supplemented by additional hazard specific data later in the plan. Additional information is also available in the State of Alaska Emergency Operations Plan.

There are more than 235 communities within Alaska comprising boroughs, cities, villages, tribal organizations, and an Indian reservation. The size and diversity of these jurisdictions are as varied as the terrain and environment of Alaska and they have varied governmental powers and authorities ranging from no organized government to home rule municipalities.

Alaska's communities, and their residents, are exposed to many different hazards as proven by several recent disaster events such as Infrastructure damage from Severe Storm disasters (2001, 2003, 2004, 2005, and 2006), avalanches caused loss of life and destroyed structures (2000), structural losses from wildland and urban fires (1995, and 2006); and transportation life line damages resulting from fall flood disasters (1995, 2003, 2006)). These disasters have high costs associated with them. This Plan is to help reduce loss to life and costs associated with future disasters.

FEMA and the City of Aniak completed Alaska's first digitized flood Map Modernization project. Anchorage's project is "in review" and expected for approval and funding as the State's second Map Modernization project community.

The Department of Transportation and Public Facilities (DOT/PF) completed a 2D model for one-half of the Talkeetna Airport which shows additional potential threat over the floodplain mapping currently in place. It is possible FEMA will combine the two information sources to make a more accurate threat assessment.

No comprehensive study to site as reference for newly completed multiple agency source information. Each agency maintains their own data archives for their specific areas of interest limiting access and knowledge of the data's existence.

Hazard cannot be treated in isolation, as there are inter-relationships between hazard agents. One hazard event frequently triggers another as secondary or even tertiary events. For example, coastal storms often trigger floods and landslides. Wildland fires can increase erosion and flooding risks. Earthquakes can trigger tsunamis, seiches or landslides. As a result, all possible consequences of a hazard need to be considered

when deciding the most appropriate mitigation actions. It is also important to consider all the hazards that could occur in an area when deciding mitigation alternatives. Some mitigation measures could worsen the effects from other hazards such as installing heavy tile roofing to reduce fire damage in a seismically active area.

4.1.1 Flood

Flooding is a natural event from which no state in this country is immune. It occurs when rain, snow, or glacial melt causes a waterway to exceed its capacity. It is a great concern in Alaska because there are more than 3,000 rivers, three million lakes with over 5% of the State (29,000 square miles) covered with glaciers. The Yukon River is almost 2,000 miles long and the third longest river in the U.S. These sources provide a multitude of opportunities for flooding.

While there are many different types of flooding, Alaska primarily experiences rainfall-runoff, snowmelt, and ice jam floods. Snowmelt flooding occurs in the spring. Rainfall-runoff flooding, the most common, usually occurs in the late summer and early fall.

Ice jam floods occur after an ice jam develops, causing water to rise upstream behind the jam. When the jam fails (releases), the stored water causes downstream flooding. Damage from ice jam floods is usually worse than from rainfall-runoff or snowmelt floods because the floods are usually higher, the water levels change more rapidly, and the ice causes physical damage. Ice jams usually develop where the channel slope decreases, gets shallower, or where constrictions occur such as at bridges, bends in the river, headwaters and reservoirs. During spring breakup, ice jams commonly dam water along big rivers. This flooding is exacerbated by snowmelt. Large floods in recent years on the Kenai, Susitna, Kuskokwim, and Yukon rivers were all caused by ice jams and snow melt.

A fourth type of flooding that is important in Alaska is a glacial outburst flood, called a jökulhlaup. They are the result of a sudden release of water from a glacier or glacially dammed lake resulting in rivers rapidly rising downstream. This can happen on many Alaskan rivers, including the Kenai River. On January 18, 1969, a glacial lake formed by the Skilak Glacier released. The Kenai River rose quickly to more than nine feet above the previous highest water level.

Sometimes, glacial outburst flooding is predictable, but not always. This is true for most types of flooding. To develop flood predictions, the National Weather Service (NWS) and DHS&EM operate a flood-forecasting network in the most populated parts of Alaska.

Predictions are also difficult for many of the smaller rivers because of the short time span between precipitation occurrence and flooding commencement. For example, in 1986 a storm front stalled over Seward, causing 18 inches of rain in 24 hours. If the storm had not stalled, it would not have been a problem.

4.1.2 Wildland Fire

Wildland fire is an important issue in Alaska because of the vast expanses of tundra and 129 million acres of forested land in the State. The abundant amount of fuel, in addition to topography and weather, all influence wildland fire behavior.

There are four different types of wildland fires:

- Wildland fire
- Urban Interface fire
- Firestorms
- Prescribed fires and prescribed natural fires

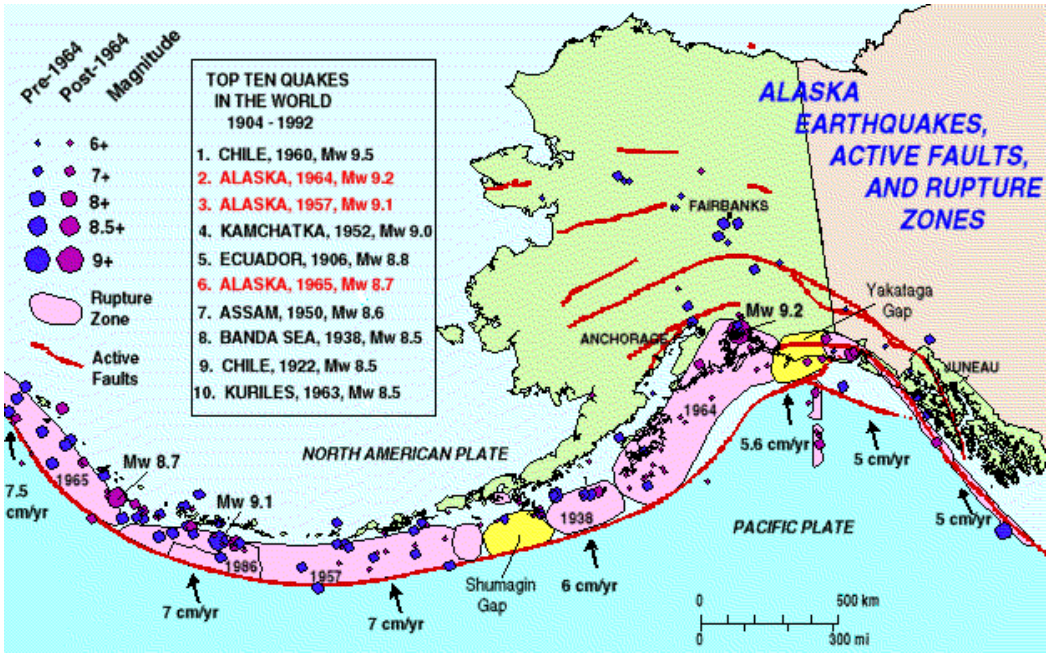
Many wildland fires do not present a threat to people or property because they are in unpopulated parts of the State. This situation is changing as more development occurs in wooded areas, placing people and property at risk.

Spruce bark beetle infested trees.

The fire risk has also increased in recent years due to the spruce bark beetle infestation. The beetles lay their eggs under the bark of the trees and the emerging larvae eat the phloem, which is what trees use to transport nutrients from their needles to their roots. If the phloem loss is significant, the tree will die. The dead trees are very dry and therefore highly flammable. This will present an even bigger problem in the coming years as the trees start to fall, littering the forest floor with flammable material.

4.1.3 Earthquakes

On Good Friday, March 27, 1964, North America's strongest recorded earthquake, with a moment magnitude of 9.2, rocked central Alaska. On a global level, three of the ten strongest earthquakes ever recorded occurred in Alaska.



Alaska earthquakes, active faults, and rupture zones. (Image courtesy of UAF/GI & USGS)

Each year Alaska has approximately 5,000 earthquakes, including 1,000 that measure above 3.5 on the Richter scale.

Alaska is vulnerable to three types of earthquakes. One type is called a subduction zone earthquake, which is caused by one crustal plate moving beneath another plate. This is the case in Southcentral Alaska and along the Aleutian Islands, the Pacific Plate dives beneath the North American plate. This type of action usually leads to the Earth's largest earthquakes, such as the Good Friday earthquake. Volcanoes are also associated with plate convergence. Good examples are the volcanoes located on the Alaska Peninsula and on the Aleutian Islands.

Another type of earthquake that is common in Alaska is the “transform fault” earthquake. These earthquakes occur when crustal plates slide by each other. This is the geologic setting offshore of Southeastern Alaska, where the North American plate and the Pacific plate slide past each other on the Fairweather-Queen Charlotte fault. This is the same type of movement as on the San Andreas Fault in California.

Earthquakes can also occur where secondary faults branch off the main boundary fault. For example, the Denali fault is a secondary fault that runs west of Douglas Island, through Haines, then curves parallel to the Alaska Highway and up past Mt. McKinley. This is the location of the world’s largest earthquake for 2002, the November 3, 2002 7.9 Denali Fault Earthquake epicentered between Mt. McKinley and Tok.

Thirdly, Alaska can experience intraplate earthquakes which occur within a tectonic plate, sometimes at great distance from the plate boundaries. They can have magnitudes into the 7s. Shallow earthquakes in the Fairbanks area would be considered intraplate earthquakes. In fact, there have been three magnitude 7 earthquakes within 50 miles of Fairbanks within the past 90 years.

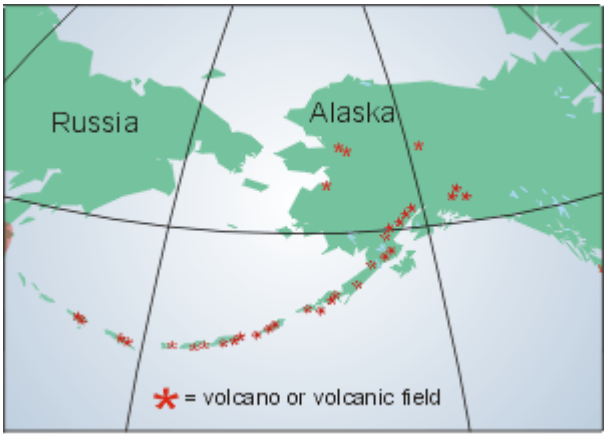
Earthquakes occur on different parts, or segments, of faults at different times. The places on major faults with the highest potential earthquake hazard are where there have not been any recent large earthquakes; these are called "seismic gaps." The Yakataga seismic gap is one place in Alaska that is considered to have a very high probability of a major earthquake in the next few decades.

Earthquakes can trigger secondary hazards including landslides, avalanches, tsunamis, uplift, subsidence, infrastructure failures and soil liquefaction.

4.1.4 Volcanoes

Alaska is home to more than 80 major volcanic centers, 41 of which have been active in the last 250 years. On average, there are one or two eruptions or reports of volcanic unrest each year. Over half of the State's population lives within 100 miles of an active volcano.

The single greatest volcanic hazard in Alaska is airborne ash, fine fragments of rock blown high into the atmosphere during explosive volcanic



Volcanoes and volcanic fields in Alaska

Volcanic eruption

eruptions. Coarse particles fall near the volcano but the fine particulates travel downwind as an eruption cloud posing a hazard to aircraft and populations even hundreds or thousands of miles away. Ash is extremely abrasive, does not dissolve in water, and is heavy and slippery when wet. Inhaling ash can be dangerous, especially for children, the elderly and those with breathing problems. Ash can also affect machinery such as cars and electrical generators. Volcanic ash nearly caused the greatest loss of life of any disaster event in Alaska. During the 1989 eruption of Mount Redoubt, a commercial airliner, with 245 passengers and crew aboard, flew into an ash cloud resulting in a loss of power to all four engines.

Lahars (volcanic mudflows), pyroclastic flows and surges, lava flows, debris avalanches, volcanic gases, and tsunami generating landslides are also potential hazards during a volcanic eruption. The severity of each of these hazards depends on the type of eruption and distance from the volcano.

The Alaska Volcano Observatory (AVO), which is a cooperative program of the U.S. Geological Survey (USGS), Alaska Division of Geological & Geophysical Surveys (DNR/DGGS), and the University of Alaska Fairbanks Geophysical Institute (UAF/GI), monitor the seismic activity at 23 of Alaska's 41 active volcanoes in real time. In addition, satellite images of all Alaskan and Russian volcanoes are analyzed daily for evidence of ash plumes and elevated surface temperatures. Russian volcanoes are also a concern to Alaska as prevailing winds could carry large ash plumes from Kamchatka into Alaskan air space. AVO also researches the individual history of Alaska's active volcanoes and produces hazard assessment maps for each center.

4.1.5 Snow Avalanches

A snow avalanche is a slope failure consisting of a mass of fluidized snow sliding down a hillside. The damage caused by an avalanche varies based on the avalanche type, the consistency and composition of the avalanche flow, the flow's force and velocity, as well as the avalanche path. Avalanches usually occur on slopes between 25 and 50 degrees, with most starting between 30 and 40 degrees. Both natural and human factors can trigger avalanches.

Dog team searching for victims of a snow machine-triggered avalanche
Photography by Bruce Tremper, courtesy of avalanche.org

Alaska often has the highest annual per capita deaths and injuries caused by avalanches. This is because some of the most-traveled roads pass through avalanche-prone areas and because there is a high

frequency of backcountry avalanches triggered by the many hikers, skiers, and snow machine users.

There is growing exposure to this hazard as development continues to occur in avalanche prone areas and participation in winter recreational activities increases.

Site of the February 2000 Cordova Avalanche

4.1.6 Tsunamis & Seiches

Tsunamis are ocean waves that are generally triggered by vertical motion of the sea floor during major earthquakes. Near ocean or undersea landslides or volcanic eruptions can also generate tsunamis. They can be generated locally or a great distance from where they landfall. Warning time can be limited when the tsunami is triggered close to the impacted coastline.

The most vulnerable areas of the State are the low-lying coastal areas in the Gulf of Alaska and those areas bordering the Pacific Ocean. While volcano-generated tsunamis may be rare, they are a threat to the Aleutian Chain and parts of Cook Inlet, including Homer and Seldovia. Tsunami professionals consider the coastline of the Bering Sea as having a very low vulnerability to tsunamis.

The 1964 Good Friday earthquake generated major tsunami activity. The earthquake and related aftershocks caused tsunami activity in Alaska, Hawaii, and along the west coast of North America. Additionally, local undersea landslides generated several tsunamis in Alaska. The tsunami activity was responsible for 106 deaths in Alaska and 16 along the U.S. West Coast. The 1958 Lituya Bay landslide caused a tsunami stripping trees to an elevation of over 1700 feet from the adjacent hillside.

Damage to Kodiak Island from the 1964 earthquake generated tsunami.

A seiche is a water wave in an enclosed, or partly enclosed, basin that varies in period depending on the dimensions of the basin. They are sometimes incorrectly referred to as locally generated tsunamis. Seiches are locally generated, allowing very little warning time. Earthquakes, landslides, avalanches, high winds, or changes in atmospheric pressure can all be triggering events. Seiches can result in very high run-ups on land.

4.1.7 Weather

Weather hazards include winter weather, thunder and lightning, hail, high wind, storm surge, coastal storms, and drought.

Winter weather includes heavy snows, ice, aufeis, and extreme cold.

Heavy snow can bring a community to a standstill by inhibiting transportation, knocking down trees and utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant.

Ice buildup can collapse utility lines and communications towers as well as make transportation difficult. Ice can also become a problem on roadways if the temperature warms up just enough for precipitation to fall as freezing rain rather where a pressure differential occurs across a mountain range (for example, a Chinook wind), such as those found in Anchorage's Hillside area. On April 1, 1980 and again in March 2003, winds up to 120 miles per hour occurred in the Anchorage area, destroying several houses and airplanes as well as causing power failures that took several days to repair. Juneau's Taku wind creates problems with the Snettisham power than snow.

Aufeis is glaciation or icing of streams and rivers, affecting road surfaces and infrastructure. Aufeis forms during the winter when emerging ground water freezes. Stream glacial flooding occurs when ice forms from the bottom up not from the top down forcing water out of the stream channel. If aufeis occurs on a roadway, it makes travel difficult. For example, the Steese Highway frequently has an aufeis problem in the winter months. In the mid 1980's, several homes in Fox suffered from an aufeis event occurring at the wellhead. The homes filled up 6 feet deep, then froze.

Extreme cold can lead to hypothermia and frostbite which are both serious medical conditions. Cold causes fuel to congeal in storage tanks and supply lines, stopping electric generators. Without electricity, heaters do not work, causing water and sewer pipes to freeze or rupture. Extreme cold can also interfere with transportation if the ambient temperature is below an aircraft's minimum operating temperature. Extreme cold increases the likelihood of ice jams and flooding. If extreme cold conditions are combined with low/no snow cover, the ground's frost level can change creating problems for underground infrastructure.

Turbulence and atmospheric imbalance cause thunderstorm events. They arise from combining:

- unstable rising warm air,
- adequate moisture to form clouds and rain, and
- the upward lift of air currents resulting from interacting weather fronts (warm and cold), sea breezes, or mountains.

Lightning exists in all thunderstorms resulting from a buildup of charged ions within the thundercloud. When lightning connects with a grounded object, electricity is released which can be harmful to humans. Lightning can also start fires

Hail is associated with thunderstorms. Hailstones are ice formations that are greater than 0.75 inches in diameter that fall with rain. The size and severity of the storm

determine the size of the hailstones. In Alaska, hailstorms are fairly rare and cause little damage, unlike the hailstorms in Mid-western states.

High winds occur in Alaska when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. Alaska's high wind can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other characteristics of hurricanes. High winds have the potential to seriously damage port facilities, the fishing industry, and community infrastructure (especially above ground utility lines).

Lake Hood, Anchorage, AK, March 2003

High winds can also be a localized problem, lines causing power failures.

A coastal storm is a generic term for a storm that strikes a coastal area. Types of coastal storms include hurricanes, tropical storms, and Nor'easters. However, in Alaska, they are usually just called coastal storms. They can produce high winds, flooding and erosion. The intensity, location and the land's topography influence the storm's impact. Another factor that influences the damage done to the shoreline by coastal storms, particularly in northwest Alaska, is whether the shore ice is solid enough to protect against erosion or other physical damage to community infrastructure.

Fierce storm conditions do not have to be present to cause damage. Northwestern communities suffer from "Silent Storms" where high-water storm surges erode and undercut the banks melting the permafrost.

Storm surge is when the water level of a tidally influenced body of water increases above the high tide mark. Storm surge is generally associated with winter low-pressure systems or coastal storms. They most commonly occur from late fall to early spring. The problem is especially severe during the highest tides of the monthly cycle.

Storm surge is controlled by four main factors:

- Intensity (wind speed) of the storm
- Low barometric pressures
- Landfalling during astronomical tide
- Coastline configuration

Drought commonly occurs over a defined period of time of very low precipitation. Droughts are fairly rare in Alaska. Drought severity depends on duration, intensity, and geographic extent, as well as the demand on the water supply. This hazard is complicated because there is no easily identifiable beginning or end and because the impacts are not very obvious and can affect a wide area.

There are four ways to define drought:

Meteorological:	a degree of dryness. Measures lack of actual precipitation compared to an expressed average.
Agricultural:	defined as soil moisture deficiencies relative to what the plant life needs.
Hydrological:	relates to the effects of the lack of precipitation on streams, rivers, lakes, and groundwater levels.
Socioeconomic:	the demand for water is greater than the supply. This results from a reduction in supply, an increase in demand or both.

A drought may result in crops not maturing, land values declining, wildlife and livestock becoming malnourished, increases in unemployment, and contribute to an increased wildland fire hazard. It can also lead to a shortage of water for residential, industrial, recreational, and navigational purposes.

4.1.8 Ground Failure

Short descriptions of types of ground failure in Alaska are discussed in this section with further detailed explanations available in section 5.9. A landslide refers to the downward and outward movement of slope-forming materials reacting under the force of gravity. Landslides usually consist of natural soil, rock, artificial fill, or a combination of those items. The term covers a range of events including mudflows, mudslides, rock flows, rockslides, debris flows, debris avalanches, debris slides, and earth flows.

There are four types of landslides; they are classified according to their type of material and type of movement.

- Slides: a downward displacement of material along one or many failure surfaces
- Flows: fast moving soils, rocks, and organic materials mixed with air and water, and going downhill. They contain a high water content and resemble viscous fluids when in motion
- Lateral Spreads: material which is laterally displaced. They can be produced through liquefaction
- Falls & Topples: a fall is when rock or other material breaks free from a cliff or slope and moves by free fall, bouncing, or rolling. Topples are a mass of rocks or soil rotating forward from a slope at a point that is below the mass' center of gravity

Geology, precipitation, topography, and cut and fill construction practices all influence landslide activity. They are often the result of seismic activity, flooding, volcanic activity, heavy precipitation, construction work, or coastal storms. Landslides can also trigger secondary hazards, such as tsunamis and flooding. Flood hazards occur where a landslide blocks a river valley and acts as a temporary dam. When the basin behind the landslide dam fills, it can drain catastrophically as the water rapidly erodes the loosely deposited material. In Alaska, as elsewhere, the greatest risks from landslides occur where buildings, roads, and other facilities are located on or near steep slopes, or on soil

materials that are susceptible to failure during severe earthquakes or heavy precipitation.

4.1.9 Erosion

Erosion is a process that involves the gradual wearing away, transportation, and movement of land. However, not all erosion is gradual. It can occur quite quickly as the result of a flash flood, coastal storm, or other event. Most of the geomorphic change that occurs in a river system is in response to a peak flow event. It is a natural process but its effects can be exacerbated by human activity.

Erosion is a problem in developed areas where the disappearing land threatens development and infrastructure. There are three main types of erosion that affect human activity in Alaska:

- Coastal erosion
- Riverine erosion
- Wind erosion

Coastal Erosion

Coastal erosion is the wearing away of land and loss of beach, shoreline, or dune material because of natural activity or manmade influences. It can occur gradually or suddenly. Usually erosion is a long-term event but happens quickly during storm events.

A 1971 study by the U.S. Army Corps of Engineers (USACE) showed that less than 11% of Alaska's coastline was undergoing "significant" erosion.

It is primarily a problem along the western and northern coast as well as the Cook Inlet. Along the majority of Alaska's coast, it is not a significant problem as there is limited development in these areas. However, the problem can be quite serious on a local level. Several native communities, such as Barrow, Shishmaref, Kivalina, Newtok, and Point Hope to name a few, are affected by this problem.

Riverine Erosion

Riverine erosion results from the force of flowing water in and adjacent to river channels. This erosion affects the bed and banks of the channel and can alter or preclude any channel navigation or riverbank development. In less stable braided channel reaches, erosion and deposition of material are a constant issue. In more stable meandering channels, episodes of erosion may only occur occasionally. Examples of riverine erosion are found throughout Alaska that threatens both public and private property. Riverine erosion on the meandering Matanuska River, near Palmer, presently threatens the stability of several houses and some infrastructure. Riverine erosion threatens communities along other rivers including the Kenai, Kuskokwim, Koyukuk, and Yukon Rivers.

Wind Erosion

Wind erosion occurs when wind is responsible for the removal, movement, and land redeposition. It can cause a loss of topsoil, which can hinder agricultural production. The blowing dust can also reduce visibility and have a negative effect on air quality. The Mat-Su Valley is a known area for wind erosion as it can get gusts of up to 100 miles per hour.

4.1.10 Technological

Cruise ship in Ketchikan. © Alaska Division of Tourism

Technological hazards are those that are not natural in origin. Alaska faces a wide variety of technological hazards including:

- Dam failure
- Hazardous material accidents,
- Security threats (including terrorism and Weapons of Mass Destruction (WMD))
- Infrastructure failures
- Oil spills
- Urban Fires (including “bush” communities and cruise ships)

Oil coated Sea Otter
Image courtesy *Exxon Valdez* Oil Spill Trustee Council.

The consequences of technological disasters are significant because they frequently occur in Alaska. For example, the 1989 Exxon Valdez oil spill is the largest in American history. Over 11 million gallons of crude oil was released into Prince William Sound. It cost over $2 billion in clean up costs and even more in environmental damage. It also affected 1,300 miles of coastline and countless numbers of wildlife with some areas still not returned to pre-spill condition.

Power outages are a type of common infrastructure failure in Alaska. They are often caused by power plant fires and result in additional damages, such as water and sewer system freeze-ups. For example, in 1975 a Bethel power plant burned down causing the local utilities to freeze. This resulted in a Federal Disaster Declaration. In 1961, the military considered evacuating Fort Greeley when a power outage occurred during extended -60°F weather.

Recent cruise ship fires, including a multiple fatality fire on the ‘Universe Explorer’ demonstrate the potential for high losses of life in some of the more remote or inaccessible areas of the State. Cruise ship traffic has increased dramatically in the last few years, and is predicted to continue to increase in the future. The smaller fire departments in Southeast Alaska have little or no capability for responding to major cruise ship fires.

4.1.11 Economic

A large section of the Alaskan economy is resource-based. Catastrophic events such as earthquakes, tsunamis, wildland fires, and storms can have severe economic impacts on Alaska's resource-based economy. Moreover, the economic impacts from other conditions, such as a severe decline in resource availability or in market prices, can be as devastating to individuals and communities. In recent years, low salmon returns have combined with low market prices to create economically disastrous conditions in western and northwestern Alaska, resulting in the governor's issuance of disaster or economic disaster declarations or administrative orders in 1997, 1998, 2000, and 2001.

Resolution 06-20 was passed during the 2006 Annual Convention for the Alaska Federation of Natives to acknowledge climate change in Alaska as having a significant impact on the availability of subsistence foods that present serious challenges to subsistence ways of life. Appendix 32 contains a copy of the amended and passed resolution.

One of the latest international scientific reports on global warming was released in February 2007. It focused new attention on changes to the Arctic, including a sharp increase projected for rain and snowfall in Alaska. John Walsh a climate scientist at the University of Alaska Fairbanks was reported as saying “other new studies affecting the Polar Regions involve accelerated loss of sea ice, harm to polar bears and other marine mammals, and increasing ultraviolet radiation through an Arctic ozone hole.” The question of climate change will continue with scientists being on both sides of the debate. Additional regional climate change information is located in Section 5.8.

4.2 State Agencies

State Division of Homeland Security and Emergency Management (DHS&EM)

DHS&EM is governed by AS 26.23.10 The Director normally serves as the Governor’s Authorized Representative (GAR) and the Deputy Director for Emergency Management normally serves as the State Coordinating Officer (SCO) during disasters and is the state’s liaison with FEMA, which assigns a Federal Coordinating Officer (FCO). During disaster operations, all departments and State agencies are expected to cooperate fully with requests from the DHS&EM Director for assistance. The Governor’s declaration of a State emergency activates the State Emergency Response Plan (ERP), which is continually updated by DHS&EM to meet changing conditions.

DHS&EM is the State agency responsible for coordinating statewide emergency preparedness, response, recovery, and mitigation activities among Federal, State, and local agencies. DHS&EM is the primary State agency for funding, administering, and coordinating numerous mitigation grant programs and projects. Under the supervision of the SHMO, DHS&EM’s Mitigation Section administers the Hazard Mitigation Grant (HMGP), Pre-Disaster Mitigation (PDM), Disaster Resistant University (DRU), Earthquake (National Earthquake Hazard Reduction Program initiatives), and Tsunami Awareness Programs that make up the State Mitigation Program for various mitigation projects for natural hazards. The Mitigation Section also is responsible for developing this State All-Hazard Risk Mitigation Plan, and working with businesses, educational

institutions, local and tribal governments, and private associations to prepare local All-Hazard Mitigation Plans statewide.

Attorney General's Office

The Attorney General's Office represents the legal interests of the State of Alaska and its State agencies.

Department of Public Safety

The Department of Public Safety provides legal counsel to DHS&EM for mitigation and other emergency management related issues, as needed.

The Community Health and Emergency Medical Services (CHEMS) is a section within Division of Public Health within the Dept. of Health and Social Services (DHSS). DHSS is charged with promoting and protecting the public health and one of CHEMS' responsibilities is developing, implementing, and maintaining a statewide comprehensive emergency medical services system. The department's statutory mandate (AS 18.08.010) requires it to:

(1) Coordinate public and private agencies engaged in the planning and delivery of emergency medical services, including trauma care, to plan an emergency medical services system;

(2) Assist public and private agencies to deliver emergency medical services, including trauma care, through the award of grants in aid;

(3) Conduct, encourage, and approve programs of education and training designed to upgrade the knowledge and skills of health personnel involved in emergency medical services, including trauma care

(4) Establish and maintain a process under which hospitals and clinics can represent themselves to be trauma centers because they voluntarily meet criteria adopted by the department which are based on an applicable national evaluation system.

In addition to these responsibilities, the section is heavily involved in planning and responding to bioterrorist events.

Department of Commerce, Community and Economic Development

The Department of Commerce, Community, and Economic Development, Division of Community Advocacy fulfills its Constitutional mandate "to advise and assist local government, review their activities, collect and publish local government information, and perform other duties prescribed by law" through its mission to promote strong communities and healthy economies. The Division administers the Community Development Block Grant (CDBG) program funds, enhancement grants to address coastal hazards, mini-grants and administers various flood mitigation planning and project grants, including the acquisition of flood-prone homes and businesses, throughout the State. This department coordinates the National Flood Insurance Program by providing technical assistance, evaluating, documenting and recommending floodplain management activities to local communities to improve the community's ability to be flood resistant.

Department of Environmental Conservation (DEC)

It is the policy of the state to conserve, improve, and protect its natural resources and environment and control water, land, and air pollution, in order to enhance the health, safety, and welfare of the people of the state and their overall economic and social well being.

DEC's Division of Spill Prevention and Response (SPAR) prevents oil and hazardous substances spills, prepares for spill occurrence, and responds rapidly to protect human health and the environment. The three goals of SPAR's mission are:

1. Spill prevention: making the system safer,
2. Preparedness: making industry and government's ability to prepare and respond to spills "better", and
3. Response: keeping Alaska cleaner.

DEC's Division of Environmental Health (EH) deals with the basics: safe drinking water, food, and sanitary practices. EH's goal is to provide businesses with clear standards so that they can protect our environment and provide safe food and drinking water to Alaskans.

DEC's Division of Water's mission is to improve and protect water quality. In keeping with this mission, the division:

- Establishes standards for water cleanliness;
- Regulates discharges to waters and wetlands;
- Provides financial assistance for water and wastewater facility construction, and waterbody assessment and remediation;
- Trains, certifies, and assists water and wastewater system operators;
- Monitors and reports on water quality.

DEC's Division of Air Quality is designed around three programs: managing non-point and mobile sources of air pollution; managing stationary out-of-stack discharges of air pollution through a permit and compliance program; and field air monitoring to measure progress and understand problems.

Division of Forestry (DOF)

The Department of Forestry participates in a statewide wildfire control program in cooperation with the forest industry, rural fire departments and other agencies. Prescribed burning may increase the risks of fire hazards; however, prescribed burning reduces the availability of fire fuels and therefore the potential for future, more serious fires.

Department of Transportation and Public Facilities (DOT/PF)

The Department of Transportation and Public Facilities (DOT/PF) personnel provide technical assistance for various emergency management programs, to include mitigation. This assistance is addressed in the DHS&EM-DOT/PF Memorandum of Agreement and includes, but is not limited to:

- Environmental reviews;
- Archaeological surveys; and
- Historic preservation reviews.

In addition, DOT/PF and DHS&EM collaborate on and coordinate with construction, buyout, and land use projects to ensure that there are no potential right-of-way conflicts with future bridge and highway multi-hazard mitigation initiatives.

Additionally, DOT/PF provides safe, efficient, economical, and effective State highway, harbor, and airport operations. The Department uses it's Planning, Design & Engineering, Maintenance Operations, and Intelligent Transportation Systems resources to identify the hazard, plan and initiate mitigation activities to meet the transportation needs of Alaskan, and make Alaska a better place to live and work. The Department budgets for temporary bridge and materials replacement necessary to make the multi-model transportation system operational following a natural disaster.

Alaska Department of Natural Resources (DNR)

The Alaska Department of Natural Resources (DNR) administers various projects designed to reduce stream bank erosion and localized flooding and to improve drainage, and discharge water quality through storm water grant program funds. The Division of Geology and Land Survey, within DNR, is responsible for Alaska's mineral, land, and water resource use and development while collaborating on multi-hazard mitigation initiatives.

Alaska Railroad Corporation (ARRC)

The ARRC is a full-service railroad serving ports and communities from the Gulf of Alaska to Fairbanks. Owned by the State of Alaska since 1985, the Railroad is governed by a seven-member Board of Directors appointed by the Governor of Alaska.

The Alaska Railroad is a self-sustaining corporation that operates without state subsidy, and provides year-round passenger, freight and real estate services. The Alaska Railroad carries nearly 500,000 passengers annually. The ARRC rail line covers over 500 miles of Alaska through very diverse environments. To assist in response planning, the rail line is broken into the following geographical sections. In this way, emergency planning can be performed specific to the unique local characteristics in each section. Many of the response issues will be common throughout the entire section (i.e.wildlife issues, local public safety response contacts, logistical resources and requirements, environmental and seasonal conditions). Passenger emergency response strategies and considerations were developed for each section. These sections are grouped based on local environment factors (topography, geography) and are as follows:

Geographic Response Section ARRC Mileposts Covered (approx)

- Section 1: Seward to Snow River Bridge O to 21
- Section 2: Snow River Bridge to Tunnel 17 to 57
- Section 3: Tunnel to Anchorage 49 to 113
- Section 4: Portage to Whittier MP 64 Spur F-O
- Section 5: Anchorage to Knik River 106 to 159
- Section 6: Knik River to Willow 138-200
- Section 7: Willow to Talkeetna 184 to 228
- Section 8: Talkeetna to Honolulu 222 to 289
- Section 9: Honolulu to Cantwell 286 to 322
- Section 10: Cantwell to Rex 314 to 388
- Section 11: Rex to Nenana 382 to 415
- Section 12: Nenana to Fairbanks 403 to 473
- Section 13: Fairbanks to Eielson AFB Spur G-O to G 29

4.3 State Facilities

The State will perform a vulnerability analysis of State owned or operated buildings and infrastructure along with its identified critical facilities.

The fastest growing jurisdictions per area population in the state are the Kenai Peninsula Borough, Municipality of Anchorage and Matanuska-Susitna Borough. The same three jurisdictions have the largest number of state facilities. The largest potential hazard is weather followed by flooding for all jurisdictions threatening a significant risk of loss to state resources.

The State of Alaska Risk Manager uses “The Marshall Valuation Service (1989), Classification of Construction Statement” for insurance classification purposes. The Statement delineating the following classifications:

- Class “A”, buildings have fireproofed structural steel frames with reinforced concrete or masonry floors and roofs,
- Class “B”, buildings have reinforced concrete frames an if concrete or masonry floors and roofs,
- Class “C”, buildings has masonry or concrete exterior walls, and wood or steel roof and floor structures, except for concrete slab on grade.
- Class “D”, buildings generally has wood frame, floor, and roof structure. They may have a concrete floor on grade and other substitute materials, but is considered combustible construction; this class includes the pm-engineered pole frame buildings.

- Class “S” buildings of Alaska and for the purpose of the evaluation of State structures will not be used until future updates of the Plan when the State Risk Manager incorporates this class into the classification of structures.
- Class “E” buildings are statewide leased.
- Class “F” building refers to Uninsured properties

Class	Frame	Floor	Roof	Walls
A	Structural steel columns and beams, fireproofed with masonry, concrete, plaster, or other incombustible materials.	Concrete or concrete on steel deck, fireproofed.	Formed concrete, precast slabs, concrete or gypsum on steel deck.	Non-bearing curtain walls, masonry, concrete, metal and glass panels, stone.
B	Reinforced concrete columns & beams Fire-resistant construction.	Concrete or concrete on steel deck, Fireproofed	Formed concrete, precast slabs, concrete or gypsum on steel deck, fireproofed.	Non-bearing curtain walls, masonry, concrete, metal and glass panels, stone.
C	Masonry or concrete load-bearing walls with or without pilasters. Masonry or concrete wall with steel, wood or concrete frame.	Wood or concrete lank on steel floor joists, or concrete slab on grade.	Wood or steel joists with wood or steel deck. Concrete plank.	Brick concrete block, or tile masonry, tilt-up formed concrete, curtain walls.
D	Wood or steel studs in bearing wall, wood or steel frame, primarily combustible construction.	Wood or steel floor joists or concrete slab on grade.	Wood or steel joists with wood or steel deck.	Almost any material except bearing or curtain walls of masonry or concrete. Generally combustible construction.

This is one of the criteria used in evaluating the summary of State owned facilities. Leased facilities are only considered for value of contents located in these buildings.

Critical Infrastructures are partially listed in appendix 7 and on the following matrixes. A complete listing may be supplied upon request.

2007 State Facilities Summary	Hazard	Buildings Owned	Building Type	Building Square Footage	Replacement Value of Owned Buildings	Replacement Value of Contents	Number of State Employees	Total Dollars Replacement Value
Alaska Gateway (REAA)	Flood	14	D	85,877	$14,226,425.00	$22,630.90	43	$14,249,055.90
Aleutians East Borough	Weather	31	D	58,755	$11,293,804.00	$20,867.30	17	$11,314,671.30
Aleutian Region (REAA)	Weather	7	A,D	29,335	$6,547,000.00	$50,000.00	3	$6,597,000.00
Annette Island (REAA)	Weather	1	D	636	$137,400.00	$0.00	0	$137,400.00
Bristol Bay Borough	Weather	21	D	39,095	$7,041,450.00	$18,452.14	53	$7,059,902.14
Bering Strait (REAA)	Weather	76	D	264,352	$43,125,145.00	$66,758.12	75	$43,191,903.12
City & Borough of Juneau	Weather	47	A-D	1,205,321	$198,968,230.00	$1,089,962.38	1,615	$200,058,192.38
City & Borough of Sitka	Weather	44	A-D	619,290	$71,713,859.00	$487,728.11	81	$72,201,587.11
City & Borough of Yakutat	N/A	8	A,D	47,060	$6,335,302.00	$86,529.00	5	$6,421,831.00
Chatham (REAA)	Technological	3	D	1,780	$483,840.00	$0.00	6	$483,840.00
Chugach (REAA)	Flood	81	D	213,566	$26,164,621.00	$18,037.25	103	$26,182,658.25
Copper River (REAA)	Flood	39	D	71,250	$9,272,322.00	$12,419.45	37	$9,284,741.45
Denali Borough	Flood	12	D	28,999	$5,060,118.00	$26,935.00	18	$5,087,053.00
Delta/Greely (REAA)	Flood	39	D	44,806	$6,104,311.00	$5,200.00	36	$6,109,511.00
Fairbanks North Star Borough	Flood	106	A-D	1,120,175	$246,099,338.00	$393,616.38	967	$246,492,954.38
Haines Borough	Flood	24	A,D	61,638	$8,903,180.00	$307,348.84	16	$9,210,528.84
Iditarod Area (REAA)	Flood	27	D	35,014	$8,093,521.00	$13,400.00	9	$8,106,921.00
Kashunamiut (REAA)	N/A	2	D	2,640	$1,235,000.00	$0.00	N/A	$1,235,000.00
Ketchikan Gateway Borough	Technological	34	A-D	386,493	$43,813,711.00	$166,758.91	106	$43,980,469.91
Kodiak Island Borough	Weather	70	D	254,728	$42,562,451.00	$75,397.33	113	$42,637,848.33
Kenai Peninsula Borough	Flood	128	D	781,139	$194,029,668.00	$226,750.85	184	$194,256,418.85
Kuspuk (REAA)	Flood	15	D	31,938	$6,121,962.00	$13,927.05	5	$6,135,889.05
Lower Kuskokwim (REAA)	Flood	43	A,C,D	127,435	$34,064,891.00	$87,828.69	77	$34,152,719.69
Lake & Peninsula Borough	Weather	31	D	36,741	$10,668,630.00	$14,098.79	3	$10,682,728.79
Lower Yukon (REAA)	Flood	25	D	50,367	$9,400,140.00	$13,800.00	5	$9,413,940.00
Municipality of Anchorage	Flood	178	A-D	4,808,845	$1,170,508,286.00	$1,050,605.36	2,907	$1,171,558,891.36
Matanuska-Susitna Borough	Flood	155	A-D	682,707	$140,528,507.00	$117,722.67	190	$140,646,229.67
Northwest Arctic Borough	Weather	26	A,B,D	75,033	$14,316,971.00	$53,100.54	8	$14,370,071.54
North Slope Borough	Weather	32	A,D	72,420	$15,423,387.00	$38,700.00	24	$15,462,087.00
Pribilof Island (REAA)	Weather	5	D	15,554	$5,150,000.00	$78,000.00	0	$5,228,000.00
Southeast Island (REAA)	Weather	19	D	40,052	$6,352,562.00	$0.00	16	$6,352,562.00
Southwest Region (REAA)	Weather	42	D	64,920	$12,907,940.00	$11,893.13	100	$12,919,833.13
Yukon Flats (REAA)	Flood	30	D	36,368	$5,822,524.00	$0.00	30	$5,822,524.00
Yukon-Koyukuk (REAA)	Flood	51	D	99,140	$18,897,828.00	$20,963.86	14	$18,918,791.86
Yupiit (REAA)	Flood	2	D	2,304	$1,045,000.00	$0.00	0	$1,045,000.00
Various Statewide Leased	N/A	212	E	2,543,384	$121,545,491.00	N/A	Unkown	$121,545,491.00
Statewide Uninsured >100,000 Rep. Value	N/A	61	F	143,315	$20,567,004.00	N/A	Unkown	$20,567,004.00
Statewide Uninsured <100,000 Rep. Value	N/A	392	F	580,299	$6,988,887.00	N/A	Unkown	$6,988,887.00
TOTALS		**2,133**	**N/A**	**14,762,771**	**$2,551,520,706.00**	**$4,589,432.04**	**6,866**	**$2,556,110,138.04**

State Infrastructure and Estimated Replacement Value

	Number of Airports	Number of Hospitals	Alaska Railroad Depot Locations	Number of Schools	Number of Dams	Est. Replacement Value of Dams	Number of Bridges	Est. Replacement Value of Bridges
Alaska Gateway (REAA)	2	0	0	8	0	$0	0	$0
Aleutians East Borough	2	0	0	7	1	Unknown	0	$0
Aleutian Region (REAA)	3	0	0	5	0	$0	2	$6,331,385
Annette Island (REAA)	0	0	0	3	0	$0	0	$0
Bristol Bay Borough	1	0	0	4	0	$0	3	$3,649,170
Bering Strait (REAA)	4	0	0	20	0	$0	27	$41,879,100
City & Borough of Juneau	0	1	0	14	1	$6,000,000	33	$78,574,555
City & Borough of Sitka	1	1	0	6	0	$0	8	$35,867,875
City & Borough of Yakutat	1	0	0	1	0	$0	75	$29,360,680
Chatham (REAA)	1	0	0	5	0	$0	0	$0
Chugach (REAA)	3	0	0	9	2	Unknown	102	$405,669,025
Copper River (REAA)	0	0	0	8	0	$0	0	$0
Denali Borough	2	0	1	4	0	$0	23	$71,250,140
Delta-Greely (REAA)	0	0	0	7	0	$0	0	$0
Fairbanks North Star Borough	1	2	1	34	0	$0	145	$355,235,655
Haines Borough	3	0	0	5	0	$0	22	$31,956,330
Iditarod Area (REAA)	1	0	0	9	0	$0	0	$0
Kashunamiut (REAA)	0	0	0	1	0	$0	0	$0
Ketchikan Gateway Borough	1	1	0	10	0	$0	25	$99,228,595
Kodiak Island Borough	1	0	0	15	2	$6,053,466	21	$43,792,150
Kenai Peninsula Borough	2	0	0	44	2	$226,000,000	61	$114,025,495
Kuspuk (REAA)	1	0	0	10	0	$0	0	$0
Lower Kuskokwim (REAA)	1	0	0	27	0	$0	0	$0
Lake & Peninsula Borough	1	0	0	15	0	$0	0	$0
Lower Yukon (REAA)	1	0	0	11	0	$0	0	$0
Municipality of Anchorage	2	4	5	95	0	$0	46	$378,512,280
Matanuska-Susitna Borough	1	1	2	38	1	50-100,000	71	$222,676,060
Northwest Arctic Borough	1	0	0	13	0	$0	3	$1,934,000
North Slope Borough	3	0	0	11	0	$0	43	$90,473,225
Pribilof Island (REAA)	1	0	0	3	0	$0	0	$0
Southeast Island (REAA)	4	0	0	32	0	$0	47	$52,257,235
Southwest Region (REAA)	1	0	0	2	0	$0	6	$2,716,100
Yukon Flats (REAA)	0	0	0	8	0	$0	0	$0
Yukon-Koyukuk (REAA)	1	0	0	18	1	Closed	62	$98,263,810
Yupiit (REAA)	0	0	0	3	0	$0	3	$2,292,375

The replacement values in this matrix are estimates, subject to verification and should be used with caution

Bridge definitions included large diameter culvert(s) with a centerline of roadway length greater than or equal to 20 ft, tunnels, and pedestrian or railroad bridges over highways.

The replacement value of the Airports, Depots, Schools,and Hospitals are included in the State Facilities Matrix

Potential losses to types of property, including transportation systems, lifelines, and utilities, which DHS&EM did not estimate, could be several times greater than losses to buildings

State Owned Mileage Statistics and Replacement Costs

	Unclassified	Primary Paved	Replacement Cost	Secondary Paved	Replacement Cost	Unpaved	Replacement Cost	Total Replacement Cost
REAA (ALL Areas)	86.069	998.841	$499,420,500,000	378.316	$1,324,106,000	1330.694	$2,661,388,000.00	$503,405,994,000
Alaska Gateway REAA	0.000	0.000	$0	0.000	$0	0.625	$1,250,000.00	$1,250,000
Aleutians East Borough	7.404	0.000	0	0.000	0	4.600	$9,200,000.00	9,200,000
Bristol Bay Borough	0.000	15.339	76,695,000	0.512	1,792,000	2.788	$5,576,000.00	84,063,000
City & Borough of Juneau	0.000	13.594	67,970,000	82.555	288,942,500	0.000	$0.00	356,912,500
City & Borough of Sitka	0.150	0.000	0	14.849	51,971,500	1.531	$3,062,000.00	55,033,500
City & Borough of Yakutat	0.000	5.142	25,710,000	1.359	4,756,500	39.111	$78,222,000.00	108,688,500
Copper River REAA	0.000	0.000	0	0.000	0	1.500	$3,000,000.00	3,000,000
Delta Greely REAA	0.000	0.000	0	0.000	0	6.750	$13,500,000.00	13,500,000
Denali Borough	0.000	94.011	470,055,000	12.958	45,353,000	52.785	$105,570,000.00	620,978,000
Fairbanks North Star Borough	158.091	286.070	1,430,350,000	231.940	811,790,000	210.965	$421,930,000.00	2,664,070,000
Haines Borough	0.070	57.273	286,365,000	11.545	40,407,500	3.620	$7,240,000.00	334,012,500
Ketchikan Gateway Borough	0.000	41.655	208,275,000	0.000	0	13.925	$27,850,000.00	236,125,000
Kodiak Island Borough	0.000	23.420	117,100,000	35.909	125,681,500	36.238	$72,476,000.00	315,257,500
Kenai Peninsula Borough	1.854	318.342	1,591,710,000	146.901	514,153,500	109.960	$219,920,000.00	2,325,783,500
Lake & Peninsula Borough	0.000	6.062	30,310,000	7.222	25,277,000	16.805	$33,610,000.00	89,197,000
Matanuska Susitna Borough	0.000	360.832	1,804,160,000	153.764	538,174,000	186.736	$373,472,000.00	2,715,806,000
Municipality of Anchorage	1.372	116.258	581,290,000	168.679	590,376,500	20.139	$40,278,000.00	1,211,944,500
Northwest Arctic Borough	14.115	1.045	5,225,000	0.294	1,029,000	26.927	$53,854,000.00	60,108,000
North Slope Borough	2.700	3.537	17,685,000	0.000	0	178.114	$356,228,000.00	373,913,000
Totals	271.825	2341.421	**$506,133,400,000**	1246.803	**$4,363,810,500**	2243.813	**$4,487,626,000.00**	**$514,984,836,500**

Primary Paved $5Million per Mile	Primary paved roads are all Interstate (Rural & Urban), Principal Arterials (Rural & Urban), and Rural Major Collectors.
Secondary Paved $3.5 Million per Mile	Secondary paved roads are all Minor Arterials (Rural & Urban), Rural Minor Collectors, Urban Collectors, and Local (Rural & Urban).
Unpaved $2 Million per Mile	Unpaved roads are all unpaved any type listed above.
Unclassified unknown	Unclassified roads are unknown types.

The replacement values in this matrix are estimates, subject to verification and should be used with caution.
Potential losses to types of property, including transportation systems, lifelines, and utilities, which DHS&EM did not estimate, could be several times greater than losses to buildings

4.4 State Capabilities

State Capability Assessment Questionnaire Summary

Each State agency administers its own program; however, DHS&EM is currently responsible for coordinating the bulk of State Hazard Mitigation programs and strategies.

The State Hazard Mitigation Officer (SHMO) and mitigation section staff, of the Division of Homeland Security and Emergency Management is responsible for Hazard Mitigation programs, strategies, and initiatives for the State. The State Hazard Mitigation Advisory Committee (SHMAC) consists of members of approximately 50 State, Federal, and local agencies, governments, tribes, business or organizations and was formed during for developing the State 409 Plan. The SHMO recognized the value of the committee's involvement during the plan's development. Subsequently, various members of the SHMAC review mitigation project selections, plan updates, map acquisitions, and policy recommendations. All SHMAC members work together to ensure that the mitigation programs complement each other while contributing toward the State's overall mitigation strategy.

The State capabilities have small changes since 2004. New GIS mapping is a benefit to hazard identification and disaster mitigation. As the life cycle of GIS mapping continues to develop the benefits will increase for the State and its agencies. New technologies and processes involving mapping will result in accurate, timely, and cost effective actions involving hazard mitigation. Interagency agreements and understandings are a benefit to the State. State agencies are effective working individually, with interagency coordination the agencies and the State become a unified team with a greater influence to mitigate, identify, and respond to hazards.

Each agency received a Capability Assessment Questionnaire (The completed or revised questionnaires are located in Appendix 13). The questionnaires address 16 focused areas for assessing individual State agency capabilities. The following summaries participant responses:

1. Q: What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

   A: All participating agencies work to incorporate standards; review procedures; determine development activities; promote the public health of the State; provide educational and awareness programs and training; assure continuity of business; ensure the design, construction, alteration, repair, maintenance and operation of facilities; guide land use planning; ensure fuel and power availability; access to transportation corridors and facilities; availability of safe food and water; pollution prevention; identification of geological hazards, mapping of hazards; and early warning of potential threats fire fuels management activities are consistent with mitigation goals: Protecting life and property.

2. Q: Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

   A: Through the processes provided by State policy, mainly planning, statutory changes, public education, and preventive mitigation efforts, State agencies and local /tribal governments **decrease** the potential for future losses resulting from natural or technological disasters in Alaska.

3. Q: Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

   A: State agencies and local /tribal governments are key organizations in decreasing vulnerability to hazards through comprehensive, coordinated public education, planning, assisting, supervising, reviewing, inspecting, enforcing, product assimilation, and funding mitigation projects.

4. Q: Does your organization own or manage lands or buildings in:

   a) 100-yr floodplain,

   b) earthquake fault area

   c) landslide/mudslide area

   d) coastal area

   e) areas subject to other hazards

   If the answer is yes, what measures are being taken to protect these investments or structures?

   A: Agencies own facilities and land in several areas throughout the State. However, structures are built to code and do not stand out as being located in uniquely hazardous areas. Measures were taken to protect such sites from wildfire. Buildings meet local ordinances for flooding and earthquake structural mitigation.

5. Q: With what Federal, State, local, or private agencies does your agency collaborate with to employ efforts to decrease vulnerability to the hazards listed in #3 above?

   A: State of Alaska

   Office of the Governor
   Alaska Science and Technology Foundation
   Alaska Coastal Management Program (ACMP)
   Coastal Impact Assistance Program (CIAP)
   Department of Administration
      Division of Risk Management
   Department of Commerce, Community and Economic Development
      Division of Community Advocacy
      Division of Insurance
      Division of Community and Economic Advocacy-NFIP
   Department of Education and Early Development
   Department of Environmental Conservation
      Division of Spill Prevention and Response (SPAR)
      Division of Environmental Health
      Division of Water
      Division of Air Quality
   Department of Fish & Game
      Division of Wildlife Conservation
   Department of Health & Social Services
      Division of State Health Planning and Development
   Department of Law
   Department of Military & Veterans Affairs
      Division of Homeland Security and Emergency Managements

Department of Natural Resources
- Division of Geological & Geophysical Surveys (DGGS)
- Division of Mining, Land, and Water Management
- Alaska Dam Safety Program [AS 46.17 and Article 3 of 11 AAC 93].
- Division of Forestry

Department of Public Safety
- Division of Alaska State Troopers
- Division of Fire Prevention
- Division of Fish & Wildlife Protection

Department of Transportation & Public Facilities
- Division of Statewide Planning
- Division of Statewide Design & Engineering Services
- Ted Stevens International Airport

University of Alaska Fairbanks
- UAF/GI
- Alaska Earthquake Information Center

State Emergency Response Commission (SERC)

SERC Membership:

(1) Seven public members appointed by the Governor: Two of whom must be members of a rural Local Emergency Planning Committee; Two of whom must be members of an urban Local Emergency Planning Committee; Two of whom must represent a Political Subdivision with an LEPC; One Public at Large member who need not be any of the above, but who could represent any of the LEPC membership categories.
(2) The Adjutant General of the Department of Military and Veterans Affairs or the Adjutant General's designee (SERC co-chair)
(3) The Commissioner of the Department of Environmental Conservation or the Commissioner's designee (SERC co-chair) and the following commissioners or their designees:
(4) The Commissioner of the Department of Commerce, Community and Economic Development;
(5) The Commissioner of the Department of Fish and Game;
(6) The Commissioner of the Department of Health and Social Services;
(7) The Commissioner of the Department of Labor and Workforce Development;
(8) The Commissioner of the Department of Natural Resources;
(9) The Commissioner of the Department of Public Safety; and
(10) The Commissioner of the Department of Transportation and Public Facilities
(11) Representatives of the following agencies as ex-officio, nonvoting members: U.S. Department of Defense - Alaskan Command; Federal Emergency Management Agency; U.S. Environmental Protection Agency; and U.S. Coast Guard and the Commissioner or designee from the Alaska Department of Education and Early Development.

Local

City of Seward
Municipality of Anchorage
Matanuska-Susitna Borough
Fairbanks North Star Borough
Kodiak Island Borough
Kenai Peninsula Borough
Alaska Seismic Hazards

Federal

Federal Emergency Management Agency

U. S. Geological Survey
Alaska Volcano Observatory
U.S. Army Corps of Engineers
Department of the Interior
U.S. Department of Agriculture
Economic Development Administration
Environmental Protection Agency
Farm Service Agency
Federal Aviation Administration
Federal Highway Administration
U.S. Agency for International Development
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Department of Defense
U.S. Air Force
U.S. Army
U.S. Coast Guard
U.S. Department of Housing and Urban Development
Bureau of Land Management
National Marine Fisheries Service
National Park Service
Natural Resources Conservation Service
National Oceanic and Atmospheric Administration
National Weather Service
West Coast/Alaska Tsunami Warning Center.
Rural Development (U.S. Department of Agriculture)
Small Business Administration

Other *Stakeholders*

Advanced National Seismic System
Anchorage Geotechnical Commission
Carver Geologic Inc.
Alaska Air Carriers Association
Tanana Chiefs Conference
Alaska Inter-tribal Conference
Denali Commission
American Red Cross
Alyeska Pipeline
Alaska Municipal League
Interagency Hydrology Committee for Alaska (IHCA)
Airline Pilots Association
Air Transport Association
Kamchatkan Volcanic Eruption Response Team
International Civil Aviation Organization

6. Q: Describe any problems in coordination among Federal, State, and local or tribal government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

   A: The most recurring problems result when potential applicants are required to complete very detailed grant applications that involve processes they are unfamiliar with e.g. Construction projects must have engineering studies, environmental assessments, and historical artifact determinations completed before the applications are approved for

funding. Future funding constraints for other State agencies may eliminate personnel positions and programs supporting mitigation efforts. Problems also occur due to lack of qualified personnel available to complete the lengthy applications quickly and in a timely manner to provide sufficient factual data to satisfy FEMA grant requirements and benefit/cost analysis. Additionally, Alaska is a "home rule" State making this a sensitive political issue. Existing State Statutes prohibit agencies from directing community activities or government.

7. Q: What are your organization's authorities?

   A: A list of the most predominates:

   44 CFR, Robert T. Stafford Act and Disaster Mitigation Act of 2000, Alaska Statute (AS) 26.23, Alaska Statute (AS) 18.08.010, Denali Commission Act of 1998, 42 USC 3121 §302, AS 41.08.020, AS 46.40, 6 AAC 50, 6 AAC 80, and 6 AAC 85, 6 AAC 80.050, Coastal Zone Management Act §309

8. Q: Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

   A: Existing statutory authorities are adequate for agencies to accomplish most respective tasks. However, Alaska is a "home rule" State making this a sensitive political issue. Smaller jurisdictions would benefit from a coordinated or streamlined permitting process. An extension to the Alaska Seismic Hazard Safety Commission until June 30, 2012 is a great benefit for scientists who recognize that Alaska has more earthquakes than any other region of the United States and is, in fact, one of the most seismically active areas of the world. Progress in other state agencies is continuing and will be a benefit to the State.

9. Q: Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

   A: Agencies have specific capabilities to reduce lose within their area of responsibility. Comprehensive plans and programs help to reduce loss. DHS&EM works with the Alaska National Weather Service to conduct two weather related, warning dissemination implementation plans for rural communities: the River Watch Plan and the Fall Sea Storm Plan. DOT has updated highway, airport, harbor, facility design / construction standards, preventative maintenance, and restoration efforts to improve probability for survival of natural disasters.

10. Q: Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

    A: Yes, the State All-Hazard Risk Mitigation Plan, SECC SOPs, EAS and NAWAS SOPs for warning etc. Each agency has indicated they have written policies and procedures that can be reviewed or consulted.

11. Q: Are public opinion and input used to build support for the agency's mitigation programs?

    A: Yes, Input is encouraged during local community meetings, local government interaction, and public outreach activities. Local All-Hazard Mitigation Plans are evaluated and information is used to refine the State's All-Hazard Risk Mitigation Plan.

12. Q: Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

    A: Some agencies suffer from understaffing preventing product development such as hazard mapping and vulnerability analysis. Other activities that could suffer if funding levels deviate too far are construction design review and project oversight.

13. Q: Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives or funding solutions should be explored to expand funding availability?

    A: There is not enough funding to conduct effective hazard mitigation throughout the State. Additional funding would be helpful to State agencies and local jurisdictions to complete mitigation projects. The State receives mitigation project funding from large disasters that reach Presidential Declaration parameters. Once a disaster occurs, DHS&EM solicit legislative support for funding the match for Federal disaster funds. Pre-Disaster and Flood Mitigation Assistance funding are also limited and competitive. Many projects will never reach fruition because the number of good projects far out number available funds. The State provides the match for Federal grants instead of passing those costs on to the communities or agencies affected. This allows greater benefit to those affected by the disaster. However, the State should consider setting aside mitigation funds to encourage pre-disaster mitigation project development at the local level. Making funds available prior to disasters could greatly reduce the risks faced with future disasters. The problem is where does the additional funding come from?

14. Q: Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

    A: Funding for updated GIS and building inventory data is among the State's greatest needs. Second to these are the drastic lack of mapped hazards to facilitate hazard vulnerability identification throughout the State;, specifically at the community level. The Geo-referenced historical data, community level critical facility, and infrastructure data is only about 45% accurate for Alaska. DHS&EM is currently working with SHMAC members to develop geo-spatial maps of the known hazards so vulnerability analyses can be conducted using VRiskMap® software to determine the threat to the State's population and infrastructure. Additionally, some data sources are proprietary preventing accurate hazard assessments. Private sector and State agency data sharing "Letters of Agreements" are drastically needed to circumvent proprietary issues.

15. Q: List any other issues, problems, or ideas related to the following categories:

    A: Communication and warning:

    Communities are too spread apart or are located in very remote locations preventing receipt of warning signals. Other communities have varying capability of obtaining communication or warning messages. Several communities experience black-outs after normal working hours.

    Dam safety:

    DNR's Division of Mining, Land, and Water and DOT & PF are working closely to ensure

safe dam structure and operation within the State. State agencies continue to develop evacuation plans and updated information on all dams.

Emergency preparedness:

Lack of funding and capability are the largest problems with exception of a few State agencies who continue to work towards emergency preparedness.

Floodplain management:

Limited desire by the communities to create or enforce building code or zoning to prevent construction in hazard areas. A lack of local Hazard Mitigation Planning in communities limits mitigation funding possibilities.

Geologic hazard mitigation:

Comprehensive mapped hazard assessments continue to slow the progress.

Hazardous materials incidents:

Many authorities regulate materials incident actions and planning.

Land use:

Several communities continue to lack building code and zoning adoption or enforcement.

Public information/education:

All agencies continue to train citizens and educate staffing on hazard awareness and mitigation processes.

16. Q: Please include any general observations or problems which may not have been covered by this questionnaire.

    A: A few agencies reported they currently have too many work demands on too few staff members to be able to adequately address hazard mitigation.

4.5 Local Capability Assessment

DHS&EM has also been actively working with local governments throughout the State to generate interest and develop initiatives for hazard mitigation. The focus of this initiative is to generate interest at the local level and create advocates for the program. The SHMO used the following forums:

- DHS&EM mitigation staff schedule and conducted “Mitigation for Emergency Managers” workshops to educate local emergency managers concerning available mitigation programs and initiatives. These workshops provide an opportunity for exchanging ideas and developing mitigation initiatives based on the evaluation of State and local needs. Additionally, it helps generate interest in the mitigation program from the ground up.
- The DHS&EM Spring Conference is an annual event and includes workshops on a variety of subjects. One of those workshops addresses the mitigation program. Topics have included the mitigation planning process, risk assessment, identification and development of viable mitigation projects, cost benefit analysis, and public-private partnerships. Attendees include Federal, State, and local emergency management officials, State and local elected representatives, business and industry representatives, and volunteer organizations.

The State mitigation program is making a concerted effort to spread the word on the short and

long-term benefits of well-planned, comprehensive mitigation initiatives. Include using training workshops, conferences, success stories. While the formal codes and standards adoption may not be possible for some jurisdictions, efforts continue to encourage local government, businesses, and individuals to voluntarily adopt building practices and land-use planning that considers mitigation measures. The State is seeing more of these initiatives take hold by demonstrating the long-term benefits of these measures to the community at large. Many jurisdictions are getting involved in various on-going planning activities related to community growth. These may include:

- **Land-use Planning:** Local governments should plan land-usage to identify areas subject to damage from natural hazards to keep inappropriate development out of those areas. Boroughs and cities are starting to work together in some areas to coordinate land-use issues so that one jurisdiction does not adversely affect the other.
- **Subdivision Regulations:** Jurisdictions are starting to look at the impacts of existing and planned subdivision developments and are considering methods to reduce and/or eliminate those impacts. Storm water retention projects and locally funded structure buyouts are a couple methods implemented within subdivision developments which are making a significant difference in this area.
- **Capital Improvement Planning:** More and more jurisdictions are considering cost-effective mitigation measures when developing capital improvement projects. Success stories continue to show that forward planning within these projects, with associated mitigation measures, can minimize natural hazard risk. Disseminating these success stories will continue to strengthen the overall mitigation program at both the State and local levels.
- **Data Limitation Note:** DHS&EM's knowledge of and ability to analyze local policies, programs and capabilities will continue to improve through submitted and coordinated local mitigation plans. Currently the state has 20 approved LHMPs with 26 additional plans nearing completion and approval. DHS&EM will incorporate local community specific risk and vulnerability data into in future State All-Hazard Risk Mitigation Plan updates, as local plans are coordinated and approved by the State and FEMA.

4.6 Mitigation Measures

This section of the State All-Hazard Risk Mitigation Plan addresses identifying and evaluating cost-effective and technically feasible hazard mitigation projects and initiatives. All hazard mitigation projects within the State are designed to mitigate the affects of disasters on one or more of the following:

- Life safety of the at-risk population;
- National Flood Insurance Program (NFIP) repetitive loss properties;
- Private structures and properties;
- Government facilities;
- Public infrastructure (through Section 404 HMGP program funds);
- Environmental resources;
- Functionality of critical facilities; and
- Public facilities and infrastructure damaged by a disaster that can be mitigated through FEMA's Public Assistance program funding.

- The process used to identify cost-effective and technically feasible mitigation projects/actions based, primarily, on the source of the mitigation funds.

4.6.1 Disaster Funds

Mitigation funds that are available as a result of a presidentially declared disaster are based on a percentage of the overall federal share of disaster assistance provided as a result of that disaster. Mitigation funds may be used anywhere in the State if stated in the disaster declaration; however, priority will be given to:

1. Mitigation projects related to the hazard that generated the disaster declaration;
2. Those jurisdictions included in the disaster declaration.

DHS&EM hazard mitigation staff will work with FEMA mitigation staff to determine the approximate amount of hazard mitigation funds available to the State. Then DHS&EM will determine the specific hazard mitigation issues to be addressed with projected mitigation funds, and DHS&EM will notify all potential applicants of the availability of mitigation funds and request the submission of proposed mitigation projects.

1. **Government Entities:** Any State, local or tribal government entity is eligible. State agencies that may have projects that help support hazard mitigation objectives include those involved with natural resources, geological hazards, public works, infrastructure regulation or construction, floodplain management, parks and recreation, and community development.
2. **Private Non-Profit Entities:** Such organizations must either have an effective ruling letter from the U.S. Internal Revenue Services granting tax exemption under Section 501(c), (d), or (e), or be able to demonstrate that they qualify as a non-profit organization under State law. These entities must also coordinate with, or be included in, local, tribal, or State All-Hazard Risk Mitigation Plans delineating how hazards within those plans affect their facilities. Also, the organizations must own and operate qualifying facilities that can be categorized as follows:
    a. Medical: Hospitals and other outpatient, rehabilitation, or long-term care facilities
    b. Custodial Care: Nursing homes and congregate living facilities including those for aging or disabled persons
    c. Educational: Elementary and secondary schools and institutions of higher education
    d. Emergency: Fire departments, ambulance and other rescue services
    e. Utility: Telephone companies, power companies, sewage treatment plants, etc.
    f. Others: Governmental type services that are open to the public including museums, zoos, community centers, libraries, homeless shelters, senior citizen centers, and rehabilitation centers.
3. **Indian Tribes:** Indian tribes, authorized tribal organizations, and Alaska Native villages and organizations; but not Alaska native corporations with ownership vested in private individuals.

DHS&EM mitigation staff will review these proposals to assist in prioritizing Hazard Mitigation Projects based on the following criteria:

1. Does the project complement existing State and local mitigation goals and objectives?
2. Is the project cost-effective, based on applying the submitted project data to FEMA's benefit cost analysis module?
3. Are sufficient mitigation funds available to complete the project?

4. Does the applicant have sufficient funds (if other funds are not available) to meet the local share of the project?
5. Does the project solve a problem?
6. Is the applicant located within the declared areas for the applicable disaster? (This does not prevent a mitigation project from being approved.)

DHS&EM mitigation staff may coordinate, in conjunction with FEMA and the applicant, with other State and/or Federal agencies to ensure that the project complies with all State and/or Federal laws and regulations. These requirements include, but are not limited to, the Endangered Species Act, the Historic Preservation Act, Floodplain Management and National Environmental Policy Act requirements.

DHS&EM mitigation staff will forward the final mitigation project package to FEMA Region X Region Director for final approval and funding.

4.6.2 Pre-Disaster Mitigation Grant Programs

FEMA's Pre-Disaster Mitigation (PDM) grant program provides funding to State, local and tribal governments for implementing cost-effective hazard mitigation planning and projects before disasters occur. Authorized by the Robert T. Stafford Disaster Assistance and Emergency Relief Act through the Disaster Mitigation Act of 2000, the goal of the PDM program is to reduce the overall risk to people and property from future disasters, while also reducing reliance on funding from disaster declarations.

Eligible applications are awarded on a nationally competitive basis: FEMA chairs a national panel to evaluate eligible proposals. PDM projects must be cost-effective, feasible, effective, and consistent with the goals of applicable FEMA-approved State and local multi-hazard mitigation plans. In addition, projects must be compliant with environmental and historic preservation laws and regulations to receive Federal funding. PDM grants are awarded to States, federally-recognized Indian tribal governments, and territories. Local governments and non-emergency management State agencies may apply to States, Indian tribes, and territories as sub-applicants. In addition, State or local governments can apply on behalf of private non-profit organizations. To receive PDM funding, applicants and sub-applicants must participate in the National Flood Insurance Program (NFIP) if they have areas designated as Special Flood Hazard Areas.

PDM funding subject to Congressional appropriations: Funding is provided through the National Pre-Disaster Mitigation Fund and is subject to Congressional appropriations. Grant awards are subject to a 75 percent Federal/25 percent non-Federal cost share. Small, impoverished communities may receive up to 90 percent Federal funding.

This new competitive program was intended to provide technical and financial assistance to States, local and tribal governments to assist with implementing pre-disaster hazard-mitigation measures that are cost-effective and that are designed to reduce injuries, loss of life, and damage and destruction of property, including damage to critical services and facilities under the State agencies or local/tribal government's jurisdiction. This is currently the State's only mitigation grant program where eligible entities are required to provide a 25 percent non-Federal match for these grants, with small, impoverished communities potentially eligible for a 10 percent non-Federal match.

PDM program submittal periods are ever changing due to FEMA's internal processes. Due to disaster event activities, these processes and timelines determine whether DHS&EM will have sufficient time and capability to participate in the solicitation process. Consequently, DHS&EM evaluates whether participating in these programs is in the State's best interest.

The following is a list of PDM grants the State was successful in obtaining through the Nationally Competitive Process:

1. 2001 Level program funding, Non-Competitive
   a. State PDM Strategic Plan Development

2. 2002 Level program funding, Non-Competitive
   a. Begin building State capacity - fund staff technical assistance
   b. Begin database development

3. 2003 Level program funding, Non-Competitive
   a. Built State capacity through staff, workshops, and presentations
   b. DHS&EM funded five boroughs' plan development
   c. UAF applied for Disaster University Funding – Not awarded

4. 2004 State did not apply due to short application period

5. 2005
   a. State Management Cost
   b. Statewide planning initiative for 10 communities
   c. City of Dillingham Local Mitigation Plan (25% Share)
   d. City of Hooper Bay Local Mitigation Plan (10% Share)
   e. Lake and Peninsula Borough Local Mitigation Plan (25% Share)
   f. Kodiak Island Borough Multi-Jurisdiction Mitigation Plan (25% Share)

6. 2006
   a. State Management Cost
   b. Kodiak Island Borough School Seismic Retrofit Construction Project
   c. Anchorage School District, Gas Shut-Off Valve Construction Project for 10 schools.

7. 2007
   a. State Management Cost – Awaiting results
   b. Statewide planning initiative for 15 communities

4.6.3 Federal Unmet Needs Programs

Unmet Needs is not a program that is guaranteed to occur following every disaster, but occurs often enough to warrant discussion.

Mitigation funds associated with a Federal Unmet Needs Program are generally available only if the U.S. Congress directs funding towards the program during a specific Presidential disaster declaration where the needs of the citizens were not able to be met through existing services. These mitigation funds are only available in those jurisdictions identified for the applicable unmet needs allocation. The State's flexibility in identifying potential mitigation projects is somewhat limited because the unmet needs funding allocation will usually specify the types of mitigation projects that the unmet needs money can address. The only recurring criteria in every appropriation for Unmet Needs funding was **"the project must be a result of the disaster that is being supplemented and in the declared area."**

DHS&EM hazard mitigation staff will work with FEMA mitigation staff to determine the approximate amount of Unmet Needs Hazard Mitigation Funds available to the State. State officials will determine how to apply these funds toward specific hazard mitigation issues. DHS&EM will notify all potential applicants of the availability of Unmet Needs Mitigation Funds and request mitigation project proposals.

DHS&EM mitigation staff will review these proposals for the following criteria:

1. Does the project complement existing State and local mitigation goals and objectives?
2. Is the project cost-effective, based on applying the submitted project data to FEMA's benefit cost analysis module?
3. Are sufficient mitigation funds available to complete the project?
4. Does the applicant have sufficient funds (if other funds are not available) to meet the local share of the project?
5. Does the project solve a problem?
6. Is the applicant located within the areas designated by the unmet needs funds allocation?

If necessary, DHS&EM mitigation staff may coordinate, in conjunction with FEMA, the applicant, and with other State and/or Federal agencies to ensure that the project complies with all State and/or Federal laws and regulations. These requirements include, but are not limited to, Endangered Species Act, Historic Preservation Act, Floodplain Management and National Environmental Policy Act requirements.

DHS&EM mitigation staff will forward the final mitigation project package to FEMA Region X Region Director for final approval and funding.

Unmet Needs Program Applicant Eligibility:

Applicants must have a mitigation plan for their jurisdiction that conforms to FEMA guidelines and the State Hazard Mitigation Plan. Development of this plan is considered an eligible project.

1. **Government Entities:** Any State, local or tribal government entity is eligible. State agencies that may have projects that help support hazard mitigation objectives include those involved with natural resources, geological hazards, public works, infrastructure regulation or construction, floodplain management, parks and recreation, and community development.

2. **Private Non-Profit Entities:** Such organizations must either have an effective ruling letter from the U.S. Internal Revenue Services granting tax exemption under Section 501(c), (d), or (e), or be able to demonstrate that they qualify as a non-profit organization under State law. These entities must also coordinate with, or be included in, local, tribal, or State All-Hazard Risk Mitigation Plans delineating how hazards within those plans affect their facilities. Also, the organizations must own and operate qualifying facilities that can be categorized as follows:

    a. Medical: Hospitals and other outpatient, rehabilitation, or long-term care facilities
    b. Custodial Care: Nursing homes and congregate living facilities including those for aging or disabled persons
    c. Educational: Elementary and secondary schools and institutions of higher education
    d. Emergency: Fire departments, ambulance and other rescue services
    e. Utility: Telephone companies, power companies, sewage treatment plants, etc.
    f. Others: Governmental type services that are open to the public including museums, zoos, community centers, libraries, homeless shelters, senior citizen centers, and rehabilitation centers.

3. **Indian Tribes:** Indian tribes, authorized tribal organizations, and Alaska Native villages and organizations; but not Alaska native corporations with ownership vested in private individuals.

Funding

Federal funds made available by Unmet Needs can provide a Federal share of **up to 75%** of the

costs of an approved project. Therefore, the remaining 25% must be met through non-Federal funds. The remaining portion (25%) of the project cost must be covered by other funds from appropriate sources as shown below.

1. Cash (i.e., contracted services)
    a. State Government Revenues
    b. Local Government Revenues
    c. Non-Government Organization Funds
    d. Community Development Block Grant

2. In-Kind Resources (Also known as Force Account)
    a. Supplies
    b. Materials
    c. Equipment
    d. Personnel

3. Third Party In-Kind (Cannot equal more than the non-Federal share)
    a. Volunteer Services
    b. Donated Services and/or Supplies
    c. Loaned Equipment or Space

Projects

Project criteria are determined by Congress at the time funding is awarded, but will usually include in part, or in whole, the eligible criteria under the **Hazard Mitigation Grant Program** page. In addition, Unmet Needs may include projects that are considered ineligible, but parallel to the criteria outlined in the **Public Assistance Program**. Types of projects that may or may not be selected by Congress are listed below:

a. Structural hazard control or protection projects
b. Construction activities
c. Retrofitting of facilities
d. Acquisition and relocation/demolition
e. Development of state or local mitigation standards
f. Development of comprehensive mitigation programs with implementation as an essential component
g. Development or improvement of warning systems
h. Debris Removal

Project Eligibility

Project eligibility is also determined by Congress, but will usually conform to the existing criteria under the **Hazard Mitigation Grant Program** unless specifically waived. In addition to existing criteria, there could be additional criteria added, such as:

- Projects which effect low- to moderate-income households by at least 51 percent.
- Projects which fall into the Public Assistance categories yet were not eligible due to extenuating circumstances.

- The project must be a result of the disaster that is being supplemented and in the declared area.

To receive any publications, request additional information regarding mitigation assistance, or if you are an eligible applicant and are interested in applying for mitigation assistance for plan development or eligible construction projects, please contact Alaska's State Hazard Mitigation Officer, at 800.478.2337 or 907.428.7000.

4.6.4 Other Mitigation Programs

Availability of mitigation funding is associated with other Federal/State programs and are specific/ program dependent. These mitigation funds can only be used in those jurisdictions that possess a FEMA approved, community adopted Local All-Hazard Mitigation Plan; fulfill all other criteria; and are specifically identified by the applicable program.

The State's flexibility in identifying potential mitigation projects is somewhat limited because of the particular requirements associated with each program. We would encourage every jurisdiction that submits mitigation projects do so in such a manner that the project complements current State and local hazard mitigation goals and objectives. Local officials will usually determine the specific hazard mitigation issues they wish to address with projected mitigation funds.

DHS&EM mitigation staff will review local mitigation proposals since these programs are usually initiated between the jurisdiction and the applicable program staff. The review will be based on the same criteria used for disaster related mitigation projects. Those criteria are as follows:

1. Does the project complement existing State and local mitigation goals and objectives?
2. Is the project cost-effective based on applying the submitted project data to FEMA's benefit cost analysis module?
3. Are sufficient mitigation funds available to complete the project?
4. Does the applicant have sufficient funds (if other funds are not available) to meet the local share of the project?
5. Does the project solve a problem?

DHS&EM mitigation staff will advise the jurisdiction to coordinate with other State and/or federal agencies to ensure that the project complies with all State and/or federal laws and regulations. These requirements include, but are not limited to, the Endangered Species Act, the Historic Preservation Act, Floodplain Management and National Environmental Policy Act requirements.

DHS&EM mitigation staff will forward their comments to the jurisdiction for their final review and determination.

When evaluating mitigation projects submitted for review and possible approval, several factors are considered. These factors include, but are not limited to, the following:

1. The specific requirements and/or restrictions placed on the projects by the funding source.
2. There will always be more requests for mitigation funds than there will be available funds.
3. Federal and State funding for mitigation projects will be limited and in some instances may not be available.
4. Whenever possible, local jurisdictions should develop mitigation projects and initiatives that can be funded locally.
5. Local jurisdictions should actively pursue public-private partnerships, where appropriate, to

achieve desired mitigation goals.

6. The requested mitigation project should complement the goals and objectives of the State and local mitigation strategy.

5.0 HAZARD DETAILED VULNERABILITY ANALYSIS, MITIGATION SUCCESS, GOALS' LOCAL SUMMARY BY HAZARD

This section is devoted to specific hazards as well as multiple "all hazards" sections for issues that are relevant to those hazards. Each section documents some of the State's mitigation successes and existing mitigation programs. In addition, it describes the State's short-term and long-term mitigation goals, the lead agencies, support agencies, timelines, and resources needed for each listed goal.

For the purposes of this Plan:

- Short-term activities are those that agencies are capable of completing within two years
- Long-term activities are those which will take longer than two years to complete.
- Possible funding sources for short and long-term goals are in Appendix 5 and 6.
- Lead agencies are responsible implementing the mitigation measures identified in this plan. They should educate people within their agency about mitigation and its importance. They are the appropriate entity to identify any inconsistencies that existing programs or activities have with the mitigation plan.
- Support agencies assist lead agencies in implementing mitigation measures. They should also educate people within their agency about mitigation and its importance. They are the appropriate entity to identify any inconsistencies that existing programs or activities have with the mitigation plan. Other affected agencies should be considered a support agency even if they are not specifically identified in this plan.
- Timeline indicates the target implementation dates or duration of the activity.
- Resources are listed to indicate the means to commit or implement each goal, if known. They are expressed as a level of effort in full time equivalent (FTE) staff members.

Mitigation goals are ranked according to their priority (high, medium, and low) and are in direct relation to the State's main mitigation goals. High relates to life/safety issues, medium relates to planning/threat education, and low relates to other good mitigation measures.

The hazard maps are intended to provide an overview of areas that are exposed to the hazard and their occurrence probability. These maps are for illustrative purposes and should not used as an indication of a specific threat. More detailed area specific maps should be used for decision making.

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5.1 ALL-HAZARDS

In this section we address many mitigation actions, programs, policies, and concerns that pertain to a variety of hazards.

Existing Programs and Strategies

Public Education

DHS&EM operates booths at several State fairs and other important functions including the Kodiak Crab Festival, the Alaska Municipal League, the Alaska Federation of Natives Convention, and the Alaska Municipal Clerks Workshop, among others providing information on hazards in Alaska as well as mitigation, preparedness, response, and recovery measures. These activities provide excellent opportunities to reach many Alaska residents.

Other public education opportunities include school presentations, outreach trips to potential flood communities, an annual Emergency Management Conference, public information media campaigns, numerous presentations and briefings for professional organizations and community groups (Chamber of Commerce, Rotary Club, media outlets, etc.), and training sessions and exercises with partner agencies/groups.

Kenai Peninsula Borough's (KPB) Office of Emergency Management also conducts extensive public education. They have hosted several seminars devoted to hazard mitigation and preparedness and have made information available through their website and community office.

Anchorage recently started its Anchorage: Watchful, Alert and Ready for Emergencies (A.W.A.R.E.) Together program which was designed to educate the citizens of Anchorage about the municipality's response in the event of a disaster, and to train citizens to respond and to be self-sufficient. The A.W.A.R.E. Together program allows the Municipality of Anchorage to use a variety of programs to empower their communities.

- A.W.A.R.E. Academy. This four hour basic disaster preparedness class trains residents to respond properly in the event of an emergency. To date, over 1,000 residents have registered for this free class.
- A.W.A.R.E. Aid. Through partnerships with the American Red Cross and the American Heart Association, A.W.A.R.E. Aid provides free CPR training to graduates of the A.W.A.R.E. Academy.
- A.W.A.R.E. Schools. Through a partnership with the American Red Cross, the Corporation for National and Community Service and the Anchorage School District, all 26,000 K-6th grade students in the Anchorage School District will receive basic emergency response training.
- A.W.A.R.E. Coalition. The A.W.A.R.E. Coalition is a forum for public safety professions in the public and private sector. Through the A.W.A.R.E. Coalition, the municipality will be able to better identify and coordinate resources that will enhance effective response in the event of an emergency.
- A.W.A.R.E. Neighborhoods. Using elements of FEMA's CERT training and the Red Cross' Disaster Resistant Neighborhoods, local Anchorage neighborhoods will learn to work together to increase self-sufficiency in the event of a major disaster.

Regional Interagency Steering Committee (RISC)

The RISC is established as the principal forum within each FEMA region to address interagency and intergovernmental issues relating to disaster planning and preparedness. The

RISC is designed to facilitate regional preparedness activities at the federal regional level. The RISCs are responsible for multi-agency coordination under the NRP on a steady-state basis. The RISCs support the national level groups ie. The Emergency Support Function Leaders Group (ESFLG) by coordinating issues and solutions that is unique to the region. RISCs also coordinate preparedness efforts with other regional level preparedness organizations such as the Regional Response Teams (RRTs) that coordinate regional ESF#10 efforts. At a minimum, the RISC is comprised of representatives from each State in the region and where appropriate, regional level representatives from ESF primary and support agencies. RISCs meet at least quarterly and provide an operational level forum for regional planning, interagency information sharing and coordination. Each RISC includes an executive level committee, from the region, that meets at least twice yearly to provide executive level guidance and oversight. The FEMA Regional Director or a designated alternate chairs the RISC.

DHS will publish a charter for the RISCs further describing their roles and responsibilities.

Hazard Mitigation Successes

State Hazard Mitigation Plan

In March 2002, Alaska's first State Hazard Mitigation Plan (409 Plan) was completed. The Governor approved and signed the promulgation letter on Aug 6, 2002.

State Hazard Mitigation Advisory Committee (SHMAC)

The Advisory Committee, chaired by the State Hazard Mitigation Officer, consists of representatives from State, Federal, local and tribal governments and agencies, academic institutions, and the private sector. The duties of the advisory committee include reviewing and identifying known hazards to present a unified mitigation management strategy. The committee also reviews and prioritizes mitigation grant proposals in accordance with the priorities of life/safety, planning, and other good mitigation. These priorities consider repetitive loss properties, benefit cost analysis, and local priorities. The SHMAC recommendations are reviewed by the SHMO, and adjustments made. The SHMO then forwards the finalized project submittal to, and seeks approval from, the Governor's Disaster Policy Cabinet.

Goals

High Priority

1. Disseminate mitigation information to increase public education and awareness.

Mitigation Measure: Educational; Preventative

1.1. Objective: Promote mitigation through computer and information technology.

1.1.1. Action: Publish outreach information on the DHS&EM mitigation web page.

Lead: DHS&EM
Support: SHMAC
Timeline: on-gong **(Completed - 2004 through present)**

1.1.2. Action: Research opportunities for other web sites to link to the State Hazard Mitigation Plan.

Lead: DSH&EM
Support: DCCED
Timeline: on-going **(Completed - Local Community Mitigation Plans are linked to the State Plan's website)**

1.2. Objective: Deliver mitigation information to various users.

1.2.1. Action: Attend State Fairs and other special events to disseminate disaster mitigation information.

Lead: DHS&EM
Support: local Communities
Timeline: on-going **(Completed - Mitigation seeks opportunities to attend outreach events throughout the year – Activities started in 1999 when the Division purchased the "Quake Cottage," earthquake simulator for teaching earthquake and tsunami mitigation.)**

1.2.2. Action: Visit schools, businesses, and organizations to present mitigation planning and techniques to improve Knowledge, Skills, and Abilities (KSA's).

Lead: DHS&EM
Support: local communities
Timeline: on-going **(Completed - Mitigation seeks opportunities to attend outreach events throughout the year)**

1.2.3. Action: Provide literature for communities to distribute.

Lead: DHS&EM
Support: DCCED, FEMA, WC&ATWC, UAF/GI, NWS
Timeline: on-going **(Completed – Mitigation seeks opportunities to attend outreach events throughout the year)**

2. Increase agency/organization cooperation and coordination.

Mitigation Measure: Educational; Preventative

2.1. Objective: Coordinate State-mitigation policy.

2.1.1. Action: Establish a quarterly teleconference schedule.

Lead: DHS&EM
Support: SHMAC
Timeline: on-going **(Completed intermittently – SHMAC met to prioritize HMGP project submittals for DPC review for seven new disasters during the 2004-2007 update cycle)**

2.2. Objective: Involve agencies/organizations at different levels of government in mitigation planning.

2.2.1. Action: Establish a contact list of SMEs.

Lead: SHMAC
Support: DHS&EM

Timeline: on-going **(Completed - SHMAC list completed in 2003. Participants consulted on as needed basis.)**

3. Encourage all Alaskan local communities and tribal governments to have a Hazard Risk Mitigation Plan.

Mitigation Measure: Educational; Preventative

Hazard mitigation plans are required to qualify for Hazard Mitigation Grant Program funding resulting from a Presidentially Declared Disaster. Hazard mitigation plans should be developed before a disaster occurs. However, post-disaster plans must be prepared and submitted with HMGP project applications and receive State and FEMA approval before funding will be released.

3.1. Objective: Develop and disseminate guidance for local and tribal hazard mitigation plans.

Needed to fulfill DMA 2000, Sec 322, Mitigation Planning requirements after FEMA implementation guidance is published.

3.1.1. Action: Develop Guidance for local and tribal mitigation plans.

Lead: DHS&EM
Support: DCCED, tribal governments & organizations
Timeline: 6 months **(Completed 2005)**

3.2. Objective: Meet DMA 2000 goal of having local and tribal mitigation plans written by November 2004 by hiring additional staff.

3.2.1. Action: Hire 2 staff members to help communities develop plans.

Lead: DHS&EM
Support:
Timeline: 3 months **(Completed 2004)**

3.2.2. Action: Create Local / tribal Hazard Mitigation Plan Templates for Impoverished, small and large communities.

Lead: DHS&EM
Support:
Timeline: 6 Months **(Completed – 2005 HMTAP Project #382)**

3.3. Objective: Encourage communities to undertake or update hazard analysis and vulnerability assessments including identifying critical facilities and lifelines. Hazard and vulnerability assessments should be kept current to reflect changing conditions. They may be contained within an EOP or as a stand-alone document. Updates should occur biennially or after any significant community change. These assessments will help to identify poor siting locations allowing State agencies and community leader's to focus their mitigation efforts to protect or relocate critical facilities and lifelines away from hazard areas.

3.3.1. Action: Host training seminars which teach the benefit of current data and accurate identification of hazards.
Lead: DHS&EM, DCCED
Support: DCCED, DEC, DNR/DGGS, ALCOM

Timeline: on-going

3.4. Objective: Encourage communities to establish a hazard mitigation team/committees.

Agencies and organizations within a community should collectively address hazard mitigation issues to ensure they are not pursuing different or conflicting goals. Additionally, FEMA requires that community residents are involved in the process.

3.4.1. Action: Create a list of potential committee members

Lead: DHS&EM
Support: local communities
Timeline: on-going

4. Improve mapping.

Mitigation Measure: Educational; Preventative

4.1. Objective: Prepare Statewide and area specific hazard maps.

Statewide maps of individual hazards are useful for conveying the general distribution of a hazard, but are inadequate for land-use and emergency management decisions. Detailed hazard maps at scales useful for planning and decision making (normally 1:63,360 or larger scale) should be prepared in Geographical Information System (GIS) format for all urban and developing areas. Where possible, the maps should convey quantitative information about each hazard that is useful for design and planning.

4.1.1. Action: Statewide hazard maps for summation of hazards to load into ArcGIS®, VRISKMap®, and HAZUS® and run HVA for additional data sets.

Lead: DNR, DGGS
Support: DHS&EM, SHMAC
Timeline: on-going

4.1.2. Action: Update and Digitize State's Flood Hazard Maps.

Lead: DCCED Flood Map Modernization Project (FEMA funded)
Support: DHS&EM, SHMAC, DOT, Denali Commission, ANTHC
Timeline: on-going

4.1.3. Action: Erosion Assessment

Lead: DCCED, USACE,
Support: DOT, DNR, DGGS NRCS, SHMAC
Timeline: on-going

4.2. Objective: Update existing topographic and orthophoto map coverage of the entire State, to include generating high resolution digital elevation models (DEMs). Accurate maps are critical for hazard identification, risk assessment (e.g. improved slope mapping for avalanche susceptibility or inundation mapping) monitoring, and accurate portrayal of hazard information for emergency management and educational uses. Priorities should include populated areas, including coastlines exposed to tsunami and storm action, active volcanoes, and areas prone to specific hazards. DEMs are used by geophysicists to detect deformation at active volcanoes; however the poor quality of existing digital topographic information hampers analysis. Pre-disaster maps and photographs are also essential for post-disaster assessment and emergency response.

4.2.1. Action: All GIS hazard-map data released for distribution should be prepared and documented according to Federal Geographic Data Committee (FGDC) standards for geospatial data and metadata, and should be compatible with ArcGIS software by State agencies.

Lead: USGS, DNR
Support: DHS&EM, SHMAC
Timeline: on-going

4.2.2. Action: Continue to acquire data sets that would be useful for decision makers after HVA's are completed.

Lead: DHS&EM Mitigation and State Vulnerability Assessment Team
Support: SHMAC
Timeline: on-going

4.3. Objective: Have compatible GIS hazard data

All GIS hazard-map data released for distribution should be prepared and documented according to Federal Geographic Data Committee (FGDC) standards for geospatial data and metadata, and should be compatible with ArcGIS software by State agencies.

4.3.1. Action: Publicize existing standard.

Lead: DNR/DGGS, DCCED
Support: DHS&EM, UAF/GI
Timeline: on-going

4.3.2. Action: Convert DCCED's Community Profile Base Maps from AutoCAD to GIS.

Lead: DCCED,
Support: DHS&EM, UAF/GI, DNR/DGGS,
Timeline: 10 years

Medium Priority

5. Keep State Hazard Mitigation Plan up to date for all hazards.

Mitigation Measure: Educational; Preventative

5.1. Objective: Update the Plan annually and following any Presidential Disaster Declaration.

5.1.1. Action: Hold quarterly teleconferences to discuss plan revisions.

Lead: DHS&EM
Support: SHMAC
Timeline: on-going

5.1.2. Action: Submit revised draft to Governor for promulgation following FEMA Mitigation Plan update timeline.

Lead: DHS&EM
Support: Affected State Agencies
Timeline: In accordance with the update cycle chart located in section 3.0.

5.2. Objective: Develop additional detailed hazard vulnerability analysis (HVA) sub-sections. Continue developing hazard information and hazard vulnerability analysis that

affect Alaska to enhance the State All-Hazard Risk Mitigation Plan.

5.2.1. Action: Collect from SHMAC member agencies and any other available sources.

Lead: DHS&EM
Support: DCCED, DNR, DPS, AVO, NWS, WC&ATWC, UAF/GI, FEMA, emergency management organizations from other states
Timeline: on-going

5.2.2. Action: Develop the Technological sub-section

Lead: DHS&EM Homeland Security State Vulnerability Assessment Team
Support: DCCED, DNR, DPS, AVO, NWS, WC&ATWC, UAF/GI, FEMA, emergency management organizations from other states
Timeline: on-going **(Partial completion, additional in 2010)**

5.2.3. Action: Develop the Terrorism sub-section

Lead: DHS&EM Homeland Security State Vulnerability Assessment Team
Support: DCCED, DNR, DPS, AVO, NWS, WC&ATWC, UAF/GI, FEMA, emergency management organizations from other states
Timeline: on-going **(Partial completion, additional in 2010)**

5.2.4. Action: Develop sub-section not already identified in the goals under NFPA and EMAP Standards

Lead: DHS&EM
Support: DCCED, DNR, DPS, AVO, NWS, WC&ATWC, UAF/GI, FEMA, emergency management organizations from other states
Timeline: on-going

5.3. Objective: Monitor State All-Hazard Risk Mitigation Plan implementation.

Ensure that the measures and policies outlined in this Plan are implemented correctly by conducting an annual review based on the annual progress report from each lead agency. The progress report form is located Appendix 18. The progress reports will be submitted by November 1 to allow enough time for the plan to be updated. This date was chosen to avoid conflicting with federal and State fiscal year -end activities.

5.3.1. Action: Complete Annual Report

Lead: DHS&EM
Support: SHMAC
Timeline: on-going

6. Improve hazard mitigation technical assistance for local governments.

Mitigation Measure: Educational; Preventative

6.1. Objective: Encourage local efforts by providing hazard mitigation training, current hazard information, and facilitating communication with other agencies.

6.1.1. Action: Develop workshops for State and local officials to provide available mitigation tools and techniques they can incorporate into daily operations.

Lead: DHS&EM

Support: Applicable State Agencies
Timeline: on-going

6.1.2. Action: Develop workshops for critical facility managers to provide available mitigation tools and techniques they can incorporate into daily operations.

Lead: FEMA
Support: DHS&EM
Timeline: on-going

6.2. Objective: Encourage additional training and assistance from FEMA on HMGP process to include Benefit Cost Analysis.

6.2.1. Action: Coordinate during next presidentially declared disaster a Mitigation Team, similar to the Public Assistance Teams, for local community support in completing the HMGP requirements. Alaska Test.

Lead: DHS&EM, FEMA
Support: Other State Agencies, SHMAC, local communities
Timeline: on-going **(Completed January 2006 for 2006 PDM grant cycle, August 2006 for FEMA DR-1663,1666,1669 disaster project development, and Dec 2006 for 2007 PDM grant cycle)**

6.2.2. Action: Coordinate additional training on Benefit Cost Analysis module for Alaska specific events and projects.

Lead: DHS&EM
Support: FEMA
Timeline: 1 year **(Completed - January 2006 for 2006 PDM grant cycle and December 2006 for 2007 PDM grant cycle)**

7. Integration of hazard mitigation into daily activities at the local level.

Mitigation Measure: Preventative

7.1. Objective: Encourage communities to incorporate hazard mitigation in local land-use plans; zoning ordinances, capitol improvement programs, community plans, floodplain management plans, transportation plans etc. Addressing hazard mitigation throughout various community planning activities will encourage or prompt development away from hazardous areas.

7.1.1. Action: Encourage plan integration, coordination, or collaboration whenever assisting communities with plan development for any state or federal funded planning activity.

Lead: DHS&EM Emergency Response Plan, State Vulnerability Assessment, and other State/federal funded planning activities.
Support: FEMA, DOT, DCCED, DCED
Timeline: On going **(Completed – Communities are encouraged to integrate DOT, Capitol Improvement Plans and other planning functions during each Local Mitigation Planning workshop or disaster related community visit.)**

8. Reduce damage to publicly funded facilities

Mitigation Measure: Protective; Preventative

This will be an expansion of Administrative Order 175 (AO175), as it is in the State's best interest to protect its investment from all hazards instead of limiting protection to flood and erosion hazards. (Administrative Order 175 is located in Appendix 26)

8.1. Objective: Minimize hazard exposure.

8.1.1. Action: Adopt a State policy requiring all State facilities, or facilities constructed with public funds, be located, designed, built, and operated to minimize risk from hazards, and insured to reduce future costs to the public.

Lead: Governor's Office
Support: DHS&EM, DPC, DLAW, DCCED
Timeline: 10 years

8.2. Objective: Retrofit existing State funded structures.

8.2.1. Action: Employ mitigation measures during routine maintenance projects to harden structures against damage from prevalent disasters in their location.

Lead: Each Department
Support: State Legislature, Governor's Office
Timeline: on-going

9. Reduce repetitive loss

Mitigation Measure: Educational; Preventative

9.1. Objective: Encourage developing disaster recovery plans that incorporate hazard mitigation.

A community has many rebuilding options during the recovery process. A community can easily implement changes to their community's land-use and building construction practices during recovery activities with coordinated plans in place. Pre-planning can prevent overlooking sound mitigative projects and reduce poor spur-of-the-moment decisions that may have long-lasting negative ramifications.

9.1.1. Action: Publish a sample disaster recovery plan on the DHS&EM website.

Lead: DHS&EM
Support: DCCED
Timeline: 3 years **(Timeline extended for additional 3 years)**

10. Better communications.

Mitigation Measure: Protective

10.1. Objective: Ensure sustainable communication system compatibility.

Communication systems often fail when they are needed the most; during a disaster or emergency. The physical infrastructure could fail, the system could become overloaded, or the equipment could be incompatible with other agencies systems. Coordinated communication plans and compatible equipment improve communication continuity.

10.1.1. Action: Implement the Alaska Land Mobile Radio (ALMR) Project

The goal of the ALMR project is to build a land mobile radio communications system that will provide each participating agency autonomous day-to-day communications and the ability to transition to a full featured interoperable system when needed. Sharing of a

common radio infrastructure will eliminate duplications of capital investment projects, thus reducing the total communications cost for each participating agency.

Lead: ALMR Executive Council
Support: DCCED, DEED, DC, DEC, ADF&G, AKRR, DMVA, DPS, DNR
Timeline: 5 years **(75% Complete – 2006/Additional 5-8 years for total completion)**

10.2. Objective: Encourage communities to implement redundant community alert warning systems.

10.2.1. Action: Install NOAA Weather Radio (NWR) transmitters where NWR signals are available, or communication capability in locations where NWR is not available.

Lead: NWS
Support: DHS&EM, DPS, Alaska Tsunami Warning Center
Timeline: on-going **(Completed Warning System installation in Perryville and Chignik Lagoon – NTHMP/TWEAK Tsunami funding – 2006, Kenai Peninsula Borough upgrading borough warning siren network using FEMA DR-1440 HMGP program funding – 2006-2007)**

Low Priority

11. Increase funding for hazard mitigation.

Mitigation Measure: Preventative

11.1. Objective: Establish a fund to promote local governments' hazard mitigation efforts.

Many communities lack the financial resources to develop and implement a comprehensive mitigation program. It is in the State's long-term interest to promote these activities.

11.1.1. Action: Establish a State fund to promote local governments' hazard mitigation efforts.

Lead: Legislature
Support: DCCED, DHS&EM
Timeline: 5 years

11.1.2. Action: Establish a special fund to be used by State agencies for hazard mitigation projects.

Lead: Legislature
Support: DCCED, DHS&EM, DOT&PF
Timeline: 10 years

11.2. Objective: Maximize opportunities for local and tribal governments' to apply for federal hazard mitigation program funding.

11.2.1. Action: Make every effort to solicit applications for federal mitigation grant program funding such as the nationally competitive PDM, statewide competitive HMGP, statewide competitive FMA, fire mitigation, and nationally competitive Homeland Security program funding sources.

Lead: DHS&EM
Support:

Timeline: on-going

12. Develop Statutes and Administrative Codes that support hazard mitigation initiatives.

Mitigation Measure: Educational; Preventative

12.1. Objective: Revise existing real estate disclosure laws to assure adequate notice to future property owners about potential hazard risks. The existing Residential Real Property Transfer Disclosure Statement only asks the seller to declare if the property is located within an avalanche area or floodplain or has had damage from natural causes including earthquakes and landslides. The disclosure statement should be expanded to ask if the property is in any known hazard area(s).

12.1.1. Action: Revise the Residential Real Property Transfer Disclosure Statement.

Lead: Governor's Office, Legislature
Support: DHS&EM, DCCED, DLAW
Timeline: 5 years

12.1. Objective: Review existing Alaska Statutes to strengthen mitigation options. Modifying statutes and regulations can streamline the permitting process and make it easier to implement worthwhile mitigation measures.

12.2.1. Action: Ensure statutes complement State mitigation strategies and collaborate with each other.

Lead: Governor's Office, DLAW
Support: DHS&EM, DNR, DOT&PF
Timeline: 3 years

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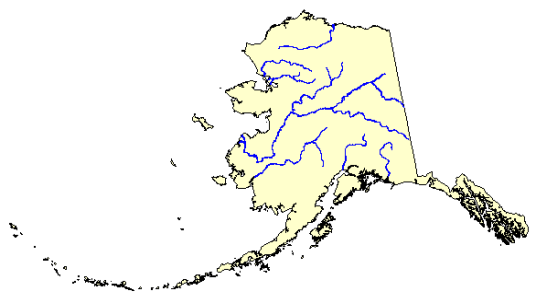
5.2 FLOODS

Flooding is a natural event and damages can occur when humans interfere with the natural process or build within areas prone to flooding. Items that can cause problems include altering the waterway and developing watersheds. Development within the floodplain is an additional hazard that does not directly alter the water path but can cause hazardous affects. Most of Alaska's communities and transportation facilities are located along large rivers and are subject to flooding. This flooding threatens life, safety and health; causes extensive property loss; and results in excess of three-quarters of a million dollars annual damage to Alaskan infrastructure.

Hazard Analysis/Characterization

Flood Experience

Alaska has had a lot of experience with flood events. One of the most flood-prone cities in the State is Skagway because of its location on a river delta. A dike along the Skagway River partially protects the city. However, the city has experienced ten flood disasters in the 1900's alone.



Alaska's Major Rivers

The Fairbanks area has a history of flooding from the Chena River. Rapid snowmelt from large snowpacks in interior Alaska causes major flooding in June and July 1964. In August 1967, twice the area's annual precipitation fell in just a few days. The resulting floods put about 95% of Fairbanks under water, causing 6 deaths, $85 million in damages, and the evacuation of 12,000 people.

In October 1986, the State was affected by a significant flooding event over a three-day period and Seward was subjected to 18 inches of rain which generating the largest flood the town had ever experienced. The flooding disrupted transportation routes throughout Southcentral Alaska and eliminated land access to Seward. Damage to Seward, other parts of the Kenai Peninsula, and the Matanuska-Susitna Borough was estimated at about $20 million.

1995 Flood in Kenai

The Southcentral part of the State experienced severe flooding again in September 1995 and the Seward Highway had to be closed after rain swept across a quarter-mile stretch of the highway near Milepost 3. Girdwood officials shut down the wastewater treatment plant when large volumes of mud

and water overwhelmed it. This caused raw sewage to be washed into local creeks. The Kenai and Kasiloff rivers had to rely on boats for transportation; residents of the Kenai Keys and Poacher's Cove areas were encouraged to evacuate.

On October 19-20, 1998 flooding occurred in the communities of Haines and Klukwan, as well as the City and Borough of Juneau, after the worst two-day rainfall in fifty years (over 6 inches of rain fell within a 48-hour period) occurred in Southeast Alaska. The flooding and associated mudslides and water erosion caused extensive damage to many road systems and properties.

Flooding in Russian Mission
Photo courtesy M. Bird ADES

Types of Flooding

Flooding in Alaska can be broken into a number of categories including rainfall-runoff, snowmelt, ground-water, ice jam, flash, fluctuating lake levels, alluvial fan and glacial outburst floods. Alaska also experiences coastal flooding from storm surge but this will be discussed in Section 5.10. These are not exclusive categories as a flood event could have elements of multiple types.

Timing of events

Many floods are fairly predictable based on rainfall patterns. For coastal areas of Alaska, most of the annual precipitation is received from September through February with October being the wettest. In Interior Alaska, the wettest period is June through November with August the wettest month. This rainfall leads to flooding in late summer and fall. Spring snowmelt increases runoff, which can cause flooding. It also breaks the winter ice cover, which causes localized ice-jam floods. Glacial outburst floods occur mostly in mid-summer through late fall. Other types do not have this seasonal component.

Rainfall-Runoff Floods

A typical rainfall event occurs in mid to late summer. The rainfall intensity, duration, distribution, and geomorphic characteristics of the watershed all play a role in determining the magnitude of a flood.

Runoff flooding is the most common type of flood. They usually results from weather systems that have prolonged rainfall associated with them.

Snowmelt Floods

These flood events usually occur in the spring or early summer. The snow pack depth and spring weather patterns influence the magnitude of flooding. Snowmelt floods can also be caused by glacial melt.

Ground-water Floods

These floods occur when water accumulates and saturates the soil. The water-table rises flooding low-lying areas, including homes, septic tanks, and other facilities. It has been a significant problem in Fairbanks, especially downstream of the Chena Lakes

Dam. When high water is impounded behind the dam; the water table rises and floods low-lying areas. Ground-water flooding also occurs in structure basements along the Chena River when the river stage remains high for more than a few days.

Ice Jam Floods

Ice jams can form during fall freeze up, in midwinter when stream channels freeze forming anchor ice and during spring breakup when the existing ice cover gets broken into pieces and the pieces get stuck at bridges or other constrictions. When the ice jam fails, it releases the collected water. Ice jams routinely cause large floods on the Kenai, Susitna, Kuskokwim, and Yukon Rivers.

Breakup flooding in Alakanuk
Photo courtesy DCCED

Water collects upstream from a jam, flooding an area by creating a lake-like effect that has a large areal extent. The effect is analogous to a dam. Little damage typically occurs from the action of the current upstream of the jam but significant damage can result from flooding once the dam breaks or the water tops the embankment. The downstream effect is very different. Once the jam is breached water usually drains rapidly from behind the jam. Not only does the downstream stage rise substantially once the jam is breached, but there is substantial current strength combined with house sized blocks of ice, which can cause erosion and significant damage. The rising water causes the ice to float and the increased velocities move the ice further downstream. These fast moving large blocks of ice are often very destructive.

Flash Floods

These floods are characterized by a rapid rise in water. They are often caused by heavy rain on small stream basins, ice jam formation, or by dam failure. They are usually swift moving and debris filled, causing them to be very powerful and destructive. Steep coastal areas in general are subject to flash floods. Debris slides are often associated with heavy rains. The Kodiak and Seward areas, as well as Southeast Alaska, are prone to flash floods.

Fluctuating Lake Level Floods

Generally, lakes buffer downstream flooding due to the storage capacity of the lake. But when lake inflow is excessive, flooding of the area around the lake can occur. The Kenai and Skilak Lake's area see periodic flooding due to rainfall, snowmelt, and glacier-dammed lake releases.

Alluvial Fan Floods

Alluvial fans are areas of eroded rock and soil deposited by rivers. When various debris forms fill the existing river channels on the alluvial fan, the water overflows the embankment and is forced to cut a new channel. Fast, debris filled water causes erosion and flooding problems over large areas. Alluvial fan flooding frequently causes road closures and infrastructure damages to the Cities of Seward and Girdwood and along the Richardson, Haines, and Dalton Highways.

Glacial Outburst Floods

A glacial outburst flood, also known as a jökulhlaup, is a sudden release of water from a glacier or a glacier-dammed lake. They can fail by overtopping, earthquake activity, melting from volcanic activity, or draining through conduits in the glacier dam.

Subglacial releases occur when enough hydrostatic pressure occurs from accumulated water to “float” the glacial ice. Water then drains rapidly from the bottom of the lake.

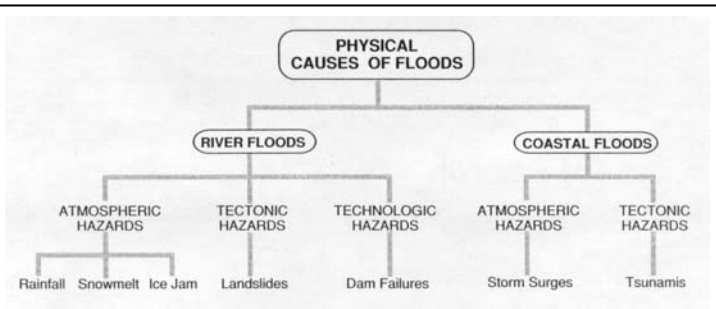
Glacial outburst flooding is possible in many parts of the State. A USGS study of glacier dammed lakes and outburst floods in Alaska found 750 glacier dammed lakes in Southcentral and Southeastern Alaska and in adjacent Canada which drain into rivers entering Alaska. The Copper, Snow, and Kenai Rivers all have periodic outbursts (2 – 5 year frequency). Kennicott Glacier at McCarthy has an annual event. The Tazlina River has frequent events.

In May 1986, Hubbard glacier blocked the entrance to the Russell Fjord, turning it into a lake. The water level rose over 80 feet. Later that year, in October, the water overtopped the glacier and the lake drained to sea level in just a few hours. This was not a typical event, however, because it was caused by the sudden advance of a glacier.

In late May or early June 2002, Hubbard Glacier pushed a moraine plug across the seaward entrance to Russell Fjord and began to restrict the tidal exchange between Disenchantment Bay and Russell Fjord. By early June, as the moraine continued to grow, the tidal exchange was blocked, forming Russell Lake. The lake level rose at an average rate of more than 0.8 feet per day because of the large amount of runoff and glacial melt in the basin. By late July, the dam completely sealed off the lake. At about 3 a.m., Aug. 14, real-time USGS water gage data revealed that the water level in the lake had peaked at about 61 feet above sea level and had begun to drop.

Following the 2002 outburst flood, the USFS was identified as the lead agency for all subsequent activities including the oversight and review of several technical studies dealing with understanding the physical, economic, and biologic impact of an overflow flood on the Yakutat community and surrounding area. To help with this process, a community-based group, The Hubbard Glacier Task Force, was formed in 2002 to provide community input to the USFS.

In December 1961, Summit Lake in British Columbia, Canada drained into the Salmon River, severely damaging the dike that protects Hyder, Alaska. Summit Lake has actually been releasing on a fairly regular basis since the 1960s. During the events, the flow of the Salmon River usually triples. In the 1960s, flooding events appeared to happen every other year but they have become more of an annual event now.



Physical causes of floods
Courtesy of Smith 1996

Another fairly frequent event occurs on the Tulsequah Glacier near Juneau. In this case, Tulsequah Lake and Nolake Lake which is five miles further north have both been involved. They release into the Tulsequah and Taku Rivers. For example, Tulsequah Lake caused an event on July 21-24, 2001 while Nolake was responsible for the August 8-10 event. These floods generally do not cause much damage except they usually inundate the airstrip near the mine on the Tulsequah River. The debris and sediment also cause changes to the river channel before and after a flood making both rivers difficult to navigate.

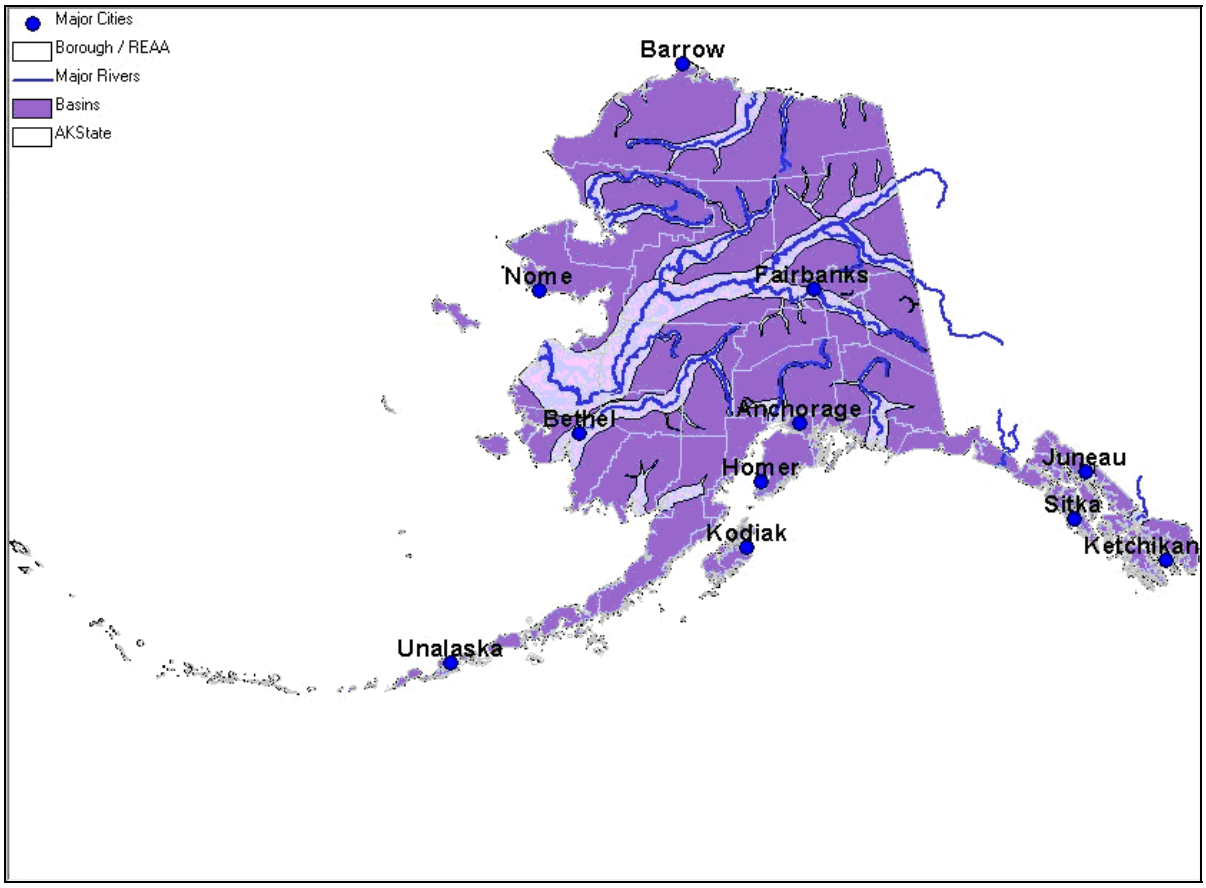
Skilak Glacier, part of the Harding Ice Field on the eastern most shoreline of Skilak Lake, experienced a glacier lake burst during January 2007 sending water down the Kenai River floating ice, causing ice break-up, and intermittent ice jams. These large ice floes stripped the Kenai River banks of docks, wharves, and boardwalks resulting in approximately $3.8 million dollars damage to State and community infrastructure and personal property.

Other problems related to flooding are deposition and stream bank erosion. Deposition and bed loading are equivalent terms which are the accumulation of soil, silt, debris and other materials within flood control structures (levees), on a river bottom, or over a delta. For example, large diameter boulders, great quantities of organic material, and stoney gravel accumulated during flood events in Lowell Creek, Jap Creek, and the Resurrection River in Seward, the Lowe River in Valdez, and in Gold Creek in Juneau to name a few. Deposition leads to the destruction of fish habitat and presents a challenge for navigational purposes. Deposition also reduces channel capacity, resulting in increased flooding or bank erosion.

Stream bank erosion occurs when material is removed from the stream bank. Erosion becomes a concern when streamside vegetation, fish habitat, land and property are lost. For example, the lower Matanuska River has had excessive bank erosion resulting in lost homes and property. Many Alaskan villages survival is threatened by bank erosion necessitating expensive construction measures to further bank loss. Erosion will be discussed in more detail in Section 5.10.

Hazard Vulnerability Analysis

The basin map depicts river basin region vulnerability. The summary sheet shows the potential threat to State owned facilities and the potential costs involved.


Major Cities
Borough / REAA
Major Rivers
Basins
AKState
Barrow
Nome
Fairbanks
Bethel
Anchorage
Homer
Kodiak
Juneau
Sitka
Ketchikan
Unalaska

2007 Flood Basin Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	337	1,327,754	100.00%	$120,838,284	$154,575,154	$37,709,387
Alaska Gateway REAA Totals	11	15,273	1.15%	$154,448	$2,385,640	$0
Bering Straits REAA Totals	15	22,442	1.69%	$2,045,348	$3,104,609	$0
Bristol Bay Borough Totals	6	11,040	0.83%	$407,948	$1,462,550	$0
Chugach REAA Totals	1	2,400	0.18%	$250,000	$250,000	$0
City & Borough of Juneau Totals	41	756,506	56.98%	$49,064,497	$64,454,389	$29,612,230
Copper River REAA Totals	29	29,520	2.22%	$3,693,708	$5,574,798	$0
Denali Borough Totals	4	12,443	0.94%	$1,135,500	$2,445,800	$150,720
Fairbanks North Star Borough Totals	26	223,153	16.81%	$35,316,630	$36,232,730	$6,583,950
Iditarod Area REAA Totals	9	12,030	0.91%	$1,903,639	$2,220,001	$361,800
Kenai Peninsula Borough Totals	1	1,800	0.14%	$96,209	$270,000	$0
Ketchikan Gateway Borough Totals	3	7,029	0.53%	$745,200	$746,220	$0
Kuspuk REAA Totals	10	22,208	1.67%	$3,270,246	$4,072,385	$250,687
Lake & Peninsula Borough Totals	3	2,640	0.20%	$786,139	$1,171,139	$0
Lower Kuskokwim REAA Totals	21	32,936	2.48%	$2,595,120	$3,853,129	$0
Lower Yukon REAA Totals	27	35,279	2.66%	$3,883,551	$5,414,697	$0
Matanuska-Susitna Borough Total	29	18,210	1.37%	$1,248,066	$1,578,934	$0
North Slope Borough Totals	5	3,310	0.25%	$265,752	$368,852	$0
Northwest Arctic Borough Totals	16	15,896	1.20%	$1,311,000	$1,524,005	$0
Southwest Region REAA Totals	11	4,507	0.34%	$172,116	$478,221	$0
Yukon Flats REAA Totals	15	19,104	1.44%	$1,371,397	$2,659,680	$0
Yukon-Koyukuk REAA Totals	47	72,420	5.45%	$10,403,565	$13,195,171	$750,000
Yupiit REAA Totals	7	7,608	0.57%	$718,205	$1,112,204	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	34782	24	352
Alaska HAZUS Building Costs	$5,755,344	$101,950	$741,175

Alaska HAZUS Building Content Costs

	Population	Households	Average Value
Alaska HAZUS Demographics Data	110,707	37,823	$95,173

Existing Programs and Strategies

River Watch

River Watch is a partnership program between DHS&EM and NWS's River Forecast Center created to warn communities of impending flooding and for issuing flood watch and warnings during spring break up. Educating communities about flood preparedness is an important component of the program along with data analysis and aerial reconnaissance of the Yukon and Kuskokwim Rivers. Reconnaissance information is communicated to the State Emergency Coordination Center (SECC) and the affected communities. Community residents use this valuable data as lead-time to prepare for the impending flooding enabling them to move personal belongings to higher ground, storing fresh water, and other activities to reduce losses.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available in communities that have adopted, and are enforcing, floodplain management ordinances. At present (April 2007), there are 32 participating communities in Alaska with 2,617 NFIP policies in place. These 32 communities encompass 86 percent of the State's population making flood insurance widely available. As of February 2007, the average annual flood insurance policy premium in Alaska is $655.00 per year. Six communities participate in the Community Rating System (CRS) which adjusts the rates paid for flood insurance based on mitigation measures undertaken by the community. These communities are the Municipality of Anchorage, Kenai Peninsula Borough, City of Valdez, City of Seward, City of Nome, and Ketchikan Gateway Borough. The NFIP is administered by FEMA and managed by the State of Alaska's floodplain Coordinator located within DCCED's, Division of Community Advocacy (DCA).

Flood Mitigation Assistance (FMA) Program

DCCED manages the FMA program. This is a Federal (75/25% cost share) grant program to help states and NFIP communities with flood mitigation actions. The program can award planning grants, project grants, or technical assistance funds. Project grants can elevate, relocate, flood proof, or acquire flood prone structures.

Administrative Order 175

State of Alaska AO 175 calls for State agencies to consider flooding and erosion issues during the siting and construction phases of State owned and financed construction projects, and adhere to Federal flood damage protection standards in all State development actions. (See Appendix 26)

Elevation in Action, Talkeetna
Photo courtesy of DCCED

Hazard Mitigation Successes

Seward

In 1988, the City of Seward adopted a Floodplain Management Ordinance that regulates developing property located in a FEMA designated flood zone. The City requires Subdivisions to document properties located within a designated flood zone. The plat map must identify the floodplain limits; noting that portions of the subdivision are located within a mapped FEMA Flood Zone. Additionally, the development must comply with Seward City Code Chapter 15.25 Floodplain Management.

The State took an innovative approach to removing a repetitively damaged home in the Nash Road area adjacent to the City of Seward from the floodplain. This structure was substantially damaged and project parties agreed the best course action to take would be to destroy the old structure, build the new structure onto an elevated pad in front of the former location and extend the well head. Both the new structure's first floor elevation and the well head opening were built two feet above the base flood elevation. The project also included a relocated and elevated septic system. The entire project also included a foundation protection system to minimize potential erosion. NFIP Insurance, FMA, Increased Cost of Compliance (ICC), HMGP, and owner funds were combined to accomplish this initiative.

Talkeetna

The historic *Don Sheldon Hanger Building* in Talkeetna was elevated using Flood Mitigation Assistance Grant funding. The hanger is now being turned into a community theater.

Fairbanks

FMA grant funds elevated a repetitively damaged home near the Chena River and flood proofed a home below the Chena Lakes/Moose Creek Dam.

State of Alaska

The State Fire Marshal and the Alaska Division of Energy signed a Memorandum of Agreement requiring that uplift protection be provided when a fuel tank farm is in an area subject to flooding.

1995 South Central Fall Flood

The State received over $ 1 Million in HMGP funding from the 1995 South Central Fall Flood. The funding was used on the following six projects:

- Replaced the Alaska Railroad Bridge at Railroad Milepost 4.8, located on the West Fork of Salmon Creek, as the old bridge trapped debris, causing upstream flooding.
- Installed stream and precipitation gauges throughout the Kenai Peninsula Borough partnering with USGS.
- Installed National Oceanic & Atmospheric Administration (NOAA) weather radio transmitters in the. Kenai Peninsula Borough
- Purchased Mobile Emergency Sirens for Kenai Peninsula Borough
- Installed armor protection on the Lowe River Levee in Valdez.
- Helped fund the Seward Comprehensive Flood Mitigation Project consisting of:
  - Elevating controls of a downtown sewer lift station.
  - Increasing the flow capacity of the culvert at Fourth Avenue (the fish ditch).
  - Removing debris from the Resurrection River.

Statewide Flood Map Modernization Project

2005, DCCED, FEMA, and the City of Aniak completed Alaska's first digitized flood map funded by FEMA's Flood Map Modernization (Map Mod) Project. Alaska's Map Mod Plan updated and prioritized FEMA funding allocations for identified community maps. DCCED staff is responsible for scoping, developing, and coordinating map production. The digitized maps allow Aniak access to accurate flood risk assessments. DCCED staff is currently coordinating and managing nine small communities under the State's Map Mod Cooperating Technical Partnership Agreement with FEMA. The other communities engaged in the Map Mod Project include the Municipality of Anchorage, Kenai Peninsula Borough, Matanuska-Susitna Borough, Fairbanks North Star Borough, City and Borough of Juneau, and the City and Borough of Sitka.

Floods

Goals

Medium Priority

1. Reduce flood damage.

Mitigation Measure: Protective; Preventative

1.1. Objective: Support elevating, flood proofing, buying out, or relocating repetitively or substantially damaged structures that are covered by flood insurance policies.

1.1.1. Action: Create a prioritized list of potential structures and prepare applications for FEMA funded programs.

Lead: DCCED
Support: DHS&EM, SHMAC, DOT&PF, DEED, DEC
Timeline: on-going

1.2. Objective: Encourage elevating, flood-proofing, buying out or relocating repetitively or substantially damaged structures that are in areas ineligible for NFIP. This would primarily involve unincorporated communities in the Unorganized Borough but may include other entities lacking the ability to participate in NFIP. These communities need special consideration as alternative funding sources and strategies are required.

1.2.1. Action: Create a prioritized list of potential structures and prepare applications for FEMA funded programs.

Lead: DCCED
Support: DHS&EM, DOT&PF, DEED, DEC, SHMAC
Timeline: on-going

1.3. Objective: Encourage relocating flood-prone villages out of floodplains**.**

- Relocating flood-prone communities will prevent repetitive losses and substantial damages. According to 44 CFR 206.434, participation in relocation projects requires:
  - Removing or demolishing vacated residences from flood-prone areas prevents re-occupation.
  - Ensuring vacated areas are prohibited from re-habitation for perpetuity.
  - No permanent structures, only temporary structures allowed, open on all sides (e.g. picnic shelters, kiosks etc.), public restrooms, and other approved facilities. This measure protects lives and prevents future, repetitive property flood loss.

1.3.1. Action: Prepare a statewide community erosion assessment and prioritize at risk communities and infrastructure.

Lead: USACOE
Support: DCCED, DHS&EM, Denali Commission, SHMAC
Timeline: on-going

1.4. Objective: Reduce development in floodplains.

1.4.1. Action: Purchase flood-prone property and convert to open space for perpetuity.

Lead: DCCED
Support: local government, State Legislature
Timeline: on-going

Prevent future damage.

Mitigation Measure: Preventative

1.5. Objective: Increase requirement for land-use planning.

Communities should utilize available land-use planning tools, including comprehensive and coordinated land-use plans, zoning, subdivision regulations, and storm water management regulations.

1.5.1. Action: Develop a CD with sample tools for distribution during Community Assistance Visits both before and after disaster incidents.
Lead: DCCED (as they guide community development activities)
Support: DHS&EM, DOT&PF, DEED, DEC
Timeline: on-going

2. Increase NFIP Participation

Mitigation Measure: Preventative

2.1. Objective: Encourage NFIP participation by all Boroughs and communities.

Support DCCED's efforts to increase NFIP participation and improve floodplain ordinance enforcement capability within the communities by providing education and training. Many smaller, flood-prone communities are unable to enforce floodplain ordinances due to lacking governing authority resources, or programmatic education.

2.1.1. Action: Encourage unincorporated communities within the Unorganized Borough to consider incorporation providing the authority to regulate structure siting, development, and land-use planning.
Lead: DCCED
Support: DHS&EM, DNR, DOT&PF&PF, DEC
Timeline: on-going

2.2. Objective: Encourage more homeowners to purchase flood insurance.

2.2.1. Action: Publicize benefits and flood insurance availability in NFIP communities.

Lead: DCCED
Support: DHS&EM
Timeline: on-going

3. Increase CRS Participation

Mitigation Measure: Preventative

3.1. Objective: Encourage communities and boroughs that participate in the NFIP to seek ways to participate in the CRS portion of the NFIP to obtain higher program ratings which would reduce flood insurance rates for their community.

3.1.1. Action: Encourage CRS applications from Nome and Bethel
Lead: DCCED, Insurance Servicing Organization (ISO)
Support: Denali Commission, DHS&EM
Timeline: 1-2 years

3.1.2. Action: Encourage CRS Applications in 2 additional cities or boroughs by 2011.

Lead: DCCED, Insurance Servicing Organization (ISO)
Support: Denali Commission, DHS&EM

Timeline: 2-4 years

3.2. Objective: Encourage FEMA to create special considerations for Alaska building conditions and engineer certification to the CRS program.

3.2.1. Action: Explain to FEMA why this is necessary.

Lead: DCCED
Support: DHS&EM, DOT&PF, DEED, DEC
Timeline: on-going

3.3. Objective: Encourage FEMA to create special considerations for Alaska NFIP program participation by allowing applicable agencies through the legislature to develop and enforce ordinances within the Unincorporated Communities within the Unorganized Borough.

3.3.1. Action: Explain to FEMA why this is necessary: DHS&EM has received a waiver for *Unincorporated Communities within the Unorganized Borough* to use the State's All-Hazard Risk Mitigation Plan as the basis for their mitigation planning activities. Each of these communities are required to further define the hazards within their area and to identify pertinent mitigation initiatives to fulfill the intent of FEMA's local planning requirements. A similar action is needed for NFIP membership, Flood Mitigation Planning, and CRS participation.

Lead: DCCED
Support: DHS&EM, DOT&PF, DEED, DEC
Timeline: on-going

4. Reduce flooding

Mitigation Measure: Protective; Preventative

4.1. Objective: Reduce flooding caused by undersized culverts.

4.1.1. Action: Develop a program to replace undersize culverts at important road crossings.

Lead: DOT&PF
Support: ADF&G, DNR, DEC, USACE, USGS, EPA, NMFS
Timeline: on-going

4.2. Objective: Sand Ice Jams.

4.2.1. Action: Investigate the feasibility of re-instituting a program of sanding riverine ice to reduce the formation of ice jams.

Lead: DHS&EM
Support: ADF&G, DOT&PF, NWS
Timeline: 2 years

<u>Low Priority</u>

5. Reduce repetitive flood losses

Mitigation Measure: Preventative

5.1. Objective: Require flood damage prevention ordinances as a condition of State/Federal disaster assistance following a flood.

5.1.1. Action: Draft legislation

Lead: DCCED
Support: DHS&EM, DOT&PF, DEED, DEC
Timeline: on-going

6. Improve forecasting and warning systems.

Mitigation Measure: Educational; Protective; Preventative

6.1. Objective: Increase data available.

6.1.1. Action: Install stream and precipitation gauges.

Lead: NWS
Support: DHS&EM, USGS, DCCED, DOT&PF
Timeline: on-going

6.1.2. Action: Encourage installation of NOAA weather radio receivers *where NWR signals are available.*

Lead: NOAA
Support: DHS&EM, NWS,
Timeline: on-going

7. Better Mapping

Mitigation Measure: Educational; Preventative

- Floodplain mapping in Alaska faces an inadequate volume of data and insufficient funding. In some areas, flood estimates are based on uncalibrated and overly conservative assumptions. These estimates depict unreasonably high discharge rates, e.g. Juneau's Mendenhall River valley shows large areas of inundation when in reality, the floods with a 1% chance of occurring (100-year flood) does not overtop the bank since the river is very incised due to glacial (isostatic) rebound.
- Integrate updated maps Statewide with VRISKMap.

7.1. Objective: Improve and expand flood-prone area mapping**.**

7.1.1. Action: Continue mapping, documenting, digitizing and creating GIS layers for all flood threatened communities in the State.

Lead: DCCED
Support: DHS&EM, USACE, UAF/GI, FEMA, DNR/DGGS, DEED, USGS
Timeline: on-going

7.2. Objective: Update existing flood maps.

7.2.1. Action: Update flood hazard maps for the Juneau area and produce Flood Insurance rate maps (FIRM) in digital and GIS formats.

Lead: FEMA and City & Borough of Juneau
Support: DCCED, DHS&EM, USACE, UAF/GI, FEMA, DNR/DGGS, DEED
Timeline: 1-3 years

7.3. Objective: Update and digitize all NFIP participating Community FIRM maps.

7.3.1. Action: Digitize Anchorage FIRM's.

Lead: FEMA, DCCED
Support: DHS&EM, USACE, UAF/GI, FEMA, DNR/DGGS, DEED
Timeline: 1-2 years

8. Pursue legislation that requires communities to pay the 25% non-Federal share of funding received as a result of a Federally declared flood disaster unless they are active NFIP members and have floodplain ordinance(s) in place.

Mitigation Measure: Educational; Preventative

Consider implementing higher regulatory standards for those communities that have floodplain management ordinances in place but still experience recurring events with repetitive losses. (Model village floodplain and model damage prevention ordinances are included in Appendix 12.) Award Special Consideration to communities that do not have the ability to establish and enforce a floodplain ordinance. (See 3.3.1. above)

8.1. Objective: Reduce repetitive flood damage losses to both private and public properties.

8.1.1. Action: Draft legislation.
Lead: DCCED
Support: DOL, DOA, DHS&EM
Timeline: 1 year

9. Minimize hazard risks associated with alluvial fans.

Mitigation Measure: Educational; Preventative

9.1. Objective: Identify alluvial fans and investigate strategies or incentives to preclude construction or improvements to private lands within these flood corridors. Communities will need to address and enforce any pertinent permitting issues to support this initiative.

9.1.1. Action: Develop strategic planning incentives and model strategies addressing land-use planning and permitting initiatives.
Lead: DOT&PF
Support: DHS&EM, DCCED, DNR, UAF/GI, DEC
Timeline: on-going

9.2. Objective: Maintaining debris flow corridors

9.2.1. Action: These corridors should covey floodwaters and isolate sediment deposits and debris away from infrastructure and personal property. Communities will need to address and enforce any pertinent permitting issues to support this initiative.

Lead: DOT&PF
Support: DHS&EM, DCCED, DNR, UAF/GI, DEC
Timeline: on-going

10. Improved habitat preservation and stream enhancement.

Mitigation Measure: Educational; Preventative

Encourage communities to adopt habitat protection corridors along streams and rivers and provide habitat tax credits for property owners who improve steam/river habitat or maintain a vegetative buffer adjacent to streams or rivers. This can help absorb floodwaters and minimize erosion.

10.1. Objective: Habitat protection corridors development.

10.1.1. Action: Coastal Management plans and local enforcement policies
Lead: DCCED
Support: ADF&G, DHS&EM, DEC, DNR, DCCED and local communities
Timeline: on-going

11. Encourage the adoption of Model State Legislation for Floodplain Management contained in the 1990 Flood Mitigation Plan.

Mitigation Measure: Educational; Preventative

The Model State Legislation for Floodplain Management proposed that the State develop and implement floodplain management standards allowing local and tribal governments to regulate flood hazard areas.

11.1. Objective: To allow floodplain management at the lowest governmental level.

11.1.1. Action: Encourage legislation to develop initiatives and authorities for local governments at all levels to develop land use ordinances and policies along with appropriate enforcement powers.

Lead: Governor's Office, Alaska Legislature
Support: DHS&EM, DCCED, local communities, AML
Timeline: on-going

12. Coordination

Mitigation Measure: Educational; Preventative

Reduce potential debris jams by creating interagency cooperation and agreements concerning riverbank and riverbed management. Agencies need to coordinate and refine permitting processes and annual drainage system maintenance plans to minimize flood related damages.

12.1. Objective: Interagency agreements and cooperation initiatives will greatly reduce time loss during critical incident response and clean-up. Each cooperating entity will have a well understood responsibility.

12.1.1. Action: Develop a bank stabilization and debris clearance interagency agreement among resource and permitting agencies.
Lead: DHS&EM or DCCED
Support: DHS&EM, DCCED, DOT&PF, ADF&G, NMFS, USGS, USACE, DNR, DEC, EPA
Timeline: on-going

12.1.2. Action: Draft Emergency Floodplain permits for debris removal and bank stabilization

Lead: DCCED
Support: ADF&G, DHS&EM, DEC, DNR, DCCED and local communities
Timeline: on-going

12.2. Objective: Encourage mitigation at the watershed level. Coordinate mitigation activities throughout a river's watershed to ensure that actions taken in one area do not affect adjacent areas. Ground water recharge, nutrient transport, wetland habitat, etc are critical issues for watersheds survivability.

12.2.1. Action: Develop groundwater recharge, nutrient transport, and wetland habitat initiatives throughout threatened human habitated watersheds.

Lead: DNR
Support: DCCED, DOT&PF, ADF&G local jurisdictions, DHS&EM, DEC
Timeline: on-going

13. Increase funding.

Mitigation Measure: Educational; Preventative

Mitigation designated funding would help communities complete projects that are beyond their resources.

13.1. Objective: Develop State disaster mitigation grant program to fund worthwhile projects such as structural or channel modification.

13.1.1. Action: Research the feasibility of establishing a State fund for structural or channel modifying mitigation projects.

Lead: ADF&G,
Support: DHS&EM, USACE, DCCED, DOT&PF, DEC, USACE, NMFS, EPA, USGS
Timeline: on-going

Summary of local capabilities, goals and actions

Flooding is the State's predominate recurring hazard as reflected in the local all hazard mitigation plans.

Nome

Capabilities: NFIP and CRS participation.

Goals: Need updated FIRM flood maps, structure elevation projects, structure flood proofing, repetitively damaged structure buyout or relocation, identify and replace undersized culverts, increase public awareness and education.

Municipality of Anchorage

Capabilities: NFIP and CRS participation, local zoning and building ordinances.

Goals: Need updated FIRM flood maps, structure elevation projects, structure flood proofing, repetitively damaged structure buyout or relocation of, identify and replace undersized culverts, increase public awareness and education.

Kenai Peninsula Borough

Capabilities: NFIP and CRS participation, local zoning and building ordinances.

Goals: Need updated FIRM flood maps, elevation projects, flood proofing, repetitively damaged structure buyout or relocation, identify and replace undersized culverts, increase public awareness and education, increase bridges capability to maintain water access.

Mat-Su Borough

Capabilities: NFIP participation, local zoning and building ordinances; participate in the River watch program.

Goals: Need updated FIRM flood maps, structure elevation projects, structure flood proofing, repetitively damaged structure buyout or relocation of, identify and replace undersized culverts, increase public awareness and education.

City and Borough of Juneau

Capabilities: NFIP participation, local zoning and building ordinances; participate in the River watch program.

Goals: Need updated FIRM flood maps, structure elevation projects, structure flood proofing, repetitively damaged structure buyout or relocation of, identify and replace undersized culverts, increase public awareness and education.

For more specified information about these areas please refer to appendix 20

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5.3 WILDLAND FIRE

Wildland fires occur in every state in the country and Alaska is no exception. Each year, between 600 and 800 wildland fires, mostly between March and October, burn across Alaska causing extensive damage.

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. The natural fire regime in Alaska is characterized by a return interval of 50 to 200 years, depending on vegetation type, topography, and location. The role of wildland fire was incorporated into fire management planning processes and the full range of fire management activities. Essential ecological process and natural change agent affects are exercised in Alaska to help achieve ecosystem sustainability. These processes dictate the appropriate management response to the fire and are interrelated with the ecological, economic, and social consequences on firefighter and public safety and welfare; threatened natural and cultural resources; and other values needing protection. Firefighter and public safety is always the first and overriding priority for all fire management activities.

Hazard Analysis/Characteristics

Fires can be divided into the following categories:

Structure fires – originate in and burn a building, shelter, or other structure.

Prescribed fires - ignited under predetermined conditions to meet specific objectives, to mitigate risks to people and their communities, and/or to restore and maintain healthy, diverse ecological systems.

Wildland fire - any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use - a wildland fire functioning in its natural ecological role and fulfilling land management objectives.

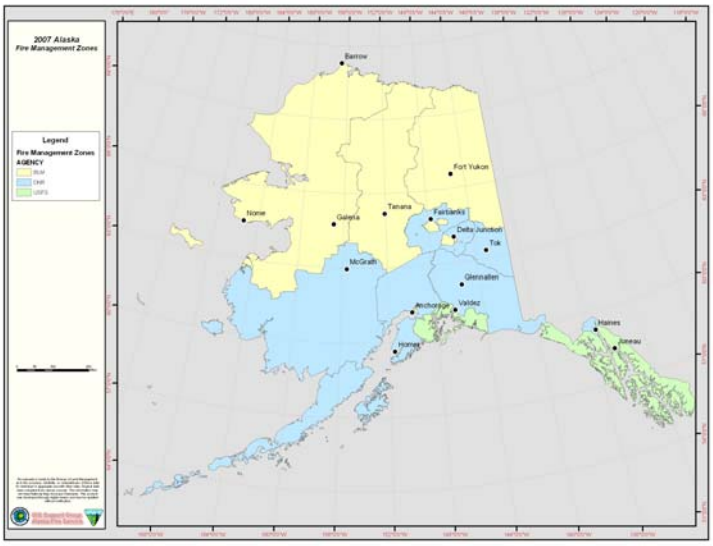
Wildland-Urban Interface Fires - fires that burn within the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The potential exists in areas of wildland-urban interface for extremely dangerous and complex fire burning conditions which pose a tremendous threat to public and firefighter safety.

1996 Miller's Reach Fire

Fuel, weather, and topography influence wildland fire behavior. Wildland fire behavior can be erratic and extreme causing firewhirls and firestorms that can endanger the firefighter lives who trying to suppress the blaze. Fuel determines how much energy the fire releases, how quickly the fire spreads, and how much effort is needed to contain the fire. Weather is the most variable factor. Temperature and humidity also affect fire behavior. High temperatures and low humidity encourage fire activity while low temperatures and high humidity help retard fire behavior. Wind affects the speed and direction of a fire. Topography directs the movement of air, directly affecting fire

behavior. Fire can also travel up slope quicker than it goes down; as what happens in a canyon. The canyon terrain funnels air which can lead to faster spreading.

Wildland fire risk is increasing in Alaska due to the spruce bark beetle infestation. The beetles lay eggs under the bark of a tree. When the larvae emerge, they eat the tree's phloem, which is what the tree uses to transport nutrients from its roots to its needles. If enough phloem is lost, the tree will die. The dead trees dry out and become highly flammable.



Fire Management Zones
Image courtesy of Division of Forestry

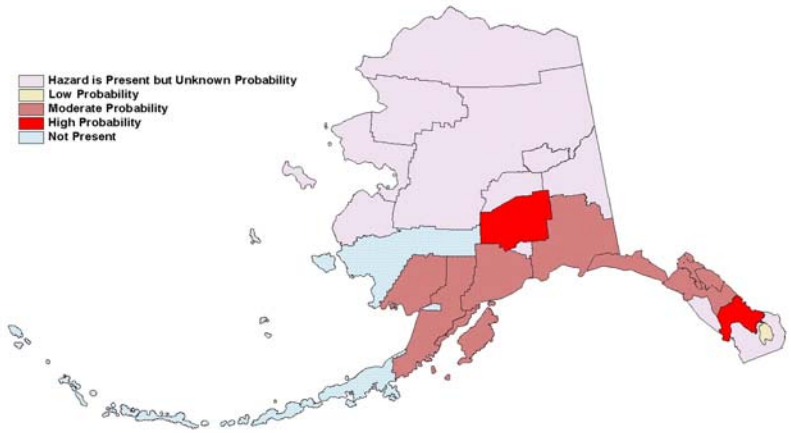
Wildland Fire Management in Alaska

In Alaska, wildland fire suppression is the responsibility of the U.S. Department of the Interior-Bureau of Land Management/Alaska Fire Service (DOI-BLM/AFS), the State of Alaska's Division of Forestry, and the U.S. Forest Service.

Each agency provides fire-fighting coverage for a portion of the State regardless of land ownership.

These agencies and others have cooperated to develop a state-wide interagency wildland fire management plan.

Areas with wildfire potential.



These three agencies, and others, work together to fight fires. The 1996 Miller's Reach Fire was one of the worst wildland fires in State history. It involved 37 fire departments, and over 100 different agencies and organizations. In addition, 1,800 fire-fighting and support personnel had responded within the first 48 hours. It took almost two weeks for the fire to be contained and during this time it burned 37,336 acres and destroyed 344 structures.

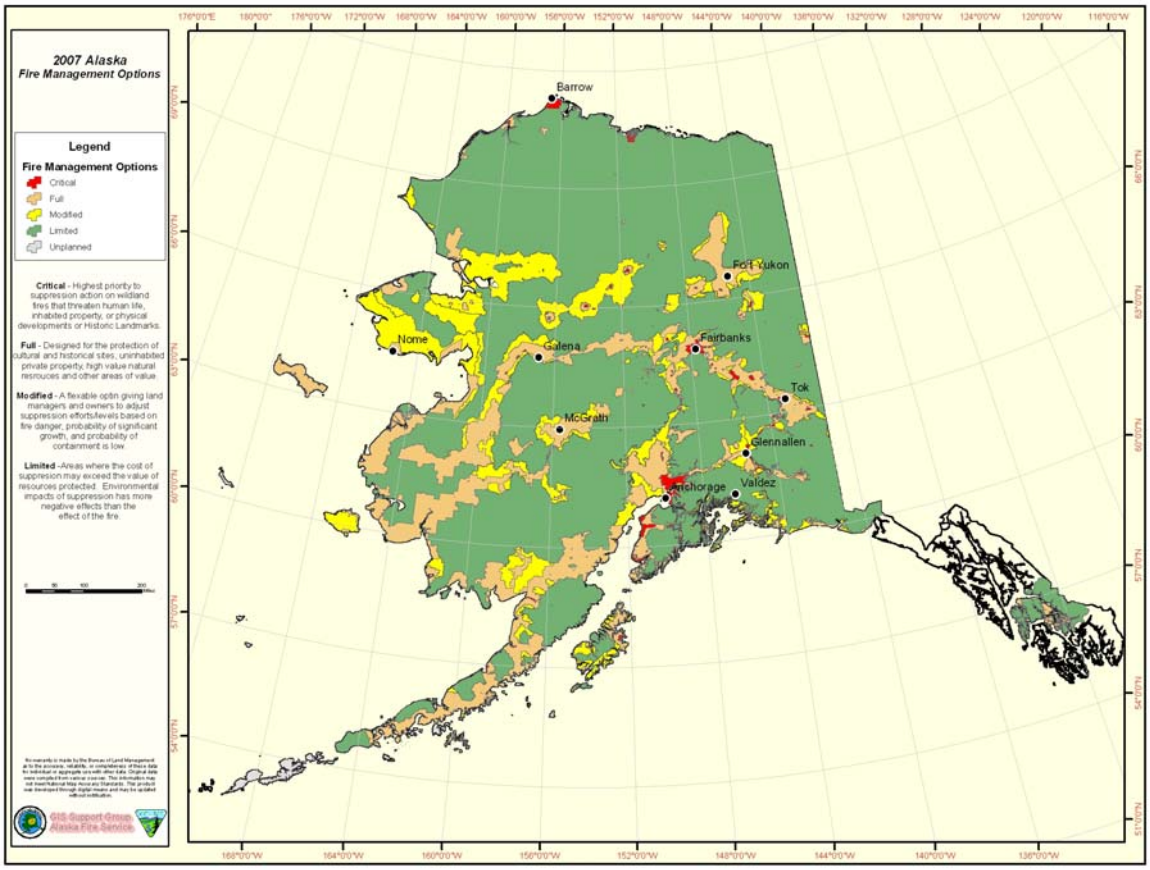
Role of Fire in the Alaskan Environment

Fire has been a natural force in the Alaskan Interior for thousands of years. It is a key environmental factor in these cold-dominated ecosystems. Without fire, organic matter accumulates, the permafrost table rises, and ecosystem productivity declines. Vegetation communities become much less diverse and their value as wildlife habitat decreases. Even some of the plant and animal species normally associated with later successional stages will find the environment unsuitable.

Fire rejuvenates these ecosystems. It removes some of the insulating organic matter has a warming affect to the soil, and nutrients are added by ash from the fire and from increased decomposition rates. Vegetative re-growth quickly occurs and the cycle begins again.

An occasional fire may be critical for maintaining the viability of northern ecosystems, yet fire can also be a threat to human life and property. The realization that fire plays an essential ecological role, but also is potentially destructive to human life and structures can make the fire management decision process very difficult.

Hazard Vulnerability Analysis



Fire Management Options in Alaska

Alaska fire protection options in the Alaska Interagency Fire Management Plan provide for a full range of suppression responses from aggressive control and extinguishment to surveillance. Firefighter and public safety is the highest priority for all options. [Note: In general, control, contain, and confine strategies interrelate with different protection options. Control strategies can be associated with critical and full protection, a contain or confine strategy can be associated with modified protection, and a confine (to a geographic area) strategy can be associated with limited protection.]

The following is the color codes for the preceding map

Critical Protection – Suppression action provided on a wildland fire that threatens human life, inhabited property, designated physical developments, and structural resources such as those designated as National Historic Landmarks. The suppression objective is to provide complete protection to identified sites and control the fire at the smallest acreage reasonably possible. Fire threatened critical sites are given the highest priority for allocating suppression resources.

Full Protection – Suppression action provided on a wildland fire that threatens uninhabited private property, high-valued natural resource areas, and other high-valued areas such as cultural and historical sites. The suppression objective is to control the fire at the smallest acreage reasonably possible. Allocating suppression resources to fires receiving the full protection option is second in priority only to fires threatening a critical protection area.

Modified Protection – Suppression action provided on a wildland fire in areas where protected resource values do not justify the expense of full protection. The suppression objective is to reduce overall suppression costs without compromising protection level for higher-valued adjacent resources. Allocation suppression resources to fires receiving the modified protection option are a lower priority than those in critical and full protection areas. A higher protection level may be given during the peak fire season burning periods than early or late in the fire season.

Limited Protection – This is the lowest suppression level action provided on a wildland fire in areas where protected resource values do not justify the expense of a higher level of protection and where opportunities can be provided for fire to help achieve land and resource protection objectives. The suppression objective is to minimize suppression costs without compromising protection of higher-valued adjacent resources. Allocated suppression resources for the limited protection option are given the lowest priority. Surveillance is an acceptable suppression response as long as higher valued adjacent resources are not threatened.

2007 Unplanned Fire Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Total	20	53,287	100.00%	$8,260,345	$11,896,339	$652,500
Aleutian Region REAA Totals	6	16,675	31.29%	$2,127,000	$2,633,000	$0
Aleutians East Borough Totals	7	19,934	37.41%	$2,532,745	$3,914,600	$262,500
Pribilof Islands REAA Totals	6	15,890	37.41%	$3,443,000	$5,191,139	$390,000
Southwest Region REAA Totals	1	788	1.48%	$157,600	$157,600	$0

	Residential	Industrial	Commercial
Alaksa HAZUS Building Count	1,786.00	5.00	29.00
Alaksa HAZUS Building Costs	400,411	26,960	58,523
Alaksa HAZUS Building Content Costs	200,214	39,841	59,931

	Population	Households	Average Value
Alaksa HAZUS Demographics Data	8,869	2,473	$119,888

2007 Critical Fire Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	611	7,879,440	100.00%	$768,832,956	$1,541,436,705	$288,537,979
Alaska Gateway REAA Totals	20	32,762	0.42%	$1,040,598	$6,301,210	$195,000
Aleutians Region REAA Totals	1	960	0.01%	$51,000	$220,000	$0
Aleutians East Borough Totals	7	3,802	0.05%	$176,000	$176,000	$0
Bering Straits REAA Totals	38	133,272	1.69%	$7,923,997	$31,891,191	$4,449,166
Bristol Bay Borough Totals	2	13,400	0.17%	$1,813,272	$3,642,700	$387,495
Chugach REAA Totals	5	11,230	0.14%	$1,902,000	$2,285,000	$0
City & Borough of Juneau Totals	4	24,703	0.31%	$3,455,975	$3,769,924	$345,000
Copper River REAA Totals	6	11,625	0.15%	$1,200,545	$1,640,298	$0
Delta/Greely REAA Totals	18	13,236	0.17%	$765,350	$1,616,155	$0
Denali Borough Totals	2	7,424	0.09%	$993,600	$1,484,800	$150,720
Fairbanks North Star Borough Totals	36	296,441	3.76%	$40,715,670	$47,242,712	$8,101,950
Iditarod Area REAA Totals	2	1,396	0.02%	$50,240	$280,000	$0
Kenai Peninsula Borough Totals	58	391,172	4.96%	$25,895,572	$81,881,095	$13,159,315
Ketchikan Gateway Borough totals	4	7,413	0.09%	$790,200	$791,220	$0
Kodiak Island Borough Totals	20	78,918	1.00%	$8,831,450	$12,839,940	$1,408,215
Kuspuk REAA Totals	1	96	0.00%	$20,000	$20,000	$0
Lake & Peninsula Borough Totals	4	10,639	0.14%	$793,200	$3,520,729	$437,063
Matanuska-Susitna Borough Totals	109	470,982	5.98%	$32,706,728	$101,149,230	$15,455,211
Municipality of Anchorage Totals	232	6,289,559	79.82%	$627,010,149	$1,225,492,130	$243,698,845
North Slope Borough Totals	6	4,210	0.05%	$506,152	$436,352	$0
Northwest Arctic Borough Totals	4	6,728	0.09%	$80,000	$80,005	$0
Southwest Region REAA Totals	5	5,480	0.07%	$1,964,000	$2,175,000	$0
Yukon Flats REAA Totals	7	6,592	0.08%	$390,726	$1,004,676	$0
Yukon-Koyukuk REAA Totals	20	57,400	0.73%	$9,757,282	$11,496,338	$750,000

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	145,451	1,807	92
Alaska HAZUS Building Costs	$24,196,650	$436,043	$3,576,313
Alaska HAZUS Building Content Costs	$12,098,039	$3,769,809	$560,919

	Population	Households	Average Value
Alaska HAZUS Demographic Data	470,958	169,395	$126,554

2007 Full Fire Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	417	933,881	100%	$92,029,337	$129,063,577	$10,471,552
Alaska Gateway REAA Totals	4	4,672	0.50%	$109,482	$1,075,000	$0
Aleutians East Borough Totals	2	320	0.03%	$5,600	$25,780	$0
Bering Straits REAA Totals	27	28,954	3.10%	$2,899,500	$3,769,721	$0
Bristol Bay Borough Totals	21	35,324	3.78%	$1,733,624	$4,420,700	$0
Chugach REAA Totals	24	32,360	3.47%	$1,590,798	$2,649,859	$0
City & Borough of Yakutat totals	1	80	0.00%	$0	$6,000	$0
Copper River REAA Totals	28	49,524	5.30%	$3,160,736	$6,866,142	$471,939
Iditarod REAA Totals	13	14,084	1.51%	$2,323,906	$3,346,522	$0
Kenai Peninsula Borough Totals	77	281,757	30.17%	$25,818,008	$23,881,902	$2,529,277
Kodiak Island Borough Totals	15	7,422	0.79%	$681,800	$1,098,600	$0
Kuspuk REAA Totals	5	5,800	0.62%	$2,722,246	$3,232,385	$250,687
Lake & Peninsula Borough Totals	22	19,678	2.11%	$2,584,249	$4,834,040	$0
Lower Kuskokwim REAA Totals	76	207,619	22.23%	$24,621,756	$37,729,844	$4,391,435
Lower Yukon REAA Totals	18	39,409	4.22%	$1,833,451	$5,176,958	$372,600
Matanuska-Susitna Borough Totals	6	19,060	2.04%	$980,800	$1,971,000	$180,000
Northwest Arctic Borough Totals	16	85,134	9.12%	$11,462,602	$13,714,519	$1,752,318
Southeast Island REAA Totals	6	14,366	1.54%	$1,564,920	$1,564,921	$0
Southwest Region REAA Totals	36	62,854	6.73%	$6,325,698	$10,327,570	$523,298
Yukon Flats REAA Totals	6	11,528	1.23%	$749,459	$1,466,867	$0
Yukon-Koyukuk REAA Totals	7	6,328	0.68%	$142,497	$793,043	$0
Yupiit REAA Totals	7	7,608	0.81%	$718,205	$1,112,204	$0

	Residential	Commercial	Industrial
Alaska HAZUS Building Count	23,741	111	8
Alaska HAZUS Building Costs	$3,447,223	$234,480	$41,214
Alaska HAZUS Building Content Costs	$1,723,530	$251,515	$55,792
	Population	**Households**	**Average Value**
Alaska HAZUS Demographics Data	60,822	18,768	$86,751

2007 Modified Fire Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	89	101,672	100.00%	$9,927,362	$15,335,440	$534,300
Bering Straits REAA Totals	21	26,120	25.69%	$2,206,118	$3,314,781	$0
Denali Borough Totals	10	17,004	16.72%	$765,159	$2,635,894	$172,500
Iditarod REAA Totals	12	19,072	18.76%	$2,636,802	$4,117,000	$361,800
Lake & Peninsula Borough Totals	3	2,640	2.60%	$786,139	$1,171,139	$0
Lower Kuskokwim REAA Totals	2	3,600	3.54%	$30,240	$480,001	$0
Matanuska-Susitna Borough Totals	22	12,736	12.53%	$995,139	$1,007,648	$0
North Slope Borough Totals	4	4,664	4.59%	$702,000	$702,002	$0
Northwest Arctic Borough Totals	8	8,456	8.32%	$830,000	$960,002	$0
Yukon-Koyukuk REAA Totals	7	7,380	7.26%	$975,765	$946,973	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	2018	26	0
Alaska HAZUS Building Costs	$283,826	$60,244	$5,776
Alaska HAZUS Building Content Costs	$141,884	$70,358	$7,887
	Population	**Households**	**Average Value**
Alaska HAZUS Demographics Data	2882	894	$88,670

2007 Limited Fire Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	603	2,503,222	100.00%	$228,574,714	$481,294,635	$74,033,743
Alaska Gateway REAA Totals	25	56,749	2.27%	$1,491,965	$8,184,975	$868,652
Aleutians East Borough Totals	17	40,323	1.61%	$2,262,007	$8,994,199	$384,386
Bering Straits REAA Totals	7	7,488	0.30%	$785,000	$1,110,001	$0
Chugach REAA Totals	64	182,709	7.30%	$24,784,279	$22,204,252	$1,497,092
Copper River REAA Totals	18	19,720	0.79%	$896,980	$2,012,236	$0
Delta/Greely REAA Totals	25	33,250	1.33%	$2,638,173	$4,841,956	$202,800
Denali Borough Totals	2	5,019	0.20%	$141,900	$961,000	$0
Fairbanks North Star Borough Totals	105	988,530	39.49%	$75,738,357	$209,221,544	$39,919,248
Iditarod Area REAA Totals	1	2,000	0.08%	$250,000	$350,000	$0
Kashunamiut REAA Totals	3	3,840	0.15%	$1,135,000	$1,235,001	$0
Kenai Peninsula Borough Totals	52	371,463	14.84%	$44,733,573	$102,931,196	$18,777,538
Ketchikan Gateway Borough Totals	7	8,912	0.36%	$370,000	$222,317	$0
Kodiak Island Borough Totals	45	169,897	6.79%	$25,387,244	$27,116,696	$3,860,550
Kuspuk REAA Totals	14	31,734	1.27%	$2,329,988	$4,165,716	$0
Lake & Peninsula Borough Totals	4	4,936	0.20%	$734,195	$1,295,835	$0
Lower Kuskokwim REAA Totals	3	2,696	0.11%	$103,205	$261,140	$0
Lower Yukon REAA Totals	19	25,310	1.01%	$3,032,000	$4,206,504	$0
Matanuska-Susitna Borough Totals	71	320,142	12.79%	$20,947,145	$48,275,009	$6,849,820
North Slope Borough Totals	33	84,180	3.36%	$9,375,548	$15,154,730	$1,354,500
Northwest Arctic Borough Totals	14	16,776	0.67%	$1,871,000	$2,124,004	$0
Southeast Island REAA Totals	24	64,674	2.58%	$4,734,897	$6,251,834	$0
Southwest Region REAA Totals	11	7,146	0.29%	$461,860	$665,200	$0
Yukon Flats REAA Totals	18	19,448	0.78%	$1,342,004	$3,350,982	$0
Yukon-Koyukuk REAA Totals	21	36,280	1.45%	$3,028,394	$6,158,308	$319,157

	Residential	Commercial	Industrial
Alaska HAZUS Building Count	4914	158	19
Alaska HAZUS Building Costs	$748,740	$250,990	$78,772
Alaska HAZUS Building Content Costs	$374,387	$256,063	$108,462

	Population	Households	Average Value
Alaska HAZUS Demographics Data	7898	2774	$85,995

Existing Programs and Strategies

Alaska FireWise

The Alaska FireWise Program is designed to educate people about wildland fire risks and mitigation opportunities. It is part of a national program that is operated in the State by the Alaska Wildfire Coordinating Group (AWCG).

Alaska Interagency Coordination Center

This center located in Fairbanks is jointly staffed and managed by state and federal employees, and coordinates the mobilization of interagency personnel and resources to fires statewide. Duplication of separate facilities for state and federal suppression agencies is avoided, resulting in fast and efficient response to wildland fires.

Hazard Mitigation Successes

1996 Miller's Reach Fire

As a result of the Miller's Reach fire, more than $1.5 million was available for wildland fire mitigation measures. This money was used to fund 13 projects:

This house in Tok, AK survived a wildfire almost untouched due to the defensible space surrounding the structure and the use of metal siding and roofing. The only visible damage is to the plastic rain gutters, which softened due to the heat and fell to the ground. Image courtesy of Alaska Visitor Information Services

- Launch a television public awareness campaign to educate homeowners on creating defensible space to minimize impacts of urban interface fires.
- Create a wildland fire prevention pilot project to educate the public via workshops and other one-on-one interaction.
- Conduct fuel management for the City of Houston, creating defensible space around several city owned critical facilities and clearing fallen black spruce (which is highly flammable) at the Little Susitna River Campground.
- Create a defensible space demonstration project around the Big Lake Public Safety Building.
- Create a defensible space demonstration project through a passive defensible space display. Construct a kiosk containing photos of fire damage and defensible space explanation displays.

Defensible space surrounding this house in Tok, AK helps make it FireWise. Image courtesy of Alaska Visitor Information Services

- Install a dry hydrant system to reduce the response times to fires and greatly minimizes impact to watershed areas.

- Install the South Houston Water Supply to provide a dependable year round water supply at a central location to 3 fire department headquarters.
- Construct fire breaks within the Matanuska-Susitna Borough, which can be used as emergency evacuation routes.
- Improve access to Castle Park on Prator Lake by improving the turning radius to the fire tanker truck fill site, therefore decreasing response time.
- Improve the Homesteaders Community Center Building by installing steel siding, smoke alarms and carbon monoxide detectors and creating defensible space.
- Install a metal roof for the Mid-Valley Senior Center.
- Install an automated weather data collection system to provide accurate and timely reports of weather patterns, which allows firefighters to do their job more effectively.
- Create a Fire Mitigation Officer position to assist the Matanuska-Susitna Borough in fire education and awareness. This position evolved into the State fire mitigation officer position and is funded by a grant from AWCG.

Kenai Peninsula Borough Project Impact

Wildland fire mitigation was one of the focuses of KPB's Project Impact program. Through this program they were able to host information sessions and distribute educational materials. A three-mile firebreak was constructed along Funny River Road to provide a safer evacuation route for local residents. Spruce bark beetle killed trees were removed, developing defensible space on 752 lots, which affected three businesses and almost 170 homes. They also established demonstration projects to show homeowners how to create defensible space.

Defensible space and located near a water source.
Image courtesy of FireWise

Goals

High Priority

1. Make buildings safer

Mitigation Measure: Educational; Preventative

FireWise building design, siting, and materials for construction are a way to reduce a structure's vulnerability to wildland fire. Examples of these are locating a structure near a water body, using dry hydrants, and ensuring there is easy access to the structure.

1.1. Objective: Promote FireWise building design, siting, and materials for construction.

1.1.1. Action: Develop workshop for builders.

Lead: DNR/DOF, USFS, local communities
Support: DCCED, DEED, DHS&EM, and DOI-BLM/AFS,
Timeline: on-going

1.1.2. Action: Develop workshop for homeowners.

Lead: local communities

Support: DHS&EM
Timeline: on-going **(Completed with Fire Mitigation grants)**

1.2. Objective: Ensure compliance with fire regulation and requirements.

1.2.1. Action: Inspect buildings

Lead: State Fire Marshall's Office
Support: DPS, DLAW, local jurisdictions
Timeline: on-going

1.2.2. Action: Train inspectors.

Lead: State Fire Marshall's Office
Support: DPS, DLAW, local jurisdictions
Timeline: on-going

1.3. Objective: Encourage revision or development of building codes and requirements.

Building codes should be revised in wildland fire prone areas. The codes should promote using nonflammable building material where appropriate and adopting a residential fire code, a wildland/urban interface code, and support or promote FireWise communities.

1.3.1. Action: Host workshops to show benefit to communities.

Lead: State Fire Marshal's Office
Support: DCCED, DNR, DEC**,** local jurisdictions
Timeline: on-going

2. Encourage the creation of firebreaks.

Mitigation Measure: Protective; Preventative

Firebreaks greatly assist in controlling wildland fires. They can be roads and natural water channels. The firebreaks would also provide transportation corridors.

2.1. Objective: Develop water storage capability at resources challenged areas for highly developed corridors with less than adequate access

2.1.1. Action: Place water or retardant storage containers in strategically significant locations.

Lead: local communities
Support: BLM/AFS, USFS, ADF&G, DOT&PF, DEC
Timeline: on-going

<u>Medium Priority</u>

3. Conduct outreach activities to encourage the use of FireWise landscaping techniques.

Mitigation Measure: Educational; Preventative

3.1. Objective: Enhance public awareness of potential risk to life and personal property. Encourage mitigation measures in the immediate vicinity of their property.

3.1.1. Action: Develop various educational tools to get the message out.

Lead: FireWise Program Coordinator
Support: All agencies
Timeline: on-going

4. Encourage urban interface fire assessments.

Mitigation Measure: Educational; Preventative

4.1. Objective: The State should encourage local jurisdictions susceptible to wildland fire to conduct an urban interface wildland fire hazard assessment.

4.1.1. Action: Assist local jurisdictions with fire hazard assessment.

Lead: DNR/DOF,
Support: BLM/AFS, USFS, local Communities
Timeline: 10 years

5. Encourage the evaluation of emergency plans with respect to wildland fire assessment.

Mitigation Measure: Educational; Preventative

5.1. Objective: All boroughs and communities should develop or evaluate emergency plans to ensure consistency with the wildland fire assessments.

5.1.1. Action: Encourage fuel management programs.

Lead: DHS&EM
Support: SERC, LEPCs,
Timeline: on-going

5.2. Objective: Identify, organize and monitor the various programs responsible for fuel management in the wildland /urban interface. The programs should include: salvage logging operations, hazardous tree felling, creating a central disposal site for contract tub grinding, chipping and open burning during approved burn periods, and providing chipper access to homeowners.

5.2.1. Action: Create and coordinate opportunities for removal, transportation and marketing unwanted forest fuel.

Lead: DNR/DOF
Support: BLM/AFS, USFS, DEC, local jurisdictions
Timeline: on-going

<u>Low Priority</u>

6. Information acquisition

Mitigation Measure: Educational; Preventative, Protective

6.1. Objective: Encourage real-time availability and use of satellite data to evaluate fire potential.

6.1.1. Action: Share data with communities for resource management.

Lead: DNR/DOF
Support: BLM/AFS, USFS
Timeline: on-going

Summary of local capabilities, goals, and actions

As of Aug 24, 2004, we have seen over 5,516,052 acres burned surpassing its previous record established before Statehood in 1959.

Anchorage

Capabilities: include fuel reduction mitigation projects in dense areas, and educational program development including FireWise, A.W.A.R.E. and open burning guidelines.

Goals: continuing educational venues and reviewing zoning ordinances for potential revisions.

Mat-Su Borough

Capabilities: include fuel reduction mitigation projects in dense areas, educational program development including FireWise, increased firebreaks, widened access to lakes for tanker support, and open burning guidelines to include fireworks.

Goals: educational venues such as the fire mitigation grant for public education, increase fire suppression capabilities, and land use ordinances for mitigation measures in borough code.

Kenai Peninsula Borough

Capabilities: include fuel reduction mitigation projects in dense areas, educational programs including FireWise, Spruce Bark Beetle Mitigation Project, and open burning guidelines.

Goals: continuing educational venues, fuels reduction mitigation projects, enhanced mapping, and reforestation program activities to mitigate potential erosion.

For more specified information about these areas please refer to appendix 20.

5.4 SNOW AVALANCHES

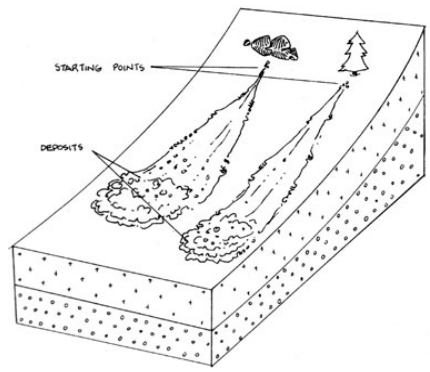
Many snow avalanches occur in Alaska every year. The exact number is undeterminable as most occur in isolated areas and are unreported. Avalanches tend to occur repeatedly in localized areas and can sheer off trees, cover communities and transportation routes, destroy buildings, and cause death. Alaska leads the nation in avalanche accidents per capita.

Hazard Analysis/Characterization

A snow avalanche is a swift, downhill-moving snow mass. Damage extent is related to avalanche type, composition and consistency of the material in the avalanche, the volume of snow and debris involved, force and velocity of the flow, and the avalanche path.

Avalanche Types

There are two main types of snow avalanches; loose snow and slab. Other types that occur in Alaska include: cornice collapse, ice, and slush avalanches.

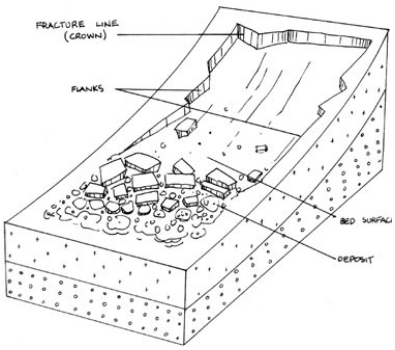


Loose snow avalanche
Image courtesy of the Canadian Avalanche Association

Loose Snow Avalanches

Loose snow avalanches, sometimes called point releases, generally occur when a small amount of incohesive snow slips and causes more incohesive snow to go downhill. They occur frequently as small local cold dry 'sluffs' which remove excess snow (involving just the upper layers of snow) keeping the upper slopes relatively safe. However they can also be large and destructive. For example, wet loose snow avalanches occur in the spring and are very damaging. Loose snow avalanches can also trigger slab avalanches.

Loose snow avalanches typically occur on slopes greater than 35 degrees, leaving behind an inverted V-shaped scar. They are often caused by snow overloading (common during or just after a snowstorm), vibration, or warming (triggered by rain, rising temperatures or solar radiation).



Slab avalanche
Image courtesy of the Canadian Avalanche Association

Slab Avalanches

Slab avalanches are the most dangerous types of avalanches. They happen when a mass of cohesive snow breaks away and travels down the mountainside. As it moves, the slab breaks up into smaller cohesive blocks.

Slab avalanches usually require structural weaknesses within interfacing layers of the snowpack. The weakness exists when a relatively strong, cohesive snow layer overlies weaker snow or is not well bonded to the

underlying layer. The weaknesses are caused by changes in the thickness and type of snow covers due to changes in temperature or multiple snowfalls. The interface fails for several reasons. It can fail naturally by earthquakes, blizzards, temperature changes or other seismic and climatic causes, or artificially by human activity. Slab is releases accelerate, gaining speed and mass as they travel downhill.

The slab margin is defined by fractures. The uppermost fracture delineating the top line of the slab is termed the “crown surface”, the area above that is called the crown. The slab sides are called the flanks. The lower fracture indicating the base of the slab is called the “stauchwall”. The surface the slab slides over is called the “bed surface”. Slabs can range in thickness from less than an inch to 35 feet or greater.

Cornice Collapse

A cornice is an overhanging snow mass formed by wind blowing snow over a ridge crest or the sides of a gulley. The cornice can break off and trigger bigger snow avalanches when it hits the wind-loaded snow pillow.

Ice Fall Avalanche

Ice fall avalanches result from the sudden falling broken glacier ice down a steep slope. They can be unpredictable as it is hard to know when ice falls are imminent. Despite what some people think, they are unrelated to temperature, time of day or other typical avalanche factors.

Slush Avalanches

Slush avalanches occur mostly in high latitudes such as in the Brooks Range of Alaska. They have also occurred in the mountain areas of the Seward Peninsula and occasionally in the Talkeetna Mountains near Anchorage. They are more common in high-latitudes because of rapid snowmelt in the spring. Slush avalanches can start on slopes from 5 to 40 degrees but usually not on slopes greater than 25 to 30 degrees. The snowpack is totally or partially water saturated. The release bed surface is nearly impermeable to water. It is also commonly associated with heavy rainfall or sudden intense snowmelt. Additionally, depth hoar is usually present at the base of the snow cover.

Slush avalanches can travel slowly or reach speeds over 40 miles per hour. Their depth is variable as well, ranging from 1 foot to over 50 feet deep.

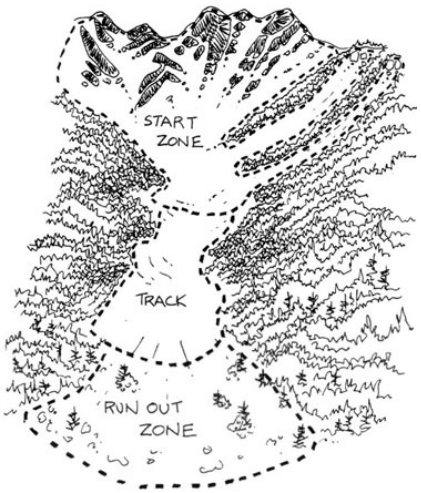
Avalanche Terrain Factors

There are several factors that influence avalanche conditions, with the main ones being slope angle, slope aspect and terrain roughness. Other factors include slope shape, vegetation cover, elevation, and path history. Avalanches usually occur on slopes greater than 25 degrees. There usually is not enough stress on the snowpack to get it to slide when the slope angle is less than 25 degrees. The snow tends to ‘sluff’ off and does not have the opportunity to accumulate when greater than 60 degrees. Avalanches can occur outside this slope angle range, but are not as common.

Slope aspect, also termed orientation, describes the direction a slope faces with respect to the wind and sun. Leeward slopes loaded by wind-transported snow are problematic because the wind-deposited snow increases the stress and enhances slab formation.

Intense direct sunlight, primarily during the spring months, can weaken and lubricate the bonds between the snow grains, weakening the snowpack. Shaded slopes are potentially more unstable because the weak layers are held for a longer time in an unstable state.

Terrain and vegetation influence snow avalanches because trees, rocks, and general roughness act as anchors, holding snow in place. However, once an anchor is buried by snow, it loses its effectiveness. Anchors make avalanches less likely but do not prevent them unless the anchors are so close together that a person could not travel between them.



Avalanche path
Image courtesy of the Canadian Avalanche Association

Avalanche Path

The local terrain features determine an avalanche's path. The path has three parts: the starting zone, the track, and the run-out zone.

The starting zone is where the snow breaks loose and starts sliding. It's generally near the top of a canyon, bowl, ridge, etc., with steep slopes between 25 and 50 degrees. Snowfall is usually significant in this area.

The track is the path taken or created by an avalanche. The track has milder slopes, between 15 and 30 degrees, but this is where the snow avalanche will reach maximum velocity and mass. Tracks can branch, creating successive runs that increase the threat, especially when multiple releases share a run-out zone.

Impact pressures		Potential Damage
KPa	Lbs/ft^2	
2-4	40-80	Break windows
3-6	60-100	Push in doors, damage walls, roofs
10	200	Severely damage wood frame structures
20-30	400-600	Destroy wood frame structures, break trees
50-100	1000-2000	Destroy mature forests
>300	>6000	Move large boulders

Avalanche impact pressures related to damage.
Source Mears 1992

The run-out zone is a flatter area (around 5 to 15 degrees) at the path base where the avalanche slows down, resulting in snow and debris deposition.

The impact pressure determines the amount of damage caused by a snow avalanche. The impact pressure is related to the density, volume (mass) and velocity of the avalanche.

History

Alaska has a long history of snow avalanches. It has been estimated that there have been over 4,500 avalanche disaster events in the past 200 years. The Palm Sunday avalanche, April 3, 1898, is considered to be the deadliest event of the Klondike gold rush. Multiple slides occurred that day along the Chilkoot Trail, near Skagway, including three with multiple fatalities. The first fatal slide killed three people. The second one killed the entire Chilkoot Railroad and Transportation Company crew who were trying to evacuate an avalanche prone area further up the trail. The third slide occurred in about the same location as the second killing approximately 70 people who were following the trail left by the construction crew. The exact death toll is unknown because of the transient nature of those involved and inefficiencies in the identification process.

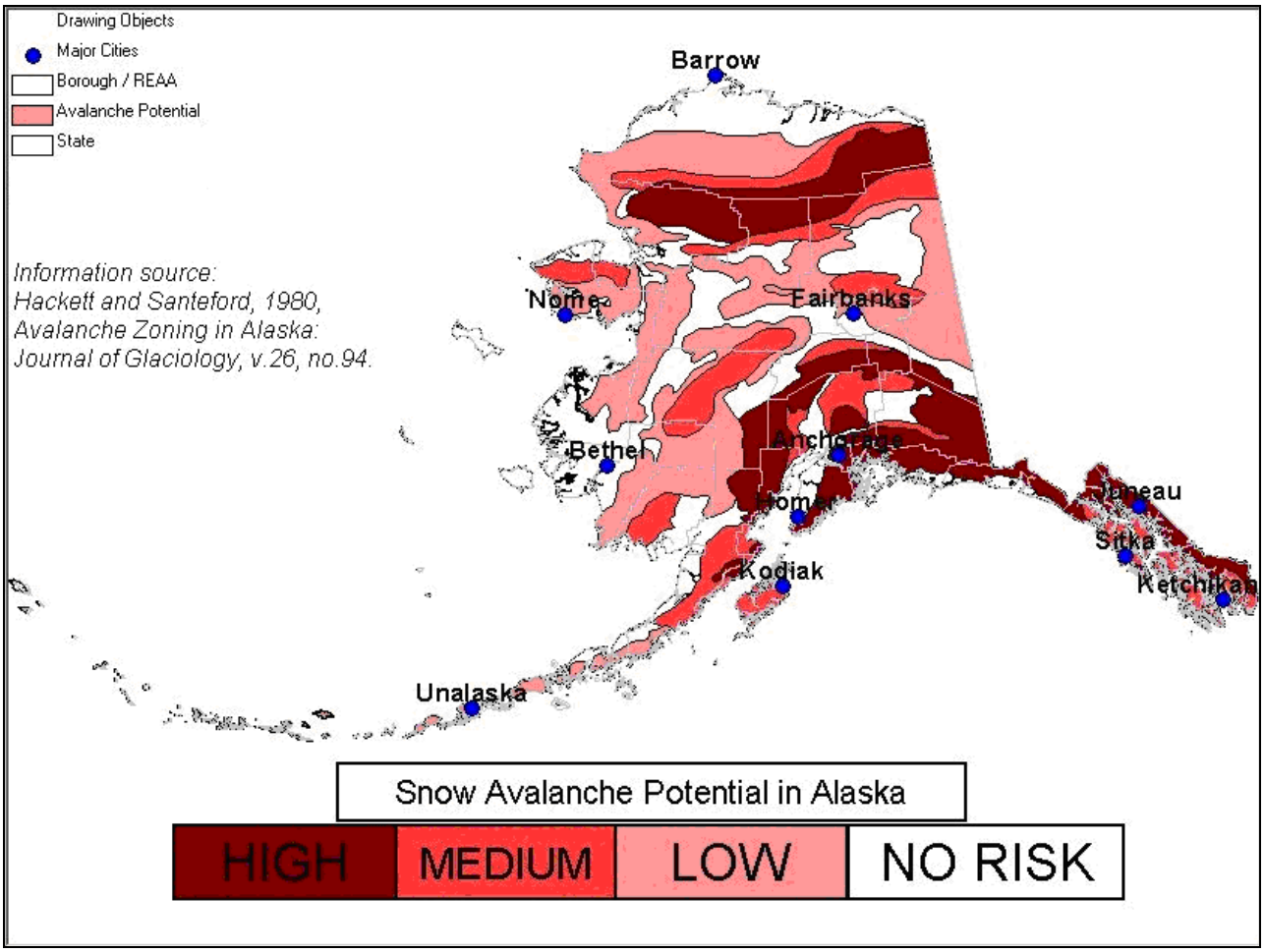
Avalanche on the Chilkoot Trail
Image Courtesy of MSCUA, University of Washington Libraries, Hegg 203

In late 1999 and early 2000 avalanches occurred in Cordova, Valdez, Anchorage, Whittier, Cooper Landing, Moose Pass, Summit, Matanuska Susitna Valley, and Eklutna from the Central Gulf Coast Storm. The most damaging avalanche occurred in Cordova, near milepost 5.5 of the Copper River Highway and was approximately ½ mile wide. It resulted in one death, at least 10 damaged structures, and about 1 million dollars in damage. Avalanches had struck in that spot before, including one in 1971.

Juneau is considered to be one of the largest urban avalanche hazard areas in the nation. In the past 100 years, more than 70 buildings within 10 miles of downtown Juneau have been hit, damaged or destroyed by avalanches. At present, Juneau has over 50 buildings, including one hotel, in avalanche zones; plus an expressway and a boat harbor.

Snow avalanches can occur in many area of the State. All major highways, railroads, and several towns face an avalanche danger. The following map shows the areas that face a snow avalanche threat.

Hazard Vulnerability Analysis



2007 High Avalanche Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq. Footage	VALUE	Replacement Value	Content Replacement Value
State Totals	534	2,506,763	100.00%	$215,195,936	$405,309,177	$85,374,317
Aleutian Region REAA Totals	1	960	0.04%	$51,000	$220,000	$0
Chugach REAA Totals	64	182,709	7.29%	$24,784,279	$22,204,252	$1,497,092
City & Borough of Juneau Totals	80	1,027,446	40.99%	$77,667,390	$119,285,288	$38,076,774
City & Borough of Sitka Totals	1	240	0.01%	$15,000	$15,000	$0
City & Borough of Yakutat Totals	9	47,140	1.88%	$5,573,835	$6,341,302	$692,232
Copper River REAA Totals	28	29,721	1.19%	$1,761,125	$3,313,634	$0
Delta/Greely REAA Totals	43	46,486	1.85%	$3,403,523	$6,458,111	$202,800
Denali Borough Totals	10	17,004	0.68%	$765,159	$2,635,894	$172,500
Haines Borough Totals	37	73,438	2.93%	$3,686,693	$9,505,267	$7,991,070
Kenai Peninsula Borough Totals	60	419,005	16.71%	$48,265,408	$109,496,585	$19,479,088
Kuspuk Borough Totals	1	96	0.00%	$20,000	$20,000	$0
Lake & Peninsula Borough Totals	4	3,912	0.16%	$748,800	$1,815,840	$0
Matanuska-Susitna Borough Total	103	342,186	13.65%	$26,332,323	$55,720,264	$7,516,679
Municipality of Anchorage Totals	59	234,794	9.37%	$14,469,513	$58,213,493	$9,426,925
Northwest Arctic Borough Totals	5	6,056	0.24%	$797,000	$987,001	$0
Southeast Island REAA Totals	20	62,158	2.48%	$4,694,751	$6,167,333	$0
Yukon-Koyukuk REAA Totals	9	13,412	0.54%	$2,160,137	$2,909,913	$319,157

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	23,318	18	282
Alaska HAZUS Building Costs	$3,613,439	$76,812	$536,677
Alaska HAZUS Building Content Costs	$1,806,749	$95,250	$555,368

	Population	Households	Average Value
Alaska HAZUS Demographics Data	61,844	21,730	$135,704

2007 Medium Avalanche Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk - Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	244	2,040,850	100.00%	$182,639,604	$255,313,994	$93,993,640
Annette Island REAA Totals	1	636	0.03%	$22,120	$137,400	$0
Bering Straits REAA Totals	13	125,431	6.15%	$35,659,600	$5,956,602	$1,025,000
Chatham REAA Totals	4	2,988	0.15%	$189,000	$483,841	$0
City & Borough of Juneau Totals	19	787,712	38.60%	$41,841,957	$91,417,123	$57,759,172
City & Borough of Sitka Totals	46	429,788	21.06%	$41,421,726	$70,132,086	$23,100,314
Copper River REAA Totals	1	640	0.03%	$126,650	$126,650	$0
Denali Borough Totals	2	5,019	0.25%	$141,900	$961,000	$0
Iditarod REAA Totals	4	3,558	0.17%	$616,950	$1,400,000	$0
Ketchikan Gateway Borough Totals	46	395,728	19.39%	$30,411,868	$43,234,088	$7,237,639
Kodiak Island Borough Totals	63	210,761	10.33%	$27,462,344	$34,365,799	$4,605,459
Kuspuk REAA Totals	5	16,408	0.80%	$548,000	$840,000	$0
Matanuska-Susitna Borough Totals	23	34,356	1.68%	$1,780,539	$2,781,353	$266,056
North Slope Borough Totals	1	180	0.01%	$1,800	$13,500	$0
Northwest Arctic Borough Totals	6	6,352	0.31%	$598,000	$678,002	$0
Southwest Region REAA Totals	6	15,849	0.78%	$1,420,990	$1,708,550	$0
Yukon flats REAA Totals	3	4,340	0.21%	$126,160	$808,000	$0
Yukon-Koyukuk REAA Totals	1	1,104	0.05%	270,000	270,000	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	12,755	8	156
Alaska HAZUS Building Costs	$2,034,451	$42,471	$277,184
Alaska HAZUS Building Content Costs	$1,017,212	$57,159	$289,339

	Population	Households	Average Value
Alaska HAZUS Demographics Data	35,297	12,954	113,939

2007 Low Avalanche Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	209	380,509	100.00%	$43,341,408	$78,461,386	$6,008,771
Alaska Gateway REAA Totals	30	62,861	16.52%	$1,613,474	$9,591,175	$868,652
Aleutian Region REAA Totals	4	22,200	5.83%	$532,000	$4,532,000	$450,000
Aleutians East Borough Totals	17	40,323	10.60%	$2,262,007	$8,994,199	$384,386
Bering Straits REAA Totals	22	26,649	7.00%	$2,288,118	$492	$0
Denali Borough Totals	2	7,424	0.00%	$993,600	$1,484,800	$150,720
Fairbanks North Star Borough Totals	2	1,080	0.28%	$161,000	$245,000	$0
Iditarod REAA Totals	6	6,930	0.00%	$864,456	$1,026,522	$0
Kuspuk REAA Totals	13	20,022	5.26%	$4,254,234	$6,008,101	$250,687
Lake & Peninsula Borough Totals	11	11,380	2.99%	$1,422,487	$2,275,627	$0
Lower Kuskokwim REAA Totals	7	32,614	8.57%	$9,652,612	$13,640,160	$2,631,028
Lower Yukon REAA Totals	7	13,554	3.56%	$1,882,000	$2,916,000	$0
Matanuska Susitna Borough Totals	3	986	0.26%	$111,250	$298,750	$0
North Slope Borough Totals	4	4,664	1.23%	$702,000	$702,002	$0
Northwest Arctic Borough Totals	9	9,840	2.59%	$1,001,000	$1,064,002	$0
Southwest Region REAA Totals	36	63,869	16.79%	$6,527,414	$10,853,791	$523,298
Yukon Flats REAA Totals	2	1,368	0.36%	$98,679	$145,200	$0
Yukon-Koyukuk REAA Totals	34	54,745	14.39%	$8,975,077	$11,069,565	$750,000

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	7,820	7	51
Alaska HAZUS Building Costs	$1,310,550	$42,826	$112,432
Alaska HAZUS Building Content Costs	$655,236	$60,583	$117,433

	Population	Households	Average Value
Alaska HAZUS Demographics Data	19,910	6,193	$87,891

Existing Programs and Strategies

Avalanche Awareness Month

The Alaska State Legislature adopted, and the Governor signed, Senate Concurrent Resolution (SCR) 16 proclaiming the month of November as *Avalanche Awareness Month.* It urges further education on recognizing avalanche risks, response to avalanches, and using appropriate equipment in avalanche areas. It also urges schools, community groups, and other public and private agencies to increase public awareness.

Alaska Mountain Safety Center (AMSC)

The AMSC is a non-profit organization specializing in avalanche hazard evaluation, mitigation, forecasting, and education. The AMSC also operates the Alaska Avalanche School which offers field-oriented classes on mountain safety training and avalanche hazard evaluation.

Southeast Alaska Avalanche Center (SEAAC)

Established in 1995, the Southeast Alaska Avalanche Center is an educational nonprofit corporation providing snow avalanche safety education and information from Yakutat to Ketchikan. The SEAAC conducts a variety of courses and workshops for the general public and specific projects and emergency focused services. The programs are particularly strong in the areas of urban, highway, snowmobile, snowboard, and heli-ski avalanche safety.

Hazard Mitigation Successes

Home Buyout/Relocation Project in Valdez, and Cordova, AK

HMGP funding bought or relocated 24 homes in the cities of Valdez and Cordova, AK. The project removed individuals from the high hazard avalanche zone and preserved the land as open space in perpetuity.

Alaska Railroad Avalanche Program

The Alaska Railroad Avalanche Program is a three-year program to improve existing avalanche risk management tools and create new control systems. The program involves improving data acquisition and management, improving explosive delivery support, upgrading snow clearing and explosives-control equipment, constructing a central avalanche office, and a secure gun storage facility in Girdwood.

Chugach Electric

Before Chugach Electric sends any of its maintenance crews to do work in a known avalanche area in the winter; it requires an avalanche assessment to ensure worker safety.

Avalanche Ordinances

Juneau, AK

The City and Borough of Juneau adopted an avalanche ordinance in 1987, which restricted development in avalanche areas to single family houses that are built to withstand avalanche impact loads. Any other development requires a conditional use permit.

Snow Avalanches

Cordova and Valdez, AK

The Cities of Cordova and Valdez have adopted avalanche district ordinances following the loss of life and destruction of property during the Central Gulf Coast Storm event, December 1999 through February 2000.

Goals

High Priority

1. Reduce Damage from avalanches

Mitigation Measure: Protection

1.1. Objective: Encourage relocating existing development from known avalanche areas. It is not a question of if an avalanche will strike these areas. It is only a question of when and whether people will be injured or killed and how much damage will result.

1.1.1. Action: Host workshops to show historical events and destruction.

Lead: DPS
Support: DHS&EM, DCCED, DOT&PF, DNR
Timeline: on-going

1.2. Objective: Encourage communities to develop avalanche overlay zones. Development of these zones would provide several benefits, for example: communities could require building to a more stringent standard to ensure structures would be able to withstand potential avalanches or to allow recreational or building use during non-avalanche season.

1.2.1. Action: Complete avalanche area GIS mapping

Lead: DCCED
Support: DHS&EM
Timeline: on-going

Medium Priority

2. Improve avalanche warning.

Mitigation Measure: Protection

2.1. Objective: Fund the Alaska Avalanche Warning Center to provide avalanche warnings. This activity would provide information about avalanche risks, avalanche forecasts, catalog avalanche paths and history, assist in identifying hazardous areas and mitigation opportunities as well as conduct public education. The center was considered one of the best in the country before its disbandment. The center is required by Alaska Statute (AS) 18.76.010.

2.1.1. Action: Re-establish the Alaska Avalanche Warning Center.

Lead: Governor's Office, Legislature
Support: DHS&EM, DPS, DOT&PF, DNR
Timeline: 2 years

3. Promote avalanche education.

Mitigation Measure: Education

3.1. Objective: Education is the best way to reduce fatalities, injuries, and property damage from avalanches. Residents, recreational enthusiasts, elected officials and others need to be aware of the dangers associated with avalanches and how to avoid them. A community avalanche warning sign program would greatly enhance an active outreach program.

3.1.1. Action: Host workshop in communities and schools to teach avalanche awareness.

Lead: DPS,
Support: DHS&EM, DCCED, DNR
Timeline: on-going

3.2. Objective: Encourage avalanche safety training for snow machine riders. Snow machines frequently trigger avalanches with deadly consequences. Training programs to teach people how to identify high-risk conditions and what to do if they are caught in an avalanche could save numerous lives annually.

3.2.1. Action: Conduct voluntary avalanche safety courses and encourage manufacturers and vendors to distribute avalanche awareness videos with their products.

Lead: Alaska State Parks, DNR
Support: Alaska Mountain Safety Center
Timeline: 5 years (No funding source is identified to date)

3.3. Objective: Fund and provide Avalanche Area warning signs for high hazard areas.

This activity would educate people toward being more aware of when they are in an avalanche prone area. A voluntary program would assist communities in identifying their avalanche potential, planning for the hazard, conducting outreach activities to educate the public about avalanche hazards, and what they can do to protect themselves. Snow Avalanche warning signs would be developed by DHS&EM to ensure consistency throughout the State.

3.3.1. Action: Establish a Community Avalanche Warning Sign program.

Lead: DHS&EM
Support: local communities
Timeline: 10 years (No funding source is identified to date)

4. Encourage artificial avalanche release and snow management.

Mitigation Measure: Protection & Prevention

4.1. Objective: Promote using artificial release and avalanche control measures to include: pre-positioning avalanche release equipment and deflection structures in existing developed avalanche prone areas.

4.1.1. Action: Identify avalanche areas for artificial release.
Lead: DPS
Support: DHS&EM, DOT&PF, DNR
Timeline: on-going (No funding source is identified to date)

5. Improve avalanche hazard mapping.

Mitigation Measure: Education & Prevention

5.1. Objective: The State should work with FEMA and other agencies to prepare an avalanche/landslide inventory with maps depicting statewide avalanche hazard areas. This information will guide community prioritization for further study and land management activities. Combine the above information with existing information into a database to be easily available to all users.

5.1.1. Action: Create a mapping initiative.

Lead: FEMA, USGS, DNR/DGGS
Support: DHS&EM
Timeline: on-going (No funding source is identified to date)

Summary of local capabilities, goals and actions

Juneau

Capabilities: Using GIS technology, ordinance adoption for snow load and avalanche control measures.

Goals: Reducing vulnerability to avalanche hazards by prohibiting new construction in avalanche zones, buyout and relocation, harden existing structures for increased snow load capabilities, public education activities, and increase warning and forecasting capabilities.

Anchorage

Capabilities: Vulnerability calculated using GIS technology.

Goals: Reducing vulnerability to avalanche hazard by prohibiting new construction in avalanche zones, harden existing structures for increased snow load capabilities, public education activities, and increase warning and forecasting capabilities.

Seward

Capabilities: Rescue capabilities for homes and automobiles. Heavy equipment for removal of snow and debris and access to avalanche probes from neighboring fire departments.

Goals: Public education, develop avalanche GIS mapping layers, develop avalanche program at Lowell canyon that includes signs, designating safe parking zones, retaining wall and renovate tunnel access.

For more specified information about these areas please refer to appendix 20.

5.5 VOLCANO

Hazard Analysis/Characterization

Alaska is home to over 40 historically active volcanoes stretching across the entire southern portion of the State from the Wrangell Mountains to the far Western Aleutians. An average of 1-2 eruptions per year occurs in Alaska. In 1912, the largest eruption of the 20th century occurred at Novarupta and Mount Katmai, located in what is now Katmai National Park and Preserve on the Alaska Peninsula.

A volcano is a vent at the Earth's surface through which magma (molten rock) and associated gases erupt, and also the landform built by effusive and explosive eruptions.

Volcanoes display a wide variety of shapes, sizes, and behavior, however they are commonly classified among three main types: cinder cone, composite, and shield.

Types of Volcanoes

Cinder cones

A cinder cone is the simplest type of volcano. They are built from particles and blobs of congealed lava ejected from a single vent. As the lava is blown into the air, it breaks into small fragments that solidify and fall as cinders and bombs around the vent to form a circular or oval cone. Most cinder cones have a bowl-shaped crater or craters at the summit and are rarely more than a thousand feet above their surroundings. Cinder cones may form as flank vents on the sides of larger composite or shield volcanoes. They often occur in clusters and produce lava flows. Cinder cones are common in western North America as well as other volcanic terrain. Some Alaskan cinder cones are found in the following locations:

- St. Michael (in western Alaska along the southern Norton Sound shoreline)
- Ingakslugwat Hills (in western Alaska's Yukon Delta region near the village of St. Mary's)
- St. Paul Island (one of the Pribilof Islands in the Bering Sea)
- Table Top-Wide Bay (a satellite vent of Makushin Volcano near Unalaska in the Aleutian Islands)

Redoubt Volcano is one of the active volcanoes of the Cook Inlet region. Steam and volcanic gas rise above the summit crater of the volcano following the 1989 to 1990 eruptions. Iliamna Volcano is on the skyline at left.

Photograph courtesy of C. Neal, USGS.

Composite volcanoes

Composite volcanoes, sometimes called stratovolcanoes, are typically steep-sided, symmetrical cones of large dimension built of alternating layers of lava flows, volcanic ash, blocks, and bombs and may rise as much as 8,000 feet above their bases. Some of the most conspicuous and beautiful mountains in the world are composite volcanoes, including Mount Shasta in California, Mount Hood in Oregon, Mount St. Helens and Mount Rainier in Washington, Mt Fuji in Japan, Mt. Vesuvius in Italy, and Shishaldin in Alaska.

Composite volcanoes have a principal conduit system through which magma from a reservoir deep in the Earth's crust rises to the surface repeatedly to cause eruptions. The volcano is built up by accumulating erupted material and increases in size as lava, and fragmented deposits, are added

to its slopes. Stratovolcanoes tend to erupt explosively because of the viscous nature of magmas associated with these volcanoes. Some stratovolcanoes produce enormous explosive eruptions that destroy a large part of the volcano itself, leaving a wide, roughly circular depression called a caldera. Eruptions that produce calderas are among the most explosive and largest eruptions known.

Most Alaskan volcanoes are stratovolcanoes, including Redoubt, Spurr, Iliamna, and Augustine.

Mount Wrangell, the shield volcano on the right skyline, is the only volcano in the Wrangell Mountains to have had documented historical activity consisting of several minor eruptions in the early 1900's.

Image courtesy B. Cella, U.S. National Park Service

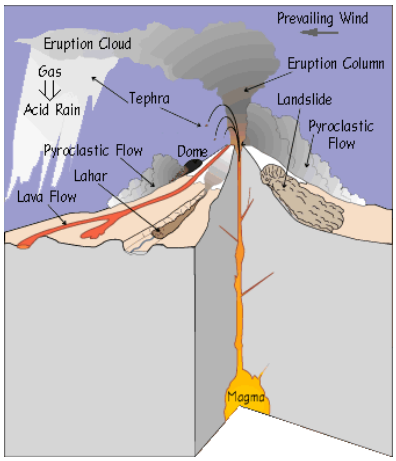
Shield volcanoes

Shield volcanoes are formed by lava flowing in all directions from a central summit vent, or group of vents, or rift zones building a broad, gently sloping cone with a dome shape. They are built up slowly by the accumulation of thousands of highly fluid lava flows that spread widely over great distances, and then cool in thin layers. Some of the largest volcanoes in the world are shield volcanoes including Mauna Loa in Hawaii. In Alaska, Wrangell, Yunaska, and Westdahl are examples of shield volcanoes.

Volcanoes are also categorized according to the age of their eruptive activity. Active volcanoes are those that have recently erupted, are currently erupting, or show signs of unrest, such as unusual earthquake activity or significant new gas emissions. Dormant volcanoes are those that are not currently active, but could become restless or erupt again. Extinct volcanoes are those that are considered unlikely to erupt again. This can be difficult to determine as a volcano could go tens of thousands of years, or longer, between eruptions. There are over 80 volcanic centers in the State but only about half are considered active.

Volcanic Hazards

Volcanic eruptions create the following hazards:



Volcanic hazards

Lava Flows

Lava flows are streams of molten rock that flow from a volcano. The distance traveled by a flow is dependant on several variables including viscosity, volume, slope steepness, and obstructions in the flow path. A typical flow may extend between 6 and 30 miles.

Lava flows cause damage by burning, crushing, or burying everything they contact. They can also melt ice and snow, causing flooding or move into a wooded area triggering wildland fires.

Pyroclastic Flows

Pyroclastic flows are high-density mixtures of hot gases and dry rock that are usually released explosively from a volcano. They are hazardous because of their rapid movement and high temperatures. They travel at speeds of 30 to +90 miles per hour and can destroy or sweep away objects due to the impact of debris or associated high winds, or cause burns.

Pyroclastic Surges

Pyroclastic surges are turbulent low-density clouds of rock debris, air, and other gases that move over the ground at speeds similar to pyroclastic flows. There are two types: hot surges consisting of dry materials over 212ºF and cold surges consisting of cooler rock debris and water or steam.

A pyroclastic flow sweeping down the north flank of 1,282-m (4,206 ft)-high Augustine Volcano

Image courtesy M.E. Yount, USGS.

Lava Domes

Lava domes are formed when viscous lava erupts slowly from a vent. This causes it to solidify near the vent forming a steep-sided rubbly dome instead of flowing away from the vent. A dome can also grow by expansion from within. As it grows its outer surface cools and hardens, then shatters, spilling loose fragments down its sides. Volcanic domes commonly occur within the craters or on the flanks of large composite volcanoes. Novarupta Dome, measures 800 feet across and 200 feet high, was formed at the end of the 1912 eruption of Katmai Volcano, Alaska.

Aerial view, Novarupta Dome, Katmai Vicinity, Alaska

Image courtesy of Gene Iwatsubo USGS

Volcanic Ash and Bombs

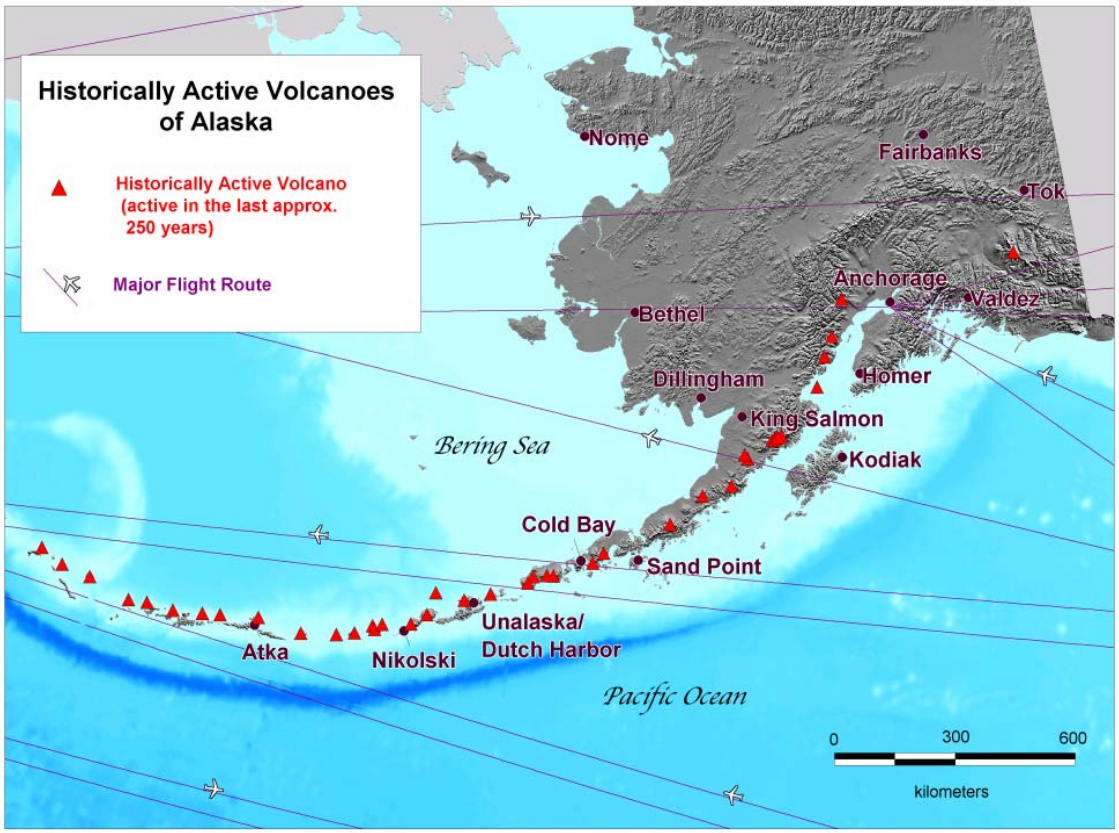
Volcanic ash, also called tephra, is fine fragments of solidified lava ejected into the air by an explosion or rising hot air. The fragments range in size, with the larger falling nearer the source. Ash is a problem near the source because of its high temperatures (may cause fires), burial (the weight can cause structural collapses), and impact of larger falling fragments called bombs. Further away, the primary hazards to humans are decreased visibility, respiratory and eye irritation, and effects on infrastructure. Chronic exposure to ash can be a significant public health hazard. Ash will also interfere with mechanical equipment operation including aircraft that inadvertently enter airborne ash clouds. In Alaska, this is a major problem as many of the major flight routes are near historically active volcanoes.

Clean-up after 1992 Mt. Spurr Eruption.

Photographer Erik Hill, courtesy of Anchorage Daily News (file 920819)

Ash clean-up from the 1992 Mt. Spurr Eruption

Photographer Bill Roth, courtesy of Anchorage Daily News (file 920917)



Alaska's active volcanoes and a schematic depiction of selected major air routes across Alaska

Volcanic Gases

Volcanic gases consist mostly of steam, carbon dioxide, sulfur dioxide, hydrogen sulfide, and chlorine compounds, but may include other substances. The gases can damage eyes, respiratory systems and cause suffocation in high concentrations (usually near the vent). They can also be very corrosive.

Lateral Blasts

Lateral blasts are inflated mixtures of gases, ash, and hot rock debris. They may be hundreds of feet thick and travel at speeds up to 370 miles per hour. They cause damage through abrasion, impact, burial, and heat. They may also trigger pyroclastic flows or surges.

Debris avalanche deposits form hummocky topography at Augustine Volcano

Debris Avalanches

Debris avalanches are sudden downward movement of unconsolidated material (mostly rock and soil). They occur without warning and travel quickly. Debris avalanches can extend for miles and cover up to 300 square miles, causing damage from impact or burial.

Lahars and Debris Flows

Debris flows, also known as lahars, are rapidly flowing mixtures of rock debris and water that

originate on the slopes of a volcano. They form in a variety of ways, primarily by the rapid melting of snow and ice by pyroclastic flows, intense rainfall on loose volcanic rock deposits, breakout of a lake dammed by volcanic deposits, and as a consequence of debris avalanches. They generally have the consistency of wet cement and have the ability to destroy or bury anything in their path.

Historic Volcanic Activity

The largest volcanic eruption of the 20th century occurred at Novarupta Volcano in June 1912. It started by generating an ash cloud that eventually extended over thousands of miles wide during the three-day event. Within four hours of the eruption, ash started falling on Kodiak, darkening the city. It became hard to breathe because of the ash and sulfur dioxide gas. The water became undrinkable and unable to support aquatic life. Roofs collapsed under the weight of the ash. Some buildings were destroyed by ash avalanches similar conditions could be found all over the area. Some villages ended up being abandoned, including Katmai and Savonoski villages. The ash and acid rain also negatively affected animal and plant life. Large animals were blinded and many starved because their food was eliminated.

Lahars from the 1989 to 1990 eruptions of Redoubt Volcano inundated this structure near the mouth of Drift River.

Photograph courtesy of C. Gardner, USGS.

The amount of ash fall from this eruption was significantly greater than the recent eruptions of Redoubt, Spurr, and Augustine Volcanoes. Fourteen earthquakes of magnitude 6 to 7 were associated with this event. An event of similar magnitude in the future is possible at a number of volcanoes along the Aleutian arc.

More recent eruptions occurred on Augustine Volcano in 1986 and again in 2006. During both eruptions repeated ash plumes rose to 30,000 feet above sea level or higher, disrupting air traffic and dusting Cook Inlet communities with ash. A lava dome formed in the summit crater towards the end of each of these eruptions. A concern is the possibility of a partial cone collapse into Cook Inlet. Such an event could trigger a tsunami along lower Cook Inlet, as happened in 1883.

Novarupta ash fall compared to that from recent Alaskan eruptions.
Image courtesy of USGS

Redoubt Volcano erupted in 1989-1990 and mudflows or lahars caused temporary closure of the Drift River Oil Terminal. A 747 jet aircraft, temporarily lost power in all four engines when it entered the Redoubt ash plume over the Talkeetna Mountains. Fortunately, the flight crew was able to restart their engines about 4,000 feet (1,219 meters) above ground and the plane landed safely in Anchorage.

Hazard Vulnerability Assessment

Aviation Color Code Used by USGS Volcano Observatories

Color codes, which are in accordance with recommended International Civil Aviation Organization (ICAO) procedures, are intended to inform the aviation sector about a volcano's status and are issued in conjunction with an Alert Level. Notifications are issued for both increasing and decreasing volcanic activity and are accompanied by text with details (as known) about the nature of the unrest or eruption, especially in regard to ash-plume information and likely outcomes.

Color	Description
GREEN	Volcano is in typical background, noneruptive state or, *after a change from a higher level,* volcanic activity has ceased and volcano has returned to noneruptive background state.
YELLOW	Volcano is exhibiting signs of elevated unrest above known background level or, *after a change from a higher level,* volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
ORANGE	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain, OR eruption is underway with no or minor volcanic-ash emissions [ash-plume height specified, if possible].
RED	Eruption is imminent with significant emission of volcanic ash into the atmosphere likely OR eruption is underway or suspected with significant emission of volcanic ash into the atmosphere [ash-plume height specified, if possible].

The responsibility for hazard identification and assessment for the active volcanic centers of Alaska falls to the Alaska Volcano Observatory and its constituent organizations (USGS, DNR/DGGS, and UAF/GI). AVO is in the process of publishing individual hazard assessments for each active volcano in the State. As of 2007, published or in-press hazard assessments cover the following volcanoes: Hayes, Spurr, Redoubt, Iliamna, Augustine, the Katmai Group, Aniakchak, Emmons Lake, Shishaldin, Akutan, and Makushin, Okmok, Great Sitkin, Tanaga, and Tanaga. Each report contains a description of the eruptive history of the volcano, the hazards they pose and the likely effects of future eruptions on populations, facilities, and ecosystems.

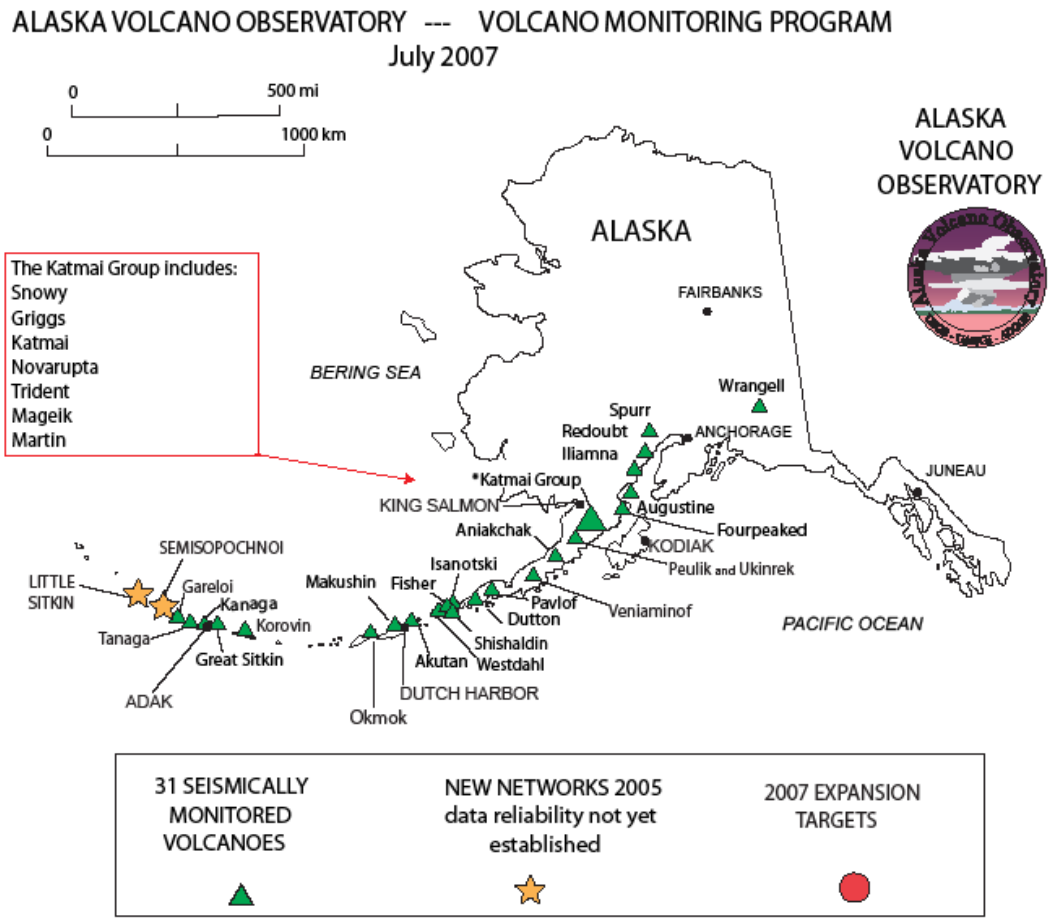
AVO has the primary responsibility to monitor all of Alaska's potentially active volcanoes and to issue timely warnings of activity to authorities and the public. During episodes of volcanic unrest or eruption, AVO is also the agency responsible for characterizing the immediate hazards and describing likely scenarios for an evolving volcanic crisis. AVO uses a two-part Alert-Notification System for Volcanic Activity to succinctly portray its interpretations of the state-of-activity and likely course of unrest at a given volcano.

A Color Code is aimed primarily at the aviation sector while Alert Levels are primarily intended to portray hazards to people and property on the ground.

Basic information about vulnerable assets and populations are identified in these assessments. However, DCCED and other State agencies could work with AVO map data to integrate quantitative, current information, regarding communities and other at-risk elements to improve AVO's vulnerability analysis.

One of the most vulnerable sectors is the aviation industry. They have the highest risk from airborne volcanic ash effects as a major portion of air traffic fly directly over or near Alaska's potentially active volcanoes. This significant trans-Pacific and intrastate air traffic, necessitated developing a strong communication and warning link between AVO, other government agencies with responsibility in aviation management, and the airline and air cargo industries. Emergency coordination procedures and communication standards during eruptions are codified in an Interagency Plan that is updated every few years

Existing Programs and Strategies



Alaska Volcano Observatory

The Alaska Volcano Observatory, a joint program of USGS, DNR/DGGS, and UAF/GI, is the State's principal agency with responsibility to assess, monitor, and issue early warning of volcanic activity and hazards in Alaska. AVO was formed in 1988, and uses Federal, State, and university resources to monitor and study Alaska's hazardous volcanoes, to predict and record eruptive activity, and to mitigate volcanic hazards to life and property.

As of July 2007, AVO maintains seismic monitoring networks on 31 of Alaska's 41 active volcanoes. Data from these networks are recorded 24 hours per day and examined for precursory signs of eruptive activity. Several times a day, AVO also examines satellite images of Alaskan, Kamchatkan, and Northern Kurile volcanoes for signs of eruptive activity, ash clouds, or possible precursory heating of the ground. These two primary data streams are used routinely to assess the likelihood and character of volcanic activity. Additional monitoring methods such as space-based satellite radar interferometry are under development.

AVO regularly disseminates information about the status of volcanoes in Alaska and neighboring Kamchatka. AVO distributes a daily written status report to more than 100 recipients at Federal, State, local agencies, the media, and the public via Internet and facsimile (fax). AVO produces a summary of Alaska's volcanic activity each Friday and similarly shared via the Internet, fax, AVO

website, and recorded message line. During volcanic crises, or if precursors to eruptive activity are noted, AVO follows a rigid emergency call-down protocol, as well as using Internet and fax outlets to notify authorities, the media, the aviation industry, and the public.

Hazard Mitigation Successes

Augustine Volcano, Cook Inlet, Alaska

The 2005-2006 eruption of Augustine is the first significant volcanic event in south-central Alaska, home to more than half the state's population, since the eruption of Mount Spurr in 1992. Based on months of slowly increasing seismicity and deformation, the Alaska Volcano Observatory (AVO) issued a statement of an increased likelihood of eruption 3 days prior to the first phreatic explosion and more than a month prior to a vulcanian explosion that sent ash to 30,000 feet. AVO utilizes a dense network of geophysical monitoring instruments on the volcano in concert with satellite imagery, airborne gas and thermal surveillance, and other techniques to detect and track more than a dozen explosive, ash producing eruptions that threatened communities and air traffic with ash clouds and ash fall. Local, State and Federal partners including the National Weather Service, Federal Aviation Administration, DHS&EM, and many others, with the AVO staff around the clock monitor events and share information about the status of the volcano and likely impacts of eruptive events.

A special concern for Augustine is the possibility of a tsunami prompted by partial flank collapse. AVO and NOAA's West Coast and Alaska Tsunami Warning Center (WCATWC) addressed this issue in a pre-eruption press conference and public meetings in Homer early in the eruption sequence. Results of tsunami modeling and wave travel times were posted on web sites and included in public statements. AVO and WCATWC developed a protocol to address the unique warning requirements for a potential Augustine tsunami. WCATWC installed a network of 'splash detectors' at Augustine to provide further confirmation of a large wave. This protocol and instrumentation is the first of its kind in the US and serves as a potential example for other volcanoes in oceanic and other settings vulnerable to volcanic tsunami.

Prior to the onset of the eruption, outreach efforts by AVO, NWS, DSH&EM, the Kenai Peninsula Borough Office of Emergency Management, and other agencies contributed to public preparedness including checking of disaster preparedness kits and plans. The NWS developed and maintained a coordinated interagency web site that compiled many of the formal warning notices including ash fall advisories and hypothetical ash cloud trajectories that were updated every 6 hours.

As of 2007 the volcano returned to its background state of seismic quiet and the new lava flows and deposits from the 2005-2006 eruption continue to cool. A detectable but weakening plume of volcanic gas still issues from the summit region and occasional rock falls and small avalanches are detected on the seismic network. It is likely that Augustine has entered a period of repose that will last years. However, based on its well-established history of frequent eruptions, Alaska can be certain it will again deal with ash clouds, ash fall, and other volcanic products from Augustine in the future.

Alaska Volcano Observatory

Since the formalization of AVO in 1988, AVO scientists have responded to numerous volcanic crises in Alaska, providing early warning for explosive eruptive events at Redoubt (1989-90) and Mt. Spurr (1992) and assisting in successful crisis management during the 1996 intrusive event and earthquake swarm on Akutan Island. Advanced eruption warnings and accurate data analysis from seismic monitoring networks and satellite platforms has prevented needless evacuations and

reduced aviation industry economic impacts. Finally, AVO has worked closely with Russian scientific colleagues in Kamchatka to monitor, track, and disseminate eruption and ash cloud warnings from Russian Far East volcanoes that may also threaten Alaskan air space.

Interagency Plan for Volcanic Ash Episodes

In December, 1989, the aforementioned KLM flight 867 that encountered an ash cloud from Redoubt Volcano highlighted a serious weakness in the aviation and volcanic ash warning system. Following this incident, a consortium of Federal, State, and private sector parties worked to develop an improved early warning system and ash avoidance protocols for the heavily traveled North Pacific airways. This effort resulted in the growth and increased capacity of the Alaska Volcano Observatory and formal adoption of a Alaska Interagency Plan for Volcanic Ash Episodes (signatories include USGS, NOAA/NWS, Federal Aviation Administration (FAA), Department of Defense (DOD) United States Air Force (USAF), and DHS&EM. The Unites State Coast Guard (USCG) will also participate in future versions. The plan documents specific responsibilities and protocols for each agency before, during, and after a volcanic event. Since the 1989 KLM ash encounter, no serious ash-aircraft incidents have been reported in Alaska, despite dozens of additional eruptions.

This multi-agency early warning and response program is a model endorsed by the International Civil Aviation Organization and emulated in many volcanically active regions around the world.

Goals

High Priority

1. Research and publish information on volcanic hazards in Alaska

Mitigation Measures: Educational; Preventative

1.1. Objective: Compile an integrated volcano hazard and risk assessment for the Cook Inlet and surrounding areas.

1.1.1. Action: Project still in planning stages

Lead: USGS
Support: DNR/DGGS, UAF/GI
Timeline: on-going as part of individual volcano hazard assessments; further data collection and integration of hazard analysis to be done

1.2. Objective: Publish volcano hazard assessments for all of Alaska's active volcanoes.

1.2.1. Action: First generation hazard assessments for nearly half of the 41 active volcanoes in Alaska are complete or in process as of 2007. AVO will continue to investigate, assess, and publicize the geologic history and hazards posed by the remaining active volcanoes as resources allow.

1.2.2. Action: Work will continue on additional areas.

Lead: AVO
Support: USFWS, DOD
Timeline: on-going **(Completed-Okmok (2005) and Emmons Lake Volcanic Center (2006)**

Medium Priority

2. Public Education

Mitigation Measures: Educational

2.1. Objective: Conduct specific outreach to the Alaskan aviation community regarding the hazards posed by Alaskan and Russian volcanoes.

AVO staff already speaks, and meet frequently, with cooperating agency employees, representatives, and gatherings of Alaska's aviation community to share information regarding volcano hazards. AVO publishes a 2-page section on volcano hazards in the Alaska Supplement, an FAA publication that is widely used by pilots using Alaska airspace.

2.1.1. Action: Revise the fact sheet on Volcano Hazards and Aviation Safety

Lead: AVO
Support: DHS&EM, FAA, NWS, Alaska Air Carriers Association
Timeline: 2004 ***extended to 2008 Planned Completion***.

2.1.2. Action: Develop a fact sheet about mitigating the risk to aviation from Kamchatkan volcanoes.

Lead: AVO
Support: DHS&EM, FAA, NWS, Alaska Air Carriers Association
Timeline: 2004 **(Completed)**

2.2. Objective: Ensure all Alaskan communities, at risk from volcanic eruptions, are aware of the hazard and what can be done to mitigate risk.

Special emphasis is needed in remote communities on the Alaska Peninsula and in the Aleutian Islands. Each community should include volcanic hazards in their EOP/ERP. AVO should work with DHS&EM to ensure appropriate materials and information is available to support this effort. Some outreach is already conducted during AVO field work in communities near volcanoes. AVO can contribute to outreach efforts by providing personnel for presentations and materials for (traveling) exhibits and programs.

2.2.1. Action: Distribute free USGS literature on volcano hazards.

Lead: AVO
Support: USGS
Timeline: on-going

3. Increase planning for volcanic hazards

Mitigation Measures: Educational; Preventative

3.1. Objective: Revise the Alaska Interagency Plan for Volcanic Ash Episodes to include the U.S. Coast Guard and make this plan available publicly online.

By agreement, this plan is updated every other year. The 2008 plan is in the final revision stages.

3.1.1. Action: The USCG will foster improved cooperation and information sharing with a valuable partner in public safety. Widely disseminating the plan will increase awareness of volcano hazards, mitigation planning, and advances in volcano risk management.

Lead: AVO
Support: NWS, DHS&EM, USAF, FAA
Timeline: on-going; next plan due in 2008

3.2. Objective: Ensure volcanic hazards are addressed in the on-going revision of the State ERP.

3.2.1. Action: Incorporate results of AVO's volcano hazard assessment as they become available.

Lead: DHS&EM
Support: AVO, USGS, DNR/DGGS, UAF/GI
Timeline: as needed and requested from the State during plan revisions

3.2.2. Action: Revise State ERP

Lead: DHS&EM
Support: All Agencies
Timeline: 2004 **(Completed-Next update 2008)**

4. Improve monitoring.

Mitigation Measures: Educational; Preventative

4.1. Objective: Expand real time seismic monitoring to high-priority western Aleutian volcanoes.

4.1.1. Action: Install monitoring equipment on, selected volcanoes

Lead: AVO
Support:
Timeline: on-going **(Completed-Tanaga, Little Sitkin, Gareloi, Semisopochnoi)**
Funding Dependent/Partial completion on Little Sitkin and Semisopochnoi

Summary of local capabilities, goals and actions

Anchorage

Capabilities: include planning, monitoring, and education.

Goals: continued planning and education activities. Evaluate heavy ash fall load capacity for structure roofs.

Juneau

Capabilities: include planning and education.

Goals: continued planning and education activities.

Mat-Su Borough

Capabilities: include monitoring and education.

Goals: continued monitoring and prepare to educate the population. Evaluate heavy ash fall load capacity for structure roofs.

For more specified information about these areas please refer to appendix 20.

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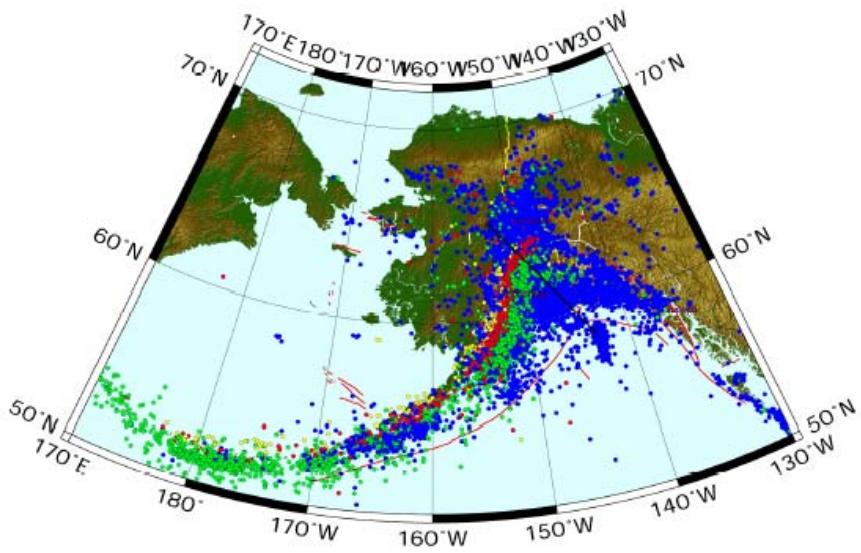
5.6 EARTHQUAKES

Approximately 11% of the world's earthquakes occur in Alaska, making it one of the most seismically active regions in the world. Three of the ten largest quakes in the world since 1900 have occurred here. Earthquakes of magnitude 7 or greater occur in Alaska on average of about once a year; magnitude 8 earthquakes average about 14 years between events.



Earthquakes in Alaska 1988-1999

Hazard Analysis/Characterization

Most large earthquakes are caused by a sudden release of accumulated stresses between crustal plates that move against each other on the earth's surface. Some large earthquakes occur along faults that lie within these plates. The dangers associated with earthquakes include ground shaking, surface faulting, ground failures, snow avalanches, tsunamis and seiches. The extent of damage is dependent on the magnitude of the quake, the geology of the area, distance from the epicenter, and structure design and construction. A main goal of an earthquake hazard reduction program is to preserve lives through economical rehabilitation of existing structures and constructing safe new structures.

Ground shaking is due to the three main classes of seismic waves generated by an earthquake. "P" (primary) waves are the first ones felt, often as a sharp jolt. "S" (shear or secondary) waves are slower and usually have a side to side movement. They can be very damaging because structures are more vulnerable to horizontal than vertical motion. "Surface" waves are the slowest, although they can carry the bulk of the energy in a large earthquake. The damage to buildings depends on how the specific characteristics of each incoming wave interact with the

Richter scale

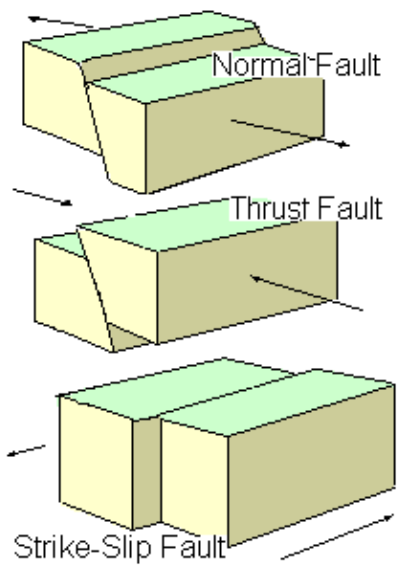
The Richter scale expresses, magnitude as a decimal number. A 5.0 earthquake is a moderate event, 6.0 characterizes a strong event, 7.0 is a major earthquake and a great earthquake exceeds 8.0. The scale is logarithmic and open-ended.

buildings' height, shape, and construction materials and whether ground failure (sliding or liquefaction) occurs beneath the structure.

Earthquakes are usually measured in terms of their magnitude and intensity. Magnitude is related to the amount of energy released during an event while intensity refers to the effects on people and structures at a particular place. Earthquake magnitude is usually reported according to the standard Richter scale for small to moderate earthquakes. Large earthquakes, like those that commonly occur in Alaska are reported according to the moment-magnitude scale because the standard Richter scale does not adequately represent the energy released by these large events.

Intensity is usually reported using the Modified Mercalli Intensity Scale. This scale has 12 categories ranging from not felt to total destruction. Different values can be recorded at different locations for the same event depending on local circumstances such as distance from the epicenter or building construction practices. Soil conditions are a major factor in determining an earthquake's intensity, as unconsolidated fill areas will have more damage than an area with shallow bedrock.

Surface faulting is the differential movement of the two sides of a fault. There are three general types of faulting. "Normal faults" have one side sliding down and away relative to the other side. "Thrust (reverse) faults" have one side moving up and over the fault relative to the other side. "Strike-slip faults" are where each side of the fault moves horizontally.



Three types of faults
Image courtesy of USGS

Earthquake-induced ground failure is often the result of liquefaction, which occurs when soil (usually sand and course silt with high water content) loses strength as a result of the shaking and acts like a viscous fluid. Liquefaction causes three types of ground failures: lateral spreads, flow failures, and loss of bearing strength. In the 1964 earthquake, over 200 bridges were destroyed or damaged due to lateral spreads. Flow failures damaged the port facilities in Seward, Valdez, and Whittier. Similar ground failures can result from loss of strength in saturated clay soils, as occurred in several major landslides that were responsible for most of the earthquake damage in Anchorage in 1964. Other types of earthquake-induced ground failures include slumps and debris slides on steep slopes.

Relationship of the Mercalli Scale to the Richter scale

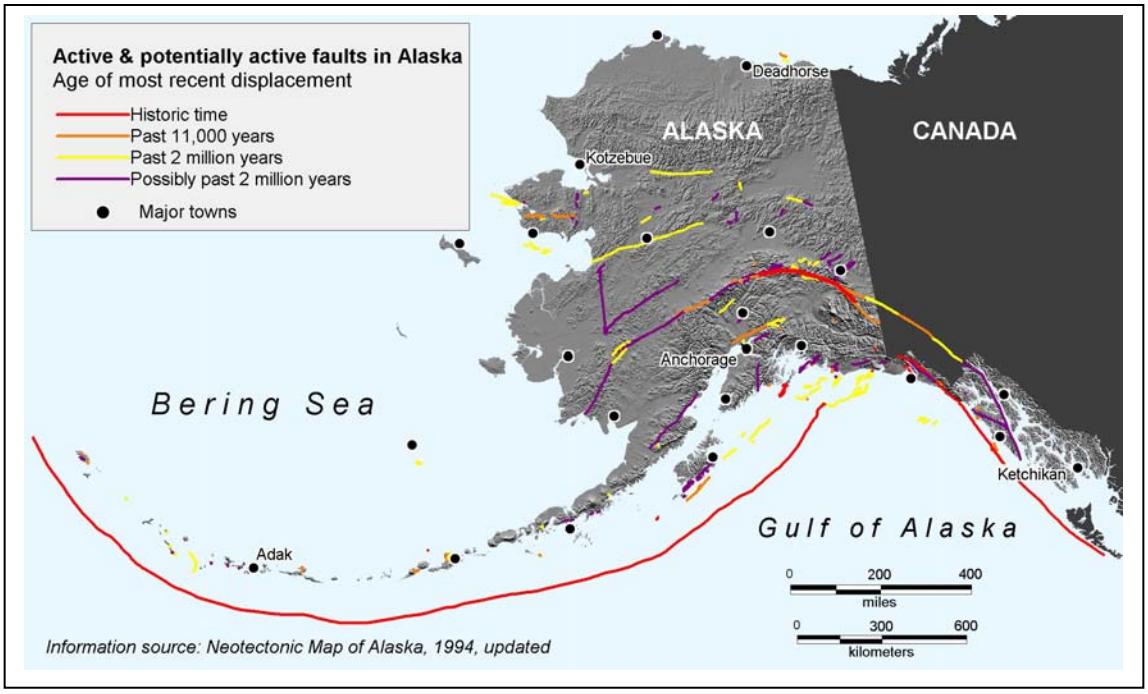
Scale		
Mercalli	**Richter**	Description
I	0-4.3	Not felt.
II		Felt by persons at rest, on upper floors, or favorably placed.
III		Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	4.3-4.8	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing cars rock. Windows, dishes, door rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.
V		Felt outdoors; direction estimated. Sleepers awakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	4.8-6.2	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken visibly, or heard to rustle.
VII		Difficult to stand. Noticed by drivers. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices, also unbraced parapets and architectural ornaments. Some cracks in masonry C. Waves on ponds, water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	6.2-7.3	Steering of cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX		General panic. Masonry D destroyed; masonry C heavily damage, sometimes with complete collapse; masonry B seriously damaged. General damage to foundations. Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluviated areas, sand and mud ejected, earthquake fountains, sand craters.
X		Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	7.3-8.9	Rails bent greatly. Underground pipelines completely out of service.
XII		Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.

Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.

Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.

Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.



Seismic History in Alaska

Approximately 75% of Alaska's detected earthquakes occur in, Alaska Peninsula, Aleutian, Cook Inlet and Anchorage areas. About 15% occur in Southeast Alaska and the remaining 10% occur in the Interior. The greatest earthquake in North American history occurred at the east end of the Alaska-Aleutian seismic zone in 1964. That quake was a moment-magnitude 9.2, lasting between four and five minutes and was felt over a 7,000,000 square mile area. It caused a significant amount of ground deformation as well as triggering landslides and tsunamis resulting in major damage throughout the region. The entire Aleutian megathrust zone where the North Pacific Plate plunges beneath the North American Plate still has the potential to generate earthquakes up to magnitude 9.

There is one known active fault within 25 miles of Anchorage with the potential to create magnitude 7.5 earthquakes. The Castle Mountain Fault produced a magnitude 5.7 earthquake near Sutton in 1984 and may have generated a magnitude 6.9 earthquake that shook Anchorage in 1933. This area is of concern, as the Parks Highway and Alaska Railroad cross the fault, and a great deal of subdivision development has and continues to occur along the fault.

One of the more memorable events in the Aleutian Islands lengthy seismic history is a magnitude 9.1 earthquake that occurred in 1959 in the Andreanoff Islands. Magnitude 7.9 events occurred in the same area in 1986 and 1996. In addition, a magnitude 8.7 earthquake occurred in the Western Aleutian Islands in 1965.

A powerful magnitude 7.9 earthquake struck central Alaska on November 3, 2002, rupturing the Earth's surface for 209 miles along the Susitna Glacier, Denali, and Totschunda Faults. Striking a sparsely populated region, it caused thousands of landslides but little structural damage and no deaths. Although the Denali Fault shifted about 14 feet beneath the Trans-Alaska Oil Pipeline, the pipeline did not break, averting

a major economic and environmental disaster. This was largely the result of stringent design specifications based on geologic studies done by the U.S. Geological Survey (USGS) and others 30 years earlier. Studies of the Denali Fault and the 2002 earthquake will provide information vital to reducing losses in future earthquakes in Alaska, California, and elsewhere.

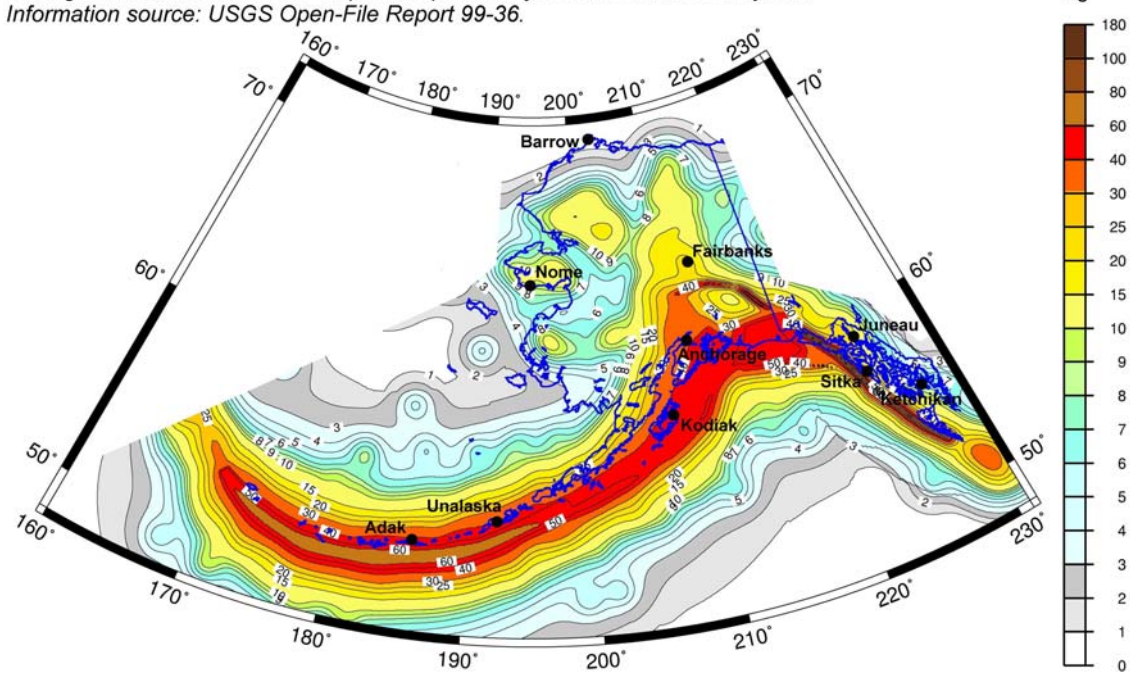
Earthquakes have affected other parts of the State. Since the early 1900's, three magnitude 7 earthquakes have occurred within 50 miles of Fairbanks. Southeast Alaska also has earthquakes from the Queen Charlotte-Fairweather fault including a magnitude 8.1 earthquake in 1949 and the magnitude 7.9 event in 1958 that triggered the giant landslide-generated wave in Lituya Bay. Areas at greatest risk from earthquakes along this fault zone are communities along the outer coast of Southeast Alaska.

A lack of large earthquakes along a portion of an active plate margin can be cause for concern. This may indicate the development of a seismic gap, which is an area where there has not been a major earthquake for a much longer time than in adjacent areas. There may be higher likelihood of a strong earthquake in these areas in the future because of strain buildup. The Yakataga seismic gap is one such area because it has not had a major earthquake in more than 100 years. Another suspected seismic gap, the Shumagin gap, shows recent evidence of slipping aseismically, so it appears to pose less potential for a major earthquake than previously thought.

Hazard Vulnerability Analysis

DHS&EM has determined for this Plan 0-10 acceleration is equal to low seismic activity; 11-30 acceleration is equal to medium seismic activity: and 31-100 acceleration is equal to high seismic activity. The information presented in the following tables is subject to verification and should be used with caution.

Peak ground acceleration with 10 percent probability of exceedance in 50 years.
Information source: USGS Open-File Report 99-36.



High Earthquake Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk -Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	220	928,708	100.00%	$109,553,660	$181,887,878	$26,776,393
Aleutian Region REAA Totals	6	28,475	3.07%	$1,595,000	$6,101,000	$450,000
Chugach REAA Totals	60	181,803	19.58%	$24,793,314	$22,083,239	$1,497,092
City & Borough of Yakutat Totals	9	47,140	5.08%	$5,573,835	$6,341,302	$692,232
Denali Borough Totals	10	17,004	1.83%	$765,159	$2,635,894	$172,500
Kenai Peninsula Borough Totals	59	418,669	45.08%	$48,224,269	$109,455,446	$19,479,088
Ketchikan Gateway Borough Totals	7	8,912	0.96%	$370,000	$222,317	$0
Kodiak Island Borough Totals	64	198,417	21.36%	$27,084,583	$32,053,375	$4,219,425.00
Matanuska Susitna Borough Totals	1	21,620	2.33%	$785,400	$1,773,705	$266,056
Municipality of Anchorage Totals	3	5,880	0.63%	$204,500	$1,064,000	$0
Southwest Region REAA Totals	1	788	0.08%	$157,600	$157,600	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	9879	117	8
Alaska HAZUS Building Costs	$1,600,554	$44,896	$207,035
Alaska HAZUS Building Content Costs	$800,243	$213,425	$63,188

	Population	Households	Average Value
Alaska HAZUS Demographics Data	25,827	9,053	$128,158

2007 Medium Earthquake Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	1,274	10,401,289	100.00%	$979,206,745	$1,949,246,210	$373,547,275
Alaska Gateway REAA Totals	14	20,133	0.19%	$583,121	$3,503,660	$0
Aleutian Region REAA Totals	3	6,160	0.06%	$583,000	$752,000	$0
Aleutians East Borough Totals	31	64,059	0.62%	$4,970,752	$13,084,799	$0
Bering Strait REAA Totals	36	130,716	1.26%	$7,746,497	$31,650,690	$646,886
Bristol Bay Borough Totals	4	13,400	0.13%	$1,813,272	$3,642,700	$4,449,166
Chatham REAA Total	4	2,988	0.03%	$189,000	$483,841	$387,495
Chugach REAA Totals	32	42,096	0.40%	$3,233,763	$4,805,872	$0
City & Borough of Juneau Totals	6	68,547	0.66%	$10,938,675	$12,389,724	$0
City & Borough of Sitka Totals	60	637,071	6.12%	$55,067,346	$72,534,108	$2,042,760
Copper River REAA Totals	66	80,869	0.78%	$5,258,261	$10,518,676	$23,410,949
Delta/Greely REAA Totals	43	46,486	0.45%	$3,403,523	$6,458,111	$471,939
Denali Borough Totals	4	12,443	0.12%	$1,135,500	$2,445,800	$202,800
Fairbanks North Star Borough Totals	142	1,284,971	12.35%	$116,454,027	$256,464,256	$150,720
Haines Borough Totals	37	73,438	0.71%	$3,686,693	$9,505,267	$48,021,198
Iditarod Area REAA Totals	4	2,692	0.03%	$144,696	$436,521	$7,991,070
Kenai Peninsula Borough Totals	141	627,727	6.04%	$48,427,184	$99,463,047	$0
Ketchikan Gateway Borough Totals	4	7,413	0.07%	$790,200	$791,220	$14,987,042
Kodiak Island Borough Totals	11	56,680	0.54%	$7,895,850	$9,000,300	$0
Kuspuk REAA Totals	1	96	0.00%	$20,000	$20,000	$1,049,340
Lake & Peninsula Borough Totals	17	22,491	0.22%	$2,884,592	$7,100,521	$437,063
Lower Kuskokwim REAA Totals	2	25,320	0.24%	$9,397,907	$12,582,159	$2,631,028
Matanuska-Susitna Borough Totals	228	792,896	7.62%	$53,646,987	$148,912,542	$22,218,975
Municipality of Anchorage Totals	311	6,283,679	60.41%	$626,805,649	$1,224,428,130	$243,698,845
North Slope Borough Totals	6	4,210	0.04%	$506,152	$436,352	$0
Northwest Arctic Borough Totals	14	13,224	0.13%	$900,000	$900,007	$0
Southwest Region REAA Totals	5	5,480	0.05%	$1,964,000	$2,175,000	$0
Yukon Flats REAA Totals	18	19,368	0.19%	$1,460,316	$3,251,570	$0
Yukon-Koyukuk REAA Totals	30	56,736	0.55%	$9,299,782	$11,509,337	$750,000

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	153346	1,944	104
Alaska HAZUS Building Costs	$1,890,972	$3,782,098	$487,006
Alaska HAZUS Building Content Costs	$12,729,408	$3,965,513	$629,720

	Population	Households	Average Value
Alaska HAZUS Demographics Data	479,117	172,454	$124,569

2007 Low Earthquake Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk -Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	697	3,467,312	100.00%	$282,450,085	$428,186,518	$114,207,420
Alaska Gateway REAA Totals	36	74,050	2.14%	$2,058,924	$12,057,525	$1,063,652
Aleutians East Borough Totals	2	320	0.01%	$5,600	$25,780	$0
Annette Island REAA Totals	1	636	0.02%	$22,120	$137,400	$0
Bering Straits REAA Totals	68	205,238	5.92%	$41,618,139	$13,493,607	$1,025,000
Bristol Bay Borough Totals	21	35,324	1.02%	$1,733,624	$4,420,700	$0
Chugach REAA Totals	2	3,696	0.11%	$412,000	$470,000	$0
City & Borough of Juneau Totals	104	1,876,465	54.12%	$120,377,572	$220,495,045	$97,143,816
Iditarod Area REAA Totals	24	33,860	0.98%	$5,116,252	$7,657,001	$361,800
Kashunamiut REAA Totals	3	3,840	0.11%	$1,135,000	$1,235,001	$0
Ketchikan Gateway Borough Totals	45	418,091	12.06%	$31,889,528	$45,546,261	$7,504,151
Kodiak Island Borough Totals	2	15,000	0.43%	$541,400	$2,893,563	$386,034
Kuspuk REAA Totals	19	37,534	1.08%	$5,052,234	$7,398,101	$250,687
Lake & Peninsula Borough Totals	17	15,402	0.44%	$2,013,191	$3,721,222	$0
Lower Kuskokwim REAA Totals	81	190,131	5.48%	$15,380,499	$25,929,966	$1,760,407
Lower Yukon REAA Totals	38	65,823	1.90%	$4,945,451	$9,560,102	$372,600
Matanuska Susitna Borough Totals	11	20,602	0.59%	$2,337,502	$3,456,286	$0
North Slope Borough Totals	38	89,024	2.57%	$10,079,348	$15,870,232	$1,354,500
Northwest Arctic Borough Totals	36	120,873	3.49%	$13,343,602	$15,978,526	$1,752,318
Pribilof Islands REAA Totals	6	15,890	0.46%	$3,443,000	$5,191,139	$390,000
Southeast Island REAA Totals	35	94,533	2.73%	$7,710,807	$9,515,305	$0
Southwest Region REAA Totals	54	75,716	2.18%	$6,953,169	$11,721,793	$523,298
Yukon Flats REAA Totals	11	17,004	0.49%	$958,762	$2,414,434	$0
Yukon-Koyukuk REAA Totals	36	50,652	1.46%	$4,604,156	$7,885,325	$319,157
Yupiit REAA Totals	7	7,608	0.22%	$718,205	$1,112,204	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	40386	382	30
Alaska HAZUS Building Costs	$6,203,415	$835,848	$129,372
Alaska HAZUS Building Content Costs	$3,101,503	$891,009	$168,356
	Population	**Households**	**Average Value**
Alaska HAZUS Demographics Data	121,988	40,093	$98,276

Existing Programs and Strategies

Outreach

- The "Quake Cottage" is an earthquake simulator operated by DHS&EM for earthquake and tsunami outreach activities. It is taken to schools, businesses, and special events to create an educational opportunity for behavioral change toward earthquake mitigation. Participants learn how to non-structurally mitigate their homes, offices, or work areas and for general disaster preparedness awareness.
- The Earthquake Resistant Model Home was developed by FEMA and the State of Washington. FEMA provided a duplicate to Alaska to display structural mitigation hardware and bracing options for either retrofit applications or for incorporating into new construction. DHS&EM takes this model on the road with the Quake Cottage to safety fairs, home shows, and other educational outreach functions to demonstrate earthquake mitigation options.

Science and Planning Initiatives

- The Alaska Earthquake Information Center (AEIC) is a project between the USGS and the University of Alaska Fairbanks Geophysical Institute (UAF/GI) to collect and analyze seismic data as well as disseminate information about earthquakes in Alaska.
- Inclusion of earthquake-hazard mitigation language in many local coastal district plans and enforceable policies.
- Identification, mapping, and evaluation of geologic hazards by DNR/DGGS.
- Cooperative program between UAF/GI and DNR/DGGS to develop seismic site-response and soil class maps for Anchorage, funded by the Alaska Science and Technology Foundation.
- Adoption of seismic provisions of the International Building Code by some municipalities (Anchorage and possibly Fairbanks)
- Developing earthquake-hazard related zoning ordinances by the Municipality of Anchorage.
- Activities of the Anchorage Geo-technical Advisory Commission to review municipal seismic policies and advise the mayor and municipal assembly on earthquake-related issues.
- Policies and standards implemented by DOT&PF for earthquake-resistant design and construction of State roads and facilities.
- The Alaska Coastal Management Program (at 11 AAC 112.210) allows State agencies and coastal districts to designate natural hazards that present a threat to life or property in the coastal area. Development in a natural hazard area may not be found consistent with the ACMP regulations unless the applicant has taken appropriate measures in the siting, design, construction and operation of the proposed activity to protect public safety, services, and the environment from potential damage caused by known natural hazards.

Hazard Mitigation Successes

Relocation of Valdez, AK

After the 1964 earthquake, the City of Valdez was relocated a few miles west of its original site. The new town site was located on stable alluvial fan deposits and bedrock. These soils withstand earthquake ground shaking better than the saturated silty sands at the former site. The new location had the added benefit of helping protect it from tsunami inundation. This was the first time in U.S. history that a community had been completely rebuilt in a new location after an earthquake.

Reconstruction of Seward, AK

The 1964 earthquake also heavily impacted the City of Seward. The waterfront failed as a result of ground motion destroying the city dock and the Alaska Railroad yard and buildings, afterward, the rail facilities were not reconstructed and the city dock was relocated. In addition, the high-risk areas near the waterfront were converted to park space and camping facilities.

Success of the Trans-Alaska Pipeline System during the 2002 Denali Fault earthquake

The 2002 Denali fault earthquake did little damage to the Trans-Alaska Pipeline System and resulted in no spillage of oil. This is a direct result of careful geologic and engineering work prior to constructing the pipeline. The pipeline was designed and constructed to accommodate up to 20 feet of surface offset on the fault using a sliding support system in the fault zone. No oil was spilled and operation of the pipeline resumed within a few days after the earthquake.

The Next Big Earthquake"

Several federal and state agencies produced "The Next Big Earthquake" an earthquake hazard education document for Alaska residents in the mid-1990s following a highly successful model from the San Francisco area after the 1989 Loma Prieta earthquake. The document was updated and redistributed in 2004 for the 40Th anniversary of the 1694 earthquake. The publication, entitled "Are you prepared for the next big earthquake in Alaska?" is a 25-page photo-illustrated primer on earthquake hazards and risks in Alaska. Working with funding and in-kind support from USGS, DNR/DGGS, DHS&EM, and the Anchorage Daily News, thousands of these inserts were distributed free-of-charge in the newspapers and as stand-alone outreach products for years thereafter. This pamphlet serves as an accessible, timeless, and informative resource for the public and hazard education professionals alike.

Anchorage

The Municipality of Anchorage adopted building code amendments in 1986 and 1992. The land-use guidelines correlate the level of geotechnical investigation with ground failure susceptibility zones.

Anchorage also established Earthquake Park to serve as open space in perpetuity. This prevents development in an area that had a significant number of landslides during the 1964 earthquake. Monuments and interpretive signs educating people about the earthquake were installed within the park.

Monument in Earthquake Park.

Unfortunately, examples of unsuccessful mitigation efforts can also be found. After the 1964 earthquake, Anchorage provided incentives for people to move to a less hazardous area. However, the local government failed to take title of some of the hazard prone land being vacated. Subsequently, redevelopment in the earthquake hazard area is reoccurring. The new construction there must meet the highest seismic building code standards in Anchorage (in accordance with local amendments to the Building Code).

Goals

High Priority

1. Maintain the newly established Alaska Seismic Hazards Safety Commission as an autonomous entity reporting to the Governor and Legislature.

Mitigation Measures: Educational; Preventative

1.1. Objective: The commission advises the Governor and legislature on seismic hazard mitigation policy development.

1.1.1. Action: Continue the Subject Matter Expert (SME) advice to the State.

Lead: DNR/DGGS
Support: UAF, DNR, DMVA, Federal Agencies, Insurance industry, three public members from fields of geology, seismology, hydrology, geotechnical engineering, structural engineering, emergency services, or planning.
Timeline: ongoing **(Completed 2005-Nine members were appointed with two additional local-government positions in 2006 and the Commission is extended to 2012).**

Medium Priority

2. Develop incentives and programs to seismically update/retrofit structures and critical facilities.

Mitigation Measures: Educational; Preventative

2.1. Objective: Create seismic retrofit legislation to provide minimum standards for structural seismic resistance to reduce the risk of life loss or injury and damage to existing structures. This initiative will greatly reduce damage for most natural disaster events. Building codes assure people build safely and taking natural hazards into consideration. Some agencies are working towards this. As an example, DOT&PF is undertaking a seismic retrofit program for State owned bridges.

2.1.1. Action: Develop legislation to require communities to adopt the current International Building Codes as a condition to receiving State and Federal grants.

Lead: Fire Marshals Office
Support: DOT&PF, Anchorage Geotechnical Commission, USGS, AEIC, DNR/DGGS
Timeline: 10 years

2.1.2. Action: Develop legislation to require communities perform commercial and private building inspections to ensure they meet International Building Code standards as a condition to receiving State and federal grants.

Lead: Fire Marshals Office
Support: DOT&PF, Anchorage Geotechnical Commission, USGS, AEIC, DNR/DGGS
Timeline: 10 years

3. Building code improvements.

Mitigation Measures: Educational; Preventative

3.1. Objective: Encourage all communities to adopt or update to the current IBC for single family, duplex, and tri-plex residential construction, and provide sufficient resources and incentives to ensure compliance. Establishing minimum seismic standards for new construction will reduce structural damage in communities and make recovery efforts easier and less costly.

3.1.1. Action: Encourage all new construction to follow IBC.

Lead: Fire Marshal's Office
Support: DHS&EM, AEIC, Anchorage Geotechnical Commission
Timeline: on-going

3.2. Objective: Promote incorporating new methods to improve building performance. New materials and construction techniques might be more effective or feasible than what is currently available.

3.2.1. Action: Host workshops for builders to show new techniques

Lead: Fire Marshall's Office
Support: DCCED, Anchorage Geotechnical Commission, Insurance Industry, USGS, AEIC, DNR/DGGS
Timeline: 10 years

3.3. Objective: Develop incentives and programs to incorporate mitigation into new construction. Incentives can include property tax and insurance premium reduction, transferable development rights, density bonuses, or waiver of impact fees.

3.3.1. Action: Bring new programs into public knowledge.

Lead: Legislature, Local communities
Support: DHS&EM, Governor's Office, DCCED
Timeline: 10 years

4. Encourage school mitigation efforts.

Mitigation Measures: Educational; Preventative

4.1. Objective: This measure will ensure a safe environment for school children and retain a school's functionality as an emergency shelter. It can take seven days or longer for outside assistance to arrive. The SB125 initiative requires all schools to have an all-hazard plan. Mitigation is a vital element of the planning process.

4.1.1. Action: Encourage non-structural mitigation and preparedness activities.

Lead: DHS&EM
Support: DHS&EM, ARC, AEIC, DEED, AST, local communities and community groups
Timeline: on-going

4.1.2. Action: Encourage preparedness activities at the household level because it can take up to seven days for assistance to reach a community.

Lead: DHS&EM
Support: ARC, AEIC, USGS, Media representatives, local jurisdictions
Timeline: on-going

Earthquakes

5. Improve earthquake detection.

Mitigation Measures: Educational; Preventative

5.1. Objective: To have the ability to identify damaged area's quickly. This includes identifying material sources, workforce, and equipment availability.

5.1.1. Action: Place earthquake / seismic sensor instruments at critical highway transportation choke points.

Lead: DOT&PF, Advanced National Seismic Safety Committee
Support: UAF/State Seismologist, USGS, DNR/DGGS,
Timeline: 10 years

5.1.2. Action: Develop contingency plans to reestablish transportation after roads or bridges have been damaged.

Lead: DOT&PF,
Support: USGS, DNR/DGGS,
Timeline: 10 years

Low Priority

6. Conduct state-wide earthquake drills.

Mitigation Measures: Educational; Preventative

6.1. Objective: Encourage statewide earthquake drills to educate people on what to do when earthquakes occur and reinforce interagency and individual expectations.

6.1.1. Action: Work with Department of Education and Early Development to ensure methods are up-to-date and consistently applied statewide.

Lead: DHS&EM
Support: DEED, ARC, Department of the Interior,
Timeline: 5 years

7. Encourage the development of earthquake structural performance standards and incorporate earthquake overlay zones in community zoning ordinances.

Mitigation Measures: Educational; Preventative

7.1. Objective: Encourage developing siting requirements based on soil type, slope, and other considerations

7.1.1. Action: Develop soil type, slope angle, and other geo-technical Geographic Information System Database and map layers with meta-data

Lead: DNR/DGGS
Support: UAF/GI, Anchorage Geotechnical Commission, USGS
Timeline: on-going

8. Mapping

Mitigation Measures: Educational; Preventative

8.1. Objective: Promote developing large-scale urban area earthquake-hazard maps.

8.1.1. Action: Seismic hazard area maps need to be created or updated. Many areas lack seismic hazard maps or have experienced significant growth making the existing maps obsolete. The maps should depict site amplification, liquefaction susceptibility, and ground failure at a minimum scale of 1 inch = 1 mile.

Lead: DNR/DGGS
Support: DHS&EM, AEIC, USGS, FEMA
Timeline: on-going

9. Establish a Board of Registration for geologists.

Mitigation Measures: Educational; Preventative

9.1. Objective: This board would track the registration of professionals performing geotechnical evaluations and recommendations. The board will adopt standards delineating required experience and education for geologists who prepare reports required by State or local laws for siting and designing facilities.

9.1.1. Action: Research if other states have a similar board and the detailed duties.

Lead: DNR/DGGS
Support: Governor's Office, legislature
Timeline: to be determined

Summary of local capabilities, goals and actions

Anchorage

Capabilities: include planning, zoning and education. Seismically retrofit City owned facilities exist.

Goals: continued planning and education. Seismically retrofit additional City owned facilities, seek additional funding sources.

Juneau

Capabilities: include planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: include planning and education.

Goals: continued planning and education. Promote the adopting building codes that include earthquake resistant measures. Seismically retrofit all borough owned facilities.

Kenai Peninsula Borough

Capabilities: include planning and education. Several seismically designed buildings exist currently.

Goals: continued planning and education. Promote the adopting building codes that include earthquake resistant measures. Seismically retrofit all borough owned facilities. Complete HAZUS modeling for the borough.

For more specified information about these areas, please refer to appendix 20.

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5.7 TSUNAMIS & SEICHES

Hazard Analysis/Characterization

Tsunamis are traveling gravity waves in water, generated by a sudden vertical displacement of the water surface. They are typically generated by an uplift or drop in the ocean floor, seismic activity, volcanic activity, meteor impact, or landslides (above or under sea in origin).

Most tsunamis are small and are only detected by instruments. Tsunami damage is a direct result of three factors: inundation (extent the water goes over the land), wave impact on structures, and coastal erosion.

Types of Tsunamis

Tele-tsunami

Tele-tsunami is the term for a tsunami observed at places 1,000 kilometers from their source. In many cases, tele-tsunamis can allow for sufficient warning time and evacuation. There is a slight risk in the western Aleutians and some parts of Southeast Alaska.

Most tele-tsunamis that reached Alaska have not caused damage. In fact, Massacre Bay on Attu Island has historically received tele-tsunamis with less than one foot recorded amplitudes.

Only one tele-tsunami has caused damage in Alaska; the 1960 Chilean tsunami. Damage occurred to pilings at MacLeod Harbor, Montague Island and on Cape Pole, Kosciusko Island where a log boom broke free.

Magnitude	***Height (ft)***
-2 to –1	<1.0 to 2.5
-1 to 0	2.5 to 4.9
0 to 1	4.9 to 9.9
1 to 2	9.9 to 19.7
2 to 3	19.7 to 34.2
3 to 4	34.2 to 79.0
4 to 5	79 to >105.0

Volcanic tsunamis

In 1883, a debris flow from the Saint Augustine volcano triggered a tsunami that inundated Port Graham with waves 30 feet high. Other volcanic events may have caused tsunamis but there is not enough evidence to report that conclusively. Many volcanoes have the potential to generate tsunamis.

Seismically-generated local tsunamis

Most seismically-generated local tsunamis occurred along the Aleutian Arc. Other locations include the back arc area in the Bering Sea and the eastern boundary of the Aleutian Arc plate. They generally reach land within 20 to 45 minutes.

Landslide-generated tsunamis

Submarine and subaerial landslides can generate large tsunamis. Subaerial landslides have more kinetic energy associated with them so they trigger larger tsunamis. An earthquake usually, but not always, triggers this type of landslide and they are usually confined to the originating bay or lake location. One earthquake can trigger multiple landslides and landslide-generated tsunamis. Low tide is a factor for submarine landslides because low tide leaves part of the water-saturated sediments exposed without the water's support. An area's instability is generally caused by "loading" from added weight such as trains, large structures, or added fill material used to reclaim land for future development.

These events usually occur in the heavily glaciated areas of Prince William Sound and

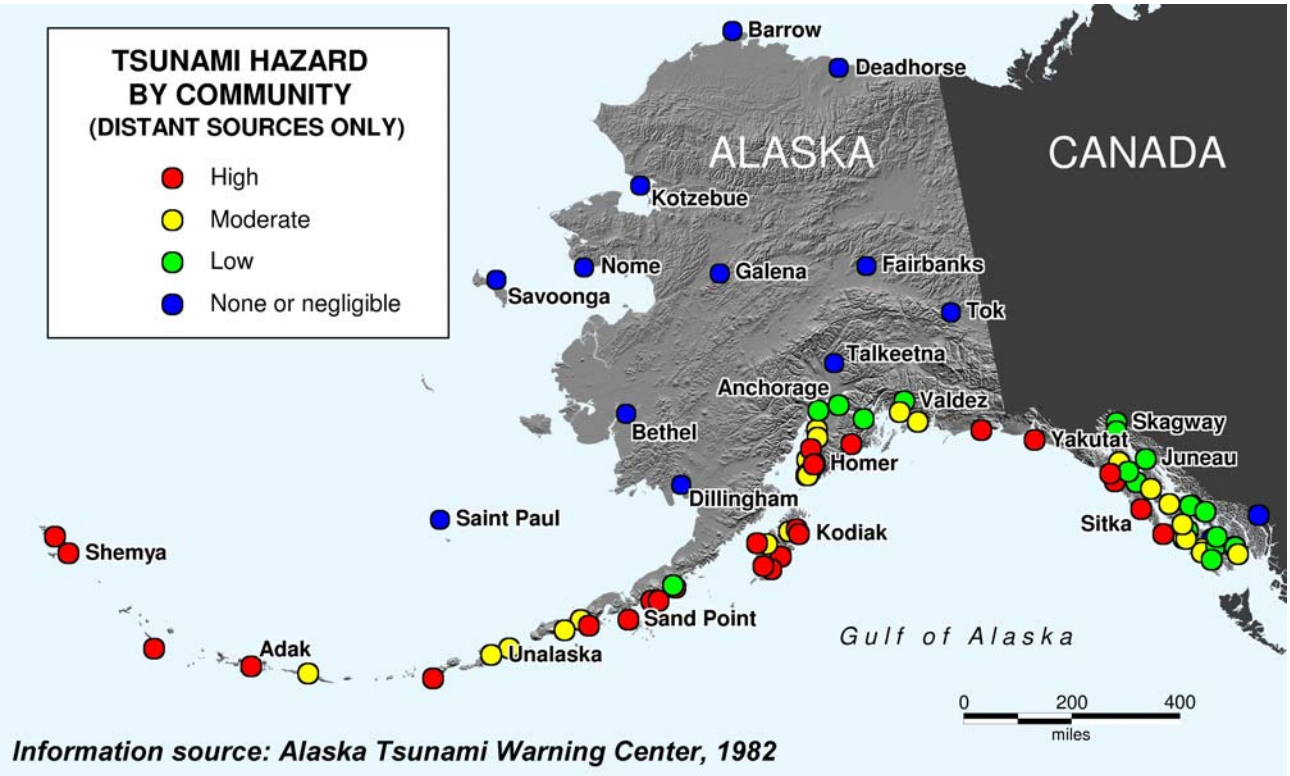
parts of Southeast Alaska.

Landslide generated tsunamis are responsible for most of the tsunami deaths in Alaska because they allow virtually no warning time.

Tsunamis generated by landslides in lakes occur more in Alaska than any other part of the U.S. They are associated with delta collapse in very deep glacial lakes and locations where delta deposits from rapidly flowing streams and rivers dump unconsolidated glacial debris.

A seiche is a wave that oscillates in partially or totally enclosed bodies of water. They are caused by earthquakes, underwater landslides, atmospheric disturbances or avalanches and can last from a few minutes to a few hours. The first wave can occur within a few minutes, giving virtually no time for warning. The resulting effect is similar to bathtub water sloshing repeatedly from side to side. The reverberating water continually causes damage until the activity subsides. The factors for effective warning are similar to a local tsunami.

The portion of Alaska bordering the North Pacific Ocean can be hit by tsunamis generated by above and underwater landslides, crustal plate movement, or volcanic activity. The Aleutian Islands could receive a tsunami generated by remote source earthquakes while areas of the Gulf of Alaska could experience a tsunami from several possible sources. The Alaska coastline facing the Bering Sea has a very low tsunami threat. However, evidence exists of a volcanically induced tsunami in Bristol Bay about 3,500 years ago.



Historical Tsunamis

1964 Earthquake Tsunami

The 1964 earthquake triggered several tsunamis, one major tectonic tsunami and about 20 local submarine and subaerial landslide tsunamis. The tectonic tsunami hit between 20 and 45 minutes after the earthquake, depending on location. The locally generated tsunamis struck between two and five minutes after being created and caused most of the deaths and damage. Tsunamis caused more than 90% of the deaths – 106 Alaskans and 16 Californian and Oregonian residents were killed.

Tsunami damage in Kodiak

Alaska's damages were most extensive in Kodiak Island, Seward, Whittier, and Valdez with significant tsunami damage throughout areas adjacent to the Gulf of Alaska.

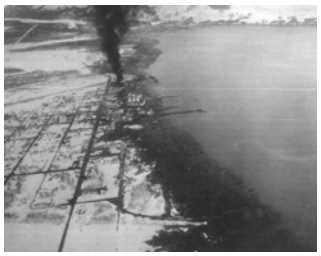
The Kodiak area experienced ten observed tsunami waves. The main electrical power unit was knocked out and the water pipe system was destroyed. In addition, the dock pier, generators, roads, houses, runways, warehouses, and other facilities were damaged or totally destroyed. In total, the damages amounted to $31.3 million, 80% of the city's industrial base was destroyed, and 600 people became homeless out of a population of 2,658. Very few fatalities occurred; only six people were reported missing and presumed dead because most sought waited to seek high ground after the earthquake.

Seward's local tsunami destroyed most of the facilities near the waterfront, including a fuel tank farm which started the first of many fires. The earthquake's shaking caused the Seward Waterfront to collapse, generating a 30-foot local tsunami. Smaller tsunami waves then spread floating burning oil and started another fire at the Texaco Petroleum tank farm further inland.

Seward rail yard

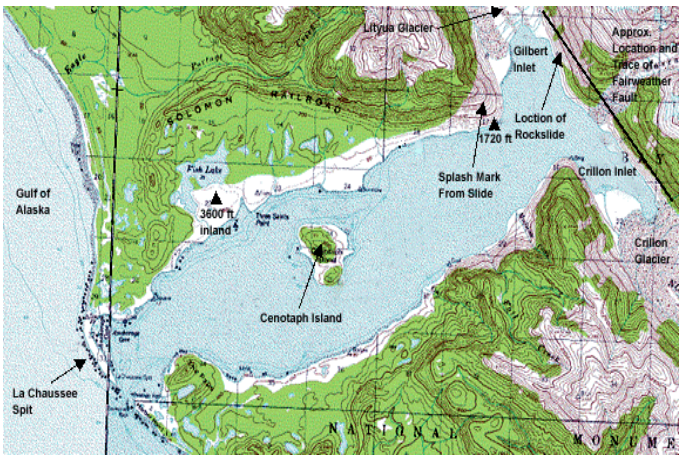
The combined slump and tsunami waves caused the dock to collapse and a number of boats (30 fishing boats and 40 pleasure craft) to sink within the small boat harbor. The railroad yards received heavy damage, as well as freight cars located in the marshalling yards. A 120-ton locomotive was moved 100 feet and a 75-ton locomotive was carried 300 feet.

About 25 minutes after the earthquake, the tectonically generated tsunami arrived. This wave spread a wall of flaming oil into Seward, destroying and setting fire to a large section of the town. Overall, Seward lost about 95% of its industrial base and 15% of the town's residential properties was totally destroyed or very heavily damaged; 12 fatalities, 200 injuries resulted in damages approximating $14 million from both local and distant tsunamis waves.


Tsunami caused fire in Valdez.

A series of at least eight tsunami waves struck Whittier destroying two saw mills; the Union Oil Company tank farm, wharf and buildings; the Alaska Railroad depot; the railroad ramp handling

towers at the army pier, and several houses, as well damaging the small boat harbor. The tsunamis were responsible for 13 deaths and approximately $10 million in damages.



Part of the Valdez waterfront slumped into the bay triggering, a locally generated tsunami. There was massive damage to the waterfront, storage, warehousing, and railroad facilities. Half of the downtown business district was totally destroyed. The resulting fires burned at the waterfront for two weeks. Almost the entire town's fishing fleet (68 out of 70 boats) was destroyed. Luckily, they were empty when the tsunami struck. The dock area was not as fortunate; prior to the tsunami, 28 people had gathered to watch a freighter unload. All were swept away. Shifting cargo in the freighter's hold caused additional fatalities.

Waves in Shoup Bay reached over 220 feet high. These were the highest recorded waves associated with the event.

1958 Lituya Bay Tsunami

A large earthquake started a giant landslide in July 1958 that ran into the head of Lituya Bay (Glacier Bay National Park) generating a tsunami. The wave washed up the adjacent mountainside to a height of more than 1,720 feet. Two fishing vessels anchored in the bay were rolled and sank, killing two people. A third boat was washed over the La Chaussee Spit. Lituya Bay is a tsunami prone area as three other fatal landslide generated tsunamis have occurred here. The earthquake actually triggered at least eight separate local tsunamis; Yakutat Bay's tsunami caused three fatalities.

Scotch Cap lighthouse before the tsunami
Image courtesy USCG

1946 Unimak Island Tsunami

A magnitude 7.3 earthquake occurred near Unimak Island on April 1, 1946. The resulting tsunami had approximately 100 feet high run-up and was strong enough to totally destroy the Scotch Cap lighthouse. This was a reinforced concrete structure. All five people in the lighthouse died and debris washed into the sea. The tsunami caused about $250,000 in damages in Alaska but the effects were widespread. Relatively minor damage was reported in Washington and Oregon as well as French Polynesia and Chile, while California was more affected, with $10,000 in damages and one death. Hawaii was heavily impacted with $26 million in damages and 159 fatalities. This event renewed interest in tsunami research.

The site of the Scotch Cap lighthouse after the tsunami
Image courtesy the USCG

1994 Skagway Tsunami

The 1994 Skagway tsunami was a landslide-generated tsunami and was responsible for one fatality and over $25 million in damages. The triggering mechanism for the landslide is not definitively known, although extreme low tide was a key factor. Some scientists believe that 23,350 tons of construction equipment and fill material located on the railroad dock may have overloaded the sediments on which the dock was built, causing it to fail during the evening's low tide. Others believe that the landslide was initiated by slope failures at the top of the slide and the construction equipment and fill were not factors in triggering the failure.

Hazard Vulnerability Analysis

HVA will be completed when data becomes available.

Existing Programs and Strategies

NOAA Tsunami Warning System

NOAA provides tsunami warning guidance to the United States and many other countries. Two warning centers comprise the national tsunami warning system: The West Coast and Alaska Tsunami Warning Center (WCATWC) in Palmer, Alaska and the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii.

The WCATWC was established in Palmer, Alaska in 1967 as a direct result of the Prince William Sound Good Friday Earthquake that occurred on March 27, 1964. This earthquake alerted State and Federal officials to the need for a facility to provide timely and effective tsunami warnings and information for the coastal areas of Alaska.

The center's operational scope has increased over the years to provide tsunami warnings to Canadian provinces and all U.S. coastal states, except Hawaii, for tsunamis generated anywhere in the world which could impact these locations.

West Coast Alaska Tsunami Warning Center, Palmer Alaska

Image Courtesy WCATWC

Tsunami warnings are initially based on seismic data with supplemental messages refined based on sea level observations, historical data, and forecast models. Regional warnings are issued within 10 minutes of earthquake origin time for any coastal earthquake in the WCATWC's area-of-responsibility (AOR) over magnitude 7. Warnings outside the WCATWC's AOR are issued after coordination with the PTWC.

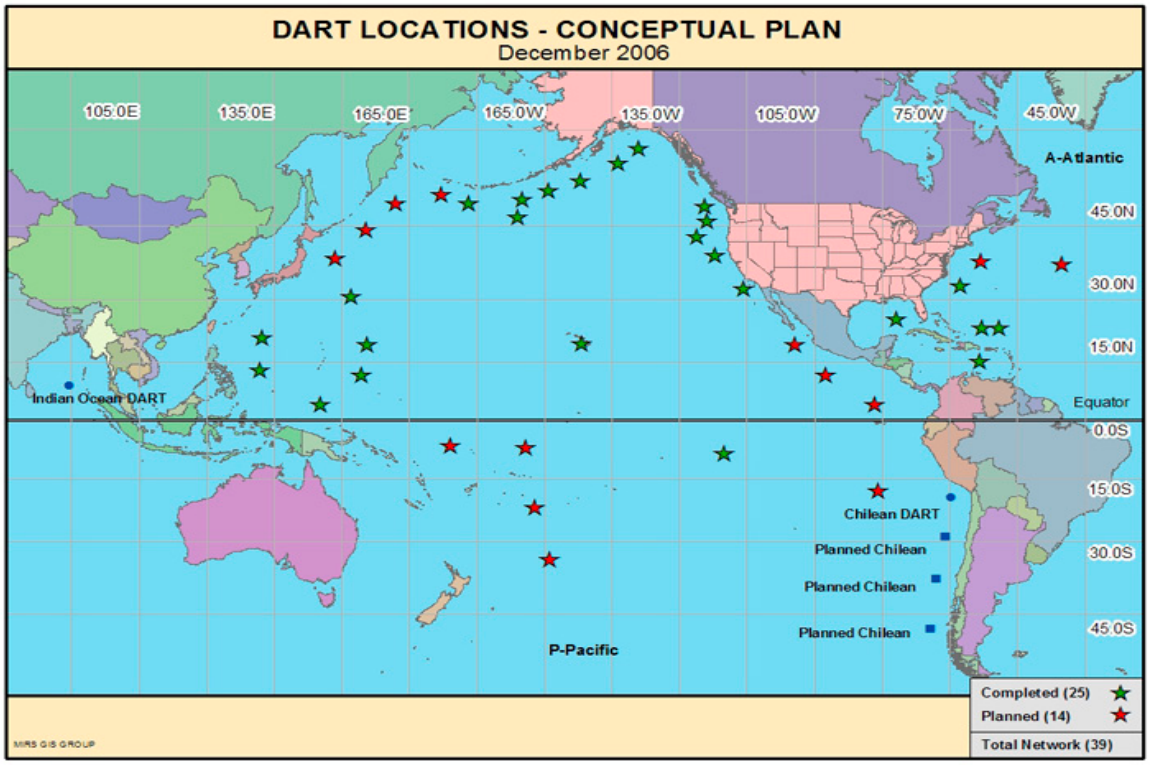


Image courtesy of NOAA

The WCAT/WC also issues information messages for earthquakes that may be felt strongly by local citizens but are not large enough to generate a tsunami in addition to tsunami warning messages. Informational messages are important in preventing needless evacuations since citizens near coastal areas are taught to move to higher ground when severe earthquake shaking occurs.

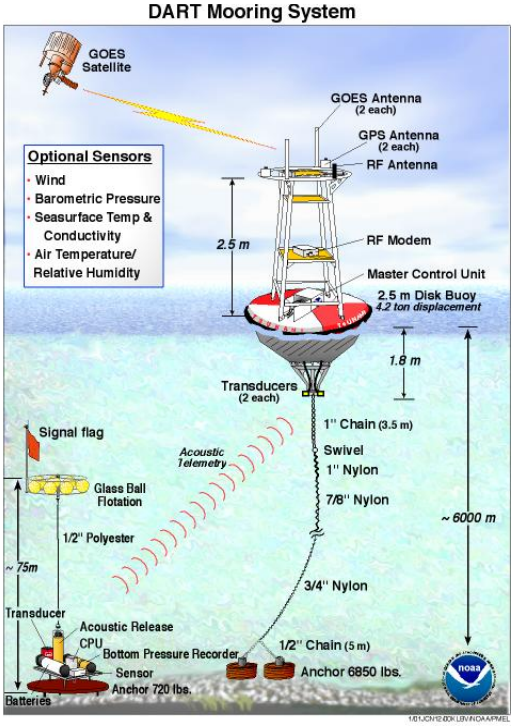


Image courtesy of NOAA.

The Deep-ocean Assessment and Reporting of Tsunamis (DART) project is a component of the NOAA Tsunami Warning System. Dart was originally funded by the U.S. National Tsunami Hazard Mitigation Program (NTHMP). The NTHMP is a comprehensive, joint Federal/State effort to preserve life while reducing property damage along U.S. coastlines from tsunami inundation events. The original cooperating U.S. agencies include NOAA, FEMA, USGS, and the five Pacific States' Emergency Management agencies of: Alaska, California, Hawaii, Oregon and Washington. The Eastern and Gulf states were added to the program in 2005.and further expanded to include all coastal U.S. states and territories in 2006. This program funds warning guidance and tsunami inundation map development,

mitigation, and hazard assessment programs.

The DART buoys provide a method to record a tsunami soon after generation and before being distorted by near coast influences. They are located in regions with a history of generating destructive tsunamis. This ensures early tsunami detection and data acquisition which is critical to real-time forecasts. DARTs shown on the accompanying map represent an operational array scheduled for completion in 2008.

A DART system consists of a seafloor bottom pressure recording system (BPR) capable of detecting tsunamis as small as one centimeter, and a moored surface buoy for real-time communication. An acoustic link is used to transmit data from the BPR on the seafloor to the surface buoy. The data are then relayed via satellite cell phone technology link to ground stations, which transmit the data to NOAA's Tsunami Warning System.

TsunamiReady Communities

The TsunamiReady Community program promotes tsunami hazard preparedness as an active collaboration among Federal, State and local emergency management agencies, the public, and the NWS tsunami warning system. This collaboration supports better and more consistent tsunami awareness and mitigation efforts among communities at risk. The main goal is improved public safety during tsunami emergencies. Before a community can be declared TsunamiReady, it must meet established criteria. The criteria is being revised in a 2007 Tsunami conference and included in the next revision of the SHRMP.

Seward was the first community in Alaska to complete all requirements of the, NWS and DHS&EM Community TsunamiReady Program, Homer, Sitka, and Kodiak have also met the program requirements and have been designated TsunamiReady.

Tsunami Inundation Mapping Program

Alaska is developing tsunami inundation maps for communities along the Gulf of Alaska as part of the National Tsunami Hazard Mitigation Program. Detailed maps of historical tsunami inundation flooding (inundation) are essential determining evacuation routes and long-term planning for vulnerable coastal communities. In addition, these maps require maintenance and upgrade as better data becomes available and coastal changes occur. Inundation maps for Kodiak (Kodiak City, USCG station, and Women's Bay), Homer, and Seldovia are completed and available to the public through the DNR/DGGS website. The next communities in priority are Seward followed by Sitka, then Valdez.

Home of the WC&ATWC facility
Palmer AK

Tsunami Warning and Environmental Observatory for Alaska (TWEAK)

TWEAK is a recently established program to collect tsunami information and biological and oceanographic data. Its efforts are focused on the following areas:

- Tsunami Research
- Water Quality
- Ocean Productivity
- Weather Prediction

- Education/Outreach

Hazard Mitigation Successes

Installation of Tsunami Warning Signs

Tsunami warning signs were installed in Sitka, Sand Point, Seward and Homer. In addition, the Alaska Department of Parks and Recreation installed signs in Shoup Bay, a remote area frequented by hikers and kayakers and inundated by a 220-foot wave in 1964.

Example of Tsunami Warning sign

Goals

<u>High Priority</u>

1. Public Education

Mitigation Measures: Educational; Preventative

1.1. Objective: Encourage all tsunami threatened coastal communities to participate in the DHS&EM Tsunami Sign Program. The Tsunami Sign Program requires communities to complete a Tsunami Hazard Plan (or annex to existing Emergency Operations or Comprehensive Plans), identify Tsunami Evacuation Routes and agree to place tsunami awareness signs in their community.

1.1.1. Action: Contact communities and discuss available mitigation programs' partnerships, benefits, and opportunities.

Lead: DHS&EM
Support: NOAA, DOT&PF, local jurisdictions
Timeline: on-going

TsunamiReady

1.2. Objective: Encourage all coastal communities with a tsunami threat to participate in the NWS/WC&ATWC/DHS&EM TsunamiReady Program.

The TsunamiReady Program requires communities to complete redundant communication capability and outreach activities for a TsunamiReady Community Certification (see program description above).

1.2.1. Action: Contact communities and discuss the TsuanmiReady programs' partnerships, benefits, and opportunities.

Lead: WC&ATWC
Support: DHS&EM, NOAA, local jurisdictions
Timeline: on-going

Medium Priority

2. Develop Tsunami Inundation Maps for all threatened communities.

Mitigation Measures: Educational; Preventative

2.1 Objective: Expedite tsunami inundation map development for vulnerable coastal communities. Communities must rely on historical or estimated information for land-use and evacuation route planning because reliable inundation maps are not available. Scientifically prepared tsunami Inundation maps will provide more accurate information allowing for more accurate community decisions.

2.1.1. Action: Develop tsunami inundation map for tsunami-threatened communities statewide.

Lead: DHS&EM
Support: WC&ATWC, UAF/GI, DNR/DGGS, NOAA
Timeline: on-going
Three out of 78 threatened communities have completed Tsunami Inundation maps. This process is solely funded by the National Tsunami Hazard Mitigation Program. There is extremely limited quality digitized bathymetric data available to accomplish this task. No State funds are available for this program.

Low Priority

3. Encourage communities to incorporate tsunami risk areas in land-use planning and zoning.

Mitigation Measures: Educational; Preventative

Land-use planning and zoning can help limit tsunami damage by minimizing, reducing, or preventing inappropriate development types in tsunami risk areas. Developing coastal construction criteria would reduce vulnerability. This can be done in many ways including: encouraging building elevations, siting structures on the higher part of the lots, and using lower floors of high rise structures as non occupied spaces. Additionally, developing site planning regulations requiring streets and structures to be perpendicular to potential wave impact has a side benefit of creating a path of least resistance for the wave reducing debris impact. These measures are targeted to reduce non-coastal dependent development. Water based facilities like ferry terminals and shipping docks should be built to withstand tsunami wave forces.

3.1. Objective: Encourage using blocking structures such as walls, berms, etc. to restrict, reduce, or redirect wave activity safely. While avoiding tsunami risk areas is preferable, it is not always possible. Some areas have already been developed and some facilities are dependent on being on the coastline. Using these structures could allow threatened facilities to survive. However, diversion devisee must be planned carefully and designed so as not to create other undesired impacts such as sediment accumulation in harbors or adjacent coastline erosion.

3.1.1. Action: Discuss benefits of using blocking structures and coastal zone construction guide with applicably threatened community officials maximizing on outreach opportunities.

Lead: local governments
Support: DHS&EM, AEIC, USACE
Timeline: on-going

3.2. Objective: Encourage Federal flood insurance program participation to cover tsunami damage.

3.2.1. Action: Work with NFIP Manager in Alaska for results

Lead: DHS&EM
Support: DCCED, FEMA, local jurisdictions
Timeline: on-going

3.3. Objective: Encourage development and adoption of coastal building codes as neither the International nor the Uniform Building Codes address tsunamis or sea storm construction requirements. Using appropriate coastal zone building construction methods can help resist tsunami and storm surge damages. For example, using coastal zone specific engineered foundations can aid with resisting erosion and scour.

3.3.1. Action: Discuss benefits of using the NTHMP coastal zone construction guide with applicably threatened community officials maximizing on outreach opportunities.

Lead: DHS&EM
Support: DCCED, FEMA, AEIC, local governments, Governor's Office
Timeline: on-going

Summary of local capabilities, goals and actions

Anchorage

Capabilities: include planning, and education.

Goals: continued planning and education.

Juneau

Capabilities: include planning and education.

Goals: continued planning and education.

Mat-Su Borough

Unknown threats, currently not developed.

Seward and Homer

Capabilities: include TsunamiReady program, planning, zoning, and education.

Goals: continued planning, education, and exercises.

For more specified information about these areas please refer to appendix 20.

5.8 WEATHER

Weather is determined by four main features: the sun, the planet's atmosphere, moisture, and the structure of the planet. Certain combinations can produce severe weather events that could potentially create primary, secondary, and even tertiary disasters.

Weather events cause the majority of Alaska's disasters. Wind-driven waves from intense storms crossing the Bering Sea produce coastal flooding and can drive large chunks of sea ice inland destroying buildings near the shore. High winds, especially across Alaska's Arctic coast, can combine with loose snow to produce a blinding blizzard and wind chill temperatures to 75°F below zero. Extreme cold (-40°F to -60°F) and ice fog may last a week at a time. Heavy snow can impact the interior and is common along the southern coast. Heavy snow accumulation in the mountains builds glaciers, but can also cause avalanches or collapse building roofs throughout the State. A quick thaw means certain flooding.

Hazard Analysis/Characterization

Winter Storms

Winter storms originate as mid-latitude depressions or cyclonic weather systems. High winds, heavy snow, and cold temperatures usually accompany them. To develop, they require:

- Moisture - The air must contain moisture in order to form clouds and precipitation.
- Cold air - Subfreezing temperatures (below 32ºF, 0ºC) in the clouds and/or near the ground to make snow and/or ice.
- Lift - A mechanism to raise the moist air to form the clouds and cause precipitation. Lift may be provided by any or all of the following:
    - The flow of air up a mountainside.
    - Fronts, where warm air collides with cold air and rises over the dome of cold air.
    - Upper-level low pressure troughs.

Snow Terminology

Heavy Snow generally means:
- Snowfall accumulating to 4 inches or more in depth in 12 hours or less
- Snowfall accumulating to 6 inches or more in depth in 24 hours or less

Snow Squalls are periods of moderate to heavy snowfall, intense, but limited duration, accompanied by strong, gusty surface winds and possibly lightning.

A Snow Shower is a moderate snowfall lasting a short duration.

Snow Flurries are an intermittent light snowfall lasting a short duration with no measurable accumulation.

Blowing Snow is wind-driven snow that reduces surface visibility and can be falling snow or already accumulated but is picked up and blown by strong winds.

Drifting Snow is an uneven distribution of snowfall and snow depth caused by strong surface winds. Drifting snow may occur during or after a snowfall.

A Blizzard means that the following conditions are expected to prevail for 3 hours or longer:
- Sustained wind or frequent gusts to 35 miles/hour or greater
- Considerable falling and/or blowing snow reducing visibility to less than 1/4 mile
- Freezing Rain or Drizzle occurs when rain or drizzle freezes on surfaces such as the ground, trees, power lines, motor vehicles, streets, highways, etc.

A series of severe winter storms in December 1999 and January 2000 triggered avalanches and flooding in Southcentral Alaska and resulted in a Federal Disaster Declaration. The Municipality of Anchorage, the Kenai Peninsula Borough, the Matanuska-Susitna Borough, and the Valdez-Cordova census area received funding to supplement the governments' recovery needs to pay for debris removal, emergency services, and repair and replacement costs for damaged public facilities related to the storms.

Heavy Snow

Heavy snow, generally more than an accumulation of 12 inches in less than 24 hours, can immobilize a community by bringing transportation to a halt. Airports and major roadways are impacted, even closed completely, stopping the flow of supplies and disrupting emergency and medical services until the snow can be removed. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Heavy snow can also damage parked light aircraft and sink small boats. Heavy snow can lead to avalanches in the mountains. A quick thaw after a heavy snow can cause substantial flooding, especially along small streams and in urban areas. Snow removal, damage repairs, and business loss costs can have severe economic impacts on cities and towns.

Heavy snow in Kotzebue after a blizzard in April 2001
Image courtesy of the NWS, Kotzebue office

Heavy snow can cause vehicle accidents, injuries, and even deaths. Overexertion while shoveling snow and hypothermia from overexposure to cold weather often cause casualties winter injuries.

Heavy snow can impact interior Alaska, but it is most common along the southern coasts. Alaska's weather is greatly influenced by large high pressure areas that can persist for weeks at a time over Siberia, interior Alaska, and northwestern Canada. Storms crossing the North Pacific often move into the Gulf of Alaska dumping large amounts of precipitation over the southern coastal region while a well-developed mass of cold air dominates the interior. The most frequent heavy snowfalls occur along the north Gulf coast from Prince William Sound to the southeastern Panhandle. One to two feet snowfalls are common in coastal communities such as Valdez and Yakutat, and these same events can bring up to six feet of snow to the nearby mountains. For example, the mountain ranges near Glacier Bay and Thompson Pass are considered two of the snowiest place in the nation.

Snow at the Kotzebue NWS office
Image courtesy of the NWS, Kotzebue office

High winds, especially across the Arctic coast, can combine with loose snow to produce blinding blizzard conditions and dangerous wind chill temperatures.

Over 147 inches of snow fell in Yakutat over a 22-day period from January 23 – February 14, 1999. The snow weight caused roofs to collapse on four buildings and caused minor damage to a number of homes and vehicles. The snow depth increased so much over such a short time period that even highway snow plows were temporarily stuck. The large snow volume seriously tapped local government's resources while trying to keep the roadways and the airport open.

NWS housing in Yakutat after a heavy snowfall
Image courtesy of the NWS Yakutat office

Record heavy snow occurred in Anchorage on March 17, 2002 when two to three feet of snow fell in less than 24 hours over portions of the city. Ted Stevens International Airport recorded a storm total of 28.7 inches, and an observer measured over 33 inches near Lake Hood. The Municipality of Anchorage was essentially shut down during the storm, which fortunately occurred on a Sunday morning when a minimal number of businesses were open. Military bases, universities, and many businesses remained closed the following day; Anchorage schools remained closed for two days. It took four days for snow plows to reach all areas of the city.

It doesn't take several feet of snow to cause considerable risk to Anchorage area residents. More than 100 vehicle accidents occurred in the Anchorage-Eagle River area when 8 to 12 inches of snow fell on March 20, 2001.

Nearly a foot of snow fell over the City of Kodiak on March 23, 2001 followed by heavy rains and high winds causing approximately $25,000. The combination of snow, ice, and rain created treacherous driving conditions and contributed to a number of accidents. Nine transformers failed during the storm, power lines came down all over the island, and a tree smashed a house damaging the roof. A 93 mph wind gust was measured at the Zachor Bay Lodge near Larsen Bay at the height of the storm.

Extreme cold

Generally the risk of extreme cold is restricted to the interior region of Alaska, bounded by the Alaska Range to the south and the Brooks Range to the north. Excessively cold temperature definitions vary according to the normal climate of a region. Near freezing temperatures are considered "extreme cold." in areas unaccustomed to winter weather. Extreme cold usually involves temperatures below –40 degrees Fahrenheit in Alaska. “Excessive cold” may accompany winter storms, be left in their wake, or can occur without storm activity.

Frostbite: damage caused when body tissue freezes, associated with feeling loss and a white or pale appearance in the extremities.

Hypothermia: is low body temperature. Normal body temperature is 98.6ºF. Seek immediate medical help when body temperature drops to 95ºF. Hypothermia also can occur with prolonged exposure to temperatures above freezing.

Extreme cold can bring transportation to a halt across interior Alaska for days or sometimes weeks at a time. Aircraft may be grounded due to extreme cold and ice fog conditions; cutting off access as well as the flow of supplies northern villages. Long cold spells can cause rivers to freeze disrupting shipping and increasing the likelihood of ice jams and associated flooding.

Extreme cold also interferes with a community’s infrastructure. It causes fuel to congeal in storage tanks and supply lines, stopping electric generation. Water and sewer pipes freeze or rupture when water heaters do not work or when electricity fails. The ground’s frost depth can increase freezing buried pipes if extreme cold conditions are combined with low or no snow cover.

The greatest danger from extreme cold is its effect on people. Infants and elderly people are most susceptible to prolonged cold exposure as frostbite or hypothermia can become life-threatening. Carbon monoxide poisoning greatly increases during episodes of extreme cold as people gravitate to alternate heating sources with insufficient venting.

A fairly widespread extreme cold event occurred across the interior part of the state during January 1989. The city of Fairbanks came to a virtual halt for fourteen days when bitter cold and ice fog

gripped the area. Tanana recorded a low temperature of –76 °F, McGrath followed closely with –75°F, and the record for the highest barometric pressure reading ever recorded in North America occurred in the Village of Northway at 31.85 inches of mercury. Aircraft were grounded for more than 6 days during the event.

Ice Storms

The term ice storm is used to describe occasions when damaging ice accumulations are expected during freezing rain situations. They can be the most devastating winter weather phenomena and are often cause automobile accidents, power outages, and personal injury. Ice storms result when rain becomes super cooled and freezes upon impact with cold surfaces. Freezing rain most commonly occurs in a narrow band within a winter storm that is also producing heavy snow accumulation and sleet in other locations.

Freezing rain develops as falling snow encounters a deep layer of warm air in the atmosphere sufficient enough for the snow to completely melt and become rain. As the rain passes through a thin layer of cold air just above the earth's surface it cools to below freezing. The drops themselves do not freeze, but rather they become super cooled. The rain drops then instantly freeze when they strike the frozen ground, power lines, tree branches, etc.

The atmospheric conditions that can lead to ice storms occur most frequently in Southwestern Alaska along the Alaska Peninsula and around Cook Inlet. Brief but frequent freezing rain instances occur along the southern coast of Alaska, but these events generally produce very light precipitation with less than ¼ inch of ice accumulation.

Freezing drizzle occurred in the local Juneau area for nearly 52 hours from January 18 – 20, 2000. Roadways became extremely icy and a number of automobile accidents occurred due to the long duration of the event even though the precipitation was very light. The freezing drizzle also created hazardous aircraft icing conditions in the area from the surface to about 2,500 meters (8,000 feet) above ground level (AGL).

On January 24, 2000 an ice storm occurred in Naknek when a frontal system associated with a strong low pressure system in the Bering Sea stalled over western Alaska. Lines were down area wide as Naknek Electrical Association estimated 1 to 2 inches of ice accumulation on power line conductors. Gale force winds and wet snow periods also impacted the area before the storm abated.

Aufeis

Aufeis, sometimes called glaciation or icing, forms when emerging ground water freezes in successive sheets until the ice is quite thick and covers a large area. Most are a few hundred yards long but can cover several square miles. They are usually two or three feet thick but can reach 30 feet or more.

Aufeis usually forms in winter and melts in summer. The conditions that lead to aufeis development are:

- Presence of groundwater moving down slope, especially above the permafrost table.
- Cold air temperatures and thin snow cover during the early winter.
- A layer of seasonally frozen ground.
- Thick snow cover in the late winter.

There are two main types: seepage and stream. Seepage aufeis is ice sheets that form from any source of seepage water on the surfaces of slopes or flatlands and are not associated with a creek or river. For example, aufeis can occur when artesian wells flow out of control or where water seeps onto a roadway because the roadway was cut into the hillside.

Stream aufeis can form on floodplains or surfaces of low stream terraces by water confined to stream valleys. Development starts when a shallow part of the stream freezes to the streambed. Upstream water is then backed up and seeps through fissures to form thin sheets of ice over the existing ice.

Aufeis is a significant problem for railroads and highways as it causes traffic problems and increased maintenance costs. The Steese Highway frequently has aufeis problems in the winter months.

Aufeis can occur in many parts of the State with the Fairbanks area facing a significant threat. This area has a history of aufeis related problems. For example, in winter of 1975-76 where Plack Road crosses the Chena Slough experienced a significant but relatively localized event. The channel of the Chena Slough had filled with ice, forcing water out of the banks and extending the aufeis area. As a result, the ice inundated the lower level of a nearby home burying bikes, tables, etc. to about three feet deep.

High Winds

High winds (winds in excess of 60 mph) occur rather frequently over the coastal areas along the Bering Sea and the Gulf of Alaska because of coastal storms. High winds, especially across the Arctic coast, can also combine with loose snow to produce blinding blizzard conditions and dangerous wind chill temperatures.

They can reach hurricane force and have the potential to seriously damage port facilities, the fishing industry, and community infrastructure (especially above ground utility lines).

Down slope wind storms created by temperature and pressure differences across the terrain can produce winds in excess of 100 mph especially in mountainous areas like the Coast Mountains and the Alaska Range. These wind storms can be particularly damaging as they are very gusty and may seem to come from several directions.

Localized downdrafts, downbursts & microbursts, are also important in Alaska. Downbursts and microbursts can be generated by thunderstorms. Downburst winds are strong concentrated straight-line winds created by falling rain and sinking air that can reach speeds of 125 mph. The combination induces strong wind downdrafts due to aerodynamic drag forces or evaporation processes. Microburst winds are more concentrated than downbursts and can reach speeds up to 150 mph. They can cause significant damage as both can last 5–7 minutes. They pose a big threat to aircraft landings and departures because of wind shear and detection difficulties.

Strong winds occasionally occur over the interior due to strong pressure differences, especially where influenced by mountainous terrain, but the windiest places in Alaska are generally along the coastlines. The west coast along Bristol Bay and the Bering Sea, the Aleutian Islands, Kodiak Island, the Alaska Peninsula, the Gulf of Alaska coast, and the Southeast Panhandle all experience wind storms on a fairly regular basis. Coastal areas that are framed by mountains, such as at Sitka, Craig, Ketchikan, and Juneau are particularly susceptible to high winds due to the channeling affect of the terrain as storms move inland.

Dangerously high winds, ranging from 70-101 mph, occurred throughout much of Southeast Alaska overnight on December 9 – 10, 1998 as a deep low pressure system curved northward along the coast. The windstorm caused widespread power and telephone outages, downed dozens of trees, and damaged homes, buildings, and airplanes.

A series of very strong low pressure systems battered the Aleutians November 2-5, 2000. During the storm, wind gusts reached an incredible 143 mph at the Dutch Harbor Spit. Hurricane force winds were recorded during the event at the following locations: 81 mph at Shemya, 82 mph at Atka, 75 mph at St. George, 81 mph at Cold Bay, 75 mph at Port Heiden, and 117 mph at King Cove. The community of King Cove sustained considerable wind damage to roofs, fences, and windows, and a boat was flipped by the storm. Approximately $50,000 of damage resulted.

On November 3, 2001, a very powerful storm developed in the northeastern Gulf of Alaska bringing hurricane force winds to several locations in the southeast Panhandle. Peak winds recorded during the event included 85 mph at Craig, 83 mph at Cape Spencer, 74 mph at the Ketchikan Harbor, and 74 mph in downtown Juneau. In Yakutat a peak wind of 84 mph was recorded, which is the highest wind ever recorded there. The high winds resulted in approximately $100,000 in property damage in the community of Yakutat.

Lightning
Image courtesy of NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory (NSSL)

Thunderstorms & Lightning

Thunderstorms are caused by the turbulence and atmospheric imbalance that arise from combining:

- Unstable rising warm air.
- Lift.
- Adequate moisture to form clouds and rain.

They are composed of lightning and rainfall and can intensify into a severe thunderstorm with damaging hail, high winds, and flash flooding. A thunderstorm is considered severe if winds reach or exceed 58 mph, produces a tornado, or drops surface hail at least 0.75 inches in diameter.

Thunderstorms affect relatively small areas. The average thunderstorm is about 15 miles in diameter and lasts less than 30 minutes in any given location.

Lightning exists in all thunderstorms. It is caused by built-up charged ions within the thundercloud. Electricity is released which can be harmful to humans and can start fires when lightning connects with a grounded object.

Stages of Development

Developing - A towering cumulus cloud develops as air rises. The cloud extends to about 20,000 feet above the level of freezing temperatures. Usually there is little if any rain, but occasionally lightning occurs during this stage, which lasts about 10 minutes.

Mature - During this stage, the storm builds to heights of 40,000 feet or more. This is the most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes. The mature stage lasts an average of 10 to 20 minutes, but may last much longer.

Dissipating - Downdrafts begin to choke off the supply of air that feeds the storm; the storm stops building, loses height, and dissipates. Rainfall decreases in intensity, but some thunderstorms produce a burst of strong winds in this stage, and lightning remains a danger.

The thunderstorms that occur in Alaska are usually the single-cell or “pulse” variety. They usually develop from a combination of atmospheric instability and moisture; triggered by surface heating from the sun. These storms generally last only 20-30 minutes and do not usually produce

severe weather. A pulse thunderstorm may rarely produce brief high winds, hail, or weak tornadoes. Multi cell thunderstorm and squall line tornadoes are rare in Alaska and super cell thunderstorms are almost unheard of here.

Wildfire is a much more common impact of thunderstorm activity in Alaska. BLM sensors positioned across the interior have located an average of 26,000 cloud-to-ground lightning strikes per year. Very active thunderstorm days may feature 2,000 to 5,000 lightning strikes, mainly occurring during the late afternoon hours during the end of June to the beginning of July. Many of these lightning strikes occur in the northern boreal forests of the Alaska interior occasionally leading to wildfires.

Alaska has a relatively low frequency of thunderstorms. In a typical year, Alaska has fewer than 20 days with thunderstorms, and they do not occur uniformly over the State. A majority of the storms occur over a preferred region between the Yukon and Tanana rivers during the warmest summer months. The most active thunderstorm area, at least in terms of cloud-to-ground lightning strikes, is the White Mountains area, north of Fairbanks. Other favored areas are the Yukon-Tanana uplands and flats, the Nowitna, Tetlin and Kantishna River Flats, the Ray Mountains, and the Kuskokwim Mountains.

Types of Thunderstorms

Single Cell - Short-lived storms (20 to 30 minutes) that cover a limited area (a few square miles).

Multicell - Multicell thunderstorms are an organized cluster of two or more single cell storms. Air flowing out of one storm fuels other storms, causing new storms to develop on the right or rear storm flank every 5 to 15 minutes.

Supercell - Supercells produce the most severe weather, last the longest (1 to 6 hours), and travel 200 miles or more. These storms can cause winds of more than 78 mph, giant hail (e.g., 2 inches), and tornado activity. Supercells produce updrafts of 56 to 112 mph that coexist with sustained downdrafts. Together, the updrafts and downdrafts act to extend the storm's duration.

Squall Lines - A line or band of active thunderstorms, a squall line may extend over 250 to 500 miles, may be from 10 to 20 miles wide, and consist of many laterally aligned cells that do not interfere with one another. The cells may be any combination of types (ordinary to severe, single cell to supercell). Squall lines may form along cold fronts, but often form as much as 100 miles ahead of an advancing cold front in the warm sector of an extratropical storm. They often trail a large, flat cloud layer that brings significant rain after the storms pass.

Thunderstorms are also periodically observed along the southern coastal areas, with a higher frequency along the eastern Gulf of Alaska coast between Cordova and Craig. Interestingly, these storms occur during the winter months as well as during summer. The risk of wildfire due to lightning strikes is much less prevalent in the coastal region than in the interior, because the frequency of storms is smaller and the climate is much wetter. Lightning caused injuries and deaths are unusual in Alaska, but certainly not unheard of. In 1986, a teenage girl was killed and three other people were injured near Tok when they took shelter under a tree. In 1993, a young man was injured by lightning while standing on a ball field in North Pole, Alaska.

A thunderstorm spawned tornado near Healy, AK

Hail

Hailstorms are a thunderstorm outgrowth in which ball or irregular shaped lumps of ice greater than 0.75 inches in diameter fall with rain. The size and severity of the storm determine the size of the hailstones. In Alaska, hailstorms are fairly rare and cause little damage, unlike the hailstorms in Mid-western states. The extreme conditions of atmospheric instability needed to generate damaging sized hail (greater than ¾ inch diameter) are highly unusual in Alaska. Small hail of pea-size is periodically observed.

Hail collecting during a thunderstorm.
Image courtesy of NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory (NSSL)

In August of 2000, an intense thunderstorm moved across the community of Sitka, dumping pea- to dime-sized hail over the downtown area. The hail covered the ground and plugged up storm drains causing minor street flooding until it melted.

Coastal Storms

Low pressure cyclones either develop in the Bering Sea or Gulf of Alaska or are brought to the region by wind systems in the upper atmosphere that tend to steer storms in the North Pacific Ocean toward Alaska from the fall through the spring. They often bring wide swathes of high winds and occasionally cause coastal flooding and erosion.

The intensity, location, and the land's topography influence the storm's impact. Another factor that influences the damage done to the shoreline is whether or not the shore ice is solid enough to protect against erosion and physical damage to community infrastructure.

Waves breaking on the beach in Nome during a 1902 storm
Image courtesy MSCUA, University of Washington Libraries, Hegg 1851

Fierce storm conditions do not have to be present to cause damage. Northwestern communities suffer from "Silent Storms" where high-water storm surges erode and undercut the banks melting the permafrost.

A series of storms struck the west coast of Alaska causing major coastal flooding November 11-13, 1974. Significant damage occurred in the communities of Deering, Shishmaref, Nome, Wales, Brevig Mission, Teller, Golovin, Elim, Koyuk, Shaktoolik, Unalakleet, St. Michael, Stebbins, Kotlik, Alakanuk, Scammon Bay, Sheldon Point, Hooper Bay and Kotzebue. Unalakleet was the hardest hit due to a combination of flooding and wind damage. Some portions of the City of Nome were less than 10 feet of water during the brunt of the storm.

An intense storm made land fall near Port Heiden, and coastal flooding occurred on Kodiak Island on January 20, 1980. The area sustained over $500,000 in damage: Kodiak Port facilities, toppled by high water and wave action; Port Lions, harbor facilities damages; Old Harbor, erosion and break water damage; Ouzinkie, harbor boardwalks damage, and Karluk and Ahkiok, private housing damages.

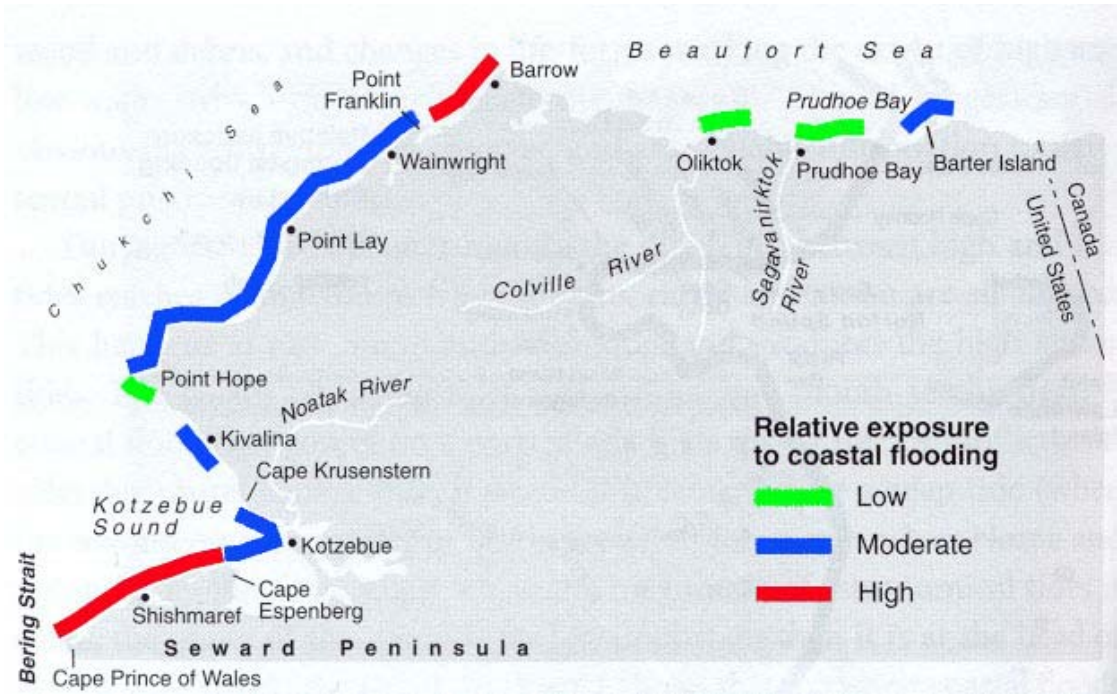
Storm Surge

Storm surges, or coastal floods, occur when the sea is driven inland above the high-tide level onto land that is normally dry. Often, heavy surf conditions driven by high winds accompany a storm surge adding to the destructive-flooding water's force. The conditions that cause coastal floods also can cause significant shoreline erosion as the flood waters undercut roads and other structures. Storm surge is a leading cause of property damage in Alaska.

Waves washing houses off sand spit during a 1902 storm in Nome
Image courtesy of MSCUA, University of Washington Libraries, Hegg 1853

The meteorological parameters conducive to coastal flooding are low atmospheric pressure, strong winds (blowing directly onshore or along the shore with the shoreline to the right of the direction of the flow), and winds maintained from roughly the same direction over a long distance across the open ocean (fetch).

Communities that are situated on low-lying coastal lands with gradually sloping bathymetry near the shore and exposure to strong winds with a long fetch over the water are particularly susceptible to coastal flooding. Several communities and villages along the Bristol Bay coast, the Bering Sea coast, the Arctic coast, and the Beaufort Sea coast have experienced significant damage from

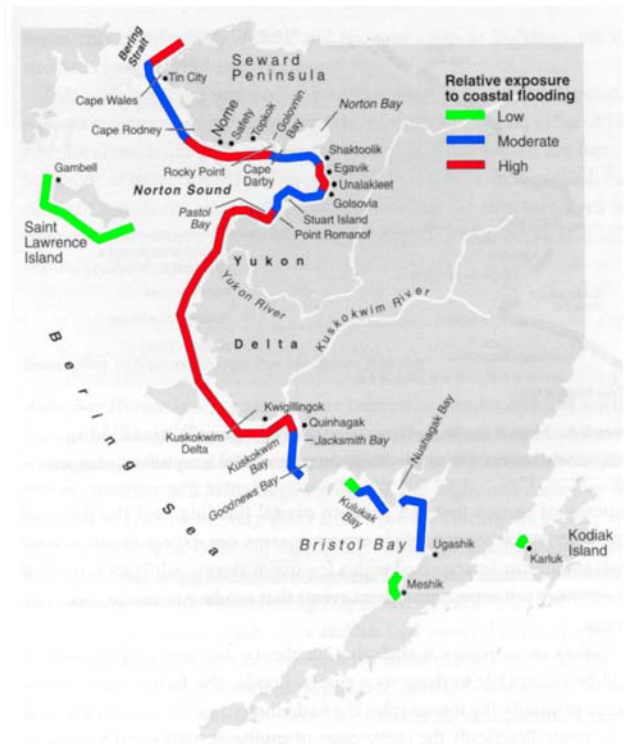


Areas subject to storm surge along the Arctic Ocean. Map adapted from Mason et. al., 1997. Low danger means flooding is infrequent and generally is not severe when it does occur. Moderate exposure means flooding may be expected once every 3 – 5 years and the magnitude of floods may be sufficient to cause beach erosion several years or more inland and damage to structures as much as six feet above normal high-tide and surf levels. High exposure means significant coastal flooding every two years or so and the flooding may cause significant beach erosion and damage to structures more than 100 years inland if these are situated within 10 feet or less of the normal high-tide and surf elevations.

coastal floods over the past several decades. Most coastal flooding occurs during the late summer or early fall season in these locations. As shorefast ice forms along the coast before winter, the risk of coastal flooding abates.

The Homer Spit has a moderate exposure to coastal flooding due to the consistent effects of erosion and the extraordinary tidal range in the region. Coastal flooding has occurred in the southeast Panhandle and on Kodiak Island, but the steep and rocky characteristics of the coastline make these events rare by comparison.

Coastal flooding and high winds caused $500,000 in damage on October 25-26, 1977 when a vigorous storm struck the eastern Aleutians. Buildings were blown from their foundation on Atka. Barges were temporarily beached near Port Heiden. Buildings were lost and wind damage occurred at King Cove. During the height of the storm, Adak reported 95-knot westerly winds and the ship "Vigilant" reported a pressure of 926.1 mb, which is a record low pressure for Alaska.



Areas subject to storm surge along the Bering Sea. Map adapted from Mason et. al., 1997.

The Bristol Bay coast experienced coastal flooding on August 17-18, 1980 as well. A strong low pressure system moved rapidly into Bristol Bay, and 30-foot tides were reported at Clark's Point. Several fishing boats were destroyed and homes and canneries were severely damaged at Ekuk and Clarks Point. Point Heiden also had boats and homes damaged. The Levelock dock washed away completely; a Dillingham fish processing plant sustained $100,000 of damage; and Naknek's New England Fish Company lost 5 boats, a dock with a crane, a mess hall and bunkhouses.

Minor coastal flooding occurred at Craig and Wrangell January 11, 1978 when a deep low moved inland over the southeast Panhandle and strong southwest winds impacted the area. At Craig, the sewage lift station and treatment plant were damaged and roads were washed out. The public dock at Wrangell was also damaged by the storm surge.

One of the most significant cases of coastal flooding occurred in Barrow on March 10, 1963. A deepening low pressure system moved eastward across the Arctic Ocean and Beaufort Sea, and a storm surge developed traveling west by northwest. Barrow experienced a surge of 11-12 feet, which damaged several homes, buildings, airplanes, and the electrical plant. Barrow's freshwater supply was also contaminated with seawater due to the flooding. Wainwright was 50% flooded by this event, and Point Lay and Barter Island also experienced coastal flooding.

Ivu

Ivu, also called an ice override, occurs when floating sea ice is pushed ashore by wind. It is fairly rare as it requires very specific weather and oceanographic conditions and shoreline topology, including gently sloping beaches to develop. They are usually associated with coastal storms and storm surge but can happen during calm weather. They usually occur in fall and early winter, but there have been reports of them occurring at other times. For example, it is believed that one struck Barrow in May of 1957. The ice usually over-rides the beach a few tens of feet inland and the entire event is generally less than an hour long.

They have been reported on the Seward Peninsula coast from Rocky Point to Cape Rodney, Gambell, the northwest coast of the Seward Peninsula, and the Arctic coast from Point Hope to Point Barrow.

In early December 1987, an ivu struck Nome. The ice cover in the area was only about two weeks old and had formed during calm weather so it was fairly flat and cohesive. One morning, light winds started in conjunction with the semimonthly maximum tides resulting in the ice riding up the beach and spilling over the seawall. By that afternoon, the event was over. Barrow can also be hard hit by ivu. In 1978, a 450-foot on shore movement was reported. There is evidence that other events in the area have gone a significant distance inland.

Climate Change

Climate changes are predicted to increase storm frequency and intensity to directly impact the extensive coastal infrastructure of Alaska by increased coastal flooding, inundation, and erosion; especially in the early winter months where sea ice has yet to form. In addition, sea level rise will exacerbate the flooding and erosion problem. Inland permafrost thaw will affect the State transportation infrastructure with collapsed roads, shifted railroad tracks, and building supports constructed on melting permafrost. Additional information is located in Section 4.1.11 and Appendices 32.

Hazard Vulnerability Analysis

HVA will be completed as data becomes available.

Existing Programs and Strategies

Storm Ready

StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To be officially StormReady, a community must:

Establish a 24-hour warning point and emergency operations center.

1. Have more than one way to receive severe weather forecasts and warnings and to alert the public.
2. Create a system that monitors local weather conditions.
3. Promote the importance of public readiness through community seminars.

4. Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.
5. Demonstrate a capability to disseminate warnings.

StormReady has different guidelines for different sized communities. Communities that would like to learn more about the StormReady program should contact their area National Weather Service Office in Juneau, Anchorage, or Fairbanks. Specific StormReady guidelines, examples, and applications also may be found on the Internet at www.nws.noaa.gov/stormready.

NWS - USCG "Operation Weather Blanket" Project
The National Weather Service and the U.S. Coast Guard 17th District formed a partnership in December 2000 to improve the dissemination of weather information throughout the Southeast, Prince William Sound, and Kodiak regions of Alaska. The project goal is to provide the Alaskan maritime community with reliable access to forecast and warning information by increasing the NWS broadcast footprint using low power transmitters located at selected Coast Guard VHF-FM communication sites (called high sites because of their strategic location on mountain peaks) to deliver a continuous weather broadcast.

By combining efforts, the USCG and NWS are improving weather product delivery to the public at a minimal cost. The completed project will continuously broadcast NWS products from 28 USCG high sites for less than $200,000. The transmitter locations will result in at least a 300% increase in broadcast coverage area and provide weather services to areas where previously there was no reception at all. Plans call for a multi-year phased installation schedule.

As of April 2002, seven new transmitters are operational, and Southeast communities like Elfin Cove, Funter Bay, and Pelican finally have dependable access to real-time warning information for severe weather, flooding, and tsunamis.

Hazard Mitigation Successes

Mitigation activities associated with the Public Assistance worksheet for the severe windstorm disaster DR-1461-AK secured roofing materials in the Mat-Su Borough. Additional buildings were identified and projects have been submitted for funding through the HMGP process to complete further mitigation. The projects are under review by FEMA and are anticipated to be approved.

Goals

1. Increase public education.

Mitigation Measures: Educational; Preventative

1.1. Objective: Conduct special statewide outreach/awareness activities, such as Lightning Safety Awareness Week, Winter Weather Awareness Week, Flood Awareness Week, etc.

Many people do not realize how dangerous extreme weather can be. Educating people about Alaska's weather hazards and ways to mitigate is vital.

1.1.1. Action: Host a minimum of four outreach events each year.

Lead: NWS
Support: DHS&EM, DCCED, DEC, DOT&PF,
Timeline: on-going

2. NOAA weather Radio/Communications

Mitigation Measures: Educational; Preventative

2.1. Objective: Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.

2.1.1. Action: Create and pursue funding for PSA.

Lead: NWS
Support: DHS&EM, DCCED, DEC, DOT&PF,
Timeline: on-going

2.2. Objective: Add more stations to the NOAA Weather Radio (NWR) network in Alaska and promote the rebroadcast of NWR using alternative technologies.

2.2.1. Action: Contact Coastal radio stations to join the network and encourage information to be posted on agency web sites.

Lead: NWS
Support: DHS&EM
Timeline: 5 years

2.3. Objective: Encourage local emergency officials to employ redundant methods of receiving weather warnings and disseminating those warnings throughout the community.

2.3.1. Action: Contact EOC's for agreement to receive warnings via FAX, E-Mail, radio, telephone and to transmit to public in redundant methods.

Lead: DHS&EM
Support: NWS
Timeline: on-going

3. Monitoring

Mitigation Measures: Educational; Preventative

3.1. Objective: Expand use of all-season storm spotter networks by recruiting and training volunteers statewide**.**

3.1.1. Action: Host workshops in communities.

Lead: NWS
Support: local communities
T**imeline**: on-going

3.2. Objective: Expand weather monitoring networks through partnerships with other agencies -- precipitation gauges, anemometers, and other weather instruments.

3.2.1. Action: Gain funding to train agencies and purchase equipment.

Lead: NWS
Support: DSH&EM, local communities
Timeline: 3 years

Weather

4. Building Construction

Mitigation Measures: Educational; Preventative; Protection

4.1. Objectives: Encourage weather resistant building construction materials and practices.

Weather resistant construction material and building practices can help structures withstand weather events with minimal damage. For example, roofs can be braced and strapped to prevent damage during high winds, grounding buildings will reduce or eliminate lightning damage, constructing sloped roofs instead of flat roofs will prevent or reduce snow damage, etc.

4.1.1. Action: Show long term benefit to community leaders.

Lead: Fire Marshal's Office
Support: local communities
Timeline: on-going

4.2. Objective: Encourage the use of snow fences where feasible.

Heavy snow accumulation often forces road closures, sometimes for months at a time. Reducing snow drifting and depth helps road crews keep the roads open later in the fall and open it earlier in the spring (clear faster).

4.2.1. Action: Identify at-risk areas and test usefulness.

Lead: DOT&PF
Support: DPS, DHS&EM
Timeline: on-going

5. Expand the StormReady and TsunamiReady programs in Alaska by *completing* at least two joint, NOAA/NWS/State, community visits per year to encourage StormReady and TsunamiReady qualification.

Mitigation Measures: Educational; Preventative

5.1. Objective: Create safer communities for Alaska residents in coastal communities.

5.1.1. Action: Help coastal communities become TsunamiReady.

Lead: NWS
Support: DHS&EM, WC&ATWC
Timeline: on-going **(As of 2007 Anchorage, Wasilla, McGrath, Juneau, and Nome have all been declared StormReady, and the entire Iditarod Trail was declared StormReady with interaction between the NWS, local communities, and the Iditarod Executive Committee. In addition, the communities of Seward, Kodiak, Homer, and Sitka have been re-declared as being both TsunamiReady/StormReady.)**

Summary of local capabilities, goals and actions

Anchorage

Capabilities: planning, and education.

Goals: continued planning and education.

Juneau

Capabilities: planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: include planning and education,

Goals: include adopting building codes to harden structures to include homes, public facilities, educate.

Seward and Homer

Capabilities: Tsunami Ready program, planning, zoning, and education.

Goals: continued planning, education and conduct exercises.

Statewide

Capabilities: Tsunami Ready program, planning and education.

Goals: NWS and DHS&EM will visit a minimum of two communities per year to encourage StormReady and TsunamiReady qualification (as appropriate). The interagency programs are volunteer based between local, State, and federal agencies. Involvement of each partner is essential to the communities' preparedness levels and the success of these readiness programs.

For more specified information about these areas, please refer to appendix 20.

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5.9 GROUND FAILURE

Hazard Analysis/Characterization

Ground failure can occur in many ways. Types of ground failure in Alaska include landslides, land subsidence, and failures related to seasonally frozen ground and permafrost.

Landslides

Landslide is a generic term for a variety of downslope movements of earth material under the influence of gravity. Some landslides occur rapidly, in mere seconds, while others might take weeks or longer to develop.

Landslides usually occur in steep areas but not always. They can occur as ground failure of river bluffs, cut-and-fill failures associated with road and building excavations, collapse of mine-waste piles, and slope failures associated with open-pit mines and quarries. Underwater landslides also are most common on steep slopes, but can involve areas of low relief and slope gradients in lakes and reservoirs or in offshore marine setting.

Landslides occur naturally or can be triggered by human activities. They occur naturally on slopes when inherent weaknesses in the rock or soil combine with one or more triggering events such as heavy rain, snowmelt, changes in groundwater level, and seismic or volcanic activity. They can be caused by long-term climatic changes that result in increased precipitation, ground saturation and a rise in groundwater level, which reduces the shear strength and increases the weight of the soil. Erosion that removes material from the base of a slope, either naturally or by human activities can also trigger landslides.

Human activities that trigger landslides are usually associated with construction such as grading that removes material from the base, loads material at the top, or otherwise alters a slope. Changing drainage patterns, groundwater level, slope and surface water, for example the addition of water to a slope from agricultural or landscape irrigation, roof downspouts, septic-tank effluent, or broken water or sewer lines can also cause landslides.

Three main factors influence landslides: topography, geology, and precipitation. Rock strength is important as certain bedrock formations or rock types appear to be more prone than others to landsliding. The orientation of fractures and bedding relative to the slope is also important. Where fractures or bedding planes “daylight” into the slope, the slope is generally more susceptible to failure. Precipitation may erode and undermine slope surfaces. If precipitation is absorbed into the ground, it increases the pore water pressure and lubricates weak zones of rock or soil.

Types of Landslides

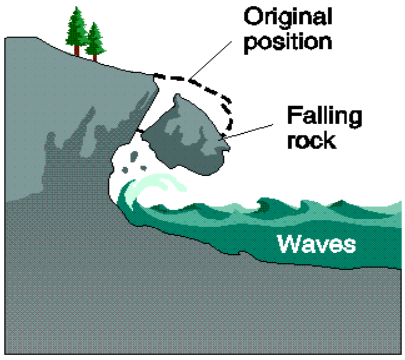
Landslides are usually classified by type of movement; falls, topples, lateral spreads, slides, and flows. A combination of two or more types is called a complex movement. Each type can be further broken down based on the type of material involved.

Principal Landslides Types:

Type of Movement		Type of Material		
		Bedrock	Debris (Course Soil)	Earth (Fine Soil)
Falls		Rock fall	Debris fall	Earth fall
Topples		Rock topple	Debris topple	Earth topple
Slides	Rotational	Rock slump	Debris slump	Earth slump
	Translational	Rock block slide	Debris block slide	Earth block slide
		Rock slide	Debris slide	Earth slide
Lateral Spreads		Rock spread	Debris spread	Earth lateral spread
Flows		Sackung	Debris flow Debris Avalanche Block Stream Solifluction Soil Creep	Earth flow Wet Sand Flow Rapid Earth Flow Loess Flow Dry Sand Flow
Complex		Combination of two or more principal types of movement		

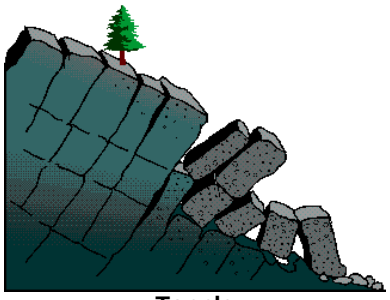
Falls

Falls occur when masses of rock or other material detach from a cliff or other steep slope and move downhill by free fall, rolling or bouncing. The movement is very quick. The typical slope angle involved is from 45 to 90 degrees. Rock falls occur when a rock on a steep slope becomes dislodged and falls down the slope. A rock fall may be a single rock or a mass of rocks, and the falling rocks can dislodge other rocks as they collide with the cliff. At the base of most cliffs is an accumulation of fallen material termed talus. Rock falls are a constant problem along transportation routes through rocky terrain.



Fall
Image courtesy of Landslides in British Columbia

Debris falls are similar, except they involve a mixture of soil, regolith (unconsolidated weathered rock and soil material), vegetation, and rocks.



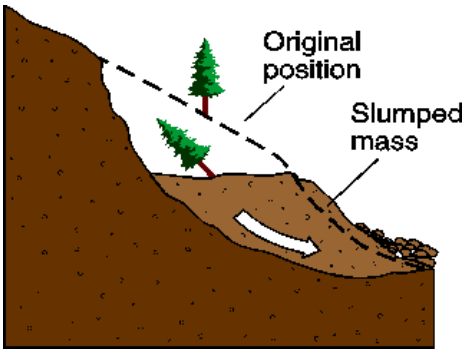
Topple
Image courtesy of Landslides in British Columbia

Topples

Topples are the forward rotation of rocks or other materials about a pivot point on a hillside. The movement is tilting without collapse but if the mass pivots far enough, a fall may result.

Slides

Slides are characterized by shear displacement along one or several surfaces. The two general types of slides are rotational and translational. In a rotational slide, the rupture surface is concave upward, and the mass rotates along the concave shear surface. Rotational slides, also called slumps, can occur in bedrock, debris, or earth. In a translational slide, the rupture surface is a smooth or gently rolling slope. In bedrock and earth, translational slides are sometimes called block slides if an intact mass slides down the slope. If rock fragments or debris slide down a slope on a distinct shear plane, the movements are called rockslides or debris slides. It is obvious that confusion can result by referring to all types of landslides as “slides”.

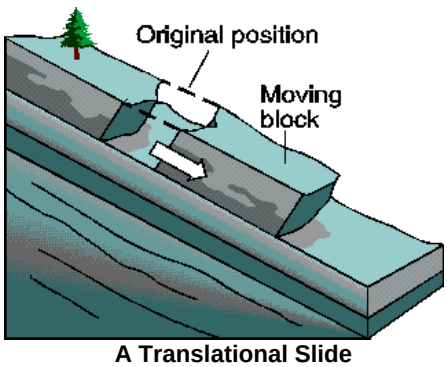


A Rotational Slide or Slump
Image courtesy of Landslides in British Columbia

Lateral Spreads

Lateral spreads involve the horizontal displacement, or spreading apart, of surface materials. They often occur on gentle slops that range between 0.3° and 3°. Lateral spreads can occur in rock but this process is not well documented and movement rates can be quite slow. They are common in fine-grained soils, such as clay, especially if the soil has been remolded or disturbed by construction, grading or similar activities. Loose

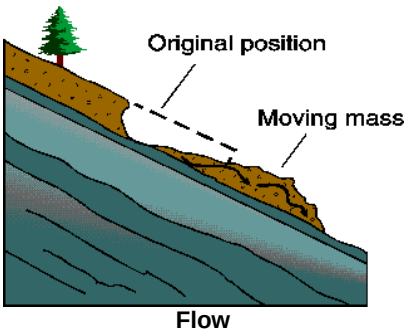
granular soils commonly produce lateral spreads through liquefaction (where saturated soils are transformed from a solid into a liquid state). Liquefaction can occur spontaneously because of changes in pore-water pressure or in response to vibrations such as those produced by seismic activity. Lateral spreads typically damage pipelines, utilities, bridges, and other structures having shallow foundations.



A Translational Slide
Image courtesy of Landslides in British Columbia

Flows

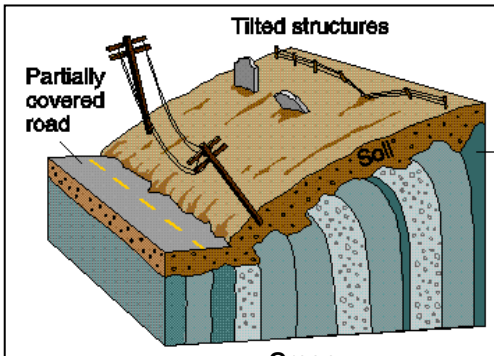
In general, a flow is a moving mass that has differential internal movements that are distributed throughout the mass. They differ from slides by their higher water content and the distribution of velocities that resembles a viscous fluid. Flows in bedrock, also called sackung, gravitational sagging, or ridgetop spreading, are common in mountainous terrain in Alaska but are not very well understood. Sackung may occur slowly but there is increasing evidence, such as after the 2002 Denali fault earthquake, they develop in response to seismic shaking.



Flow
Image courtesy of Landslides in British Columbia

Flows in soil or debris include soil creep, solifluction, block streams, debris flows, and debris avalanches. Soil creep is an imperceptibly slow, downward movement of slope-forming soil or rock due to gravity. Creep can occur due to alternate wetting and drying which expands and contracts the ground. Creep is more of a problem where the ground freezes and thaws or where clay minerals are present because many of them expand considerably when they contact water. Evidence of soil creep includes bent fences or retaining walls, curved tree trunks, and tilted trees and poles.

Solifluction is a slow down-slope flow of water-saturated soil. It is often observed in areas with perennially frozen ground because the frozen ground traps snow and ice melt within the surface layer making it more fluid. In such areas this process is properly called gelifluction. Meltwater and rain saturate the soil in the springtime because they cannot percolate into the frozen layers below. The surface layers thaw to only a small depth during the short summer. This creates a very unstable situation at the interface between



Creep
Image courtesy of Landslides in British Columbia

the frozen and unfrozen layers, and the heavy, waterlogged bed on top flows slowly down slope as a dense sludge lubricated by the semi-liquid layer below. The entire surface layer tends to move together as a cohesive mass. Gelifluction can occur on even moderate slopes, because of the ease with which a lobe slides on the frozen substratum. Solifluction and gelifluction do not occur abruptly, but the lobes can move downhill several inches per day.

Block streams are slow moving tongues of rocky debris on steep slopes, which are often fed by talus cones.

A debris flow is a rapid movement of loose soil, rock and organic matter combined with water and air to form a downward moving slurry. The slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way.

Debris flows tend to occur on slopes in the 20-45 degree range. They are usually associated with unusually heavy precipitation or with rapid snowmelt. They can also occur following the failure of a natural dam formed by landslide debris, glacial moraine, or glacier ice.

The phrase “debris avalanche” describes a very fast debris flow. Debris flows are often associated with volcanic hazards, usually stratovolcanoes because of their steep slopes and large amounts of easily remobilized materials, but they can occur in any steep terrain.

Flows in earth include earth flows, loess flows, dry sand flows, wet sand flows, rapid earth flows, and mudflows. Earth flows range from very slow to rapid flows and have a characteristic hourglass shape. A bowl or depression forms at the source where the unstable material collects and flows out. The central area, the flow track, is narrow and usually becomes wider as it reaches the valley floor. Earth flows generally occur in fine-grained materials or clay-bearing rock on moderate slopes and with saturated conditions. In Alaska, debris flows are common following wildfires that reduce the soil-anchoring effect of roots and increase water infiltration into the soil.

Loess flows and dry sand flows are rapid to very rapid flows of dry material. Loess is a buff-colored deposit of wind-blown silt. Loess flows are usually initiated by seismic activity, and are a fluid suspension of silt in air. A loess flow occurred in 1920, in China, following an earthquake where hills of loess gave way and combined with air to move as a dry flow downslope killing 200,000 people. Dry sand flows usually occur along shorelines or in windblown deposits. Some areas of interior Alaska, particularly near Fairbanks, have thick loess deposits.

Wet sand flows occur along riverbanks or shorelines composed of saturated clean sand. The destabilized sand usually flows into an adjacent body of water.

Rapid earth flows, also called quick clay flows, are very rapid flows that involve subjacent material liquefaction and the entire slide mass.

Mudflows are flows of fine-grained material such as silt or clay, with high water content. They differ from debris flows only in the size of their component materials (more than 50% sand, silt, and clay-sized particles).

Complex

A rock avalanche can be considered a complex type of movement.

Rock avalanches, sometimes called sturzstroms, involve the failure and disintegration of a large rock mass on a mountain slope and the rapid movement of this debris downslope and into a valley. Such landslides may reach very high speeds; in the 1959 Pandemonium Creek rock avalanche in British Columbia, Canada, for example, the debris reached speeds of more than 200 mph.

Secondary Effects

Landslides are often triggered by other hazards. For example, a landslide may occur during floods because of sudden increased ground saturation. Landslides are often associated with seismic and volcanic events. Some of the costliest landslides in American history were associated in the 1964 Good Friday earthquake. It has been estimated that ground failure, not shaking, caused about 60% of the non-tsunami earthquake damage.

The secondary effects of landslides can also be very destructive. Landslide dams cause damage upstream due to flooding and downstream due to a flood which may develop as a result of a sudden dam break. Landslides can also trigger tsunamis and seiches.

Land Subsidence

Land subsidence is any sinking or settling of the earth's surface. Underground mining, ground water, petroleum extraction, and drainage of organic materials are typical causes of subsidence. However, these are rare in Alaska. More common land subsidence causes in Alaska are sediment compaction, tectonic subsidence during earthquakes, and ice-rich permafrost thawing.

Seasonally Frozen Ground

Frost action is the seasonal freezing and thawing of water in the ground and its effect on the ground and man’s development. Frost heave occurs when ice formation in the sediment’s pore spaces forces the grains apart, causing an upward ground displacement. Frost jacking causes unheated structures like porches, fence posts, and utility poles to be jacked upward. When the ground ice thaws, the ground loses bearing strength and its ability to support structures is weakened. It is a widespread problem in Alaska.

Permafrost

Ground failure related to permafrost is a significant problem in Alaska. Permafrost is frozen ground in which a naturally occurring temperature below 32 degrees Fahrenheit (0 degrees Celsius) has existed for two or more years. Approximately 85 percent of Alaska is underlain by continuous or discontinuous permafrost. Permafrost is continuous in extent over most of the Arctic but is discontinuous and sporadic or isolated in most areas south of the Brooks Range. Only the southern coastal margins are permafrost-free. Measured recorded depths extend from 1,330 feet near Pt. Barrow to 350 feet at Nome, 265 feet at Fairbanks, and 100 feet near Tok. Permafrost can form a strong and stable foundation material if it is kept frozen, but if it is allowed to thaw, the

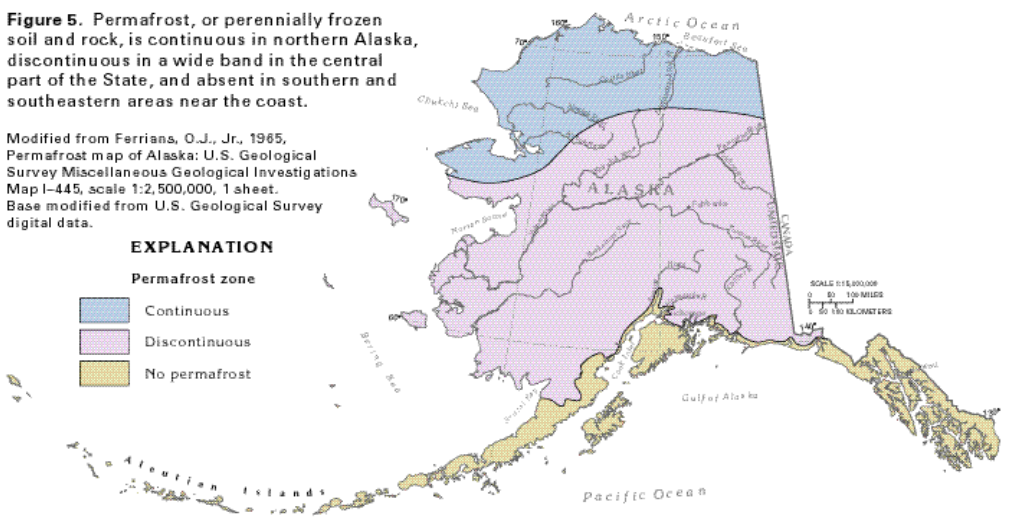


Figure 5. Permafrost, or perennially frozen soil and rock, is continuous in northern Alaska, discontinuous in a wide band in the central part of the State, and absent in southern and southeastern areas near the coast.

Modified from Ferrians, O.J., Jr., 1965, Permafrost map of Alaska: U.S. Geological Survey Miscellaneous Geological Investigations Map I–445, scale 1:2,500,000, 1 sheet. Base modified from U.S. Geological Survey digital data.

Image courtesy USGS

soil can become weak and fail. Materials most susceptible to thaw settlement are fine-grained soils with high ice content. Permafrost can thaw in response to general climate changes and warming or because of human activity that heats the soil or removes insulating cover.

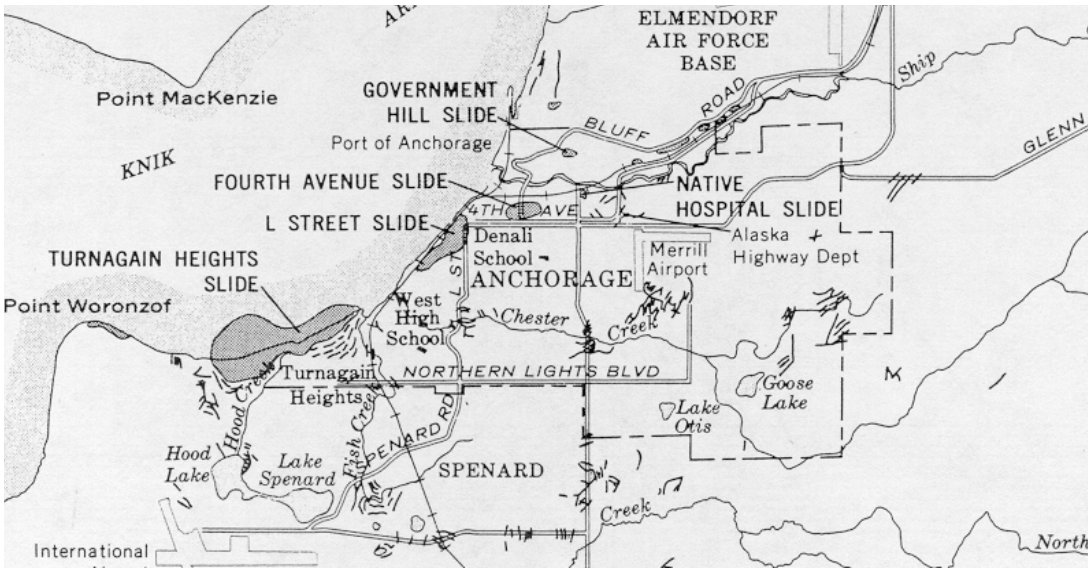
Ground Failure in Alaska

Ground failure is a problem throughout Alaska with landslides presenting the greatest threat. Multiple landslides have affected Juneau in the past 100 years. One of the most destructive events occurred on November 22, 1936. Prolonged heavy rainfall triggered a debris flow that struck a residential area causing numerous injuries and deaths. On July 16, 1984, heavy rain fell on already waterlogged soils and triggered a debris avalanche/flow that destroyed a small hydroelectric dam, damaged two houses and left debris on the Glacier Highway and inside several local businesses.

The "roller coaster railroad" (the abandoned Copper River Northwestern Railroad) near Strelna, illustrates how building the railroad made the underlying ice-rich permafrost thaw and caused the railroad bed to settle unevenly.

Ground-failure hazards exist to some degree in all areas of the state. In Ketchikan, on November 29, 1969, a debris flow caused by the overflow of an emergency spillway destroyed the Upper Lake Silvis powerhouse, plunging the city into partial darkness. In 1983, numerous debris flows occurred in the Brooks Range, endangering the Dalton Highway, which services the Trans-Alaskan Pipeline System. Solifluction flows are visible on the alpine hillsides of interior Alaska, including those near the Steese and Taylor highways.

The 1964 earthquake triggered a wide variety of falls, slides, flows, and lateral spreads throughout Southcentral Alaska. The Anchorage area was heavily impacted because of Bootlegger Cove Clay failures. Some of the more significant events



Generalized map of Anchorage area landslides triggered by the 1964 Good Friday Earthquake.

occurred at Fourth Avenue, L Street, Government Hill, and Turnagain Heights. Several, less devastating slides occurred throughout town including slides at Point Woronzof and the Potter Hill slides.

The Government Hill Elementary school was severely damaged by a complex translatory slide. The south wing of the school dropped about 30 feet (9 m) while the east wing split lengthwise and collapsed. Part of this slide became an earth flow that spread 150 feet (45.5 m) across the flats into the Alaska Railroad yards.

Government Hill Elementary
Image courtesy of U.S. Geological Survey, Menlo Park, CA

The Turnagain Heights landslide was the largest and most complex translatory slide associated with the Good Friday earthquake. The landslide likely began as a block slide but evolved to include lateral spreading, slumping and possibly other types of movement. This landslide caused serious damage to a housing development in which three people died.

The earthquake caused at least one rock avalanche. A slab of rock became detached from the mountain peak overlooking Sherman Glacier. The rock slab disintegrated as it moved downhill, helping it achieve great velocities and extend a great distance over the glacier.

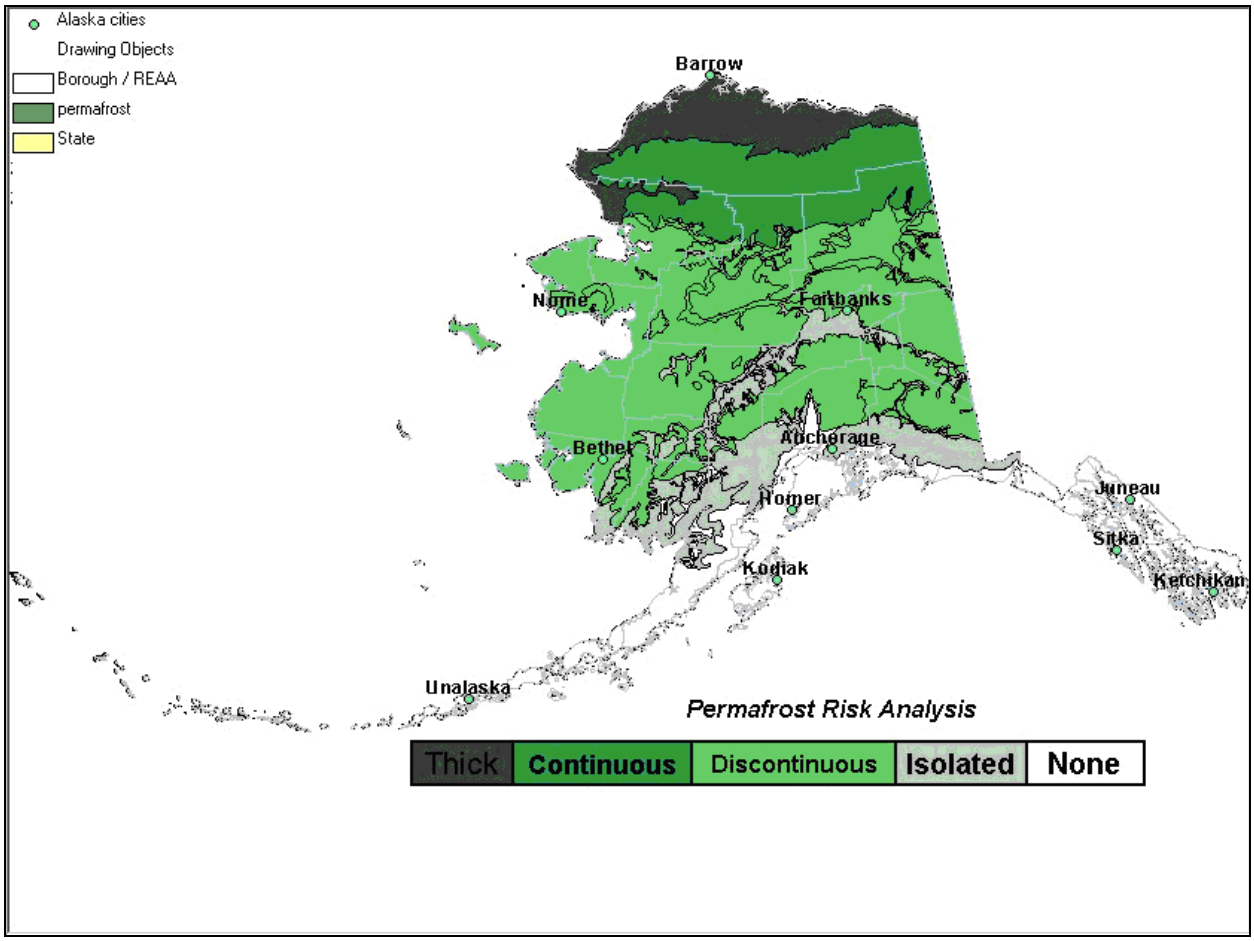
Extensive subsidence also occurred as a result of the 1964 Good Friday Earthquake. The zone of subsidence covered about 110,000 square miles (285,000 km^2), including the north and west parts of Prince William Sound, the west part of the Chugach Mountains, most of Kenai Peninsula, and almost all the Kodiak Island group. In some areas, subsidence exceeded 7 feet (2 m). Part of the Seward area is about 3.5 feet

lower than before the earthquake and portions of Whittier subsided over 5 feet. The village of Portage, at the head of Turnagain Arm of Cook Inlet, subsided 6 feet (1.8 m), partly due to tectonic subsidence and partly due to sediment compaction during the earthquake.

Map of subsidence and uplift

Much of northern Alaska is vulnerable to seasonally frozen ground and permafrost. Seasonally frozen ground and thaw settlement are among the most serious hazards in the Fairbanks area. Repair costs are significant.

Hazard Vulnerability Analysis



2007 Thick PermaFrost Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	46	100,252	100.00%	$11,422,048	$17,812,813	$1,354,500
Alaska Gateway REAA Totals	1	1,696	1.69%	$100,000	$390,080	$0
Bering Strait REAA Totals	5	5,392	1.69%	$568,500	$740,001	$0
North Slope Borough Totals	37	88,844	88.62%	$10,077,548	$15,856,732	$1,354,500
Northwest Arctic Borough Totals	3	4,320	4.31%	$676,000	$826,000	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	1,876	6	13
Alaska HAZUS Building Costs	$335,747	$25,216	$31,543
Alaska HAZUS Building Content Costs	$167,875	$34,855	$32,991

	Population	Households	Average Value
Alaska HAZUS Demographics Data	6,505	1,810	$97,322

2007 Continuous PermaFrost Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	14	19,468	100.00%	$2,957,137	$3,896,914	$319,157
Northwest Arctic Borough Totals	5	6,056	31.11%	$797,000	$978,001	$0
Yukon-Koyukuk REAA Totals	9	13,412	68.89%	$2,160,137	$2,909,913	$319,157

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	273	0	1
Alaska HAZUS Building Costs	$40,800	$254	$4,242
Alaska HAZUS Building Content Costs	$20,395	$254	$4,397

	Population	Households	Average Value
Alaska HAZUS Demographics Data	568	167	$72,592

2007 Discontinuous PermaFrost Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	487	867,789	100.00%	$75,385,791	$125,938,507	$6,858,884
Alaska Gateway REAA Totals	30	62,861	7.24%	$1,613,474	$9,591,175	$868,652
Bering Strait REAA Totals	53	59,726	6.88%	$5,499,618	$7,695,003	$0
Chugach REAA Totals	27	33,930	3.91%	$1,794,563	$2,983,672	$0
Copper River REAA Totals	56	70,868	8.17%	$4,394,116	$9,217,278	$471,939
Delta/Greely REAA Totals	25	33,250	3.83%	$2,638,173	$4,841,956	$202,800
Denali Borough Totals	14	29,447	3.39%	$1,900,659	$5,081,694	$323,220
Fairbanks North Star Borough Totals	3	2,080	0.24%	$561,000	$645,000	$0
Iditarod REAA Totals	10	11,288	1.30%	$1,906,950	$2,790,001	$0
Kashunamiut REAA Totals	3	3,840	0.44%	$1,135,000	$1,235,001	$0
Kuspuk REAA Totals	15	32,838	3.78%	$2,579,988	$4,715,716	$0
Lake & Peninsula Borough Totals	1	1,104	0.13%	$80,000	$550,000	$0
Lower Kuskokwim REAA Totals	65	169,313	19.51%	$14,684,926	$23,272,363	$1,594,057
Lower Yukon REAA Totals	34	60,551	6.98%	$4,535,451	$8,690,100	$372,600
Northwest Arctic Borough Totals	33	116,993	13.48%	$12,690,602	$14,985,527	$1,752,318
Southwest Region REAA Totals	39	64,119	7.39%	$6,337,893	$10,261,470	$523,298
Yukon Flats REAA Totals	19	21,716	2.50%	$1,399,339	$3,055,180	$0
Yukon-Koyukuk REAA Totals	53	86,257	9.94%	$10,915,834	$15,215,167	$750,000
Yupiit REAA Totals	7	7,608	0.88%	$718,205	$1,112,204	$0

	Residential	Industrial	Commercial
Alaska HAZUS Building Count	22,991	5	106
Alaska HAZUS Building Costs	$3,319,551	$38,838	$234,872
Alaska HAZUS Building Content Costs	$1,659,686	$51,139	$251,968

	Population	Households	Average Value
Alaska HAZUS Demographics Data	40,618	12,868	$78,346

2007 Isolated PermaFrost Hazard Vulnerability Analysis - State Facilities

Borough/REAA	# of Facilities	SQ Footage	% of Risk Sq footage	VALUE	Replacement Value	Content Replacement Value
State Totals	422	1,966,453	100.00%	$169,888,411	$389,087,133	$64,360,899
Alaska Gateway REAA Totals	14	21,630	1.10%	$387,871	$3,740,630	$195,000
Bering Strait REAA Totals	1	2,683	0.14%	$160,980	$160,980	$0
Bristol Bay Borough Totals	6	11,040	0.56%	$407,948	$1,462,550	$0
Chugach REAA Totals	32	54,538	2.77%	$4,883,051	$7,068,997	$157,241
Copper River REAA Totals	8	9,624	0.49%	$761,645	$1,198,898	$0
Denali Borough Totals	5	3,310	0.17%	$265,752	$368,852	$0
Fairbanks North Star Borough Totals	129	1,210,603	61.56%	$110,893,987	$245,209,274	$46,503,198
Iditarod REAA Totals	16	23,868	1.21%	$3,303,758	$5,023,521	$361,800
Kenai Peninsula Borough Totals	1	1,800	0.09%	$96,209	$270,000	$0
Ketchikan Totals	3	7,029	0.36%	$745,200	$746,220	$0
Kuspuk REAA Totals	4	4,696	0.24%	$2,472,246	$2,682,385	$250,687
Lake & Peninsula Borough Totals	10	10,168	0.52%	$2,143,734	$3,732,814	$0
Lower Kuskokwim REAA Totals	5	7,294	0.37%	$254,705	$1,058,001	$0
Matanuska-Susitna Borough Totals	124	368,692	18.75%	$28,224,710	$58,342,626	$7,696,679
Municipality of Anchorage Totals	34	193,450	9.84%	$12,815,133	$53,373,153	$9,196,294
Northwest Arctic Borough Totals	6	4,056	0.21%	$60,000	$60,003	$0
Southwest Region REAA Totals	8	5,881	0.30%	$449,665	$731,300	$0
Yukon Flats REAA Totals	12	15,852	0.81%	$1,082,850	$2,767,345	$0
Yukon-Koyukuk REAA Totals	6	10,239	0.52%	$478,967	$1,089,584	$0

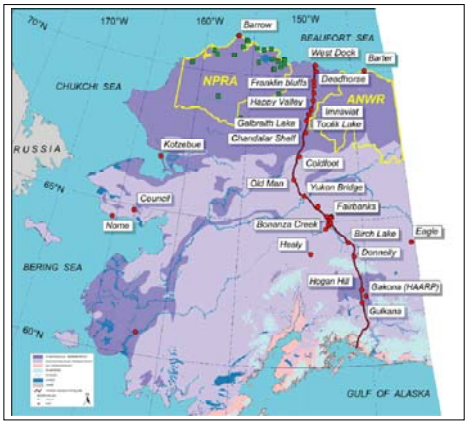
	Residential	Industrial	Commercial
Alaska HAZUS Building Count	25,165	19	371
Alaska HAZUS Building Costs	$4,408,679	$108,141	$723,973
Alaska HAZUS Building Content Costs	$2,204,219	$142,760	$770,136

	Population	Households	Average Value
Alaska HAZUS Demographics Data	82,854	29,134	108,894

Existing Programs and Strategies

Alaska Permafrost Observatory (APO)

The Alaska Permafrost Observatory (APO) presents an emerging system for a comprehensive, long-term observation of permafrost temperatures in Alaska. The APO is required for timely detection of changes in permafrost stability and for predictions of negative consequences of permafrost degradation within the State of Alaska.



Individual permafrost observatories
Map courtesy of APO

Currently the University of Alaska Fairbanks (UAF) has a network of 45 borehole sites throughout Alaska, some of which are equipped with air and shallow soil temperature and moisture sensors, dataloggers, and automatic climate stations with snow depth sensors. Individual permafrost observatories (sites) were established in the late 1970s and early 1980s by the Geophysical Institute, UAF, along the trans-Alaska pipeline route and at select locations in Alaska. Measurements are made annually in most of the boreholes (typically 60 to 80 m depth). At some sites soil temperatures to 1 m are recorded hourly year round. As a result, more than 20 years of permafrost temperature records have been obtained along a distance that spans the entire permafrost zone in Alaska.

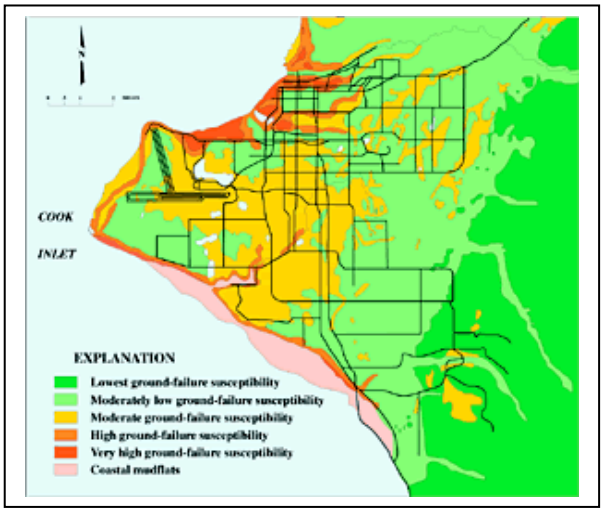
The examination of all collected data will generate information about spatial and temporal changes in permafrost characteristics, and will provide an assessment of the possible mitigation measures which could be taken in order to avoid adverse impacts on existing as well as planned infrastructure.

Hazard Mitigation Successes

Juneau – Break-away, sacrificial walls on the Marine View Building on the lower floors to let landslides pass through. Another building was built into the hillside so that any landslides will pass overhead.

Anchorage Ground Failure Map

Harding-Lawson Associates developed maps for the Municipality of Anchorage that show areas of potential seismically induced ground failure in the Anchorage area. DGGS published this map on an update base map in 1997.



Goals

1. Mapping

Mitigation Measures: Educational; Preventative

1.1. Objective: Identify and map ground failure prone areas.

The identification of potential ground failure areas and development of landslide susceptibility maps is vital.

1.1.1. Action: Develop large-scale (1:63,360 scale or larger) maps of landslides and landslide-prone areas in urban areas.

Lead: USGS, DGGS
Support: DOT&PF, AKRR, DHS&EM,
Timeline: on-going

2. Improve land-use practices within the State

Mitigation Measures: Educational; Preventative

2.1. Objective: Encourage regulations that require excavation, grading, landscaping, and construction practices that do not increase a slope's instability.

Slope instability can be minimized by regulating excavation, grading, landscaping, and construction practices.

2.1.1. Action: Show benefit to communities of new land-use regulations.

Lead: DCCED
Support: DHS&EM
Timeline: on-going

2.2. Objective: Encourage land-use regulations including landslide overlay zones.

Landslide problems are often caused by land mismanagement. Improper land-use practices on ground with questionable stability can create and accelerate serious landslide problems. Land-use zoning in partnership with professional inspections and proper design can alleviate many problems associated with landslides.

2.2.1. Action: Encourage State and local government to pass regulations in documented problem areas.

Lead: DCCED
Support: DNR
Timeline: on-going

3. Reduce damage from ground failure

Mitigation Measures: Protective

3.1. Objective: Reinforce existing landslide prone structures.

Existing structures can be retrofitted to reduce damage from landslides. For example, flexible utility connections will move with a structure undergoing soil creep whereas rigid connections would break.

3.1.1. Action: Identify at risk facilities, structures, and roadways.

Lead: DOT & PF, DNR, Risk Management
Support: DHS&EM
Timeline: 2-5 years

3.2. Objective: Acquire landslide prone property.

Property acquisition is one of the best ways to prevent development in hazardous areas keeping people and property out of harm's way.

3.2.1. Action: Identify high risk properties for acquisition.

Lead: local communities
Support: DHS&EM & DNR
Timeline: on-going

3.3. Objective: Encourage permafrost sensitive construction when appropriate.

Ground failure associated with permafrost melting can be avoided if permafrost sensitive construction practices are followed in permafrost areas. For example, building on piles to allow cold air to circulate beneath heated structures can prevent ground failure due to melting permafrost.

3.3.1. Action: Map sensitive areas for potential construction guidance.

Lead: Fire Marshal's Office (Building Codes)
Support: DNR, Army Corps of engineers
Timeline: 3 years

3.4. Objective: Encourage a "landslide warning system" development.

A landslide warning system could notify high-risk areas, giving them an opportunity to take appropriate action.

3.4.1. Action: Host workshops to show benefit of warning system to communities.

Lead: USGS, NWS
Support: DHS&EM, local communities
Timeline: 2-3 years

3.5. Objective: Inventory past landslides.

Develop a landslide inventory to provide information about historical events such as location and spatial extent.

3.5.1. Action: Research for possible completion

Lead: DGGS
Support: USGS
Timeline: 2 years

3.6. Objective: Control and stabilize landslides where appropriate and cost-effective.

Controlling and stabilizing landslides can be costly as they usually involve major engineering works. However, these activities may be necessary to avoid damage.

3.6.1. Action: Identify land at risk.

Lead: Army Corps of Engineers, DNR
Support: USACOE
Timeline: 2 years

Summary of local capabilities, goals and actions

Anchorage

Capabilities: planning, zoning, and education.

Goals: continued planning and education. Update ground-failure susceptibility map. Seek additional funding sources.

Juneau

Capabilities: planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: planning, zoning, and education.

Goals: continued planning and education.

Seward and Homer

Capabilities:, planning, zoning, and education.

Goals: continued planning, education, and conduct exercises.

For more specified information about these areas please refer to appendix 20.

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5.10 EROSION

Hazard Analysis/Characterization

Erosion is a process that involves the wearing away, transportation, and movement of land. Erosion rates can vary significantly as erosion can result quickly from a flash flood, coastal storm, or other event, or quite slowly from long-term environmental changes. Erosion is a natural process but human activity exacerbates its effects.

In Alaska, coastal erosion is the most destructive, riverine erosion a close second, and wind erosion a distant third. Erosion rarely causes death or injury. However, erosion causes property, development, and infrastructure destruction.

Erosion classifications can be confusing, as there are multiple terms to refer to the same type of erosion. For example, riverine erosion may be called stream erosion, stream bank erosion, or riverbank erosion. Coastal erosion is sometimes referred to as tidal erosion. Bluff erosion is sometimes included in coastal erosion, other times they are two separate processes. The same goes for beach erosion. For this section, coastal erosion encompasses bluff and beach erosion while riverine erosion will be considered synonymous for stream, stream bank, and river bank erosion.

- Bluff erosion: when water runs off the land forming gullies. It is also caused by wave action at the toe of the bluff or when a bluff collapses under the weight of a heavy snow or rainfall.
- Beach erosion: when wave action takes away the light sand.

Coastal Erosion

Coastal erosion is the wearing away of land resulting in loss of beach, shoreline, or dune material from natural activity or human influences. Coastal erosion occurs over the area roughly from the top of the bluff out into the near-shore region to about the 30 foot water depth. It is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. Bluff recession is the most visible aspect of coastal erosion because of the dramatic change it causes in the landscape. As a result, this aspect of coastal erosion usually receives the most attention.

A bluff disappearing into the ocean Shishmaref AK

The forces of erosion are embodied in waves, currents, and wind on the coast. Surface and ground water flow, and freeze-thaw cycles may also play a role. Not all of these forces may be present at any particular location.

Coastal erosion can occur from rapid, short-term daily, seasonal, or annual natural events such as waves, storm surge, wind, coastal storms, and flooding or from human activities including boat wakes and dredging. The most dramatic erosion often occurs during storms, particularly because the highest energy waves are generated under storm conditions.

Coastal erosion also may be from multi-year impacts and long-term climatic change such as sea-level rise, lack of sediment supply, subsidence, or long-term human factors such as the construction of shore protection structures and dams or aquifer depletion. Studies are underway to determine the effects generated from global warming.

Ironically, attempts to control erosion through shoreline protective measures such as groins, jetties, seawalls, or revetments, can actually lead to increased erosion activity. Shoreline structures

eliminate the natural wave run-up and sand deposition processes and can increase reflected wave action and currents at the waterline. The increased wave action can cause localized scour both in front of and behind structures and prevent the settlement of suspended sediment.

- *Bottomfast ice* - ice that has frozen to the ocean floor.
- *Shorefast ice* – ice that has frozen only to the shore.

Fortunately, erosion is hindered by bottomfast ice, which is present on much of the Arctic coastline during the winter. These areas are fairly vulnerable while the ice is forming. The winds from a fall storm can push sea ice into the shorefast ice, driving it onto the beach. The ice will then gouge the beach and cause other damage.

Factors Influencing the Erosion Process

There are a variety of natural and human-induced factors that influence the erosion process. For example, shoreline orientation and exposure to prevailing winds, open ocean swells, and waves all influence erosion rates. Beach composition influences erosion rates as well. For example, a beach composed of sand and silt, such as those near Shishmaref, are easily eroded whereas beaches primarily consisting of boulders or large rocks are more resistant to erosion. Other factors may include:

- Shoreline type
- Coastal geomorphology
- Shoreline structure types
- Development density
- Amount of encroachment into the high hazard zone
- Erosion inducing coastal structure proximity
- Nature of the coastal topography
- Elevation of coastal dunes and bluffs
- Shoreline exposure to wind and waves

Definitions:

Groin - A narrow, elongated coastal-engineering structure built on the beach perpendicular to the trend of the beach. Its purpose is to trap longshore drift to build up a section of beach.

Jetty - A narrow, elongated coastal-engineering structure built perpendicular to the shoreline at inlets to stabilize the position of a navigation channel, to shield vessels from wave forces, and to control sand movement along adjacent beaches to minimize sand movement into a channel.

Seawall - A vertical, wall-like coastal-engineering structure built parallel to the beach or duneline and usually located at the back of the beach or the seaward edge of the dune.
They are designed to halt shoreline erosion by absorbing wave impact.

Revetment - An apron-like, sloped, coastal-engineering structure built on a dune face or fronting a seawall. Designed to dissipate the storm wave forces and prevent undermining seawalls, dunes, or placed fill.

Coastal Erosion in Alaska

Erosion warning sign in Homer

Coastal erosion is a problem in all 30 coastal States, including Alaska. A 1971 USACE study showed that just less than 11% of Alaska's coastline was undergoing "significant" erosion. This may not sound like much but it means that approximately 5,100 miles of Alaska's coast is experiencing "significant" erosion. That's greater than most states have as a borderline.

Erosion does not present a problem when undeveloped coastlines are affected. However, erosion is a significant threat in developed areas such as Alaska's western and northern coasts and along the Cook Inlet. The entire or portion of a community can be threatened. Communities like Shishmaref and Point Hope's survival are threatened whereas only some sections of Anchorage along the Coastal Trail have a risk.

Riverine Erosion

Riverine erosion is the long-term process whereby river banks and riverbeds are worn away. This process is best described as a River's tendency for constant course alteration, shape and depth change, and the balancing act between the water's sediment transport capacity and its sediment supply.

Riverine erosion is often initiated by river bank failure or heavy rainfall; increasing the sediment loads. As the sediment load increases, fast-flowing rivers will erode their banks downstream. Eventually, the river becomes overloaded or velocity is reduced, leading to sediment deposition further downstream or in dams and reservoirs. The deposition may eventually lead to the river developing a new channel.

Erosion and material deposition are a constant issue in less stable braided channel reaches. More stable meandering channels have fewer erosion episodes. While all rivers change in the long-term, short-term change rates vary significantly. These variables include: earthquakes, floods, climatic changes, bank vegetation loses, urbanization, and civil works waterway construction projects.

Erosion and Deposition Processes:

Degradation: Lowering the channel bed on a substantial river length occurring over a relatively long time period in response to disturbances that affect general watershed conditions, such as sediment supply, runoff volume, and artificial channel controls.

Aggradation: Raising the channel bed resulting from disturbances in watershed conditions that produce the opposite effect to those leading to degradation.

General Scour: Lowering the streambed in a general area as a consequence of a short duration event such as a flood. Examples are erosion zones near bridge abutments and scour near gravel pits.

Local Scour: Vortex formations are localized phenomena around bridge piers which lowers the bed.

Deposition: Raising the streambed due to specific flood episodes. An example is a sand bar during a flood event. Deposition is used in this document as the counterpart of general scour.

Lateral Migration: Stream bank alignment shifting is due to a combination of the above: vertical erosion and deposition processes. The most common example is floodplain river migration or meandering. Another example is a river bank's loss or retreat due to mass failure.

Riverine erosion has many consequences including land and development loss. It can also affect marine transportation and channel navigation sources, cause increased harbor and river delta

sedimentation, and degrade channel navigation. Other problems include water quality reduction due to high sediment loads, native aquatic habitat losses, damage to public utilities (roads, bridges and dams), and increase maintenance, prevention, and control costs.

Riverine Erosion in Alaska

Public and private property threatened riverine erosion examples are found throughout Alaska: the Matanuska, Kenai, Yukon, and Kuskokwim Rivers are just a few.

Riverine erosion on the meandering Matanuska River, near Palmer, has already destroyed several homes with many more at risk. Attempts to control erosion using armored dikes have met with very limited success and eventual failed.

Erosion on the Kenai is a great concern to resource-management agencies because increased sedimentation and stream bank cover loss is associated with accelerated erosion rates threatening salmon returns. The Kenai River salmon tourist fishing industry can generate as much as $78 million demonstrating a potentially devastating economic loss to the area.

Wind Erosion

Wind erosion is when wind is responsible for land removal, movement, and redeposition. It occurs when soils are exposed to high-velocity wind. The wind will pick up the soil and carry it away. The wind moves soil particles 0.1-0.5 mm in size in a hopping or bouncing fashion (known as saltation) and those greater than 0.5 mm by rolling (known as soil creep). Wind can suspend and carry fine particles (less than 0.1 mm. Drought further increases wind erosion potential.

Wind erosion, hinders agricultural production from topsoil loss. Wind blown dust reduces visibility, causing automobile accidents and hindering machinery; and has a negative effect on air and water quality creating animal and human health concerns. Wind erosion also damages public utilities and infrastructure.

Wind erosion is not a significant problem in most areas of Alaska. The Mat-Su Valley is affected by wind erosion as it experiences frequent wind gusts of up to 100 miles per hour.

Hazard Vulnerability Analysis

HVA will be completed when data becomes available.

Existing Programs and Strategies

State of Alaska Erosion Management Policy

This is a general State policy concerning erosion control structure construction and maintenance. It establishes policies requiring non-structural alternative investigations before constructing erosion control structures.

Administrative Order 175 (AO 175)

AO 175 was issued by Governor Tony Knowles in 1998. It calls for State agencies to consider flooding and erosion issues during the siting and construction phases of State owned and financed construction projects. (See Appendix 26)

Hazard Mitigation Successes

Shishmaref Relocation Strategic Plan

The community of Shishmaref determined that the threat to life and property from reoccurring coastal erosion required action. The community established an Erosion and Relocation Coalition

made up of the governing members of the City, Indian Reservation Act (IRA) Council, and Shishmaref Native Corporation Board of Directors. The coalition developed a plan to assist the community, State, Federal, and other agencies with identifying needs for an orderly relocation to a less hazard prone area. The community hopes it will be relocated by 2009. However, there is limited available funding for such an expensive effort.

Nome Seawall

Construction on the Nome Seawall began in 1949 and was completed in 1951. The finished seawall was 3,350 feet long, 60 feet wide at its base, and narrowed to 16 feet wide at top. It stands 18 feet above the mean sea tide. The seawall was constructed with granite boulders that were trucked 13 miles from the Cape Nome quarry costing over $1 million.

Goals

1. Identify erosion prone areas

Mitigation Measures: Educational; Preventative

1.1. Objective: Identify erosion prone areas and their erosion rates.

1.1.1. Action: Educate local community leaders on pertinent issues concerning erosion prone areas.

Lead: DNR
Support: Army Corps of Engineers
Timeline: 3 years

2. Reduce damage

Mitigation Measures: Educational; Preventative

2.1. Objective: Relocating infrastructure and residential structures away from high risk areas.

Encourage communities to develop Local All-Hazard Mitigation Plans to enable them to qualify for federal mitigation grant program and partner funding. No federal mitigation assistance is available without a community adopted and State and FEMA approved Plan. Communities can then apply for mitigation assistance to relocate structures away from hazard high areas. This effort is the most effective for reducing the erosion risk.

2.1.1. Action: Help create LHMP to ensure future funding.

Lead: DHS&EM
Support: Denali Commission, local communities
Timeline: on-going

3. Investigate beach nourishment and dune restoration projects

Mitigation Measures: Educational; Preventative; Protective

3.1. Objective: Research effective methods that could accomplish protective measures.

3.1.1. Action: Encourage community research and protective measure implementation.

Lead: Communities, Army Corps of Engineers
Support: NRCS, DNR, EPA
Timeline: 5 years

Erosion

4. Encourage the retention and planting of vegetation in riverine areas.

Mitigation Measures: Educational; Preventative

4.1. Objective: Restore and protect existing riverine areas.

4.1.1. Action: Help recruit local volunteers to help with completion of planting.

Lead: Communities, Communities, DNR,
Support: EPA, NRCS
Timeline: 3 years

Summary of local capabilities, goals and actions

City of Nome

Capabilities: grants received for additional floodplain mapping.

Goals: planning, zoning, and education.

Anchorage

Capabilities: planning, zoning and education.

Goals: continued planning and education.

Juneau

Capabilities: planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: planning and education.

Goals: continued planning and education.

Seward and Homer

Capabilities: TsunamiReady program participation, planning, zoning, and education.

Goals: continued planning, education, and plan exercise development.

For more specified information about these areas please refer to appendix 20

5.11 ECONOMIC

Hazard Analysis/Characterization

Economic disasters can result from uncontrollable natural events that have large negative effects on a region's economic base. Unfortunately, economic disasters also result from poor business practices and public policies that inhibit competition. An economic disaster declaration does not trigger the availability of disaster assistance in the manner of a natural or technological disaster, but it can provide the basis for seeking and receiving financial assistance. For example, the declaration of an economic disaster for fisheries led to the availability of assistance through provisions of the Magnusen-Stevens Fisheries Conservation and Management Act and the Inter-jurisdictional Fisheries Act in 1998, 1999, and 2000. In other instances, a disaster declaration has been unnecessary to secure assistance. For example, when Southeast pulp mills closed, extensive worker assistance was provided through the Job Training Partnership Act and the Trade Adjustment Act; funds were made available for projects through the Economic Development Administration, the U.S. Forest Service, and USDA-Rural Development.

Economic disaster mitigation is not usually handled by emergency management agencies, as these agencies are oriented to natural and technological disasters. Instead, it is essentially performed by economic development agencies. These agencies, or any segment of government, cannot create private economies even though they have an historic and legitimate role in fostering opportunities for economic development. Government's role cannot be to create or replace the marketplace, but to recognize and understand it, and help its citizens capitalize on the opportunities. Economic development agencies have programs designed to build, broaden and diversify the economic base by fostering economic development, and/or creating an environment in which economic development can flourish.

Public infrastructure, sensible regulations, public-private partnerships, efficient and coordinated service delivery, industry advocacy, marketing, economic analysis, and the dissemination of timely information all represent legitimate venues for government to promote economic development.

Approaches to Economic Development

Economic development can be promoted in a variety of ways, using a variety of approaches. These approaches can overlap with one another and are not meant to represent distinctly separate strategies, but to be illustrative. These approaches are also dynamic, state strategies evolve accordingly. Economic development approaches include:

- Industrial recruitment - competing for siting large industrial or manufacturing companies by promoting advantages such as tax abatement, transportation access, or providing developed industrial locations.
- Targeted incentives - using regional, economic, and workforce analysis to match the most suitable type of industry for particular areas.

- Quality of life - promoting recreation and leisure opportunities, quality schools, cultural amenities, low crime rates, a skilled workforce, and clean air and water, to attract new business.
- Tax abatement - offering property tax abatement and other forms of tax relief as a development incentive.
- Workforce development - training the resident workforce for existing and anticipated jobs created through policy-based development initiatives, evolving technology, etc. For example, showcasing well-educated workforces, where higher than average percentages of workers have high school degrees or college diplomas.
- Resource endowments - promoting the existence of natural resource endowments to attract extractive industries. Alaska, particularly, is known as the nation's resource treasure chest with its huge oil and mineral reserves.
- The new economy - promoting an adaptable, consumer-friendly, technology-savvy, innovative, performance-driven, and accountable environment to attract technology-based and knowledge-based industries.
- Web-based economic information systems - developing web sites, often using boroughs or sub-state regions as portals, to display and link to comprehensive economic information providing users with easy access.
- Regional partnerships - promoting regional organizations to implement community and regional economic development priorities. These organizations are like a 'two-way door', with local and regional issues, problems and priorities passing upward to the agencies, and agency programs, funding, and technical assistance passing downward to the benefiting populations.

Assessing Risk

The first step to long-term mitigation involves understanding which economies are at risk and which economies have the best chance to reduce risks through public and private investments. Ways to quantify economic risks include:

- Identifying comparative advantages in order to produce goods or services better than a competitor.
- Monitoring long-term supply and demand trends.
- Measuring the diversity of end-product markets.
- Measuring the size and diversity of base industries.
- Measuring the growth rates in employment, income, and gross sales.
- Monitoring the relative dependence on imports.
- Assessing the skill levels in the work force.
- Assessing the infrastructure needs to reduce transportation and energy costs.

Risk can then be used to evaluate and rank economies on their potential resilience during an economic downturn. Perhaps more importantly, when risks are regularly monitored, economic information is more freely shared, thus creating fewer uncertainties.

Hazard Vulnerability Analysis

HVA will be completed when data becomes available.

Existing Programs and Strategies

DCCED sponsors programs and activities to foster economic development including those represented here.

Alaska Regional Development Organizations (ARDORs).

The ARDOR program is based on the premise that locally driven initiatives, in partnership with the State, can most effectively stimulate economic development and produce healthy, sustainable local economies. ARDORs can be found at http://www.commerce.state.ak.us/oed/ardor/ardor.htm

The ARDORs are intended to:

- Enable communities to pool their limited resources, and work together on economic development issues.
- Develop partnerships among public, private, and other organizations.
- Offer a technical, nonpartisan capacity to develop and implement an economic development strategy.
- Often have extensive experience with Federal/State programs.
- Provide needed technical assistance via direct links with local citizens.

Division of International Trade and Market Development

As adopted by the 22nd Alaska State Legislature, the mission of the Division of International Trade and Market Development (ITMD) is to increase international trade and investment in Alaska. Exports represent ten percent of Alaska's Gross State Product. Increasing trade will lead to more jobs, an increased investment in development projects, and an expansion of Alaska's manufacturing and service base.

Web Information Services

RAPIDS Database-

Developed and maintained by DCCED, the RAPIDS (Rural Alaska Project Identification System) database provides a community-by-community listing of capital projects funded, underway, or planned by State and Federal agencies. With only a few exceptions, agencies provide information that allows for annual updating of the database. RAPIDS can be found at: http://www.commerce.state.ak.us/dca/commbd/CF_Grants.htm

Economic Development Resource Guide-

Developed and maintained by DCCED, the guide lists many of Federal, State, non-profit and foundation funding sources directed toward community and economic development projects and programs. It is available online at: http://www.commerce.state.ak.us/dca/edrg/EDRG.htm

Alaska Economic Information System-

The Alaska Economic Information System (AEIS), developed as a joint project between DCCED and the U.S. Department of Commerce, Economic Development Administration, is a map-based website that provides an economic overview of the entire state and more detailed industry sector profiles and economic narratives by census area. The site also displays considerable quantitative data in a graphic format in areas such as population growth, out-migration and per capita income. The site is linked to other relevant sites including the RAPIDs database. The AEIS is online at: http://www.commerce.state.ak.us/dca/AEIS/AEIS_Home.htm

The AEIS is designed as a development tool which will allow a clearer focus on content and assure the site's usefulness not only for agency officials, researchers, and interested members of the public, but also for entrepreneurs, business owners, corporations, and others who may be considering making business investments in the State. AEIS is also being developed as a predictive tool that will give users the ability to understand the economy's dynamics and a sense of the threats, opportunities, strengths, and weaknesses that are at play within census areas or their aggregates.

Community Profiles-

DCCED developed a web-based database that allows users to select a one page community summary, detailed community information, or run a custom query about a community. The profiles are online at: http://www.commerce.state.ak.us/dca/commdb/CF_COMDB.htm

Community Development Quota (CDQ) Program

The Community Development Quota Program began in December of 1992 with the goal of promoting fisheries related economic development in western Alaska. The program is a Federal Fisheries program that involves coalitions of communities who have formed six regional organizations, referred to as CDQ groups. There are 65 communities within a 50-mile radius of the Bering Sea coastline who participate in the program.

The six CDQ groups are:

- Aleutian Pribilof Island Community Development Association (6 communities)
- Bristol Bay Economic Development Corporation (17 communities)
- Central Bering Sea Fishermen's Association (1 community)
- Coastal Villages Region Fund (20 communities)
- Norton Sound Economic Development Corporation (15 communities)
- Yukon Delta Fisheries Development Association (6 communities)

Alaska Fisheries
@ Kurt Byers Alaska Division of Tourism

The CDQ program allocates a portion of the Bering Sea and Aleutian Island harvest amounts to CDQ groups, including Pollock, Halibut, Sablefish, Atka mackerel, Pacific cod, and crab. There are no significant amounts of salmon allocated. Based upon its evaluation of the Community Development Plans submitted by the six CDQ groups, the State of Alaska and the National Marine Fisheries Service periodically allocates percentages of each species to CDQ groups.

The program is modeled after the Alaska Native Claims Settlement Act (ANCSA). However, the CDQ program was created with three primary differences:

- Government oversight of all business activities
- Community based shareholders instead of individual shareholders
- Requirement that all investments be fisheries related

Since 1992, over $110 million in wages, education, and training benefits have been generated for over 25,000 residents. The CDQ program has contributed to fisheries infrastructure development in western Alaska by funding docks, harbors, and seafood processing facilities construction.

For more information, please visit their website at
http://www.dced.state.ak.us/bsc/CDQ/cdq.htm

Small Business Development

The Small Business Assistance Center supports small business start-up and expansion in Alaska. Assistance provided includes:

- Responding to information requests from business owners.
- Developing publications on business topics.
- Small business referrals to community resources in rural Alaska.

For more information, please visit their website at
http://www.commerce.state.ak.us/oed/smallbus/home.htm

Office of Fisheries Development

The Office of Fisheries Development performs a number of functions related to Alaska's commercial fishing and seafood industry's economic development. The office serves as a catalyst for fisheries related economic development projects in Alaska working with industry, State, Federal, and local agencies.

Prince William Sound Fishing
@ Mark Skok Alaska Division of Tourism

The Office of Fisheries Development's focus is to increase the value of Alaska's seafood harvest and processing industry. Alaska fisheries will become more valuable through:

- Alaska's fisheries sustainable management.
- Developing innovative, market driven seafood products.

- Greater value added production in Alaska.
- Improving Alaska seafood quality.
- Capital accumulation for seafood industry investment.
- Promote participation and investment by Alaskans and coastal communities.
- Improvements in fishery resource technology.
- Enhanced infrastructure to lower costs.

For more information about this program, please visit their website at http://www.commerce.state.ak.us/oed/seafood/seafoodprocessors.htm

Responses to Economic Disasters

1999-2000 Operation Renew Hope

Successive years of low salmon returns led to the creating a formalized mechanism to deliver emergency response services to affected residents in coastal Alaska from Bristol Bay to the Seward Peninsula and along the Yukon River drainage to the Canadian border.

Operation Renew Hope was established to deliver immediate, short-term assistance to families and individuals throughout the disaster area. Approximately $1 million in State emergency response funds were used to purchase and deliver frozen chum salmon and U.S. Department of Agriculture surplus foods, and to hire additional staff to help administer relief efforts as well as provide outreach and community assistance. A $380,000 grant to DOT&PF for brush-clearing activities around runways at 30 rural airports within the disaster region provided short-term jobs for 150 villagers living in the Yukon, Kuskokwim, and Norton Sound areas.

The State also secured a $1 million, five-year Federal grant from the Federal Highway Administration. The grant will provide DOT&PF with $200,000 annually for the life of the program to recruit, train, and retain rural residents interested in road construction and related transportation careers. Other assistance secured under the operation Renew Hope effort included:

Subsistence: The Alaska Board of Game and the Federal Subsistence Board opened moose season early in Game Management Unit 18 below Mountain Village on the Yukon River Delta.

Bureau of Indian Affairs (BIA): Funding for BIA's general assistance program was increased by $1 million. BIA disbursed the funds directly to the tribes for allocation to individuals in their area.

Low Income Home Energy Assistance Program (LIHEAP): An additional $6.75 million was approved for fuel and weatherization programs for the disaster area under the LIHEAP program.

Bulk Fuel Loans: Villages in the Yukon Kuskokwim Delta, and on Norton Sound, received assistance with the final bulk fuel shipments through Alaska Industrial Development and Export Authority, similar to their normal bulk fuel loan program. The cost of the effort was approximately $800,000.

Alaska Student Loan Deferments: Alaska student loan holders affected by the disaster had until November 30, 2000, to apply for a special 6-month deferment on their payments. The deferment is interest bearing but does not count as the one-time hardship deferment allowed in law.

Small Business Administration (SBA): Economic Injury Disaster loans were available to eligible commercial fishermen and other small business owners in the disaster area. These loans have an interest rate of 4%, a maximum term of 30 years, and a limit of $1.5 million. Eligibility is based on the financial impact of the disaster to cover expenses that could have been met had the disaster not occurred.

Alaska Division of Investments: Individuals with loans under the Commercial Fishing Revolving Loan Fund who were unable to make their payments were able to file an extension application.

Rural Alaska Firefighters: There were over 40 fire mission assignments for crews from villages within the Yukon-Kuskokwim-Norton Sound disaster area to aid in fire suppression efforts in the contiguous U.S. The total income earned from these assignments exceeded $3 million.

Coordinated Response Partnerships

1993 Sitka Mill Closure Response

The State response began with a Rapid Response effort from the (former) Department of Community and Regional Affairs (DCRA) Dislocated Workers Unit. DCRA assisted in the establishment of a Labor-Management Committee to help design dislocated worker services. DCRA, working with the former Department of Labor, also established a Career Transition Center that operated through the Sitka campus of the University of Alaska-Southeast for two years. The Center provided retraining, relocation and support services to laid-off mill workers.

During operation, the center served approximately 400 dislocated workers. These workers were re-trained for new occupations; relocated to employment outside Sitka; and/or received support services that assisted in finding, or resulted in, employment. While some Sitka mill workers left the community, the majority remained in Sitka in other occupations.

1996 Valdez Harborview Closure Response

The Harborview Developmental Center housed a population of approximately 100 developmentally disabled adults in an institutional setting in Valdez. The facility was closed after the Department of Health and Social Services (DHSS) completed a feasibility study in 1996, which demonstrated that closing Harborview and housing clients in community-based facilities was cost-effective. The closure resulted in a loss of 44 local jobs.

DCCED (formerly DCRA) acted as lead agency, and worked with the community, DHSS and the Department of Corrections to identify an alternate use for the facility. The Department of Corrections proposed to start a therapeutic community at Harborview, but funds for this conversion of the facility were not appropriated by the legislature. The Department of Corrections subsequently started a therapeutic community at an alternative site.

The last of Harborview's clients were moved to community facilities in November, 1997. By the end of December the last program staff members were terminated. Effective July 1, 1998, the facility was officially transferred to DOT&PF. The former Harborview Hospital portion of the building is in asset protection status.

1997 SEA-CERT (Southeast Alaska Community Economic Revitalization Team)

Following the announcement of the closure of the Ketchikan pulp mill in late 1996, Governor Knowles petitioned the U.S. Department of Agriculture Secretary in January, 1997, to create a Community Economic Revitalization Team (CERT) for Southeast Alaska, similar to those instituted in the Pacific Northwest during that region's timber decline. Creating the CERT both acknowledged the regional nature of the timber crisis, and created a mechanism for providing multi-agency economic development assistance to affected communities. Between 1997 and 2000, acting under a Memorandum of Understanding signed by thirteen Federal agencies, SEA-CERT participating agencies provided assistance to communities with project scoping, project development and project funding.

SEA-CERT had several principal objectives.

- Create a compulsory mechanism for agency coordination.
- Provide simplified, easy access to government programs and services.
- Assure that agencies were responsive to local project priorities.
- Improve agency confidence in received rant application quality , by forwarding to the agencies only "funding-ready" projects that had undergone project scoping and/or development.

While the effort enjoyed some success in project scoping, development and funding it did not achieve its objectives, particularly reforming the agency approach to local project funding. This was due to several factors, including a direct payment of $110 million made to Southeast municipalities through a congressional appropriation. Other factors included the largely voluntary participation of the agencies, and the non-participation of some; the perception of SEA-CERT as substantially a bureaucratic process with little output; and the uncertainty of communities whether their projects would be funded. SEA-CERT did not receive Federal appropriations similar to the CERTs in the Pacific Northwest.

In addition to the longer-term community and economic development work undertaken through SEA-CERT, the Alaska Departments of Community and Regional Affairs and Labor collaborated to open the Ketchikan Career Transition Center in a donated building near the mill site. Over the course of a two-plus-year operation, from the mill closure in March of 1997 to the Center's closure in June of 1999, the Center served 325 clients, 285 of whom enrolled for services under the Job Training Partnership Act. One hundred fifteen were trained for new occupations.

Goals

1. Support Web Information Services

Mitigation Measures: Educational; Preventative

1.1. Objective: Web Information Services, such as RAPIS, EDRG, AEIS and Community Profiles, provide easy access to economic development information to interested parties within the State and beyond.**Action:** Create web links to documentation information.

Lead: DCCED
Support: Department of Labor
Timeline: on-going

2. Support Regional Strategies

Mitigation Measures: Educational; Preventative

2.1. Objective: The State's overall economic development strategy can be comprised of regional plans adopted within the larger framework of State development goals.

Given the substantial differences between regions of the State, regionalizing the State's approach to economic development is sensible. The State should ensure that regional plan templates stress identification of key 'indicators', or plan elements, that will help direct public investment while assuring that the unique values and opportunities of each region can be preserved. Common elements among plans might include:

- Identifying specific linkages between economic sectors, such as transportation infrastructure and manufacturing, or telecommunications and e-marketing.
- Identifying crucial public investment in regional facilities or facilities that support regional development.
- Identifying key opportunities for business development and future employment (also tied to workforce training and university curricula).
- Identifying alternative sources of power production that are less expensive than diesel generation.
- Undertaking a systematic approach to link workforce development with existing and emerging job opportunities.
- Identifying opportunities for expansion of base sector economic activities (fisheries, health care, mining, tourism).

2.1.1. Action: To insure regional and State economic plans have consistency.

Lead: DCCED
Support: Department of Labor
Timeline: 2 years

3. Assess Workforce Training and Development

Mitigation Measures: Educational; Preventative

3.1. Objective: To assist employment of Alaskans.

A survey of workforce skills should be undertaken or updated by regions to determine resident skills, for example, the number and home community of journeymen and apprentices in the trades and crafts; certified electric and utility system operators; trade school graduates; and so on. As a companion effort, a listing of the jobs typically available in the region in Native non-profits, health corporations, school districts, regional governments and Community Development Quota organizations should be assembled and matched with workforce training opportunities that may exist in the university or in planned regional training centers. Curricula in planned regional training facilities should be closely developed with the participation of regional organizations.

The flow of public construction funds into rural Alaska is likely to continue, and the effort to train and/or match local residents for construction jobs is worthwhile and should continue. The next area of effort should examine preparation of the workforce for the year-around employment in clerical, administrative, computer and professional jobs in the regional Native non-profit, health and housing authorities.

3.1.1. Action: Host information workshops and job placement seminars.

Lead: Department of Labor
Support: University of Alaska, the Denali Commission, Alaska Native Coalition on Education and Training, Alaska Vocational Technical Center
Timeline: on-going

4. Promote Economies of Scale

Mitigation Measures: Educational; Preventative

Seek out opportunities for achieving economies of scale in land, air and water transportation, power production and community facilities.

4.1. Objective: DOT&PF's Statewide Transportation Improvement Program (STIP) process could be used to identify opportunities for inter-modal transportation development and road connections between communities.

4.1.1. Action: For example, the Lake and Peninsula Borough has advocated for improvement of the Williamsport-Pile Bay road to be listed in the STIP. Improvement of this road, which connects Lake Iliamna with Cook Inlet, will reduce time and lower costs of moving freight (including boats) from Anchorage to the Lake Iliamna-Bristol Bay region. Likewise, where road connections can be made between communities, opportunities will be created for shared facilities such as power generation and airports. These opportunities do not exist uniformly due to environmental constraints, high construction costs, cost-benefit ratios and local preference. Where such opportunities do exist, however, investment in transportation infrastructure can produce efficiencies and economies of scale for other investments.

Lead: DOT&PF
Support: local communities, tribal governments
Timeline: 3-5 years

4.1.2. Action: Investigate improving one airport for larger airplane landings instead of spreading those dollars to two or more airports, or installing a larger, more efficient generator to serve two or more communities instead of one, could become possible as follow-ons to DOT&PF investment.

Lead: DOT&PF
Support: local communities, tribal governments
Timeline: 3-5 years

Summary of local capabilities, goals and actions

Anchorage

Capabilities: planning, and education.

Goals: continued planning and education.

Juneau

Capabilities: planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: planning and education.

Goals: continued planning and education.

Seward and Homer

Capabilities: planning, and education.

Goals: continued planning, education and conduct exercises.

For more specified information about these areas please refer to appendix 20.

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5.12 DAMS

Hazard Analysis/Characterization

A dam is a barrier built across a waterway to store, control or divert water (FEMA, Multi-Hazard, 1997). Alaska Statute 46.17.900(3) defines a dam as an "artificial barrier and its appurtenant works, which may impound or divert water." The State does not have the ability to regulate all dams in Alaska. , A dam must meet at least one of the following three descriptions listed in the statute to be under State's jurisdiction:

Forks Creek Dam near Ketchikan is not a dam according to Alaska Statute because it only impounds .0.95 acre-feet even though it is 17 feet high. Therefore it is non-jurisdictional.

- "(1) Has, or will have, an impounding capacity at maximum water storage elevation of 50 acre-feet and is at least 10 feet tall measured from the lowest point at either the upstream or downstream toe of the dam to the crest of the dam." A dam with a structural height of 10 feet or taller and that stores 50 acre-feet or more of water meets this description.
- "(2) Is at least 20 feet tall measured from the lowest point at either upstream or downstream toe of the dam to the crest of the dam." A dam that is 20 feet or more tall meets this description regardless of its storage capacity.
- "(3) Poses a threat to lives and property as determined by the department after an inspection." In other words, a barrier with a Class I (high) or Class II (significant) hazard potential classification is considered a dam, even if it does not meet the geometric criteria of 1 or 2 above.

Anchorage's Campbell Lake Dam, just 11 feet high, can impound 800 acre-feet of water therefore meeting the state definition of a dam.

Dams in Alaska

At present, there are 169 dams listed on the Alaska Dam Inventory database at the Alaska Department of Natural Resources (DNR), including State and Federal jurisdictional dams, and non-jurisdictional dams. Most non-jurisdictional dams constructed since the original inventory was compiled in the early 1980s are not listed.

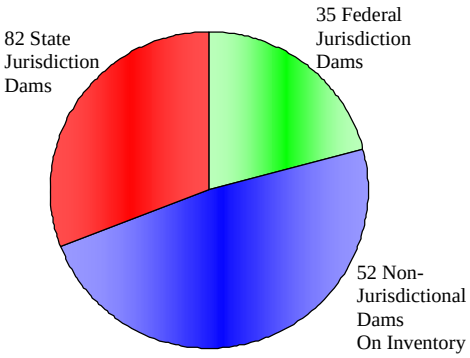

Figure 13.1 Dams in Alaska by Jurisdiction

In Alaska, dams exist for many purposes, some of which include:

- Hydroelectric
- Water supply
- Flood control and storm water management
- Recreation
- Fish and wildlife habitat
- Fire protection
- Mine tailings

The Alaska Dam Safety Program (ADSP) is responsible for supervising the safety of the 82 dams under State jurisdiction, which includes issuing Certificates of Approval for new State jurisdictional dam construction. Non-jurisdictional dams are periodically reviewed to determine if a change in jurisdiction has occurred. For example, new development downstream of an existing dam could change the hazard potential classification of the dam.

The 82 dams under the State's jurisdiction are listed in table 13.1. The dams under Federal jurisdiction are listed in table 13.2 and the non-jurisdictional dams are listed in table 13.3.

Hazard Vulnerability Analysis

Table 13.1 Dams under State Jurisdiction

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
AK00010	Lake Connell	Ketchikan Gateway Borough	Ketchikan	High	Yes
AK00011	Carlanna Lake	Ketchikan Gateway Borough	Ketchikan	High	Yes
AK00017	Hess Creek Dam	Yukon Flats REAA	Livengood	High	No
AK00018	Meals Lake Dam	Chugach REAA	Cordova	High	Yes
AK00022	Bettinger Upper Reservoir Dam	Kodiak Island Borough	Kodiak	High	Yes
AK00023	Bettinger Lower Reservoir Dam A	Kodiak Island Borough	Kodiak	High	Yes
AK00033	Eklutna Dam	Municipality Of Anchorage	Eklutna Village	High	Yes
AK00034	Lake "O" The	Municipality Of	Anchorage	High	Yes

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
	Hills	Anchorage			
AK00041	Bettinger Lower Reservoir Dam B	Kodiak Island Borough	Kodiak	High	Yes
AK00060	Lowell Creek	Kenai Peninsula Borough	Seward	High	No
AK00077	Douglas Island Dam	City & Borough Of Juneau	Douglas	High	Yes
AK00092	Alitak Cannery Dam #1	Kodiak Island Borough	Alitak Cannery	High	No
AK00115	Middle Stream Lower Dam	Aleutian Region REAA	Atka	High	No
AK00116	Middle Stream Middle Dam	Aleutian Region REAA	Atka	High	No
AK00117	Middle Stream Upper Dam	Aleutian Region REAA	Atka	High	No
AK00189	Lower Fire Lake Dam	Municipality Of Anchorage	Eagle River	High	Yes
AK00014	Wrangell Lower		Wrangell	High	Not Required
AK00019	Aquaculture Dam	Chugach REAA	San Juan Cannery	Low	Not Required
AK00024	Seldovia Upper Dam	Kenai Peninsula Borough	Seldovia	Low	Not Required
AK00028	Campbell Lake Dam	Municipality Of Anchorage	Anchorage	Low	Not Required
AK00042	Bettinger Lower Reservoir Dam C	Kodiak Island Borough	Kodiak	Low	Not Required
AK00043	Bettinger Lower Reservoir Dam D	Kodiak Island Borough	Kodiak	Low	Not Required
AK00044	Long Lake Dam	City & Borough Of Juneau	Juneau	Low	Not Required

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
AK00061	Aleut Creek Dam	Aleutian Region REAA	Navy Town	Low	Not Required
AK00064	Kotzebue Water Supply Dam	Northwest Arctic Borough	Kotzebue	Low	Not Required
AK00086	Chiniak Satellite Tracking Sta. Dam	Kodiak Island Borough	(Remote)	Low	Not Required
AK00091	Alitak Cannery Dam #2	Kodiak Island Borough	Alitak Cannery	Low	Not Required
AK00094	Uyak Cannery Dam	Kodiak Island Borough	Whitney Fidalgo Cannery	Low	Not Required
AK00095	Alitak Cannery Dam #4	Kodiak Island Borough	Alitak Cannery	Low	Not Required
AK00105	Squaw Harbor Dam	Aleutians East Borough	Squaw Harbor	Low	Not Required
AK00106	West North Lake Dam	Aleutian Region REAA	Adak Naval Base	Low	Not Required
AK00107	East North Lake Dam	Aleutian Region REAA	Adak Naval Base	Low	Not Required
AK00108	Bonny Rose Lake Dam	Aleutian Region REAA	Adak Naval Base	Low	Not Required
AK00122	New England Fish Co Dam	Aleutians East Borough	Sand Point	Low	Not Required
AK00123	Lake Demarie Dam	Aleutian Region REAA	Adak	Low	Not Required
AK00171	Pillar Creek Dam No. 3	Kodiak Island Borough	Kodiak	Low	Not Required
AK00178	Ward Cove Cannery Dam	Ketchikan Gateway Borough	Ketchikan	Low	Not Required
AK00179	Neets Creek Dam	Ketchikan Gateway Borough	Fish Hatchery	Low	Not Required
AK00184	Bluff Lake Diversion	Ketchikan Gateway Borough	Fish Hatchery	Low	Not Required

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
AK00200	Red Dog Water Supply Dam	Northwest Arctic Borough	Kivalina	Low	Yes
AK00203	Upper Cannery Tailings Impoundment	City & Borough Of Juneau	Hawk Inlet	Low	Not Required
AK00207	Mahoona Dam	Kodiak Island Borough	Ouzinkie	Low	Not Required
AK00211	Fort Knox Water Dam	Fairbanks North Star Borough	Chatineka	Low	Yes
AK00212	Fort Knox Tailings Dam	Fairbanks North Star Borough	Chatineka	Low	Yes
AK00214	Cabin Creek Dam	SE Island REAA	Petersburg	Low	Not Required
AK00260	Red Dog Mine Water Diversion Dam	Northwest Arctic Borough	Kivalina	Low	Yes
AK00267	Armin F. Koernig Dike	Chugach REAA	San Juan Cannery	Low	Not Required
AK00301	Two Bull Ridge Pond T5 Dam	Denali Borough	Healy	Low	Not Required
AK00302	Two Bull Ridge Pond T6 Dam	Denali Borough	Healy	Low	Not Required
AK00012	Whitman Lake	Ketchikan Gateway Borough	Herring Cove	Significant	Yes
AK00013	Wrangell Upper	SE Island REAA	Wrangell	High	Yes
AK00016	Petersburg Upper Dam	SE Island REAA	Petersburg	Significant	Yes
AK00020	Pillar Creek Dam No.1.A	Kodiak Island Borough	Kodiak	Significant	No
AK00021	Pillar Creek Dam No. 2.C	Kodiak Island Borough	Kodiak	Significant	No
AK00029	Westchester Lagoon Dam	Municipality Of Anchorage	Anchorage	Significant	No
AK00032	Shotter Creek Upper Dam	Chatham REAA	Hoonah	Significant	No

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
AK00049	Eyak Lake	Chugach REAA	Cordova	Significant	No
AK00051	Isatkuag Lagoon Dam	North Slope Borough	Barrow	Significant	No
AK00053	Itasigrook	North Slope Borough	Barrow	Significant	No
AK00070	Pillar Creek Dam No. 2.A	Kodiak Island Borough	Kodiak	Significant	No
AK00071	Pillar Creek Dam No. 2.B	Kodiak Island Borough	Kodiak	Significant	No
AK00072	Pillar Creek Dam No.1.B	Kodiak Island Borough	Kodiak	Significant	No
AK00073	Monashka Creek Dam	Kodiak Island Borough	Kodiak	Significant	No
AK00082	Roycroft Lake	Kenai Peninsula Borough	Moose Pass	Significant	Yes
AK00090	Alitak Cannery Dam #3	Kodiak Island Borough	Alitak Cannery	Significant	No
AK00093	Lower Eklutna	Municipality Of Anchorage	Eklutna Village	Significant	No
AK00098	Stover Dam	Kodiak Island Borough	Kodiak	Low	No
AK00101	Bridge Creek Dam	Kenai Peninsula Borough	Homer	Significant	Yes
AK00119	Cannery Creek Dam	Chugach REAA	Fish Hatchery	Significant	Yes
AK00120	Hydaburg Dam	SE Island REAA	Hydaburg	Low	No
AK00166	Old Harbor City Dam	Kodiak Island Borough	Old Harbor	Low	No
AK00185	Monashka Creek Dike	Kodiak Island Borough	Kodiak	Significant	No
AK00201	Red Dog Tailings Dam	Northwest Arctic Borough	Kivalina	Significant	Yes
AK00213	Nixon Fork Tailings Dam	Iditarod REAA	McGrath	Significant	No
AK00261	Illinois Creek Heap Leach	Yukon-Koyukuk REAA	Kaltag	Significant	No

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
	Dam				
AK00262	Beluga Lake Dam	Kenai Peninsula Borough	Homer	Significant	No
AK00264	Akutan Hydro Dam	Aleutians East Borough	Akutan	Significant	No
AK00265	Icy Creek Reservoir Dam	Aleutian Region REAA	Captains Bay	Significant	No
AK00266	Icy Lake Dam	Aleutian Region REAA	Captains Bay	Low	No
AK00268	Humboldt Creek Reservoir Dam	Aleutians East Borough	Sand Point	Significant	No
AK00303	Red Dog Back Dam	Northwest Arctic Borough	Kivalina	Significant	No
AK00304	Pogo R.T.P. Dam *	Delta/Greely REAA	Delta Junction	Significant	- - -

Source: Alaska Dam Inventory, June 2004
NOTES:
1) The information presented in the above table is subject to verification and should be used with caution.
2) * indicates construction pending.
3) Nearby development listed for location purposes only and does not imply any specific level of risk to development

Table 13.2 Dams under Federal Jurisdiction

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
AK00002	Blue Lake Dam	City & Borough Of Sitka	Sitka	High	Yes
AK00003	Salmon Creek Dam	City & Borough Of Juneau	Juneau	High	Yes
AK00006	Ketchikan Lakes Dam	Ketchikan Gateway Borough	Ketchikan	High	Yes
AK00027	Solomon Gulch Dam	Chugach REAA	Valdez	High	Yes
AK00085	Moose Creek Dam/Chena Lakes Project	Fairbanks North Star Borough	Fairbanks	High	Yes

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
AK00099	Nasa Tracking Station Dam #1	Fairbanks North Star Borough	Nasa Tracking Station	High	No
AK83021	Solomon Gulch Spillway	Chugach REAA	Valdez	High	Yes
AK00004	Annex Creek Dam	City & Borough Of Juneau	(Remote)	Low	No
AK00007	Upper Silvis Dam	Ketchikan Gateway Borough	(Remote)	Low	Yes
AK00008	Lower Silvis	Ketchikan Gateway Borough	(Remote)	Low	Yes
AK00009	Lower Dewey Dam	Chatham REAA	Skagway	Low	No
AK00035	Ship Creek Dam	Municipality Of Anchorage	Anchorage	Low	Not Required
AK00036	Gregory Lake Dam	Municipality Of Anchorage	Elmendorf AFB	Low	Not Required
AK00037	Fawn Lake Dam North	Ketchikan Gateway Borough	Ketchikan	Low	Yes
AK00050	Humpback Creek #3	Chugach REAA	Cordova	Low	Not Required
AK00054	Purple Lake	Annette Island REAA	Metlakatla	Low	Not Required
AK00058	Lake Osprey Dam	City & Borough Of Sitka	Sitka	Low	Not Required
AK00059	Dewey Forebay	Chatham REAA	Skagway	Low	Not Required
AK00074	Chester Lake	Annette Island REAA	Metlakatla	Low	Not Required
AK00076	Otter Lake Dam	Municipality Of Anchorage	Ft. Richardson AB	Low	Not Required
AK00079	Jerome Lake Dam	Kenai Peninsula Borough	(Remote)	Low	Not Required
AK00103	Chignik Dam	Lake & Peninsula	Chignik	Low	Not

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification	Emergency Action Plan
		Borough			Required
AK00153	Karluk Lagoon Dam	Kodiak Island Borough	Karluk Lagoon	Low	Not Required
AK00158	Nasa Tracking Station Dam #2	Fairbanks North Star Borough	Nasa Tracking Station	Low	Not Required
AK00161	Haines Army Depot Water Supply Dam	Haines Borough	Haines	Low	Not Required
AK82401	Explorer Glacier Pond Dam	Municipality Of Anchorage	Portage	Low	No
AK83008	Terror Lake	Kodiak Island Borough	(Remote)	Low	No
AK83009	Shotgun Creek Div	Kodiak Island Borough	(Remote)	Low	No
AK83012	Green Lake	City & Borough Of Sitka	Sitka	Low	No
AK83016	Bradley Lake Dam	Kenai Peninsula Borough	(Remote)	Low	No
AK83022	Fawn Lake Dam South	Ketchikan Gateway Borough	Ketchikan	Low	Yes
AK00001	Cooper Lake Dam	Kenai Peninsula Borough	Cooper Landing	Significant	Yes
AK00005	Crystal Lake Dam	SE Island REAA	(Remote)	Significant	Yes
AK00039	Pelican Cove Creek Dam	Chatham REAA	Pelican	Significant	No
AK83013	Swan Lake	Ketchikan Gateway Borough	(Remote)	Significant	Yes

Source: Alaska Dam Inventory, June 2004

NOTES:

1) The information presented in the above table is subject to verification and should be used with caution.

Table 13.3 Non-Jurisdictional Dams

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification
AK00030	Big Kitoi	Kodiak Island Borough	Fish Hatchery	Low
AK00031	Indian River	City & Borough Of Sitka	Sitka	Low
AK00063	Shotter Creek Lower Dam	Chatham REAA	Hoonah	Low
AK00075	City Of Angoon Dam	Chatham REAA	Angoon	Low
AK00083	Excursion Inlet Cannery Dam	Chatham REAA	Excursion Inlet	Low
AK00084	Saxman Lower Reservoir	Ketchikan Gateway Borough	Saxman	Low
AK00088	Larson Bay Cannery Dam	Kodiak Island Borough	Larson Bay	Low
AK00089	Port Lions Dam	Kodiak Island Borough	Port Lions	Low
AK00096	Fish Creek Dam	Kenai Peninsula Borough	Seldovia	Low
AK00097	Port Graham Dam #2	Kenai Peninsula Borough	Port Graham	Low
AK00102	Tin City Dam	Bering Straits REAA	Tin City	Low
AK00104	Port Alexander Dam	City & Borough Of Sitka	Port Alexander	Low
AK00109	Lake Leone Dam	Aleutian Region REAA	Adak Naval Base	Low
AK00110	Adak Log Dam	Aleutian Region REAA	Adak Naval Base	Low
AK00112	Mitchell Creek Dam	Aleutian Region REAA	Adak Naval Base	Low
AK00114	North Stream Lower Dam	Aleutian Region REAA	Atka	Low
AK00118	Atka Power Dam	Aleutian Region REAA	Atka	Low
AK00125	Peter Pan Seafoods	Lake & Peninsula Borough	Chignik	Low

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification
	Chignik Dam			
AK00126	False Pass Dam	Aleutians East Borough	False Pass	Low
AK00127	Nurses Creek Dam	Aleutian Region REAA	Adak	Low
AK00128	Akutan Water Supply Dam	Aleutians East Borough	Akutan	Low
AK00130	Akutan Power Dam	Aleutians East Borough	Akutan	Low
AK00131	Rowan Bay	SE Island REAA	(Remote)	Low
AK00133	Kennel Creek Dam	City & Borough Of Sitka	Sitka	Low
AK00134	Corner Bay Dam	City & Borough Of Sitka		Low
AK00135	Tenakee Springs Dam	Haines Borough	Tenakee	Low
AK00136	Tenakee Spring School Dam	Haines Borough	Tenakee	Low
AK00138	Port Alexander Cold Storage Dam	City & Borough Of Sitka	Port Alexander	Low
AK00142	Ketchikan Diversion Dam	Ketchikan Gateway Borough	Ketchikan	Low
AK00143	Ketchikan Debris Control Dam	Ketchikan Gateway Borough	Ketchikan	Low
AK00145	Saxman Upper Dam	Ketchikan Gateway Borough	Saxmon	Low
AK00146	Klawock Dam	SE Island REAA	Klawock	Low
AK00147	Nunoo Creek Dam	Chugach REAA	Tatitlek	Low
AK00149	Salt Chuck Mine Dam	SE Island REAA	(Remote)	Low
AK00150	Sheldon Jackson College Dam	City & Borough Of Sitka	Sitka	Low

DAM ID Number	Name	Borough/REAA	Nearby Development	Hazard Potential Classification
AK00154	Old Karluk Dam	Kodiak Island Borough	Old Karluk	Low
AK00156	Zachar Bay Fisheries Dam	Kodiak Island Borough	(Remote)	Low
AK00157	Louie Nelson Homestead Dam	Haines Borough	(Remote)	Low
AK00159	Lost Lake Dam	Copper River REAA	(Remote)	Low
AK00160	Port Graham Dam #1	Kenai Peninsula Borough	Port Graham	Low
AK00162	Klukwan Dam	Haines Borough	Klukwan	Low
AK00163	Ellamar Dam #1	Chugach REAA	Ellamar	Low
AK00164	Ellamar Dam #2	Chugach REAA	Ellamar	Low
AK00165	Jim Edwards Dam	Copper River REAA	McCarthy	Low
AK00167	Port Wakefield Dam	Kodiak Island Borough	Port Wakefied	Low
AK00168	Crab Bay Dam #4	Chugach REAA	Chenega	Low
AK00169	Tatitlek	Chugach REAA	Tatitlek	Low
AK00182	Lake Lucile Dam	Matanuska-Susitna Borough	Wasilla	Low
AK00208	Forks Creek Dam	Ketchikan Gateway Borough	Mountain Point	Low
AK00210	Hawk Inlet Cannery Dam	City & Borough Of Juneau	Hawk Inlet	Low
AK00263	Rainbow Lake Dam	Matanuska-Susitna Borough	Wasilla	Low
AK00300	Kipnuk Water Supply Dam	Lower Kuskokwim REAA	Kipnuk	Low

Source: Alaska Dam Inventory, June 2004
NOTES:
1) The information presented in the above table is subject to verification and should be used with caution.
2) Emergency Action Plans are not required for non-jurisdictional dams.

State Owned Dams

Most of the dams in Alaska are not owned by the State of Alaska. Out of the 169 dams in the inventory, only 10 are believed to be owned by the State, or have a disputed ownership with a State interest. The ten dams are listed in table 13.4.

Dam Failure

The failure of a dam can be a dramatic incident that results in a major catastrophe with substantial economic impacts and loss of life. There are varying degrees of failure which can contribute to the uncontrolled release of water from the reservoir, ranging from improper gated spillway operation to the partial or full breach of the main structural component of the dam. Lesser degrees of failure often occur in advance of a catastrophic failure and are generally amenable to mitigation if detected and properly addressed. There are several general causes of a dam failure including:

- Inadequate spillway capacity which results in dam overtopping during extreme rainfall events.
- Internal erosion or piping caused by seepage through the embankment or foundation or along conduits.
- Improper or insufficient maintenance leading to decay and deterioration.
- Inadequate design, improper construction materials, and poor workmanship.
- Operation issues.
- Failure of upstream dams on the same river system.
- Landslides into a dam's reservoir creating a wave that overtops the dam.
- Seismic instability.

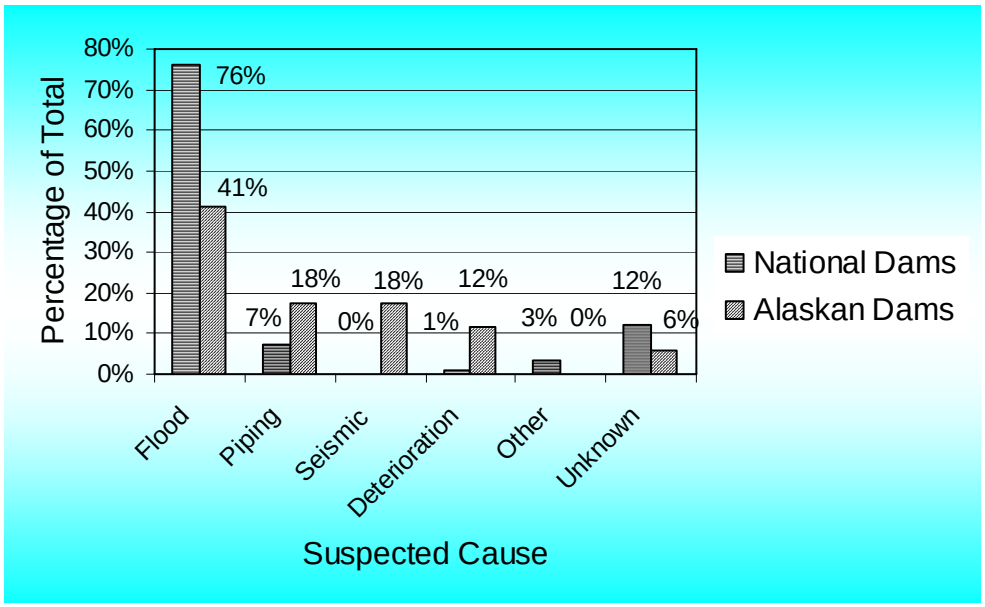

Figure 13.3 National and State comparison of Dam Failure Causes

Figure 13.3 compares the causes of dam failures nationally with those in Alaska. Flooding is the nation's overwhelming leading cause of dam failures. This holds true for Alaska as well. This generally can be equated to an inadequate spillway capacity. Failures due to piping, seismic activity, and deterioration appear higher in Alaska than nationally. The low number of dams and limited failure data skews the statistics; however, the trend is generally consistent.

Dam failures can occur wherever there is a dam. The risk increases as dams age and deteriorate from deferred maintenance and decay. Eighty percent of the older dams designed and constructed before Alaska adopted dam safety regulations (1989) may have a higher risk due to design inadequacy.

The State is especially concerned for those dams with known or suspected deficiencies as there is a greater failure risk than with those that are properly designed and structurally sound. Table 13.5 is a partial list of dams with known or suspected deficiencies.

Dam Hazard Potential Classification

All dams are classified according to the potential impacts of a catastrophic failure unfortunately; the classification system is inconsistent between Federal and State agencies. FEMA promotes standardized guidelines. In general, the hazard potential classification is based on the potential loss of life, economic loss, and environmental damage. Alaska's three hazard classifications are described in the current dam safety regulations (11 AAC 93.157) as follows:

- Class I: A dam whose failure would, in the opinion of the DNR commissioner, result in probable loss of life, serious hazard to public health, or serious damage to homes, high-value industrial or commercial properties, or major public utilities.

Table 13.4 State Owned Dams

DAM ID NUMBER	DAM NAME	GENERAL LOCATION	RESPONSIBLE AGENCY	PURPOSE	DAM TYPE	DAM LENGTH (FT)	DAM HEIGHT (FT)	NORMAL STORAGE (ACRE-FT)	YEAR BUILT	REGULATORY LEVEL	HAZARD POTENTIAL CLASSIFICATION	COMMENTS
AK83016	Bradley Lake Dam	Kenai Peninsula Borough	Alaska Energy Authority	Hydroelectric	Rockfill	600	125	284150	1991	Federal	Low	Major hydroelectric facility on Kenai Peninsula.
- - -	Larson Bay Hydroelectric Dam	Kodiak Island Borough	Alaska Energy Authority	Hydroelectric	- - -	- - -	- - -	- - -	- - -	- - -	- - -	Details regarding this dam are not readily available.
AK00044	Long Lake Dam	City & Borough Of Juneau	A.I.D.E.A.	Hydroelectric	Concrete	337	30	147000	1973	State	Low	Also known as Snettisham Dam.
AK00030	Big Kitoi Dam	Kodiak Island Borough	ADF&G	Water Supply	Other	40	8	1500	1962	Currently Unregulated	Low	Water supply dam for fish hatchery on Afognak Island
AK00119	Cannery Creek Dam	Chugach REAA	ADF&G	Water Supply	Concrete	360	17	1400	1979	State	Significant	Water supply dam for fish hatchery on Pr. William Sound
AK00182	Lake Lucille Dam	Matanuska-Susitna Borough	ADF&G	Recreation	Timber/ Earthfill	60	6	2051	1969	Unregulated	Low	Located in Wasilla.
AK00261	Illinois Creek Heap Leach Pad Dam	Yukon-Koyukuk REAA	ADNR	Mining Operations	Rockfill	2710	83	103	1996	State	Significant	Scheduled for closure no later than 2005.
AK00049	Eyak Lake Dam	Chugach REAA	ADOT&PF	Fish and Wildlife	Other	365	2	13000	1972	State	Significant	Located in Cordova.
AK00262	Beluga Lake Dam	Kenai Peninsula Borough	ADOT&PF	Recreation	Earthfill	1060	13	900	0	State	Significant	Ownership uncertain. Dam is located in road right of way near Homer spit.
AK00268	Humboldt Creek Reservoir Dam	Aleutians East Borough	ADOT&PF	Water Supply	Earthfill	395	19	50	0	State	Significant	Ownership uncertain. Dam is located in road right of way in Sand Point.

Source: DNR, Dam Safety and Construction Unit, 2004 and Alaska Dam Inventory, 2004
NOTES: 1) The information presented in the above table is subject to verification and should be used with caution.

Table 13.5 Partial List of Dams with Known or Suspected Deficiencies

DAM ID NUMBER	DAM NAME	HAZARD POTENTIAL CLASSIFICATION	REGULATORY LEVEL	NEAREST DEVELOPMENT	OWNER TYPE	PURPOSE	TYPE	YEAR BUILT	KNOWN OR SUSPECTED DEFICIENCY
AK00003	Salmon Creek Dam	High	Federal	Juneau	Private	Hydroelectric	Concrete Arch	1914	Seismic Stability (SS) (See Note 3)
AK00060	Lowell Creek Diversion Dam	High	State	Seward	local government	Flood Control	Rockfill	1945	Hydrology and Hydraulics (H&H)
AK00017	Hess Creek Dam	High	State	Livengood	Private	Water Supply	Earthfill	1946	Obsolete, Decayed, Excess Vegetation, H&H (See Note 3)
AK00023	Bettinger Lower Dam A	High	State	Kodiak	local government	Water Supply	Timber Frame	1959	Obsolete, Decayed, SS, H&H (See Note 3)
AK00041	Bettinger Lower Dam B	High	State	Kodiak	local government	Water Supply	Timber Frame	1959	Obsolete, Decayed, SS (See Note 3)
AK00034	Lake "O" The Hills Dam	High	State	Anchorage	Private	Recreation	Earthfill	1975	Seismic Stability
AK00189	Lower Fire Lake Dam	High	State	Eagle River	local government	Recreation	Earthfill	1960	Decayed, Excess Vegetation, H&H
AK00013	Wrangell Upper Dam	High	State	Wrangell	local government	Water Supply	Earthfill	1967	Seismic Stability
AK00032	Shotter Creek Upper Dam	Significant	State	Hoonah	local government	Water Supply	Earthfill	1968	Obsolete, Decayed
AK00053	Itasigrook Dam	Significant	Uncertain	Barrow	Uncertain	Water Supply	Earthfill	1964	Decayed
AK00082	Roycroft Lake Dam	Significant	State	Moose Pass	Private	Hydroelectric	Earthfill	1979	Decayed, Excess Vegetation, H&H
AK00262	Beluga Lake Dam	Significant	State	Homer	State	Recreation	Earthfill	Unknown	Decayed
AK00012	Whitman Lake Dam	Significant	State	Herring Cove	local government	Water Supply	Concrete Arch	1932	Decayed
AK00093	Lower Eklutna	Significant	State	Eklutna	Private	Hydroelectric	Concrete Arch	1923	Obsolete, Decayed

DAM ID NUMBER	DAM NAME	HAZARD POTENTIAL CLASSIFICATION	REGULATORY LEVEL	NEAREST DEVELOPMENT	OWNER TYPE	PURPOSE	TYPE	YEAR BUILT	KNOWN OR SUSPECTED DEFICIENCY
AK00014	Wrangell Lower Dam	High	State	Wrangell	local government	Water Supply	Earthfill	1968	Seismic Stability
AK00019	Aquaculture Dam	Low	State	San Juan Cannery	Private	Water Supply	Concrete & Earth	1932	Decayed, Excess Vegetation, H&H
AK00028	Campbell Lake Dam	Low	State	Anchorage	Private	Recreation	Rockfill	1957	Erosion, Excess Vegetation
AK00064	Kotzebue Water Supply Dam	Low	State	Kotzebue	local government	Water Supply	Earthfill	1970	Stability
AK00122	New England Fish Co. Dam	Low	State	Sand Point	Private	Water Supply	Earthfill	1940	Decayed, Excess Vegetation, H&H
AK00178	Ward Cove Cannery Dam	Low	State	Ketchikan	Private	Water Supply	Timber Crib	1932	Decayed, Excess Vegetation, (H&H)
AK00105	Squaw Harbor Dam	Low	State	Squaw Harbor	Private	Water Supply	Earthfill	1970	Obsolete, Excess Vegetation
AK00214	Cabin Creek Dam	Low	State	Petersburg	local government	Water Supply	Rockfill	1996	Damage
AK00086	Chiniak Satellite Station Dam	Low	State	Kodiak	Private	Water Supply	Earthfill	1954	Obsolete, Excess Vegetation, H&H
AK00210	Hawk Inlet Cannery Dam	Low	Non-jurisdictional	Hawk Inlet	Unknown	Water Supply	Timber	1930	Obsolete, Decay
AK00079	Jerome Lake Dam	Low	Federal	Cooper's Landing	Federal	Recreation	Gabion	1967	Excess Vegetation
AK00182	Lake Lucile Dam	Low	Non-jurisdictional	Wasilla	State	Recreation	Other	1969	Decayed
AK00263	Rainbow Lake Dam	Low	Non-jurisdictional	Wasilla	Private	Recreation	Earthfill	Unknown	Decayed, Excess Vegetation
AK00145	Saxman Upper Dam	Low	Non-jurisdictional	Saxman	local government	Water Supply	Concrete	1980	Excess Vegetation
NA	KAPP Dam	NA	Non-jurisdictional	Anchorage	Unknown	Hydroelectric	Concrete	Unknown	Obsolete, Decayed

NOTES:
1) The information presented in the above table is subject to verification and should be used with caution.
2) This is a partial list of dams in Alaska with known or suspected deficiencies. The condition of all dams in Alaska is unknown. Limited information is readily available regarding Federally regulated dams.
3) Operational controls in place to assure dam safety.
4) NA - Not assigned

- Class II: A dam whose failure would, in the opinion of the DNR commissioner, result in a possible health hazard, probable loss of high-value property, probable damage to major highways, railroads, or other public utilities, or probable damage to or loss of important salmon spawning habitat as identified by the commissioner of the Department of Fish and Game, but not result in loss of human life.

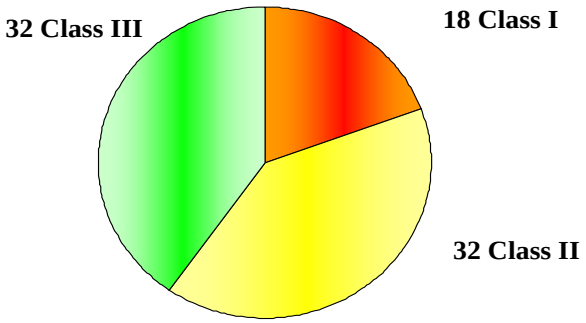

Figure 13.4 Hazard Classification of the 82 Dams under state Jurisdiction Dams

- Class III: A dam whose failure would, in the opinion of the commissioner, result in property losses restricted mainly to rural land and buildings and local roads, and would not result in loss of human life or hazard to health.

Proposed revisions to the Alaska dam safety regulations would make Alaska consistent with FEMA guidelines, where, in general, the failure of a high hazard dam would probably result in the loss of life; the failure of a significant hazard dam would result in significant economic and environmental impacts; and the failure of a low hazard dam would be limited to relatively minor consequences.

The approximately 82 dams under the State's jurisdiction can be divided into these three classifications as shown in the appropriate figures previously listed. In general, the Class I dams are located in major urban areas of Alaska such as Anchorage, Juneau, Ketchikan, and Kodiak. Class II dams are located across the state and include the major tailings storage facilities at the Fort Knox and Red Dog mines.

Fort Knox Tailings Storage Facility Dam near Fairbanks

The Alaska dam safety regulations require Class I and Class II dams to have an emergency action plan (EAP) which includes a map of the potential inundation zone in the case of a dam breach. Because of the cost in developing these maps, many of the dams do not have maps of their dam breach inundation areas. In practice, the inundation map is only required for Class I dams in Alaska, however, existing inundation map quality is limited. An informal population risk estimate for State and Federal, Class I (high) hazard potential dams in Alaska is 4,000 people.

The Carlanna Creek outlet in Ketchikan in 1982. This area could be flooded by a failure of the Carlanna Lake Dam.
Additional development has occurred since the photo was taken.

Historic Events

There have been several dam failures in Alaska's history. The most recent event occurred in July 2000 when the City of Kake's main water supply dam failed. After the dam failed, the small reservoir drained quickly and the town became acutely aware of the importance of the dam. Significantly impacted, Kake was forced to find a temporary and long-term solution to provide water to the 800 person village. The water supply loss was the most apparent impact. The local processor lost production for the next two weeks occurring at the peak of the fishing season,. The hatchery experienced an increased egg and fry mortality rate due to water quality problems. No one was injured when the dam failed, but the hatchery experienced some damage to their access road. Tragically, a child was severely scalded by boiling water in a kitchen accident later in the week when trying to make the water safe to use.

City of Kake Dam after failure on July 25, 2000

The failure of the City of Kake's Dam had a truly significant impact on the entire community. The response to this disaster included local residents and government entities, businesses, State agencies, and the federal government. The initial economic impact to the community was estimated at approximately $2 million, not including replacement of the dam. The budget for a new, replacement dam planned by the Corps of Engineers is approximately $10 million. Currently the new dam construction is complete and began operation as of April 2007.

Only one dam failure in Alaska has resulted in a fatality. Anchorage's Lake O' the Hills dam failed in 1972, resulting in the downstream death of a child swept into a culvert by the floodwaters. The inundation map for this dam includes the grounds adjacent to O'Malley Elementary School, homes, and O'Malley Road. Table 13.9 lists the known dam failures in Alaska since 1962.

Lake O' the Hills Dam in Anchorage

Existing Programs and Strategies

Alaska Dam Safety Program

By 1984, the State of Alaska recognized the need for a dam safety program within the Department of Natural Resources. Consequently, the legislature passed the Alaska Dam Safety Act in 1987, and in 1989, dam safety regulations were promulgated under Article 3 of 11 AAC 93. These statutes and regulations established the current basis of the Alaska Dam Safety Program.

> The mission of the Alaska Dam Safety Program is to protect life, property, and the environment in Alaska through the effective collection, evaluation, understanding, and sharing of the information necessary to identify, estimate, and mitigate the risks created by dams.

The purpose of the Alaska Dam Safety Program is to protect lives and property from the risks created by impounding water behind dams. The Dam Safety and Construction Unit in the Water Resources Section of the Division of Mining, Land, and Water is solely responsible for administering this program. Dams and their reservoirs represent a technological hazard that can be effectively mitigated through various measures developed to focus attention on the dam safety, assuming the appropriate financial resources are available.

Alaska Statute 46.17 authorizes the Department to employ a qualified, professional engineer to "supervise the safety of dams and reservoirs" in Alaska. The State Dam Safety Engineer is responsible for regulating dams that meet certain requirements for State jurisdiction based primarily on height, storage volume, and hazard potential classification. Federally owned or operated dams and dams regulated by the Federal Energy Regulatory Commission (FERC) are specifically exempt from State jurisdiction.

The Alaska Dam Safety Program mitigates the technological hazard of dams through a regulatory process that includes maintaining an inventory of Alaska's dams, issuing permits for the construction, operation, repair, modification, removal, and abandonment of dams, and supervising the periodic safety inspection and emergency action planning for dams. If necessary, the State Dam Safety Engineer is authorized to seek legal injunctions through the Attorney General's office or, in an emergency, to enter property and take whatever action is deemed necessary to "protect life and property from the risks posed by the dam's operation or potential failure

Table 13.9 Dam Failures in Alaska since 1962

NAME	NID NO.	DESCRIPTION	CLASS	HEIGHT	DATE OF FAILURE	TYPE OF FAILURE	CONSEQUENCES	SUSPECTED CAUSE	
Hess Creek Dam	AK00017	Earth embankment	High	56	1962	Full breach	Repair costs	Inadequate spillway design and construction	FLOOD
Slate Creek Dam	AK00175	Earth embankment	Low	30	1963	Full breach	Repair costs	Internal piping.	PIPING
Campbell Lake Dam	AK00028	Earth embankment	Low	11	1964	Full breach	Repair costs	Foundation liquefaction, slope stability	SEISMIC
Lake of the Hills Dam	AK00034	Earth embankment	High	13	1964	Unknown	Unknown	Seismic	SEISMIC
Old Eklutna Dam	None	Earth and sheet pile	Low	NA	1964	Structural damage	Replacement costs	Seismic racking	SEISMIC
Lake of the Hills Dam	AK00034	Earth embankment	High	13	1972	Full breach	One life lost	Inadequate low level outlet design and construction. Classic piping.	FLOOD
Old Carlanna Dam	None	Timber cribbing	High		1973	Full breach	$2.2 million property*	Heavy rains.	FLOOD
Old Monashka Creek Dam	AK00073	Earth with sheet steel core	Low	24	1978	Full breach	Replacement costs	Insufficient spillway capacity.	FLOOD
Alitak Cannery Dam #2	AK00091	Earth embankment	Low	18	Before 1980	Spillway damage	Unknown	Inadequate spillway design and construction	FLOOD
Alitak Cannery Dam #4	AK00095	Earth embankment	Low	12	Before 1980	Full breach	Unknown	Unknown	UNKNOWN
Larson Bay Dam	AK00088	Concrete gravity	Low	14	Before 1980	Full breach	Unknown	Degradation of concrete	DETERIORATION
Upper Memory Lake Estates Dam		Earth embankment			1982				
Campbell Lake Dam	AK00028	Earth embankment	Low	11	1989	Full breach	Repair costs	Insufficient spillway capacity.	FLOOD
Valdez Creek A5 Dam	None	Compacted waste rock	Low	NA	1991	Full breach	65 million gallons of tailings released to Valdez Creek	Internal piping.	PIPING
Fish Creek Dams	None	Earth	Low	NA	1992	Unknown	Water quality upset	Unknown. See Ft. Knox history file (AK00212)	
New Valdez Creek A5 Dam	None	Compacted waste rock	Low	45	1992	Full breach	15 million gallons of tailings released to Valdez Creek	Internal piping.	PIPING
Shotgun Diversion Dam	AK83009	Rockfill w/concrete face	Low	40	1999	Overtopping	Repair costs	Overtopping	FLOOD
City of Kake Dam	AK00144	Timber Frame	Significant	23	2000	Full breach	$2 million economic	Structural damage	DETERIORATION

Source: DNR, Dam Safety and Construction Unit, 2004
NOTES:1) The information presented in the above table is subject to verification and should be used with caution.

Hazard Mitigation Success

Guidelines for Cooperation with the Alaska Dam Safety Program

The Alaska Dam Safety Program published "Guidelines for Cooperation with the Alaska Dam Safety Program" (2003). This document is a compendium of information regarding the Alaska Dam Safety Program and includes recommendations for minimum standards based on the hazard potential classification for dam design, construction, and operation, including hydrologic and seismic evaluations, construction quality assurance, and emergency action planning.

Emergency Action Planning for Dams

In 1998, the Alaska Legislature established performance measures for the Alaska Dam Safety Program that included reviewing and exercising up to six emergency action plans (EAPs) at dams within the following fiscal year. However, out of more than 40 Class I and II hazard potential dams that required EAPs, only about six plans were on file with the Department and none were current. The Dam Safety and Construction Unit chose to pursue a cooperative effort with the dam owners and operators by providing local training opportunities regarding EAPs to raise the compliance level with this important hazard mitigation requirement. The Dam Safety and Construction Unit hosted three courses in Anchorage in 1999, 2000, and 2001 with financial assistance from FEMA and the Association of State Dam Safety Officials (ASDSO). The first course was titled "How to Develop an Emergency Action Plan for Dams" and was presented with assistance from the Illinois Department of Natural Resources and the Illinois Division of Emergency Services. Upon invitation from Alaska, the FERC then presented the "Emergency Action Plan Exercise Design Course," with assistance from the Public Utility District (PUD) No.1 of Douglas County, Washington, who provided a dam owner's perspective at the second course. The final course called "Dam Failure Analysis" was a technical seminar presented at the ASDSO Western Region Conference held in Anchorage in 2001.

Lower Fire Lake Dam in Eagle River

Tangible Benefits of Dam Safety

- Long service life on capital investments due to regular inspections and maintenance.
- A reduced risk of loss due to catastrophic failures of a dam.
- Public safety of parties not directly involved with operation of dam.
- Independent review of technical issues associated with the facility.
- Reduced insurance premiums as a result of favorable ratings from the National Flood Insurance Program.

Intangible Benefits of Dam Safety

- The image of responsibility associated with the support of and compliance with a properly developed and administered dam safety program.

The result of this approach can be measured much easier than the benefits. Twenty-one students attended the 1999 course, 25

students attended the 2000 course, and 42 students attended the 2001 course. These people represented some of the key dam owners and operators in Alaska and their consultants, as well as several emergency response managers. Consequently, new or revised EAPs are now on file for 17 state jurisdictional dams in Alaska. The benefits achieved by raising the compliance level with one of the most important aspects of a dam safety program are immeasurable.

Hazard Classification and Jurisdictional Review

The question of the hazard potential classification and the jurisdictional status of existing and proposed dams recur on a regular basis. A dam that was once a Class (III) low hazard dam could become a Class I (high) hazard dam if development occurs in the dam break inundation zone. The hazard potential classification must be defined in advance to determine design and construction standards for proposed new dams. The Dam Safety and Construction Unit developed the Hazard Classification and Jurisdictional Review form to address this question on a consistent basis. Since 2001, 45 dams have been reviewed, including 30 existing dams and 15 proposed new structures.

Alaska Dam Rehabilitation Projects

The highest risk dam in the State, the Lower Fire Lake Dam in Eagle River is currently undergoing a major rehabilitation. Additional dam rehabilitation occurred at the Red Dog Mine Tailings Dam, Itasigrook Dam in Barrow, and Whitman Lake Dam in Ketchikan. The replacement dam which failed in Kake in 2000 is complete as of April 16, 2007. Water is being impounded on a temporary authorization from ADNR. A certificate of approval to operate a dam is contingent upon completion of the post-construction documentation, including the site Emergency Action Plan (EAP). Two high hazard dams in Kodiak have been removed. The dam rehabilitation work in the State will continue to ensure the highest degree of safety for the residents of Alaska.

Goals

1. Improve information, data collection, and compliance

Mitigation Measures: Educational; Preventative

1.1. Objective: Obtain accurate vulnerability information for the Class I and Class II State jurisdiction dams.

Determining the risk associated with a particular facility requires access to a broad range of technical information that is often not available. Obtaining good quality information can be a costly and time-consuming operation. For example, construction records may not be available for an old dam. To fully understand the ability of the structure to withstand an earthquake may require a geotechnical investigation of the dam and its foundation, a site specific seismic assessment, and a structural stability evaluation. The total cost to collect this type of information could easily be more than $100,000. A number of dam owners in Alaska simply lack the funding to fully understand the risks created by their dams. In addition, much of the data in the Alaska Dam Inventory is based on the original inventory conducted in the early 1980s. The quality of this data, including the hazard potential classification, needs to be verified for each dam. This

important task is costly and time consuming, but imperative to have an accurate understanding of the risk.

1.1.1. Action: Obtain vulnerability information for one Class I and Class II State jurisdiction dam every year.

Lead: DNR, Dam Safety and Construction Unit
Support: DNR, dam owners
Timeline: 20 years

1.1.2. Action: Convert existing dam inundation maps into an electronic format suitable for Geographical Information System / Geospatial Information Technology (GIS/GIT) use.

Lead: DNR, Dam Safety and Construction Unit
Support: DNR, dam owners, DHS&EM
Timeline: 10 years

1.2. Objective: Obtain current Periodic Safety Inspections and EAPs for all Class I and II dams under State jurisdiction.

Alaska dam safety regulations require all dams under State jurisdiction to have a current periodic safety inspection and Class I and Class II dams to have current EAPs. At the end of State fiscal year 2007 only 53% of state jurisdiction dams have a current periodic safety inspection, and 37% of Class I and Class II state jurisdiction dams have an EAP, of which only 16% are current.

1.2.1. Action: Contact dam owners without a current periodic safety inspection or EAP and establish a timeline for them to provide current information.

Lead: DNR, Dam Safety and Construction Unit
Support: Dam owners
Timeline: 10 years **(On-Track Due and overdue notices are sent out annually)**

2. Improve agency response capability to dam related emergency

Mitigation Measures: Educational; Preventative

2.1. Objective: Develop an EAP for the Dam Safety and Construction Unit

The Dam Safety and Construction Unit is usually included in the notification flowcharts of dam specific, emergency action plans. However, the specific responsibilities of the DNR during a dam emergency are not always defined. Furthermore, the independent actions of the Dam Safety and Construction Unit during a natural disaster, such as severe flooding or an earthquake are not defined either. An EAP is required in order to anticipate the appropriate actions that should occur on the part of the DNR during such events. This objective is consistent with the goals identified in the FEMA grant to the Dam Safety and Construction Unit from the National Dam Safety Program.

2.1.1. Action: Develop an EAP for the Dam Safety and Construction Unit

Lead: DNR, Dam Safety and Construction Unit
Support: FEMA, DHS&EM

Timeline: 2 years **(Accomplishing-The draft "Emergency Action Plan for Generic Dams" developed for Dam Safety by Meridian Management will be revised and completed as the "Emergency Action Plan for the Alaska Dam Safety Program". This document will outline steps for Dam Safety in a dam related emergency, expectations from other government agencies, and establish communication protocols. This work is complete and under review as of July 5, 2007).**

3. Quantify the risk to the state of Alaska from dams

Mitigation Measures: Educational; Preventative

3.1. Objective: Conduct a statewide risk assessment for dams in Alaska

A risk assessment will help understand and quantify the risk from dams to the State of Alaska. A better understanding of the risks will help develop priorities for the Alaska Dam Safety Program and identify areas where mitigation efforts should be focused to maximize limited resource efficiency. This objective is consistent with the goals identified in the FEMA grant to the Dam Safety and Construction Unit from the National Dam Safety Program.

3.1.1. Action: Retain a contractor to develop statewide dam risk assessment

Lead: DNR, Dam Safety and Construction Unit
Support: FEMA, DHS&EM
Timeline: 2 years **(Suspended- Dam Safety recently put out an RFP in 2007 for a risk evaluation of dams in Alaska. This project is intended to generally categorize and quantify risks to and from dams. No proposals were received from this solicitation, in spite of a deadline extension. This project is suspended indefinitely.)**

4. Increase staff in the Dam Safety and Construction Unit

Mitigation Measures: Educational; Preventative

4.1. Objective: Hire an Engineering Assistant

The Dam Safety and Construction Unit staff consists of one Technical Engineer II. This individual is responsible for supervising the safety of more than 80 State jurisdiction dams, as well as the technical review of all applications for new construction that may be submitted. The result is a “fireman’s job” where limited resources must be allocated to projects with a perceived high priority. AS 46.17 authorizes the DNR to retain a contractor to assist with technical reviews; however, this is practical only with a new application that has a sufficient fee to cover the associated costs. (This also adds administrative responsibilities to the workload that further interferes with the technical engineering responsibilities of the job). Furthermore, if the State licensing program for small hydroelectric facilities (5 megawatts and less) comes into effect, an unknown number of additional dams could come under State jurisdiction. This would increase the workload of the Dam Safety and Construction Unit and the risk of dams under State supervision.

Because the number of dams in Alaska is small in comparison to other states, a large

dam safety staff is not justified. However, an Engineering Assistant I or II would be a direct benefit to identifying effective mitigation initiatives for the dam safety program. This would result in a total staff of two engineers in the Alaska Dam Safety Program. The additional cost would be the associated salary and benefits. The risk associated with limited technical staff in the State's dam safety regulatory agency was identified in a peer review of the Alaska Dam Safety Program conducted by the ASDSO in 2002.

4.1.1. Action: Hire an Engineering Assistant

Lead: DNR, Dam Safety and Construction Unit
Support: DNR, Legislature, Regulatory Commission of Alaska
Timeline: 5 years **(*Busted*-Dam Safety requested a staff increase in the FY 2008 budget request. In light of budget cuts proposed by the current gubernatorial administration, this goal is off track for the next state fiscal year.)**

5. Increase public awareness about dam safety

Mitigation Measures: Educational; Preventative

5.1. Objective: Continue to conduct outreach/awareness activities

The concept of dam safety in Alaska currently suffers from relative obscurity from a public awareness perspective. Many Alaskans are not aware of dams in Alaska or the Alaska Dam Safety Program. The Dam Safety and Construction Unit has increased public awareness by promoting the National Dam Safety Awareness Day, hosting the Western Region Conference of the ASDSO, and providing local training opportunities for dam owners and operators, consultants, regulators, and emergency managers. In addition, presentations on dam safety have been made for professional organizations such as local chapters of the American Society of Civil Engineers and the Alaska Miners Association, and the State Dam Safety Engineer has served as a guest lecturer at the Alaska Pacific University. This objective is consistent with the goals identified in the FEMA grant to the Dam Safety and Construction Unit from the National Dam Safety Program.

5.1.1. Action: Continue to promote public awareness

Lead: DNR, Dam Safety and Construction Unit
Support: FEMA, ASDSO, DHS&EM,
Timeline: 2 years **(*On track*-this goal is currently being accomplished daily, inadvertently. The media storm surrounding the Pebble project is highlighting the significance of dams and the importance of dam safety. Incidentally, this project will be under state dam safety jurisdiction. One of the dams at this project is conceptually 740 feet maximum height by 16,000 feet in length. Dam Safety will be directing an independent design review panel as part of the regulatory process for this project.)**

6. Improve Communication

Mitigation Measures: Educational; Preventative

6.1. Objective: Improve communication between federal, State and local agencies

The biggest problem in working with the various Federal, State, and local agencies is communicating with, and understanding the roles, that various parties play. This is most acute at the local level where perceived priorities, project understanding, and financial and human resources limit the ability of the various participants to coordinate effectively. For example, local agencies or private entities often seem to underestimate the value of an EAP.

6.1.1. Action: Continue to participate in the State Hazard Mitigation Advisory Committee

Lead: DHS&EM
Support: DNR, Dam Safety and Construction Unit
Timeline: On-going

7. Dam Rehabilitation

Mitigation Measures: Educational; Preventative

7.1. Objective: Rehabilitate the dams with known or suspected deficiencies.

As seen in Table 13.5, a substantial number of dams in Alaska need repairs, ranging from completing deferred maintenance to major dam rehabilitation. Alaska was included in a recent report entitled "The Cost of Rehabilitating Our Nation's Dams" prepared by a task committee of ASDSO (revised in October, 2003). The report looked at the total number of "eligible" (non-federally owned dams) on the National Inventory of Dams and evaluated the need for rehabilitation through a detailed logic diagram. The rehabilitation cost was weighted based primarily on the height of the dam, and included considerations for deferred maintenance, detailed engineering assessments, hazard potential reclassification, physical improvements, or removal. No consideration was given to specific knowledge regarding the condition of actual dams in Alaska. Based on the methodologies presented in the report, the rehabilitation cost was estimated at $18,729,120 for 21 high hazard potential dams in Alaska.

Note: This cost estimate does not include significant or low hazard potential dams. In addition, performing a more detailed cost estimate based on site specific information about dams in Alaska was beyond the scope of this annex.

In many cases, the owners of these dams lack the financial capability to address these deficiencies. On a national level, the Small Watershed Rehabilitation Act was recently funded, but Alaska does not have any dams that qualify for financial assistance under the bill. Some states have established low interest, revolving loans, grants, or other creative alternatives to provide financial resources for dam rehabilitations. Financial support for a broad range of dams needing hazard mitigation related rehabilitation is a current national level discussion subject, and should be discussed on a State level in Alaska as well.

7.1.1. Action: Identify potential funding sources that can be used for dam rehabilitation.

Lead: DNR, Dam Safety and Construction Unit
Support: DHS&EM, FEMA, ASDSO
Timeline: 5 years **(*Accomplishing*-This long term goal will require**

patience and perseverance over a long period of time; however, significant accomplishments have been made. (See Hazard Mitigation Success in this section) Rehabilitation projects are pending at the Campbell Lake Dam in Anchorage, the Vortac Lake Dam in Kotzebue, and the Wrangell Dam Complex in Wrangell.)

Summary of local capabilities, goals and actions

Anchorage

Capabilities: planning, zoning and education.

Goals: continued planning and education. Mapping overlay zone.

For more specified information about these areas please refer to appendix 20.

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5.13 OIL SPILLS & HAZARDOUS MATERIALS

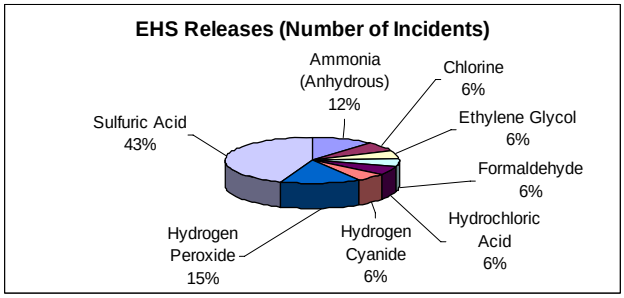
The State contains a number of thoroughfares over which hazardous substances may be transported. These include the approximate 2500 miles of highway system, the Alaska Railroad, airports, and marine vessel traffic. All classes of hazardous substances may be expected on these routes. The most common method of transport along the highway system is with semi-tractor trailer rigs. The Alaska Railroad is also a major transporter of hazardous substances. Ocean-going vessels transport hazardous substances into and out of upper Cook Inlet and other coastal communities. Fresh water transport occurs on a smaller scale, yet can be fairly extensive in the Yukon-Kuskokwim Delta during summer months. Air transport is not a common means of transporting hazardous substances into or out of the State. Small quantities of hazardous substances may be transported to airports for subsequent distribution on fixed-wing aircraft. In addition, there are a number of fixed sites within the State where hazardous substances are stored and used. Hazardous substance releases may also occur as a result of other natural hazards, such as earthquakes, fire, floods, and weather extremes.

Hazard Analysis/Characterization

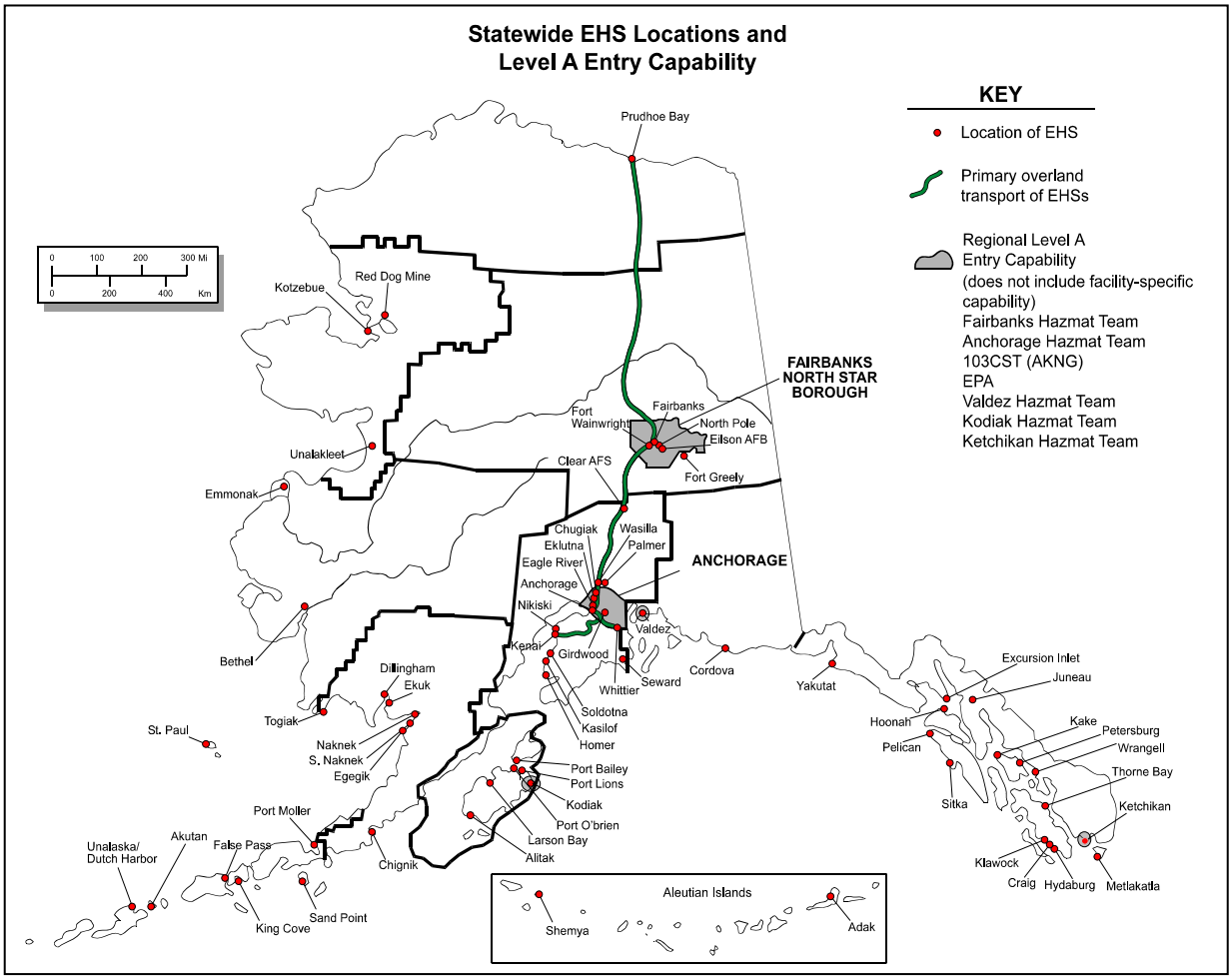
The definition of a hazardous substance is: an element or compound which, when it enters into the atmosphere or in or upon the water or surface or subsurface land presents an imminent and substantial danger to the public health or welfare, including but not limited to fish, animals, vegetation, or any part of the natural habitat in which they are found.

“Hazardous substances” generally refers to petroleum products, natural gas, synthetic gas, acutely toxic chemicals and other toxic chemicals. “Hazmat” is the common term used to describe hazardous substances – those which pose a threat to safety, human health and the environment. Hazmat releases demand immediate attention because of this threat. Hazardous materials are characterized as HS (hazardous substances) or EHS (extremely hazardous substances). While all hazardous substances can present problems when spilled, those classified as EHS are of primary concern. These substances, such as chlorine and ammonia, pose an acute inhalable toxic threat to humans.

The U.S. Environmental Protection Agency (EPA) has classified over 300 substances as EHS. Approximately 20 of these chemicals are commonly used in Alaska. The State of Alaska experienced a total of 34 extremely hazardous substance (EHS) releases during Calendar Year 2006 (January 1 thru December 31, 2006).



The map below shows EHS-handling facilities throughout the State.

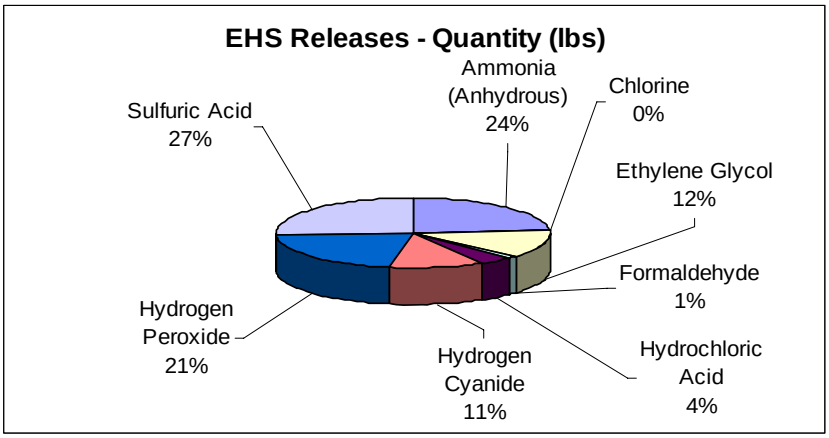


EHS Releases by Substance and Quantity: The following is a breakdown of the EHS released over this 12-month period. To ensure consistency, the total volume released was converted to pounds, using a factor of 1 gallon = 8 pounds. Sulfuric acid accounted for nearly 50% of the total number of releases. The number of anhydrous ammonia releases has been reduced significantly.

Substance	Number	Quantity (lbs)
Ammonia (Anhydrous	4	258
Chlorine	2	4
Ethylene Glycol	2	136
Formaldehyde	2	10
Hydrochloric Acid	2	48
Hydrogen Cyanide	2	120
Hydrogen Peroxide	5	232
Sulfuric Acid	15	283
Total	**34**	**1091**

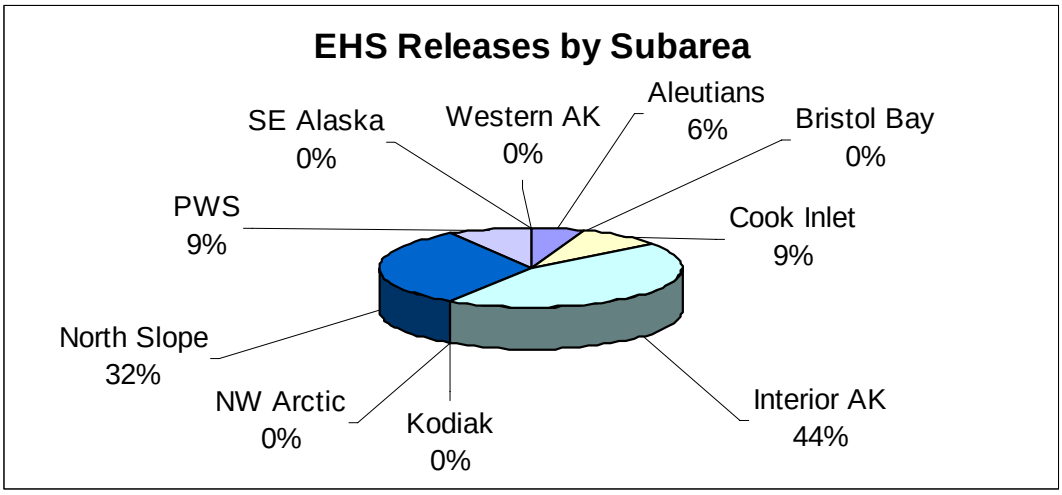
Significant EHS Releases: The significant EHS releases (100 lbs or greater) were as follows:

- 200 pounds (25 gallons) of hydrogen peroxide (September 19, 2006 – Interior Alaska)
- 112 pounds (14 gallons) of ethylene glycol (October 3, 2006 – Interior Alaska)
- 100 pounds of anhydrous ammonia (August 29, 2006 – Cook Inlet)
- 100 pounds of anhydrous ammonia (October 24, 2006 – Cook Inlet)



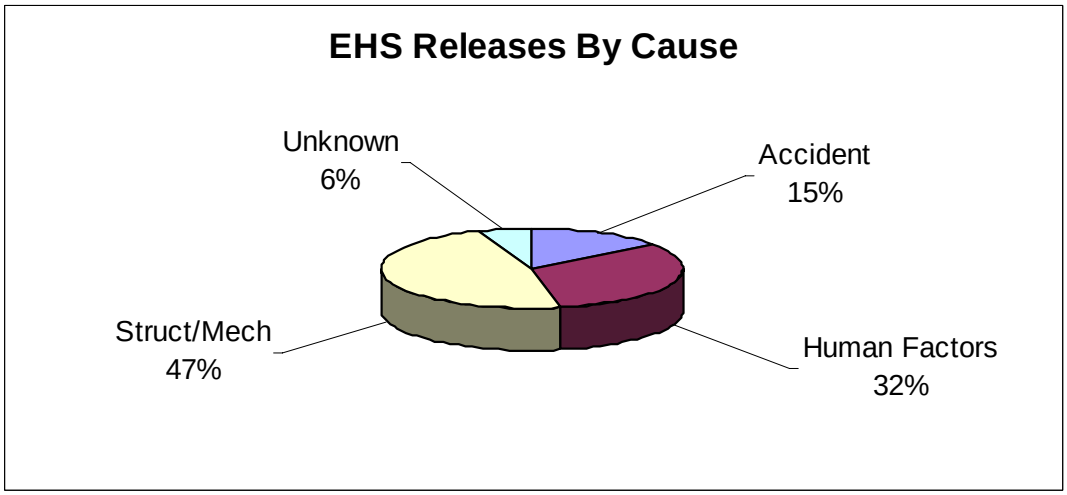
EHS Releases by Location: In terms of EHS releases by sub area, Interior Alaska (44%) led the way, followed by the North Slope (32%). Several other sub areas did not experience any reported EHS releases.

EHS Releases by Sub area	Number
Aleutians	2
Bristol Bay	0
Cook Inlet	3
Interior AK	15
Kodiak	0
NW Arctic	0
North Slope	11
Prince William Sound	3
Southeast Alaska	0
Western AK	0
Total	**34**



EHS Releases by Cause: Structural/Mechanical (47%) and Human Factors (32%) were the two leading causes of EHS releases in the State of Alaska.

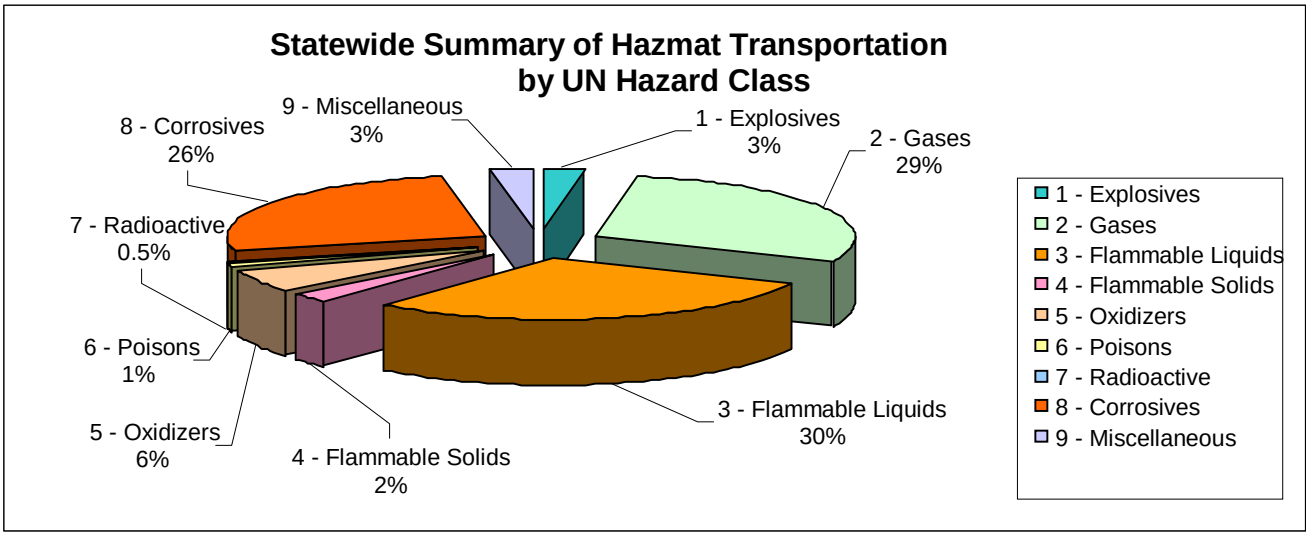
EHS Releases By Cause	Number
Accident	5
Human Factors	11
Structural/Mechanical	16
Unknown	2
Total	**34**



The Alaska Department of Environmental Conservation (DEC) is required by law to respond to hazardous substances releases and ensure public health, welfare, and environment protection. This includes ensuring the containment and cleanup of released material and problem correction.

The two primary types of hazardous substance releases are:

1. **Stationary -** The uncontrolled release of hazardous substances from a fixed site such as hazardous substance storage sites, or sites where hazardous substances are used.
2. **Transportation -** The uncontrolled release of hazardous substances during transport such as highways, railway, pipelines, and waterways.



Historically, State major hazardous substance incidents have involved highway and/or railway transportation. Numerous small incidents from fixed sites and roadway transportation have occurred. Persons, property, and environment at risk depend on the nature of the hazardous substance released, quantities, location, and prevailing environmental conditions (i.e. weather).

Hazard Vulnerability Analysis

Statewide Hazardous Materials (HAZMAT) Commodity Flow Study

This study was jointly sponsored by DEC, the Alaska Department of Military and Veterans Affairs (DMVA), and Region 10 of the U.S. Environmental Protection Agency (EPA). The study provides a comprehensive hazardous material and hazardous substances transportation commodity flow report for the State, including information on major petroleum product pipelines. The report can be found on the State website at http://www.ak-prepared.com/serc/acrobat_docs/hazmat_flow_study.pdf

Air Quality

Some inhalable highly toxic hazardous substances can be released into the air as a gas, such as chlorine or ammonia. A flammable hazardous substance can produce toxic smoke. An airborne release would most likely occur from a stationary source or from a transportation incident. Airborne hazardous substances will generally have a limited vulnerability zone before it is dispersed into the atmosphere. The vulnerability zone is determined by changing wind speed, direction.

People should immediately evacuate designated areas when instructed and should not re-enter the area until emergency response personnel have verified the hazards are clear. Those who experience any adverse symptoms from hazardous substance release exposure should contact their local physicians for assistance.

Drinking Water Supply System

Do the following if a liquid hazardous substance is released near a drinking water well: First, contact the local DEC office to report the spill; and second, to obtain additional information on specific well water testing procedures to see if it may be contaminated with products that could pose a health risk. DEC recommends that water well testing be discussed with an independent a State certified laboratory concerning potential problems and their recommendation for sampling analysis. A standard screening test for petroleum hydrocarbons is called TPH (total petroleum hydrocarbons). A TPH analysis could be done if the homeowner is unsure of the type of petroleum contamination that may be in the well. If the TPH test indicates the presence of petroleum hydrocarbons, additional testing may be needed to determine if it is gasoline or diesel. If gasoline contamination is suspected, the water should be tested for VOC's (volatile organic compounds). If diesel contamination is suspected, the water should be tested for DRO (diesel range organics). Again, it is best to discuss the suspected problem with a laboratory specialist to determine the best water analysis process.

Wastewater Disposal System

Do not dispose of hazardous substances in an onsite sewer system, or a drain connected to city sewer. Not only can hazardous substances harm the onsite sewer system and cause ground and groundwater contamination, it's illegal to dispose of them into a sewer system. If the groundwater becomes contaminated, the well and/or neighboring wells may also become contaminated. Normal amounts of used household chemical products, such as detergent, bleach, drain cleaners, toilet bowl cleaners, and deodorizers, and other household chemicals are okay to dump down the drain into a sewer system and will not harm the system or interfere with the natural bacterial action in the septic tank.

There are a number of Household Hazardous Waste collection events throughout the State at local landfills where a person can deliver used or unused hazardous substances and dispose of them safely. Contact the local landfill to find out if and when they might provide a collection event.

Existing Strategy and Programs

DEC Prevention and Emergency Response Program

Oil and hazardous substance handling can pose a significant threat to Alaska's economy and environment. The State's social and economic history has been altered by oil development and expanding chemical use since the discovery and development of the Kenai and Cook Inlet oil and gas fields in the 1950's and 60's. Alaskans have long recognized the need for protecting our natural resources and prudent oil and hazardous

substances management have necessitated developing laws to ensure it will happen. These laws prohibit the discharge of oil or hazardous substances, require prompt reporting when a spill does occur, and mandate containment, control, removal, and proper waste materials disposal. Under existing State and federal law, the spiller is responsible for cleanup.

March 2004 Seward Vessel HAZMAT exercise
Courtesy DEC

The Alaska Department of Environmental Conservation (DEC) is tasked with carrying out these laws. The Prevention and Emergency Response Program (PERP) within the Division of Spill Prevention and Response (SPAR) is responsible for ensuring prevention of spills and response to spills that do occur. To make sure spills get cleaned up, Alaskans have established the Oil and Hazardous Substance Release Prevention and Response Fund, which pays for State and local government cleanup costs. The Department is mandated by statute to seek cost recovery from the spiller and reimburse the fund.

The mission of DEC's Prevention and Emergency Response Program is to protect public safety, health, and the environment by preventing and mitigating the effects of oil and hazardous substance releases and ensuring their cleanup through government planning and rapid response. The program is Alaska's primary response organization for emergency response to oil and hazardous substance releases. The Program's goals are to protect public health and the environment from the direct or indirect effects of spills, guard the safety of persons involved, undertake or confirm satisfactory cleanup and mitigate spill impacts and damage restoration, and recover State-incurred costs to the Oil and Hazardous Substance Release Prevention and Response Fund.

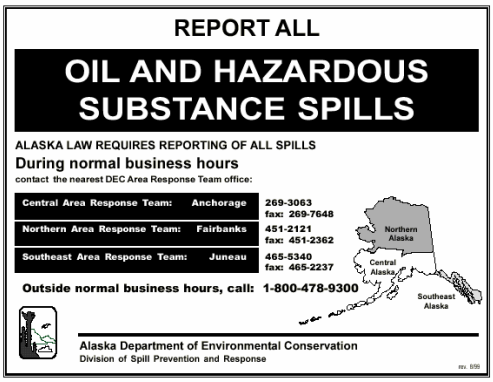
***Prevention*:** The prevention program's goal is to "make the system safer." In an ideal situation, all oil and hazardous substance spills could be prevented; however, this is not always the case. Spill prevention is achieved by eliminating human and mechanical failure to the greatest extent possible, using the best technology and practices, and having back-up safety systems in place. PERP staff works with industry and the public to identify and implement ways to prevent spills.

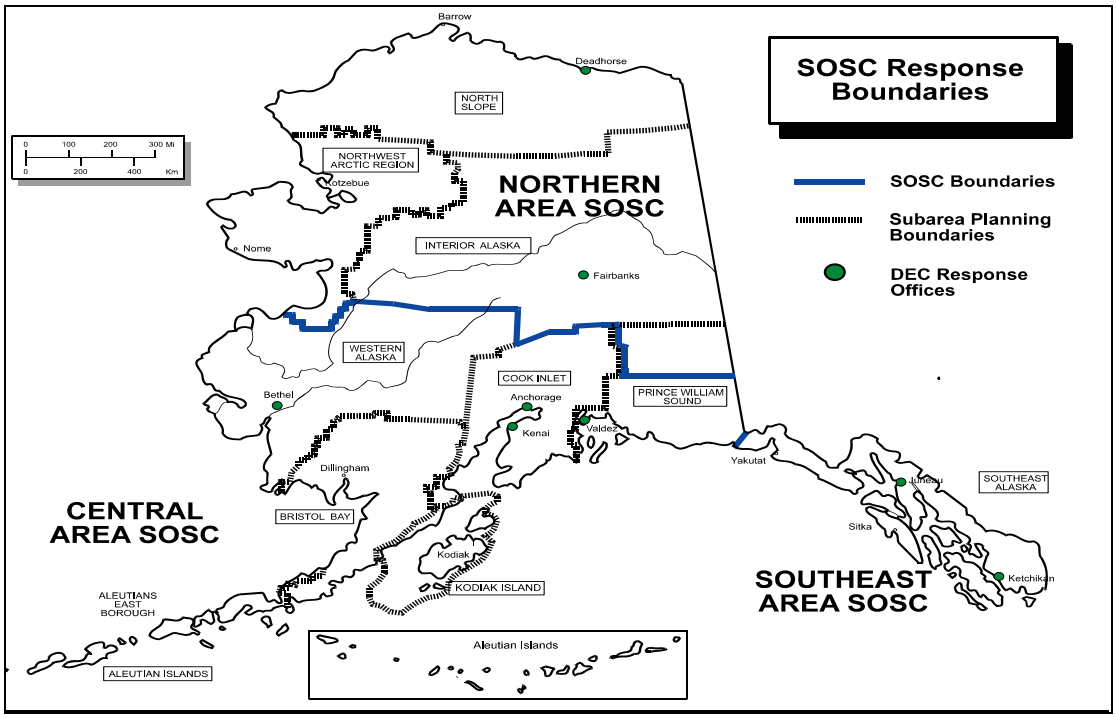
PERP maintains a comprehensive spill database and produces periodic spill summaries which detail source, cause, type, amount, and other information for all reported spills. Timely and accurate spill information allows staff to track the spill frequency and causes and target specific areas for spill prevention initiatives.

Research oil and hazardous substance spill prevention and response technologies is an important factor in preventing and mitigating the spill effects. PERP staff works with key players throughout the international oil-spill research community to conceive, discuss,

and identify projects that will enhance the ability of the State and industry to prevent and respond to oil spills. DEC works with its Alaska stakeholders to identify and prioritize projects that will provide the greatest benefit to all Alaskans. Participants continue to research cleanup technology, non-mechanical response options, fate and effects of spilled oil, contingency planning and preparedness, training, spill-management systems and spill prevention has been proposed or conducted in cooperation with citizens' groups, industry oil-spill response cooperatives, other State and federal agencies, and academic institutions.

***Preparedness*:** The preparedness program's goal is to "make industry and government's ability to prepare and respond to spills better." DEC receives over 2,000 oil and hazardous substance release reports each year. A field visit or follow-up assistance is required for roughly 40% of all reported spills. PERP staff may initiate and sustain ongoing response activities for 50-100 significant incidents in any given year. The majority of spill reports are made during normal working hours to the nearest DEC team. DEC also has a callout system for receiving spill reports, mobilizing and responding to a significant spill at any time and any location in the State. DEC maintains a toll-free 24-hour spill reporting number.





The State is divided into three DEC Area Response Teams based in Anchorage, Fairbanks, and Juneau, with field units in Bethel, Kenai, Ketchikan, North Slope, and Valdez. Each Area Response Team has a pre-designated State On-Scene Coordinator

(SOSC). Area Response Teams have expertise and resources to combat a spill and also work in coordination with other State, local, and federal officials. DEC response teams are trained to assess the hazard and determine what actions should be taken for either oil or hazardous substance spills. Industry and government-led drills and exercises are a critical component of response readiness. After-action spill response and training drill reviews are undertaken to identify areas for further improvement.

PERP maintains a specialized equipment inventory to carry out its mission. Equipment standards, procurement, inventory, and management are the statewide PERP Logistics Team's responsibility. In addition, PERP maintains term contracts with private oil-spill response organizations which can be activated in an emergency to provide additional resources. Activation of local response resources through community spill response agreements, ramp-up of personnel from other programs and State agencies, and emergency hires are some of the other ways in which PERP augments its capability to respond to significant incidents. DEC also maintains cooperative response agreements with other State and federal agencies, including the U.S. Coast Guard, Environmental Protection Agency, Minerals Management Service, and the Alaska Department of Military and Veterans' Affairs.

The Alaska Federal/State Preparedness Plan for Responses to Oil and Hazardous Substance Discharges/Releases (Unified Plan) provides the blueprint for government response to oil and hazardous substance spills. DEC is actively involved in developing the Unified Plan's ten Sub area Contingency Plans, each of which covers a different geographic region of the State. The Unified and Sub area plans are used to coordinate an effective spill response.

Response: The response program's goal is to "Keep Alaska Cleaner". To meet its statutory responsibilities, DEC has implemented the following Response Objectives:

- Safety – Ensure the safety of all persons involved in a response or exposed to the immediate effects of the incident.
- Public Health – Ensure the protection of public health from the direct or indirect effects of contaminated drinking water, air, or food.
- Environment – Ensure the protection of the environment, including natural and cultural resources, from the direct or indirect effects of contamination.
- Cleanup – Ensure adequate containment, control, cleanup, and disposal by the responsible party, or take over the response when cleanup is judged inadequate.

August 24, 2002 Qanirtuuq Princess Ammonia Cylinders in water
Courtesy DEC

- Restoration – Ensure contamination damage assessment, property restoration, natural resources and environmental protection is accomplished.
- Cost Recovery – Ensure cost recovery is addressed and penalties recovered to reimburse the Oil and Hazardous Substance Release Prevention and Response Fund making the fund available for future emergency response actions.

"Response" includes all actions taken by the Department to ensure safety, while protecting public health and the environment. Spill containment, control, damage assessment, clean up; and cost recovery are essential to the State. In most cases, the spiller conducts the actual cleanup under DEC oversight. The Department oversees cleanup activities, taking into account the concerns of the public under what might be called the "responsible party" system. The Department takes over the response using its cleanup contractor resources if necessary when cleanup is inadequate, or the spiller is unknown (called an "orphan spill").

The goal of a cleanup is to protect the public and State resources while cleaning up the spill. Frequently the fastest, most efficient and least expensive method is to work with the responsible party. In some cases, immediate actions by the Department as well as local public safety and fire personnel are needed to ensure the safety and health of those who may be directly affected by an oil or hazardous substance spill.

During a spill response, PERP staff carries out a variety of key tasks, depending on the size and nature of the incident. The Department only responds to those which may have a significant impact on public health or the environment because of the large number of reported spills. For small spills, PERP staff may work over the phone with the responsible party to ensure cleanup. Some of the key tasks during a response are:

- ensuring the safety of those involved
- protecting public health
- identifying the spiller or "responsible party"
- evaluating the adequacy of the cleanup
- investigating the cause
- determining the volume spilled and recovered
- tracking the movement of the spill
- measuring and documenting the extent of contamination
- ensuring the containment, cleanup, removal and disposal of spilled materials
- coordinating with all local, State and federal interests using the Incident Command System (ICS)
- providing logistical support for field operations
- assessing damage to natural resources
- ensuring restoration of the environment

The operations carried out during a response are varied and complex and require a very high level of training, experience, and organization. These operations are carried out by DEC Area Response Teams. DEC uses its internet website to inform the public about significant spills. DEC is also expanding the site to make spill response information more readily available to the interested public.

Several key prevention and response enhancements for DEC include the following. All of these may be reviewed at: http://www.dec.state.ak.us/spar/perp/index.htm

- Alaska Incident Management System (AIMS) Guide for Oil and Hazardous Substance Response
- Spill Tactics for Alaska Responders (STAR Manual)
- Alaska Commercial Fisheries Water Quality Sampling Methods and Procedures Manual
- Geographic Response Strategies
- Potential Places of Refuge guidance documents
- Tundra Treatment Manual
- In Situ Burning Guidelines

Statewide Hazardous Material Response

DEC's statewide hazmat response planning is intended to better protect public health and the environment from the effects of hazmat releases by:

- Establishing an in-State hazmat response capability that will facilitate rapid response to a Level A or Level B incident anywhere in Alaska.
- Developing, maintaining, and enhancing existing hazmat offensive and defensive response capabilities at the local level.
- Developing and maintaining effective response strategies and cooperative agreements to integrate local hazmat response capability into the State's overall response network.

Kodiak HAZMAT Exercise
Courtesy DEC

Response to a hazmat release requires specialized training and equipment. Responders to hazmat spills need to be protected from dangerous chemicals. Protective clothing, respirators, or self-contained breathing apparatus may be required. The protection level needed corresponds to the nature of the release and the potential health threat from the substance. There are four hazmat responder protection levels:

1. "Level A" provides the greatest level of respiratory, skin, and eye protection, including a fully-encapsulating suit and self-contained breathing apparatus (SCBA).

2. "Level B" also provides SCBA and chemical-resistant clothing.

3. “Level C” provides a respirator and chemical-resistant clothing, while

4. “Level D” provides coveralls without respiratory protection and is used for responses to the least harmful substances.

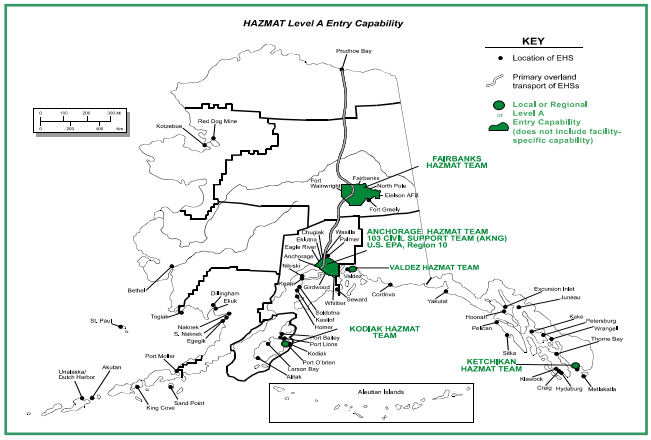
A Level A hazmat team may consist of up to eight people with associated response gear, and may require considerable communications and other logistical support. The team is designed to take “offensive” action, such as entering the “hot zone” to stop or contain the release. Depending upon the nature of the incident, “defensive” action, such as establishing a safe perimeter and evacuating those at risk from the release, may be the preferred response option. Incidents requiring Level A or B gear are of primary concern since they pose the most significant threat to public health and welfare. DEC’s efforts are focused on developing and enhancing the capability to respond to such incidents in Alaska.

Alaska Statewide Hazardous Materials Response Team

The Statewide Hazmat Team is composed of several teams capable of deploying to any location in the State to respond to a Hazmat release. The Team is “Level A” capable (i.e., the highest level of capability for response). The Teams are based in Anchorage, Fairbanks, Kodiak, Valdez, and Ketchikan and are available for callout through the DEC State On-Scene Coordinator (SOSC). The Teams are available for emergency response only, and not for cleanup and recovery operations. Once the emergency phase is terminated, the teams are returned to their location of origin.

Statewide Hazardous Response Team September 27, 2002 Chlorine release at APU Swimming Pool
Courtesy DEC

Other hazmat response capabilities within Alaska include the Alaska National Guard 103rd Civil Support Team, the U.S. Environmental Protection Agency (EPA), and the Department of Defense.



Community Spill Response Program

Hundreds of oil and hazardous substance spills occur across Alaska every year. Whether from freighters, fishing boats, leaking storage tanks, discarded wastes, abandoned drums, mystery spills, or other sources, these spills can cause serious damage to public health and property as well as to the environment. Local residents are frequently the first line of defense in responding to oil or hazardous substance releases because of the vast size of the State and the remote location of many of its cities and communities. In many cases outside responders cannot arrive in time to deal with the immediate impacts, especially a life-threatening release of a hazardous gas such as chlorine or ammonia. Alaska's communities can play an important role in minimizing the impacts of oil and hazardous substance spills. According to the January 1990 report by the Alaska Oil Spill Commission entitled, ***Spill: the Wreck of the Exxon Valdez***, *"A substantive role should be given to the affected communities in any response system local interests, local knowledge and experience often made the community-based work force the most efficient available."*

Recognizing the importance of local involvement, DEC is working with local communities to provide for coordinated and effective response and to expand the network of resources available to protect human health and the environment from the risks associated with oil and hazardous substance spills. By forging partnerships at the local level, both DEC and local residents will be better prepared to respond to these incidents.

The Community Spill Response Program is intended to better protect public health and the environment from the effects of oil and hazardous substance releases by:

- Providing for the immediate protection of public health and the environment.
- Developing, augmenting and sustaining first-tier response capability and readiness at the local level.
- Making the local response part of the State response.
- Using local knowledge, experience and resources to the greatest extent possible.
- Integrating local oil and hazardous substance response capability into the State's overall response network.

According to Alaska law, anyone who causes or permits oil or a hazardous substance spill must clean it up immediately, unless the cleanup is technically infeasible or would cause greater environmental damage or threat to human life or health. Spillers must report the spill to DEC. The DEC State On-Scene Coordinator (SOSC) determines the feasibility of cleanup and judges the adequacy of the cleanup actions. The SOSC may augment or take over a cleanup that is judged inadequate. DEC must also respond to "orphan spills" – those with no identifiable spiller. The Community Spill Response Program helps to ensure that local resources are available to the SOSC for this purpose. The program is implemented through Community Spill Response Agreements (CSRAs).

DEC has negotiated CSRAs with over 40 boroughs, municipalities, and communities across the State and will develop additional agreements as needed. The agreements allow DEC to request local assistance based on particular incident needs. There are three important aspects of the agreements:

1. **Activation -** If DEC is notified by the spiller or a local authority of a release or threatened release of oil or a hazardous substance which may pose an imminent and substantial threat to public health or the environment, the SOSC may request activation of the CSRA for available local response resources. The SOSC will monitor the adequacy of the response and take whatever additional actions are needed.
2. **Reimbursement -** Under State law, actual costs incurred for response actions under a CSRA may be reimbursed by DEC. If the CSRA is activated by the SOSC, actual expenses for responses both inside and outside of the local jurisdiction can be reimbursed. Specific provisions for billing and expense reimbursements are included in the agreement.
3. **Local Resource Identification -** Each agreement has an attachment listing the local resources, including manpower, equipment, and other support, which are available for emergency response purposes.

DEC works with those communities which have signed a CSRA to improve preparedness and to identify ways in which local capability may be enhanced and augmented to respond to specific hazards that exist in the area. DEC works with these communities to support local training and additional response equipment needs that have been identified. Training in equipment deployment and use, hazardous waste operations, and other response-related topics may be conducted by DEC or coordinated with other agencies or private contractors. Drills and exercises using local equipment and manpower are also undertaken.

DEC is engaged in statewide projects to enhance local emergency response capability in addition to its work with individual communities through Community Spill Response Agreements. Nearshore response equipment packages, which may consist of high-speed response vessels, storage barges designed for use with local “vessels of opportunity”, or Conex-type steel containers with containment boom and other response equipment, are being procured and positioned in coastal areas to enhance local spill response capability. In addition, inland response equipment packages have

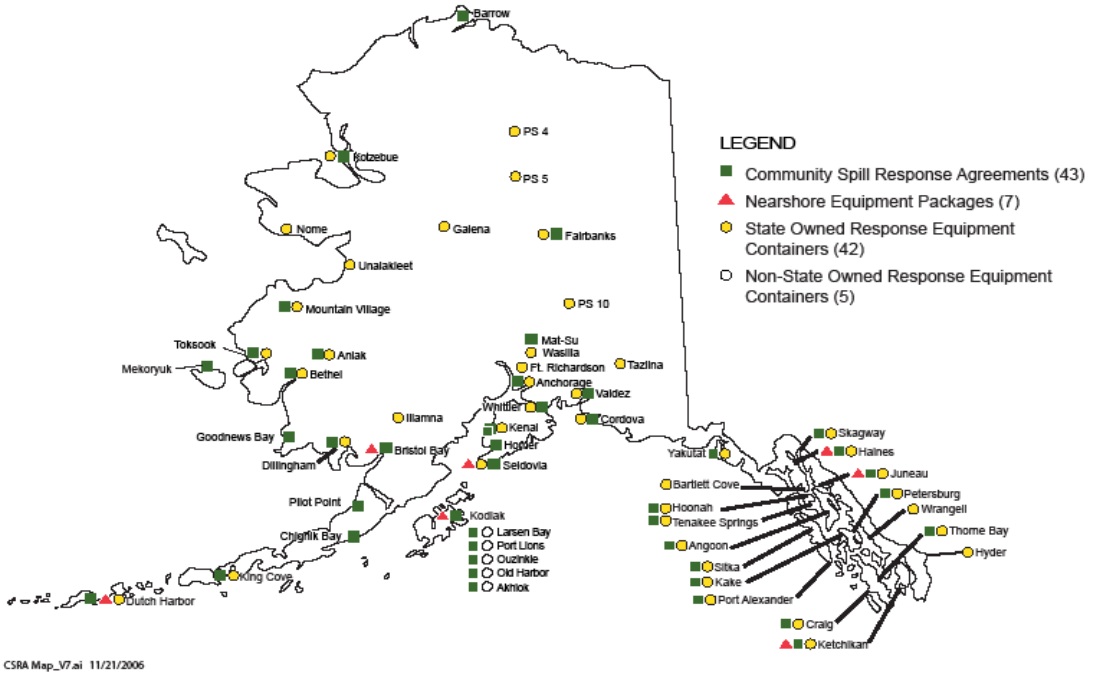
Spill response equipment deployment training
Courtesy DEC

HAZMAT response training
Courtesy DEC

been staged in at-risk areas around the State to provide a mix of specialized tools that can be accessed by DEC responders and local trained personnel in an emergency. DEC is also engaged developing a statewide hazardous materials response strategy, which will build on existing capabilities to provide better protection of public health and the environment from the effects of oil and hazardous substance spills throughout Alaska.

Map of Community Spill Response Agreements, Response Equipment Containers, and Nearshore Equipment Packages in Alaska

as of November 2006



Statewide Response Equipment Packages

DEC is responsible for ensuring that oil and hazardous substances spills are immediately contained, controlled, and cleaned up. To help meet this goal, DEC is developing a wide array of response resources that can be accessed in the event of a significant release. These resources include a network of response equipment packages to be positioned in at-risk areas throughout the State. Instead of having to wait for outside resources to arrive at a spill site, these response packages will provide an immediate on-site response capability that can be accessed by DEC responders and/or local trained personnel in a timely manner.

Each package contains a mix of response equipment tailored to the particular needs and potential threats present in the community where it is located. For example, in Southeast Alaska packages may be designed to assist with initial response and cleanup of non-persistent oil spills in harbor areas. In most cases, regardless of the makeup of the individual package, it will be stored in a 20x8x8 foot steel “Conex” type container.

Each container is stored in a strategic location that allows reasonable security as well as quick and easy access in an emergency situation. Conexs are also air transportable by C-130 aircraft and can be flown to remote sites. The Conex package concept allows the equipment to be easily broken down and repackaged to suit the type of discharge for which it will be used. Nearshore response equipment is used in coastal communities for response to spills on water. The equipment can be used by local responders and "vessels of opportunity" to recover spills from an unknown source, or those that have escaped the primary containment efforts of the responsible party.

Most packages are under the direct control of the DEC State On-Scene Coordinator for the area in which it is located. The equipment is inventoried, stored, accessed, and managed by DEC area staff or by the personnel responsible under the applicable local response agreement. DEC will use the local response agreement as a mechanism to augment the local organization's resources, training, and equipment in communities with a response organization that can jointly respond to an oil or hazardous substance release. The equipment packages may also be made available at cost to responsible parties, local communities, spill response cooperatives, and response action contractors.

State Emergency Response Commission (SERC)

Congress enacted the Emergency Planning and Community Right-To-Know Act (EPCRA), also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) responding to concerns for safety around chemical facilities. EPCRA covers the manufacture, use, exposure, transportation, and public education of hazardous materials. The SERC is the leading entity in implementing SARA at the State level to mitigate the effects of an accidental release or hazardous materials spill. The SERC establishes Local Emergency Planning Districts within Alaska and manages the State's Local Emergency Planning Committees (LEPC). Alaska statute also directs the SERC to be an all-hazard SERC. This means that the Alaska SERC is tasked to address hazardous materials and all other hazards and threat issues that might create an emergency situation in Alaskan communities. Alaska Statute 26.23.071 establishes the Alaska SERC and specifies its duties.

Article IV of the SERC Bylaws

SERC MEMBERSHIP
Section 1. Members. To the extent practicable, the SERC shall be comprised of individuals with expertise in the emergency response field. The SERC shall consist of the following members:
(1) Seven public members appointed by the Governor:
Two of whom must be members of a rural Local Emergency Planning Committee;
Two of whom must be members of an urban Local Emergency Planning Committee;
Two of whom must represent a Political Subdivision with an LEPC;
One member who need not be any of the above, but who could represent any of the LEPC membership categories.

(2) The Adjutant General of the Department of Military and Veterans Affairs or the Adjutant General's designee (SERC co-chair)

(3) The Commissioner of the Department of Environmental Conservation or the Commissioner's designee (SERC co-chair) and the following commissioners or their designees:

(4) The Commissioner of the Department of Commerce, Community and Economic Development;
(5) The Commissioner of the Department of Fish and Game;
(6) The Commissioner of the Department of Health and Social Services;
(7) The Commissioner of the Department of Labor and Workforce Development;
(8) The Commissioner of the Department of Natural Resources;
(9) The Commissioner of the Department of Public Safety; and
(10) The Commissioner of the Department of Transportation and Public Facilities
(11) Representatives of the following Federal agencies as ex-officio, nonvoting members:

U.S. Department of Defense - Alaskan Command;
Federal Emergency Management Agency;
U.S. Environmental Protection Agency; and
U.S. Coast Guard.

Federal Program

The U.S. Environmental Protection Agency (EPA) has an Office of Solid Waste and Emergency Response (OSWER) that is charged with protecting public health and the environment from toxic waste and chemical accident risks.

OSWER provides policy, guidance, and direction for:

- safely managing waste,
- preparing for, and preventing chemical and oil spills, accidents, and emergencies
- cleaning up and reusing contaminated property

OSWER provides technical assistance to all government levels to establish programs that safeguard our air, water, and land from the uncontrolled spread of waste.

Goal: "Preventing Pollution and Reducing Risk in Communities, Homes, Workplaces, and Ecosystems" states that:

Pollution prevention and risk management strategies aimed at eliminating, reducing, or minimizing emissions and contamination will result in cleaner and safer environments in which all Americans can reside, work, and enjoy life. EPA will safeguard ecosystems and promote the health of natural communities that are integral to the quality of life in this nation.

Goal: "Better Waste Management, Restoration of Contaminated Waste Sites, and Emergency Response," states that:

America's wastes will be stored, treated, and disposed of in ways that prevent harm to

people and to the natural environment. EPA will work to clean up previously polluted sites, restoring them to uses appropriate for surrounding communities, and respond to and prevent waste-related or industrial accidents.

Hazard Mitigation Successes

Goals

1. **Objective**: Enhance Statewide Hazmat Response Team capabilities.

   1.1 Action: Continue to facilitate Statewide Hazmat Response Work Group meetings and promote active communication and dialogue amongst the work group members on issues such as exercises/training, equipment, lessons learned, and other key components.

   Lead: ADEC
   Support: Statewide Hazmat Response Team members
   Timeline: on-going

Summary of local capabilities, goals and actions

Anchorage

Capabilities: hazardous waste collection facility at Anchorage Landfill.

Alaska Statewide

Capabilities: Hazardous Materials Response Team composed of several teams capable of deploying to any location in the State to respond to a Hazmat release. Additionally Household Hazardous Waste collection events are available at local landfills throughout the State

5.14 Terrorism

Hazard Analysis/Characterization

The Department of Defense definition of terrorism is "the calculated use of violence or the threat of violence to inculcate fear; intended to coerce or to intimidate governments or societies in the pursuit of goals that are generally political, religious, or ideological." The threat of terrorism is ever present, and an attack is likely to occur when least expected. Combating terrorism requires a continuous state of awareness; it is a necessary practice rather than a type of military operation. Characteristics of crimes of terrorism are though they may appear to be senseless and random, the attacks make sense to the terrorists; terrorists need to publicize their attacks; and every possible target cannot be protected all the time.

For purposes of the State All-Hazard Risk Mitigation Plan, it is important to recognize that every state in the nation is vulnerable to a terrorist attack, and that targeted government or business officials, as well as members of the general public, could become victims.

While there may not be significant historical evidence to demonstrate a vulnerability to terrorism in Alaska, there is sufficient rationale to recognize that the State and all of its communities are potentially vulnerable to this hazard. Those persons most at risk are those working in government facilities, abortion clinics, and minorities. Business owners who are minorities may be at risk as well as those types of businesses that may be seen as supported by government, serving controversial clientele, or selling unpopular products.

In addition, national statistics indicate that violence still plagues about 25% of the nation's abortion clinics, and most recently ecological terrorist, extreme animal rights activists and anti-economic development terrorist organizations have been active.

State Capital Juneau AK
©Alaska Division of Community & Business Development

Some of Alaska communities have transportation infrastructure, water systems, government buildings, including the Capitol in Juneau, courthouses, abortion clinics, or other facilities or services that should all be considered as vulnerable to terrorist attack. Most Boroughs and REAA's in the state have some degree of vulnerability to this hazard.

Terrorists strike at government and civilian targets to instill fear. They often conduct surveillance of potential targets to assess vulnerabilities. Terrorists are trained to blend in with their surroundings. Regardless of their level of expertise, they invariably make mistakes. Staying aware of your surroundings, knowing what to look for and promptly reporting suspicious activity may help to prevent a terrorist attack.

Examples of suspicious activity include:

Describing suspicious behavior - be specific, accurate and complete

- **Who** did you observe?
- **What** did you see?
- **Where** did you see it?
- **When** did you see it?
- **Why** is it suspicious?

Things to be aware of when observing a person:

- Sex
- Age (approximate)
- Race
- Height
- Weight
- Build (medium, heavy set, thin, etc.)
- Hair color, style, and length
- Complexion (light, dark, ruddy, olive, etc.)
- Peculiarities (scars, tattoos, birthmarks, glasses, etc.)
- Clothing (from head to toe, style)
- Weapons, if any
- Method of transportation (foot, vehicle, direction etc.)

Things to be aware of when observing a vehicle:

- License plate
- Year, make, model, and color
- Body type (2-door, 4-door, van, SUV, pick-up, etc.)
- Number of passengers
- Damage or anything unusual (logos, markings, etc)

If you observe any suspicious behavior, do not confront the individual or take action yourself. Notify your local law enforcement office as soon as possible or call 9-1-1 if it is an emergency.

The mission of the Office of Homeland Security is to be the single, statewide focal point for coordinating the State's efforts to prevent terrorist attacks, reduce Alaska's vulnerability to terrorism, and minimize the loss of life or damage to critical infrastructure, and recover from attacks if they occur.

The openness of our society makes this both challenging and extremely difficult. The State has streamlined many procedures in order to improve the flow of information throughout the government and to the private sector.

Improving the flow of information to the public will help create a responsible level of awareness. By doing so, we avoid over-reaction, at the same time allowing a proper response when it's appropriate.

Examples of Terrorism Include

The World Trade Center bombing in New York City, the Murrah Federal Building bombing in Oklahoma City, the Olympic Centennial Park bombing in Atlanta and the Pan American Flight bombing over Lockerbie, Scotland are a few recent examples.

Hazard Vulnerability Analysis

The Hazard Vulnerability Analysis for this section has security concerns and is often difficult to describe. This information can be requested and may be supplied upon approval.

Existing Strategy and Programs

Operation Liberty Shield

Operation LIBERTY SHIELD is a comprehensive *national* plan designed to increase protections for America's citizens and infrastructure while maintaining the free flow of goods and people across our border with minimal disruption to our economy and way of life. Operation LIBERTY SHIELD is a multi-department, multi-agency, national team effort. It includes:

- Increased security at borders
- Stronger transportation protections
- Ongoing measures to disrupt threats against our nation
- Greater protections for critical infrastructure and key assets
- Increased public health preparedness
- Federal response resources positioned and ready

U.S. Flag
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Anti-Terrorism All-Hazard Advisory Council of Alaska (ATAACA)

The Governor's Homeland Security Task Force merged with the Federal Anti-Terrorism Task Force to form the Anti-Terrorism Advisory Council with a broad spectrum of members from Federal, State, and local agencies as well as members of business and industry. A voluntary change in mission in the wake of Hurricane Katrina includes considerations for all-hazards. Now known as the Anti-Terrorism and All-Hazard Advisory Council of Alaska, it is an interagency group which provides integrated situational awareness and operational information to enable coordinated local, State, and Federal actions to prevent or mitigate threats and hazards having potential state-wide impact. In response to a credible terrorist threat or attack, or to a civil emergency with potential state-wide impact, the ATAACA will:

- Provide timely, accurate and fused information to decision makers.
- Maintain public trust and confidence.
- Develop Media Action Plans to deliver complete, consistent and accurate information to the public.
- Facilitate interagency security and law enforcement planning to enhance public safety and security.
- Conduct coordinated public-private critical infrastructure protection planning and execution.
- Prevent duplication of effort, eliminate gaps and seams.
- Enable efficient allocation of limited resources.
- Before establishment of a Joint Field Office pursuant to the National Response Plan, provide a coordinated all-hazards response.
- When federal presence is established under the National Response Plan, assist response and recovery efforts.

Security and Vulnerability Assessment (SVA) Team

The Division of Homeland Security and Emergency Management SVA Team is a key resource, unique to the State of Alaska. The team members come from, and are on the roles of five different departments of State Government (Military and Veterans Affairs, Administration, Environmental Conservation, Health and Social Services, Transportation and Public Facilities), however, they work for and in the offices of the Division. The Teams major functions are as follows.

- The Team maintains an up-to-date list of infrastructure considered to be critical to the State, i.e., State of Alaska Critical Infrastructure (CI). The Team, in consultation with CI owner/operators, also divides each CI entity into its critical components or nodes.
- At the request of infrastructure owner/operators the Team conducts security/vulnerability assessments of CI nodes. Based on these assessments the Team provides owner/operators with recommendations for reducing CI vulnerabilities. These recommendations range from very expensive, high-tech, to inexpensive, easily implemented solutions.
- In order to accomplish its assessments, the Team uses an internally developed and continually updated assessment tool. This tool, which is heavily dependent on owner/operator input, is interactive, comprehensive and completely integrated.
- The Team conducts critical analyses of the State's major systems, such as energy, transportation, food and medical systems. These analyses establish overall criticality rankings; identify critical components; highlight intra-sector as well as inter-sector dependencies; and outline contingency plans for reconstitution of functions/services.
- The SVA Team assists jurisdictions and State agencies in applying for CI type grants, especially Port Security and Buffer Zone Protection Grants. The Team helps them interpret DHS guidance, develop grant applications and report on grant execution.
- The members of the SVA Team provide State and national level infrastructure intelligence/information to the various in-State infrastructure sectors.

Hazard Mitigation Successes

Recently Port of Anchorage Officials invited the State of Alaska's SVA Team to assess the Ports Critical Infrastructure. The Port's Senior Leadership required an accurate portrayal of how critical the facility is to the State of Alaska's daily operating infrastructure. The Team met with Port Officials interviewed key personnel on detailed questions about how the port functions, what segments are significant in keeping the port operational.

Port Security personnel worked with the SVA team, performed a walk around of the facility. The SVA Team took photographs, asked questions on how each critical component worked and examined the affect of each node on the overall operability of the Port Facility. The SVA team consolidated the information and photographs, produced a report addressing priority assets that keep the port infrastructure operational. The Team also inspected the critical nodes that would directly affect the overall functioning of the port and their partner agencies that rely on the ports functionality of critical infrastructure.

Port of Anchorage officials applied for a Fiscal Year 2007 Department of Homeland Security Port Security Infrastructure Protection Program. The grant was approved for $969,429.00. The Port's Leadership Team was very enthusiastic with the results received. They stated that the application accompanied by the SVA report received excellent results from the DHS grant review committee and it was instrumental to receiving the grant award.

Goals

High Priority

1. Identify potential terrorism vulnerability to State.

Mitigation Measure: Prevention, Protection

1.1. Objective: Identify potential terrorist targets and determine vulnerability.

1.1.1. Action: Prioritize structures in State with respect to vulnerability.
Lead: DHS&EM
Support: SHMAC members
Timeline: on-going (no funding identified at this time)

1.2. Objective: Identify and prioritize corrective actions to include building retrofits, relocating government operations, developing redundant systems, security, detection and monitoring equipment, protective gear: terrorism response equipment etc.

1.2.1. Action: Visit identified potential terrorist targets.

Lead: DHS&EM SVA Team
Support: Department of Public Safety
Timeline: on-going (no funding identified at this time)

1.3. Objective: Partner with industry and utility groups to identify and minimize risk of privately owned systems (e.g. electric power systems, water systems, etc.)

1.3.1. Action: Create committee of industry officials.

Lead: DHS&EM
Support: SHMAC members
Timeline: on-going (no funding identified at this time)

Medium Priority

2. Promote anti-terrorism training

Mitigation Measure: Education, Prevention

2.1. Objective: Appropriate level training for government employees, public safety and emergency services personnel will secure State safety.

2.1.1. Action: Identify a timeline for training completion
Lead: DHS&EM
Support: DEC, EPA
Timeline: on-going (no funding identified at this time)

2.2. Objective: Development and implementation of instructional programs for medical practitioners on the identification and treatment of chemical, biological and radiological terrorism agents will create a sense of readiness.

2.2.1. Action: Research level of knowledge to help develop a plan of action.

Lead: DHHS
Support: DHS&EM
Timeline: 5 years (no funding identified at this time)

Summary of local capabilities, goals and actions

Anchorage

Capabilities: planning, zoning, and education.

Goals: continued planning and education.

Juneau

Capabilities: planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: planning and education.

Goals: continued planning and education.

Seward and Homer

Capabilities: planning, zoning, and education.

Goals: continued planning and education.

For more specified information about these areas please refer to appendix 20.

5.15 TECHNOLOGICAL, HUMAN-CAUSED &TERRORISM

Hazard Analysis/Characterization

This area of hazards will include discussions of Terrorism, Nuclear Attack, Civil Disorder/Disturbance, Public Health Emergencies and Environmental issues, and Mass Transportation Accidents. Alaska has been fortunate to not have experienced any significant episodes of these types of hazards. The potential communities' vulnerability must be based on prediction and estimation, rather than on historical evidence of impact to the State's population, property, or environment. Nevertheless, even in the absence of an historical record of these hazards, the State All-Hazard Risk Mitigation Plan recognizes that the State and its communities are potentially vulnerable to future events.

Terrorism

Definition: the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, to influence political or social objectives. Weapons of Mass Destruction associated with terrorism originate as nuclear, biological, and chemical devices.

Terrorism activities may originate from a single person, special interest groups, or as acts sponsored by a foreign government. The most popular method used in the United States occurred from terrorist bombings. Terrorist acts include using arson, hostile takeovers, shootings, biological agents (such as anthrax, plague, botulism and others) chemical agents (such as hydrogen cyanide, sulfur mustard, sarin, and chlorine), and hostage.

Bomb Threat Stand-Off Distances

Threat Description	Explosives Capacity[1] (TNT Equivalent)	Building Evacuation Distance[2]	Outdoor Evacuation Distance[3]
Pipe Bomb	5 LBS/ 2.3 KG	70 FT/ 21 M	850 FT/ 259 M
Briefcase/ Suitcase Bomb	50 LBS/ 23 KG	150 FT/ 46 M	1,850 FT/ 564 M
Compact Sedan	500 LBS/ 227 KG	320 FT/ 98 M	1,500 FT/ 457 M
Sedan	1,000 LBS/ 454 KG	400 FT/ 122 M	1,750 FT/ 533 M
Passenger/ Cargo Van	4,000 LBS/ 1,814 KG	600 FT/ 183 M	2,750 FT/ 838 M
Small Moving Van/ Delivery Truck	10,000 LBS/ 4,536 KG	860 FT/ 262 M	3,750 FT/ 1,143 M
Moving Van/ Water Truck	30,000 LBS/ 13,608 KG	1,240 FT/ 378 M	6,500 FT/ 1,981 M
Semi-Trailer	60,000 LBS/ 27,216 KG	1,500 FT/ 457 M	7,000 FT/ 2,134 M

This table is for general emergency planning only. A given building's vulnerability to explosions depends on its construction and composition. The data in these tables may not accurately reflect these variables. Some risk will remain for any persons closer than the Outdoor Evacuation Distance.

Source: Office of Director of National Intelligence

Technological Terrorism

The threat of cyber terrorism also must be considered for a State such as Alaska where government and industrial services are highly dependent on the Internet, telecommunications and computer networks.

103rd WMD-CST
Global Communications Vehicle
Courtesy DHS&EM

Technological Terrorism is defined as a potential disruption in the nation's data control systems similar to the threat posed by Y2K. Recent cyber-attacks on financial, business, and governmental computer systems are being considered as terrorist-related acts. The Department of Justice (DOJ) Federal Bureau of Investigation (FBI) is the primary response agency for domestic terrorism. The Department of Justice through the FBI will coordinate the domestic preparedness programs and activities of this nation to address the threat posed by terrorists and the use of weapons of mass destruction. The establishment of the Homeland Security Agency may change the Federal Lead Agency Status. According to the FBI, sporting events, political

conventions, and other special events are attractive targets for domestic and foreign terrorists because they are highly visible and attract celebrities and political leaders. Other targets of opportunity for terrorism include large public works facilities, utilities, transportation facilities such as airports, train stations, subways, bridges and ferries, military bases, schools, medical facilities and other State and federal facilities.

Nuclear Attack/Materials – Specific

Federal and military installations, as well as weapons-based facilities in the State of Alaska, may house nuclear material at any given time. Management protocols for federally controlled Nuclear Facilities include but are not limited to the following:

- Manages onsite emergency response
- Directs in-plant radiological protection activities
- Directs emergency mechanical maintenance
- Directs emergency electrical maintenance
- Directs personnel accountability and site security
- Directs safety and hazard-control
- Performs engineering and technical analysis
- Provides computer technical support

Attack (Nuclear, Conventional, Chemical, and Biological)

Of all the possible disasters and hazards we can imagine, a strategic nuclear, biological, or chemical attack could be the most devastating and far-reaching in consequences. The use of these weapons against the Alaska and the United States is unlikely. Unfortunately, however, as long as such weapons exist, there is always a chance that they could be used. The potential for traditional war-related attacks, using conventional weapons, is a scenario that is more likely to occur, based on currently available information. Although the threat of all-out nuclear war is significantly reduced with the dissolution of the Soviet Union, several scenarios still exist that might subject a jurisdiction to widespread radioactive contamination or high-level radiation exposure. Government officials and other decision makers must remember that the terms of the START II Treaty (passed by the U.S. Senate in 1996), when fully complied with at the end of 10 years from its signing, allows its signatories, Russia and the United States, to maintain 1,000 nuclear weapons each. Also, no one can deny the instability of the Korean peninsula, where nuclear weapons have been developed.

103rd WMD-CST
Survey Response Vehicle
Courtesy of DHS&EM

Additionally, the Department of Defense estimates that as many as 26 nations may possess chemical agents or weapons, and an additional 12 may be seeking to develop them. The Central Intelligence Agency reports that at least 10 countries are believed to be conducting research on biological agents for weaponization. While the threat of nuclear attack has diminished over the past several years, concerns over the use of chemical and biological warfare agents have increased. Recent events, such as the September 11, 2001, terrorist attacks on the World Trade Center buildings in New York City and the Pentagon in Washington D.C., along with follow-up anthrax-related attacks in 2001, have increased awareness of the vulnerability of the U.S.

to future attacks involving chemical or biological warfare agents. The survey vehicle owned by the CST103rd in Alaska can collect samples of unknown agents which will be analyzed in a lab for further identification.

Statistics

Although several isolated attacks involving biological agents have occurred over the last few decades, the most recent series of incidents in the U.S. that gained nationwide exposure occurred between early October and early December 2001, when five people died from anthrax infection, and at least 13 others contracted the disease in Washington, D.C.; New York City; Trenton, New Jersey; and Boca Raton, Florida. Anthrax spores were found in a number of government buildings and postal facilities in these and other areas. Most of the confirmed anthrax cases were tied to contaminated letters mailed to media personalities and U.S. Senators. Thousands of people were potentially exposed to the spores and took preventive antibiotics. Numerous mail facilities and government buildings were shut down for investigation and decontamination. In the wake of these incidents, federal, State, and local emergency response agencies across the United States responded with similar equipment to the Hazmat suit pictured to thousands of calls to investigate suspicious packages, unknown powders, and other suspected exposures. Fortunately, almost all of these incidents turned out to involve no actual biohazard.

103rd WMD-CST
HazMat Suit
Courtesy DHS&EM

Measure of Probability and Severity

Attacks against the United States as a whole, and against individual States or local entities, can be categorized as originating from either domestic or international sources. However, because the impacts on life and property would largely be the same regardless of the source of such an attack, similar preparedness, response, and recovery activities apply.

103rd WMD-CST
Self Contained Breathing Apparatus
Courtesy DHS&EM

Biological and chemical weapons have often been used to terrorize an unprotected population, instead of actual use as weapons of war. However, the potential damage that can occur in the event of such an attack is huge, particularly to human health. A single nuclear weapon detonation could cause massive destruction, and all aforementioned types of attacks could cause extensive casualties. An all-out nuclear attack could affect the entire population in the vicinity of the impacted area. Some areas would experience direct weapons effects: blast, heat, and initial nuclear radiation. Other areas would experience indirect weapons effects, primarily radioactive fallout. As long as world leaders maintain rational thinking, the probability of an attack by any of the aforementioned methods remains low.

Secondary effects of these attacks, which could severely stress the country, include lack of adequate shelter, food, water, health and medical facilities and personnel, and mortuary services,

disruption of communication systems, and power outages. Because of the potential devastation and significant secondary effects caused by this type of attack, the severity is rated high.

Impact of Attack Hazard

The population is vulnerable to two separate categories of impacts associated with these types of attacks: ***direct*** and ***indirect*** impacts.

Direct Effects

These are effects directly associated with detonation or use of the weapon.

- ***Conventional Weapons*** – Direct effects of conventional weapons generally are related to injuries inflicted by penetration of ammunition rounds or shrapnel from exploding ordnance (mortars, etc.). Injuries from shock waves/blast overpressure near the targets may also occur, along with damage caused by fires produced from incendiary warheads, grenades, and other munitions. In addition, some injuries may occur as a result of flying or falling debris where the weapons are used. Heavy artillery use can also damage roadways and buildings, and disrupt utility services for lengthy periods of time.
- ***Chemical and Biological Weapons*** – Direct effects of chemical weapons involve initial spread of agents and fragmentation of the weapons. Chemical agents are toxins used to produce neurological and pulmonary injuries or death. Biological agents are infectious microbes used to produce illness or death. They can be dispersed as aerosols or airborne particles directly onto a population, producing an immediate effect (a few seconds to a few minutes for chemical agents) or a delayed effect (several hours to several days for biological agents). Severity of injuries depends on the type and amount of the agent used and duration of exposure. Because some biological agents take time to grow and cause disease, an attack using this type of agent may go unnoticed for several days. The Mobile Analysis Lab pictured has the capabilities to analysis unknown agents for identification.

103rd WMD-CST
Mobile Analysis Lab
Courtesy DHS&EM

- ***Nuclear Weapons*** – Direct effects include intense heat, blast energy, and high-intensity nuclear radiation. These effects generally will be limited to the immediate area of the detonation (up to 22 miles), depending on weapon size, altitude of burst, and atmospheric conditions.
- ***Agroterrorism*** – The direct effect of agroterrorism is the intentional use of a biological weapon on livestock and food crops to disrupt the food supply chain. Agroterrorism will cause disease in livestock, crops, and humans who consume food products. It will require the agriculture industry to destroy livestock and food crops.
- ***Radiological Weapon*** – Direct effects of a radiological weapon are penetration by shrapnel by the blast, radiological poisoning from penetration of radiological contaminated shrapnel, and ingestion of minute radiological particles.
- ***Dispersion Device*** (RDD) - A Radiological or “dirty bomb” will contaminate an area by penetration of shrapnel into structures and settlement of dust and debris on the area.

- ***Explosive Weapon*** (large amount of high explosive) – The direct results of an explosive weapon are immense destruction caused by the blast and multiple fatalities.

Indirect Effects

These are effects not directly associated with the detonation and use of the weapon.

- ***Conventional Weapons*** – Unexploded ordnance throughout a battle zone or explosion hazards to those in the area can persist after warfare has ended. Many conventional munitions also contain toxic compounds that can leach into surrounding soils and groundwater if left in place.
- ***Chemical and Biological Weapons*** – Indirect effects are generally limited to downwind areas. They can be geographically widespread and vary in intensity—depending on weapon size, type of chemical or biological agent, and wind patterns. The spread of these agents can contaminate food and water supplies, destroy livestock, and ravage crops.
- ***Nuclear Weapons*** – When a nuclear weapon explodes near or on the ground, it draws up large quantities of earth and debris into a mushroom cloud. This material becomes radioactive, and the particles can be carried by wind hundreds of miles before they drop back to earth as "fallout." In an attack, many areas of the United States would probably escape fallout altogether or experience non-life-threatening levels of radiation. However, because weather that determines where fallout will land is so unpredictable, no locality in the United States is free from risk of receiving deadly radiation levels after a strategic attack.
- ***Agroterrorism*** – Agroterrorism's indirect effects are loss of breeding stock to replenish herds and flocks, loss of seed crops, and possibly loss of land use for a long period of time depending on the disease involved. Agroterrorism has a high probability of creating an economic downturn.
- ***Radiological Weapon*** – The indirect effect of a RDD is inability to use the contaminated area for a short-to-long time period, depending on the identification of the radioactive material. Because radioactive material from a RDD can penetrate wood, asphalt, concrete, and masonry (and radioactive dust and particles can enter the smallest crevices), decontamination will be extremely difficult or impossible.
- ***Explosive Weapon*** (large amount of high explosive) – The indirect effect of an explosive weapon is the fear, terror, and lasting psychological damage done to survivors and other individuals.

Synopsis

Even though the START treaty has reduced the overall number of nuclear weapons, and many chemical weapons stockpiles are scheduled to be destroyed, we must continue to plan for, and be prepared for, this type of hazard. While it may not be possible to prevent such an attack, steps can be taken to lessen the likelihood or the potential effects of an incident by implementing certain measures:

- Identifying and organizing resources;
- Conducting a risk or threat assessment and estimating losses;
- Identifying mitigation measures that will reduce the effects of the hazards and developing strategies to deal with the mitigation measures in order of priority; and
- Implementing the measures and evaluating the results (and keeping the Plan up-to-date).

Civil Disorder/Disturbances

Historical Statistics United States – Incidents of civil disorder that erupted into violence are part of American history, spanning several centuries.

- In March 1770, just prior to the Revolutionary War, a riot occurred when Boston citizens taunted British soldiers and began throwing things at them during a demonstration. Five people were killed when the troops fired during the incident, which became known as "The Boston Massacre."
- Three years later, on December 16, 1773, a group of Boston citizens protested the British tax on tea to the colonies by throwing it overboard. The "Boston Tea Party" was a harbinger of troubles that eventually led to the Revolutionary War.
- On May 4, 1886, another violent event occurred in Haymarket Square in Chicago when a confrontation took place between police and strikers at the McCormick reaper works. A bomb was thrown and a gun battle erupted, during which seven police officers and four workers were killed. Many police and civilians were also injured in what became known as the "Haymarket Square Riot."
- Controversy over civil rights and the unpopular war in Vietnam during the 1960s and 1970s resulted in one of the most turbulent periods in American history. During this same time, major riots occurred in Los Angeles in 1965; Detroit in 1967; Chicago in1968 during the Democratic National Convention; Santa Barbara, California, in 1970; East Los Angeles, California, in 1970 and 1971; and Attica, New York, in 1971, during a major prison riot. Violent rioting once again erupted across the country on April 29, 1992, when four police officers were acquitted after being accused of beating a black suspect (Rodney King). Also in recent years, issues such as abortion, gay rights, immigration, and gun control have generated great public debate and resulted in many mass assemblies and demonstrations.

There is little information on civil disorder events in Alaska. As with the hazard of terrorism, even in the absence of a historical record of events of this hazard, it has been included in the SHRMP because of the *potentia*l that it could occur in the State. It is assumed that most communities of the State are not likely to experience civil disorder as a hazard, barring some extraordinary and unpredictable circumstance. The communities/groups considered to be most vulnerable to this hazard are low income, and large gathering places, such as sports stadiums, and universities.

Civil disorder and disturbances, like terrorism, are a crime, and could be anticipated to be more likely to be committed by low income populations or those perceiving themselves as in some manner disenfranchised from the principal populations of Alaska.

Civil disorder is a term that generally refers to groups of people purposely choosing not to observe a law, regulation, or rule, usually in order to bring attention to their cause, concern, or agenda. Civil disorder can take the form of small gatherings or large groups blocking or impeding access to a building, or disrupting normal activities by generating noise and intimidating people. They can range from a peaceful sit-in to a full-scale riot in which a mob burns or otherwise destroys property and terrorizes individuals. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order.

Throughout this country's history, incidents that disrupted the public peace have figured prominently. The Constitutional guarantees allow for ample expression of protest and dissent, and in many cases collide with the Preamble's requirement of the government "to ensure domestic tranquility." Typical examples of such conflicting ideology include the protest movements for civil rights in the late 1960s and the Vietnam War protest demonstrations in the mid-1970s. The balance between an individual's or group's legitimate expression of dissent and the right of the populace to live in domestic tranquility requires the diligent efforts of everyone to avoid such confrontations in the future. In modern society, laws have evolved that govern the interaction of its members to peacefully resolve conflict. In the United States, a crowd itself is constitutionally protected under "the right of the people to peacefully assemble." However, assemblies that are not

peaceable are not protected, and this is generally the dividing line between crowds and mobs. The laws that deal with disruptive conduct are generally grouped into offenses that disturb the public peace. They range from misdemeanors such as blocking sidewalks or challenging another to fight, to felonies such as looting and rioting.

Types of Crowds and Mobs

A ***crowd*** may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified into four general categories:

1. Casual Crowd – A casual crowd is merely a group of people who happen to be in the same place at the same time. Examples of this type include shoppers and sightseers. The likelihood of violent conduct is all but nonexistent.
2. Cohesive Crowd – A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity such as worshiping, dancing, or watching a sporting event. Although they may have intense internal discipline (e.g. rooting for a team), they require substantial provocation to arouse to action.
3. Expressive Crowd – An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest something. In May of 2007 at least four statewide organizations spoke out and rallied in Fairbanks in protest of the recent Supreme Court ruling to uphold the Partial-birth Abortion Ban Act.
4. Aggressive Crowd – An aggressive crowd is comprised of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They tend to be impulsive and highly emotional and require only minimal stimulation to arouse them to violence. Examples of this type of crowd include demonstrations and strikers.

Casual Crowd
Courtesy DHS&EM

A ***mob*** can be defined as a large disorderly crowd or throng. Mobs are usually emotional, loud, tumultuous, violent, and lawless. Like crowds, mobs have different levels of commitment and can be classified into four categories:

1. Aggressive Mob – An aggressive mob is one that attacks, riots, and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.
2. Escape Mob – An escape mob is attempting to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs have lost their capacity to reason and are generally impossible to control. They are characterized by unreasonable terror.
3. Acquisitive Mob – An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting sprees. This mob exploits a lack of control by authorities in safeguarding property. Examples of acquisitive mobs would include the looting in South Central Los Angeles in 1992 or food riots in the aftermath of Katrina in 2005.

4. Expressive Mob – An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent up emotions in highly charged situations. Examples of this type of mob include the June 1994 riots in Canada following the Stanley Cup professional hockey championship, European soccer riots, and those occurring after other sporting events in many countries, including the United States.

Although members of mobs have differing levels of commitment, as a group they are far more committed than members of a crowd. As such, a "mob mentality" sets in, which creates a cohesiveness and sense of purpose that is lacking in crowds. Thus, any strategy that causes individual members to contemplate their personal actions will tend to be more effective than treating an entire mob as a single entity.

Alaska's potential seems to indicate that, with the exception of temporary gatherings of individuals under highly charged circumstances, e.g. large sporting events, meetings of controversial groups, etc., the vulnerability of Alaska to civil disorder is not significant.

Impact of the Disorder/Disturbance

When disturbance does break out, it generally proves extremely difficult for first-responder law enforcement authorities to quell the mob promptly. The rules of Constitutional law set stringent limits on how police officers can behave toward those whom they try to arrest. Restraint also plays a crucial part in avoiding any action that "fans the flames." Initial police presence is often undermined because forces may be staffed below the peak loads needed to bring things back under control. At a result, the riot may continue until enough State police or National Guard units arrive to bolster the arrest process and subsequently restore order. In many cases, damage to lives and property may already be extensive.

Public Health Emergencies/Environmental Issues

Public health emergencies can take many forms—disease epidemics, large-scale incidents of food or water contamination, or extended periods without adequate water and sewer services. There can also be harmful exposure to chemical, radiological, or biological agents, and large-scale infestations of disease-carrying insects or rodents. This section focuses on emerging public health concerns and potential pandemics. Public health emergencies can occur as primary events by themselves, or they may be secondary to another disaster or emergency, such as flood, or hazardous material incident.

Scientist in laboratory
Courtesy of Alaska Department of Health & Social Services

The common characteristic of most public health emergencies is that they adversely impact, or have the potential to adversely impact, a large number of people. Public health emergencies can be statewide, regional, or localized in scope and magnitude. In particular, two public health hazards have recently emerged as issues of great concern, with far reaching consequences.

1. One pertains to the intentional release of a radiological, chemical, or biological agent, as a terrorist act of sabotage to adversely impact a large number of people.
2. The second hazard concerns a deadly outbreak (other than one caused by an act of terrorism) that could kill or sicken thousands of people across the county or around the globe, as in the case of the Spanish Flu epidemic of 1918-1919.

Whether natural or man-induced, health officials say the threat of a dangerous new strain of influenza virus in pandemic proportions is a very real possibility in the years ahead. Unlike most illnesses, the flu is especially dangerous because it is spread through the air. A classic definition of influenza is *a respiratory infection with fever*. Each year, flu infects humans and spreads around the globe.

Scientist
Courtesy Alaska Department of Health & Social Services

There are three types of influenza virus, known as Types A, B, and C.

1. Type A - is the most common, most severe, and the primary cause of flu epidemics.
2. Type B - cases occur sporadically and sometimes as regional or widespread epidemics.
3. Type C - cases are quite rare and hence sporadic, but localized outbreaks have occurred.

Fortunately, influenza usually is treatable, and the mortality rate remains low. Each year, scientists estimate which particular strain of flu is likely to spread, and they create a vaccine to combat it. A flu pandemic occurs when the virus suddenly changes or undergoes an “antigenic shift,” permitting it to attach to a person’s respiratory system and leave the body’s immune system defenseless against the invader.

Mass Transportation Accidents

For the purpose of this plan, mass transportation is defined as the means, or system, that transfers large groups of individuals from one place to another. This section simply addresses only the potential transportation accidents involving people, not materials. Thus, mass transportation accidents include public airlines, railroad passenger cars, tour buses, city bus lines, school buses, passenger cruise lines, and other means of public transportation. The peak periods are related to seasonal population or special events.

Tour Bus in Alaska
©Division of Commuity & Business Development, BLM, Ed Bovy

The State estimates 1,631,500 out-of-State visitors traveled to Alaska from May through September in 2006, the visitors traveling by air increased slightly, those traveling by highway decreased slightly, and cruise-ship and ferry stayed roughly even, according to The Alaska Visitor Statistics Program report, written by State consultants. Among the visitors, 958,900 were cruise-ship passengers, 587,800 traveled by air and 84,800 entered or exited the State on the highway or State ferry.

Cruise Ship in Alaska
©Division of Community & Business Development

Anchorage International Airport in the year 2006 provided service to 5,043,147 total passengers, and 100,496 total landings. Additionally the freight total is 5,934,526,792 with this volume of traffic over 5,000 acres of land the potential for accidents is present.

The Ted Stevens International Airport Police and Fire Department is responsible for ensuring around-the-clock police, fire, and first responder emergency medical services at Anchorage International Airport and its surrounding property, such as Lake Hood. The Airport Police and Fire Department protects over 7,000 employees and over 5,000 acres of land at Ted Stevens

Anchorage International Airport. Other responsibilities include enforcing all municipal, State and federal laws with special emphasis on Transportation Security Administration regulations and policies.

The Alaska Railroad is a powerful economic engine hauling nearly 8 million tons of freight per year. They transport building products to construct Alaska homes and businesses and support critical resource industries such as coal, oil and gas. Trains carry more than 500,000 passengers annually, providing access for Alaskans and visitors from tidewater in Seward and Whittier to the interior of Alaska.

As with the hazard of terrorism and civil disorder even in the absence of a historical record of mass transportation accidents the State is including the information in the SHRMP because of the *potentia*l of an occurrence in the State exists.

Further development on this section will continue with future revisions of the State All-Hazard Risk Mitigation Plan.

Hazard Vulnerability Analysis

The Hazard Vulnerability Analysis for this section has security concerns and is often difficult to describe. This information can be requested and may be supplied upon approval.

Existing Programs and Strategies

Alaska Shield 2007 (7- 16 May 2007)

The exercise provided a unifying theme to validate Team Alaska's ability to operate within its own authority, with resources available in Alaska, and to test preparedness. Alaska Shield, a statewide multi-venue, multi-agency, multi-jurisdictional exercise which validates interagency plans to protect Alaska's critical infrastructure integrating State, federal, local, and private sector resources. Alaska Shield exercised Team Alaska's concurrent planning processes for ongoing crises and consequence management outcomes.

Fueling Safety Program

The Ted Stevens Anchorage International Airport Fire Department in 2005 became the first airport in the State to receive certification to teach the Federal Aviation Administration's (FAA) Supervisor Fueling Safety Program.

In accordance with 14 CFR Part 139, the FAA requires that an airport maintain certain operational and safety standards as a condition of having an Airport Operating Certificate. The intent of the course is to ensure that supervisory fueling personnel recognize the importance of aircraft fueling safety and are equipped to instruct in the principles that will ensure safety during refueling operations at airports. Under Part 139, recurrent fire safety training is required of all airport fueling personnel and supervisors must have completed an authorized aviation fuel training course in fire safety.

AS 26.05.100 Alaska State Defense Force

A State militia, known as the Alaska State Defense Force, may be organized through voluntary enlistments under regulations as to discipline and training that may be prescribed by the governor. During the time that the Alaska National Guard or the Alaska Naval Militia, or any part of either of them, is not available to the State by reason of active federal service, or the National Guard or Naval Militia requires augmentation to perform its State mission, the governor may activate the Alaska State Defense Force.

Hazard Mitigation Successes

103rd Weapons of Mass Destruction-Civil Support Team

The team is composed of command and control, operations, entry, logistics, communication and medical/analytical sections. Ninety percent of the team is HazMat Technician and EMT certified. There are over 14 different specialties within the team giving the Local Incident Commander tremendous assets to draw upon as needed. The team assists in assessing the incident site and makes recommendations for mitigating the loss of life or property.

During the aftermath of Katrina the team from the 103rd traveled to the greater surrounding area to assist local, State and Federal agencies with hazard identification and support. The team split into smaller groups and the knowledge of members effectively supported officials. Additionally, the training and skills of the team are used throughout the State for necessary military support during an emergency disaster to:

- **Assess** a suspected chemical biological, radiological, or event in the support of the Local Incident Commander.
- **Advise** civilian responders regarding appropriate actions in planning for and responding to WMC incidents.
- **Facilitate** expeditious arrival of additional State and Federal assets**:** to help save lives, prevent property damage and ease suffering.

103rd WMD-CST Mobile Analysis Lab
Courtesy of DHS&EM

Goals

<u>High Priority</u>

1. Examine the physical environment of the locations where civil disorder events could occur.

Mitigation Measure: Prevention, Protection

1.1. Objective: Develop response plans for dealing with civil disturbance and supporting local authorities at special facilities or locations.

1.1.1. Action: Create planning committees to help develop plans.

Lead: local communities
Support: DPS
Timeline: five years

1.2. Objective: By identifying facilities and locations with potential civil disorder the response will be more affective.

1.2.1. Action: Identify facilities and locations most likely to experience civil disorder.

Lead: DHS, DPS
Support: local communities
Timeline: on-going

2. Establish a State multi-agency health response team

Mitigation Measure: Prevention, Protection

2.1. Objective: By creating a team of health professional throughout the State area specific knowledge can be shared.

2.1.1. Action: Research health officials throughout the State for selection.

Lead: DHHS
Support: DHS&EM
Timeline: three years

Medium Priority

3. Create emergency response organizations which are better prepared to manage the situations.

Mitigation Measure: Prevention, Education

3.1. Objective: Identify and train State and local government personnel for riot control operations.

3.1.1. Action: Create and schedule training for operative personnel.

Lead: DPS
Support: National Guard
Timeline: on-going

3.2. Objective: By providing training for community leaders in civil disorder potential recognition and intervention it insures a safer environment.

3.2.1. Action: Identify key leaders for participation of specific training**.**

Lead: local communities
Support: DHS&EM
Timeline: three years

Summary of local capabilities, goals and actions

Anchorage

Capabilities: planning, zoning, and education.

Goals: continued planning and education.

Juneau

Capabilities: planning and education.

Goals: continued planning and education.

Mat-Su Borough

Capabilities: planning and education.

Goals: continued planning and education.

Seward and Homer

Capabilities: planning, zoning, and education.

Goals: continued planning and education.

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Prepared By

Division of Homeland Security & Emergency Management

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ALASKA

All-Hazard Risk Mitigation Plan
Appendices

Prepared By

Division of Homeland Security & Emergency Management

October 2007

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APPENDIX 1 – ACRONYMS

ACMP	Alaska Coastal Management Program
ADES	Alaska Division of Emergency Services
ADF&G	Department of Fish and Game (State of Alaska)
ADOI	Alaska Division of Insurance
AEIC	Alaska Earthquake Information Center
AEMS	Alaska Emergency Management System
AFS	Alaska Fire Service
AFN	Alaska Federation of Natives
AGDC	Alaska Geospatial Data Committee
AHS	Alaska Hydrologic Survey
AKRR	Alaska Railroad
ALCOM	Alaskan Command
ANILCA	Alaska National Interest Lands Conservation Act
AOR	Area of Responsibility
AMSC	Alaska Mountain Safety Center
ANSS	Advanced National Seismic System
ARC	American Red Cross
AS	Alaska Statute
AST	Alaska State Troopers
AVO	Alaska Volcano Observatory
AWCG	Alaska Wildfire Coordinating Group
BLM	Bureau of Land Management
BPR	Bottom Pressure Recording
CAP	Community Assistance Program
CDBG	Community Development Block Grant
CIAP	Coastal Impact Assistance Program
CRS	Community Rating System
DART	Deep-ocean Assessment and Reporting of Tsunamis
DAS	Department of Administration
DC	Department of Corrections
DCA	Division of Community Advocacy (State of Alaska)
DCCED	Department of Commerce, Community & Economic Development (State of Alaska)
DEC	Department of Environmental Conservation (State of Alaska)
DEED	Department of Education & Early Development (State of Alaska)
DGC	Division of Governmental Coordination (State of Alaska)
DGGS	Division of Geologic & Geophysical Surveys (State of Alaska)
DHS&EM	Division of Homeland Security & Emergency Management
DLAW	Department of Law (State of Alaska)
DMVA	Department of Military & Veterans Affairs (State of Alaska)
DNR	Department of Natural Resources (State of Alaska)
DOA	Department of Agriculture (U.S.)
DOD	Department of Defense (U.S.)
DOF	Division of Forestry (State of Alaska)
DOI	Department of the Interior (U.S.)
DOJ	Department of Justice (U.S.)
DOT	Department of Transportation & Public Facilities (State of Alaska)
DPC	Governor's Disaster Policy Cabinet (State of Alaska)
DPS	Department of Public Safety (State of Alaska)
EAS	Emergency Alert System
EMPG	Emergency Management Program Grant

EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FGDC	Federal Geospatial Data Clearinghouse
FMA	Flood Mitigation Assistance Program
GIS	Geographic Information System
GOES	Geostationary Operational Environmental Satellite
HMGP	Hazard Mitigation Grant Program
HUD	U.S. Department of Housing and Urban Development
HVA	Hazard and Vulnerability Analysis
IHCA	Interagency Hydrology Committee for Alaska
KPB	Kenai Peninsula Borough
LEPC	Local Emergency Planning Committee
MSB	Matanuska-Susitna Borough
NAWAS	National Warning System
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic & Atmospheric Administration
NOS	National Ocean Service
NPS	National Park Service
NWS	National Weather Service
PMEL	Pacific Marine Environmental Laboratory
SBA	Small Business Administration
SEAAC	South-east Alaska Avalanche Center
SECC	State Emergency Coordination Center
SERC	State Emergency Response Commission
SHMAC	State Hazard Mitigation Advisory Committee
SHMO	State Hazard Mitigation Officer
SME	Subject Matter Expert
SRC	Senate Concurrent Resolution
TIME	Tsunami Inundation Mapping Effort
UAF	University of Alaska Fairbanks
UAF/GI	University of Alaska Fairbanks Geological Institute
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USCG	United States Coast Guard
USFA	United States Fire Administration
USFS	United States Forest Service
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
WC&ATWC	West Coast/Alaska Tsunami Warning Center
WMD	Weapons of Mass Destruction
WP	Warning Point

APPENDIX 2 – DEFINITIONS

Aufeis	When new ice continues to form on top of older ice. Ice-forming situations occur wherever there are continuous sources of water and freezing temperatures.
Alluvial Fan	Area of deposition where steep mountain drainages empty into valley floors. Flooding in these areas often includes characteristics that differ from those in riverine or coastal areas.
Alluvial Fan Flooding	Flooding that occurs on the surface of an alluvial fan (or similar landform) that originates at the apex of the fan and is characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flow paths.
Anabatic Wind	Any wind blowing up an incline; the opposite to katabatic wind.
Avalanche	Mass of snow and ice falling suddenly down a mountain slope and often taking with it earth, rocks and rubble of every description.
Borough	The basic unit of local government in Alaska.
Caldera	A caldera is a large, usually circular depression at the summit of a volcano formed when magma is withdrawn or erupted from a shallow underground magma reservoir.
Chinook	A warm down-slope wind.
Community Rating System	An NFIP program that provides incentives for NFIP Communities to complete activities that reduce flood hazard risk. When the community completes specified activities, the insurance premiums of policyholders in these communities are reduced.
Community	Any state, area or political subdivision thereof, or any Indian tribe or tribal entity that has the authority to adopt and enforce statutes for areas within its jurisdiction.
Critical Facility	Facilities that are critical to the health and welfare of the population and that are especially important during and after a hazard event. Critical facilities include, but are not limited to, shelters, hospitals, and fire stations.
Daylight	The exposure of strata by a cut whose angle is

	steeper than that of the underlying beds. Such exposure increases the likelihood of landsliding.
Dam	A structure built across a waterway to impound water.
Development	Any manmade change to improved or unimproved real estate including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.
Economic Disaster	When the annual income to workers in the designated area dropped below the average annual income for the base period for workers in the designated area and the drop in income is of such magnitude that the average family income of all residents of the designated area as determined by the department is below the poverty guidelines issued by the federal Department of Health and Human Services, adjusted by the department to reflect subsistence economic patterns and appropriate cost-of-living differentials; the availability of alternate employment shall be considered in determining whether an economic disaster has occurred under this paragraph.
Earthquake	A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the earth's tectonic plates.
Earthquake Swarm	A collection of earthquakes that are frequent in time. There is no identifiable main shock.
Elevation	The raising of a structure to place it above flood waters on an extended support structure.
Emergency Operations Plan	A document that: describes how people and property will be protected in disaster and disaster threat situations; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies, and other resources available for use in the disaster; and outlines how all actions will be coordinated.
Erosion	The wearing away of the land surface by running water, wind, ice, or other geological agents.
Federal Disaster Declaration	See Presidential Disaster Declaration
Federal Emergency Management Agency (FEMA)	A federal agency created in 1979 to provide a single point of accountability for all federal activities related to hazard mitigation, preparedness, response, and recovery.

Flash Flood	A flood event occurring with little or no warning where water levels rise at an extremely fast rate.
Flood	A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.
Floodplain	A "floodplain" is the lowland adjacent to a river, lake or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood. The 100-year floodplain by the 100-year flood.
"Flood frequencies"	Frequencies are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. The frequency is the chance of a flood occurring during a given timeframe. It is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1% chance and the 10-year flood has a 10% chance of occurring in any given year.
Fumarole	Fumaroles are vents from which volcanic gas escapes into the atmosphere. Fumaroles may occur along tiny cracks or long fissures, in chaotic clusters or fields, and on the surfaces of lava flows and thick deposits of pyroclastic flows. They may persist for decades or centuries if they are above a persistent heat source or disappear within weeks to months if they occur atop a fresh volcanic deposit that quickly cools.
Geographic Information System	A computer software application that relates physical features of the earth to a database that can be used for mapping and analysis.
Governing Body	The legislative body of a municipality that is the assembly of a borough or the council of a city.
Groin	A narrow, elongated coastal engineering structure built perp
Hazard	A source of potential danger or adverse condition.
Hazard Mitigation	Any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. (44 CFR Subpart M 206.401)

Hazard Mitigation Grant Program	The program authorized under section 404 of the Stafford Act, which may provide funding for mitigation measures identified through the evaluation of natural hazards conducted under §322 of the Disaster Mitigation Act 2000.
Hazard and Vulnerability Analysis	The identification and evaluation of all the hazards that potentially threaten a jurisdiction and analyzing them in the context of the jurisdiction to determine the degree of threat that is posed by each.
Infrastructure	The public services of a community that have a direct impact to the quality of life. Infrastructure refers to communication technology such as phone lines or Internet access, vital services such as public water supply and sewer treatment facilities, and includes an area's transportation system, regional dams or bridges, etc.
Interferometry	A method employing the interference of electromagnetic radiation to make highly precise measurements of the angle between the two rays of light.
Inundation	The maximum horizontal distance inland reached by a tsunami.
Jökulhlaup	A sudden flood-like release of water from a glacier. (Glacier outburst flooding)
Katabatic wind	Any wind blowing down an incline; the opposite to anabatic wind.
Knot	A unit of measurement equally 1 nautical mile per hour. This is roughly 1.15 statute miles per hour or 1.852 kilometers per hour.
Lahar	Lahar is an Indonesian word for a rapidly flowing mixture of rock debris and water that originates on the slopes of a volcano. Lahars are also referred to as volcanic mudflows or debris flows. They form in a variety of ways, chiefly by the rapid melting of snow and ice by pyroclastic flows, intense rainfall on loose volcanic rock deposits, breakout of a lake dammed by volcanic deposits, and as a consequence of debris avalanches.
Landslide	Downward movement of a slope and materials under the force of gravity.

Lava dome	Lava domes are rounded, steep-sided mounds built by very viscous magma. Such magmas are typically too viscous (resistant to flow) to move far from the vent before cooling and crystallizing. Domes may consist of one or more individual lava flows.
Littoral	Of or pertaining to the shore, especially of the sea.
Local Government	Any county, borough, municipality, city, township, public authority, school district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency, or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity, for which an application for assistance is made by a State or political subdivision of a State.
Magma	Molten rock originating from the Earth's interior.
Municipality	A political subdivision incorporated under the laws of the state that is a home rule or general law city, a home rule or general law borough, or a unified municipality.
Natural Disaster	Any natural catastrophe, including any hurricane, tornado, storm, high water, wind, driven water… tsunami, earthquake, volcanic eruption, landslide, snowstorm, fire, or drought. (44 CFR Subpart M 206.401)
Orthophoto	An aerial photo that has been corrected to eliminate the effects of camera tilt and relief displacement. The ground geometry is recreated as it would appear from directly above each and every point.
Overlay Zone	Overlay zones (overlay districts) create a framework for conservation or development of special geographical areas. In a special resource overlay district, overlay provisions typically impose greater restrictions on the development of land, but only regarding those parcels whose development, as permitted under the zoning, may threaten the viability of the natural resource. In a development area overlay district, the provisions may impose restrictions as well, but also may provide zoning incentives and waivers to encourage certain types and styles of development. Overlay zone provisions are often complemented by the adoption of other innovative

	zoning techniques, such as floating zones, special permits, incentive zoning, cluster development and special site plan or subdivision regulations, to name a few.
Period	The length of time between two successive peaks or troughs. May vary due to complex interference of waves. Tsunami periods generally range from 5 to 60 minutes.
Planning	The act or process of making or carrying out plans; the establishment of goals, policies and procedures for a social or economic unit.
Preparedness	The steps taken to decide what to do if essential services break down, developing a plan for contingencies, and practicing the plan. Preparedness ensures that people are ready for a disaster and will respond to it effectively.
Presidential Disaster Declaration	The formal action by the President to make a State eligible for major disaster or emergency assistance under the Robert T. Stafford Relief and Emergency Assistance Act, Public Law 93-288, as amended.
Pyroclastic	Pertaining to fragmented rock material formed by a volcanic explosion or ejection from a volcanic vent.
Pyroclastic Flow	Lateral flow of a turbulent mixture of hot gases and unsorted pyroclastic material (volcanic fragments, ash, etc.) that can move at high speeds.
Recovery	The long-term activities beyond the initial crisis period and emergency response phase of disaster operations that focus on returning all systems in the community to a normal status or to reconstitute these systems to a new, less vulnerable condition.
Response	Those activities and programs designed to address the immediate and short-term effects of the onset of an emergency or disaster.
Retrofit	The strengthening of structures to mitigate disaster risks.
Rift Zone	A rift zone is an elongate system of crustal fractures associated with an area that has undergone extension (the ground has spread apart).
Risk	The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting

	in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It can also be expressed in terms of potential monetary losses associated with the intensity of the hazard.
Riverine	Relating to, formed by, or resembling rivers (including tributaries), streams, creeks, brooks, etc.
Riverine Flooding	Flooding related to or caused by a river, stream, or tributary overflowing its banks due to excessive rainfall, snowmelt or ice.
Run-up	The maximum vertical height of a tsunami in relation to sea level.
Seiche	An oscillating wave (also referred to as a seismic seawave) in a partially or fully enclosed body of water. May be initiated by long period seismic waves, wind and water waves, or a tsunami.
Stafford Act	1) The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended. 2) The Stafford Act provides an orderly and continuing means of assistance by the Federal Government to State, local and tribal governments in carrying out their responsibilities to alleviate the suffering and damage which result from disaster.
State Disaster Declaration	A disaster emergency shall be declared by executive order or proclamation of the Governor upon finding that a disaster has occurred or that the occurrence or the threat of a disaster is imminent. The state of disaster emergency shall continue until the governor finds that the threat or danger has passed or that the disaster has been dealt with to the extent that emergency conditions no longer exist and terminates the state of disaster emergency by executive order or proclamation. Along with other provisions, this declaration allows the governor to utilize all available resources of the State as reasonably necessary, direct and compel the evacuation of all or part of the population from any stricken or threatened area if necessary, prescribe routes, modes of transportation and destinations in connection with evacuation and control ingress and egress to and from disaster area. It is required before a Presidential Disaster Declaration can be requested.

State Hazard Mitigation Officer (SHMO)	The SHMO is the representative of state government who is the primary point of contact with FEMA, other state and Federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.
Storm Surge	Rise in the water surface above normal water level on open coast due to the action of wind stress and atmospheric pressure on the water surface.
Tectonic Plate	Torsionally rigid, thin segments of the earth's lithosphere that may be assumed to move horizontally and adjoin other plates. It is the friction between plate boundaries that cause seismic activity.
Tephra	Tephra is a general term for fragments of volcanic rock and lava regardless of size that are blasted into the air by explosions or carried upward by hot gases in eruption columns or lava fountains. Tephra includes large dense blocks and bombs, and small light rock debris.
Topography	The contour of the land surface. The technique of graphically representing the exact physical features of a place or region on a map.
Tribal Government	A Federally recognized governing body of an Indian or Alaska Native Tribe, band, nation, pueblo, village or community that the Secretary of the Interior acknowledges to exist as an Indian tribe under the Federally Recognized Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.
Tsunami	A sea wave produced by submarine earth movement or volcanic eruption with a sudden rise or fall of a section of the earth's crust under or near the ocean. A seismic disturbance or land slide can displace the water column, creating a rise or fall in the level of the ocean above. This rise or fall in sea level is the initial formation of a tsunami wave.
Vent	Vents are openings in the Earth's crust from which molten rock and volcanic gases escape onto the ground or into the atmosphere. Vents may consist of a single circular-shaped structure, a large elongated fissure and fracture, or a tiny ground crack.
Vulnerability	Describes how exposed or susceptible to damage an asset it. Vulnerability depends on an asset's

	construction, contents, and the economic value of its functions. The vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power – if an electrical substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Other, indirect effects can be much more widespread and damaging than direct ones.
Wildfire	An uncontrolled fire that spreads though vegetative fuels, exposing and possibly consuming structures.
Zoning Ordinance	An ordinance under the state or local government's police powers that divides an area into districts and, within each district, regulates the use of land and buildings, height, and bulk of buildings or other structures, and the density of population.

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APPENDIX 3 - REGULATORY AUTHORITY

This is a partial list of the regulatory authorities that authorized mitigation activities.

Federal

Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288) as amended through the Disaster Mitigation Act of 2000 (Public Law 106-390)

Executive Order 12612, Federalism

FEMA Regulations, 44 CFR Part 9, Floodplain Management & Protection of Wetlands

FEMA Regulations, 44 CFR Part 10, Environmental Considerations

FEMA Regulations, 44 CFR Part 13, Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments

FEMA Regulations, 44 CFR Part 206, Subparts M and N

The National Flood Insurance Act of 1968, Sections 1366 an 1367, as amended by the National Flood Insurance Reform Act of 1994, Sections 553 and 554 Mitigation Assistance

FEMA Regulations, 44 CFR Part 59-77 National Flood Insurance Program

Other Federal Acts:

Federal Water Pollution Control Act (P.L. 92-500, enacted in 1972), commonly known as the Clean Water Act (amended by P.L. 95-217 in 1977, P.L. 97-117 in 1981, and P.L. 100-4 in 1987).

Coastal Zone Management Act

National Environmental Policy Act of 1969 the National Environmental Policy Act of 1969 (NEPA). The Act, considered to be the basic "National Charter" for protection of the environment, includes three major goals:

1. it sets national environmental policy
2. it establishes a basis for environmental impact statements
3. it created the Council on Environmental Quality

State of Alaska

Article 3, Section 23 of the Alaska State Constitution authorizes the governor to make changes in the organization of the executive branch or assignment of functions among units to provide for efficient administration. If changes require the force of law, they shall be set forth in executive orders. The legislature has 60 days of a regular session to disapprove executive orders. If not disapproved then orders become effective at a date designated by the governor. The governor also has the authority to issue Administrative Orders that direct agencies to implement specific goals and objectives. Administrative Orders are only in effect during a governor's term of office while Executive Orders can transcend administrations.

Alaska Disaster Act, Alaska Statute 26.23.010, states the purpose of DHS&EM is to:

a) Reduce vulnerability of people and communities to damage, injury and loss of life and property resulting from a disaster;
b) Prepare for the prompt and efficient rescue, care and treatment of persons victimized or threatened by disaster;
c) Provide a setting conducive to rapid and orderly restoration following a disaster;
d) Clarify and strengthen the roles of state agencies and local communities to prevent, prepare for, respond and recover from disasters;
e) Authorize and provide for cooperation in disaster prevention, preparedness, response and recovery;
f) Authorize and provide for coordination of activities relating to disaster prevention, preparedness, response and recovery; and
g) Assist in the prevention of disasters caused or aggravated by inadequate planning for, and regulation of, public and private facilities and land use.

Title 29, Municipal Government

AS 29.03 The Unorganized Borough

Areas of the state not within the boundaries of an organized borough. The legislature has the authority to establish, alter, or abolish service areas within the unorganized borough.

AS 29.05.030 Emergency Ordinances

To meet the demands during a public emergency the governing body may adopt an emergency ordinance declaring an emergency exists together with supporting statement of facts. The ordinance can not be used to levy taxes, grant, renew or extend a franchise or regulate the rate charged by a public utility.

AS 29.35.040 Emergency Disaster Powers

Once the Governor or President has declared a municipality to be a disaster area it may participate in and provide housing, urban renewal, and redevelopment in same manner as home rule city. Expect powers transferred by a city, these powers may only be exercised on a non-areawide basis. A municipality must exercise these powers within 5 years after the declaration and may only be extended for no more than three years.

AS 29.40.040 Land Use Regulation

Comprehensive Plan shall adopt or amend provisions governing the use and occupancy of land that may include:

1. Zoning regulations restricting use of land and improvements by geographic district;
2. Land use permit requirements designed to encourage or discourage specified uses and construction of specified structures, or to minimize unfavorable effects of uses and construction of structures;
3. Measures to further goals and objectives of comp plan.

AS 29.40.070 Platting Regulations

Platting regulations may include controls of

1. Form, size, and other aspects of subdivision, dedications and vacations of land;
2. Dimension and design of lots;
3. Street width, arrangement, rights of way including requirements for public access to lots and installation of street paving, curbs, gutters, sidewalks, sewers, water lines, drainage and other public utility facilities and improvements;
4. Dedication of streets, rights of way, public utility easements and areas considered necessary by the patting authority for other public uses.

AS 29.40.100. Information required Plats must show:

1. Initial point of survey;
2. Original or re-established corners;
3. Actual traverse areas of closure.

AS 29.45.230. Tax adjustments on property affected by a natural disaster.[i]

Municipalities can provide for reassessment and reduction of taxes for property destroyed, damaged or otherwise reduced in value by a disaster. Taxpayer must submit a sworn statement that loss exceeds $1,000. Reduction in taxes is only for the remainder of the year following the disaster. With reassessments, local governments shall re-compute the tax and refund any taxes already paid.

Alaska Department of Commerce, Community and Economic Development, Division of Insurance

AS 21.06.080 gives the director the authority to take action deemed necessary to assure that contracts of insurance already issued will be honored during a catastrophe. Actions can include emergency orders permitting the immediate licensing of adjusters to facilitate handling of claims, permitting a licensee to move or remove a record as required by the existence of the catastrophe, or permit the issuance by the insurance company of checks or drafts on out-of-state bans to pay a claim.

Alaska Division of Geological & Geophysical Surveys

AS 41.08.020 Powers and duties

(a) The state geologist shall conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources; the locations and supplies of groundwater and construction materials; the potential geologic hazards to buildings, roads, bridges, and other installations and structures; and shall conduct such other surveys and investigations as will advance knowledge of the geology of the state. With the approval of the commissioner, the state geologist may acquire, by gift or purchase, geological and geophysical reports, surveys, and similar information.

[i] Disaster in this instance means a major disaster declared by the President under federal law or by the governor under AS 26.23.010 – 26.23.110.

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APPENDIX 4 – AGENCIES

Within Alaska there are an abundance of federal and state agencies responsible for issuing disaster warnings, collecting and distributing data and information and providing assistance to communities and individuals to prepare for or respond to disasters.

This appendix is a description of the State's capacity to address hazards (a list of departments and agencies with authority to regulate hazard conditions). For more details, please see Appendix 13 Capability Assessment Questionnaires.

State of Alaska

Department of Administration

Division of Risk Management

Department of Commerce, Community and Economic Development

Division of Insurance

AS 21.06.080 gives the director the authority to take action deemed necessary to assurance that contracts of insurance already issued will be honored during a catastrophe. Actions can include emergency orders permitting the immediate licensing of adjusters to facilitate handling of claims, permitting a licensee to move or remove a record as required by the existence of the catastrophe, or permit the issuance by the insurance company of checks or drafts on out-of-state banks to pay a claim.

Division of Community Advocacy (DCA)

Alaska Costal Management Program (ACMP)

ACMP balances the use and protection of coastal resources and uses by developing local coastal district plans and reviewing development projects against the standards and policies of the program. The governor appoints the six state agency officials and nine locally elected officials that make up the Coastal Policy Council (CPC), which determines overall ACMP policy direction.

Land Management and Mapping

The department helps rural communities effectively deal with current land issues and prevent future land management problems.

Municipal and Regional Assistance Division

The fundamental purpose of this program is to help local and regional governments to become more self sufficient in providing effective government services to community residents. This is accomplished through a variety of programs.

Community Development Program

The program provides assistance to communities on regional and community planning issues including Alaska Coastal Management Program, National Flood Insurance Program (NFIP) administration and planning, technical advice and training on general community and regional planning efforts. NFIP provides over flood insurance coverage to individuals, businesses, and renters in over 32 communities in Alaska.

Local Government Assistance
This program provide assistance and training in interpreting Title 29 and other laws or regulations affecting or defining municipal authority; technical advice on ordinance writing; grant project development and application; and lead communities through a process that leads to community visions for the future.

Department of Education and Early Development

In 1966 there was established in state law a system of public schools to be administrated and maintained. The Department of Education and Early Development is responsible for the development of life long learners. The State Board of Education and Early Development is the executive board of the department. The board develops educational policy, promulgates regulations governing education, appoints the Commissioner of Education and Early Development with the Governor's approval, and is the channel of communication between state government and the public for educational matters. Education polices are determined by the board and administrated by the Commissioner through department divisions. Programs administered include: public school funding, early childcare, teacher certification and student assessment. State operated schools and programs include: Alyeska Central School the state's correspondence program, Mt. Edgecumbe High School the state's boarding school program, Alaska Vocational Technical Center the state's adult vocational training center. The department also administers the state libraries, archives, records and museum services, provides grants to the arts community and provides loans to post-secondary students through the Alaska Student Loan Corporation.

The department's hazard mitigation responsibilities are over site in planning and education. AS 14.33.100 requires school districts to develop model crisis response plans, instruct and conduct emergency drills. Additionally each district in the state public school system is encouraged to initiate and conduct a program of health education for K-12. The program is to be evaluated by the department.

The department has determined that each facility occupied by the department shall have an Emergency Response Plan. The ERP also includes the department's response to emergencies.

Department of Environmental Conservation (DEC)

It is the policy of the state to conserve, improve, and protect its natural resources and environment and control water, land, and air pollution, in order to enhance the health, safety, and welfare of the people of the state and their overall economic and social well being.

Division of Spill Prevention and Response (SPAR)

SPAR prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment. The three goals of SPAR's mission are:

1. Spill prevention – making the system safer

2. Preparedness – making industry and government's ability to prepare and respond to spills "better"
3. Response – keeping Alaska cleaner

Division of Environmental Health (EH)

EH deals with the basics: safe drinking water, food and sanitary practices. EH's goal is to provide businesses with clear standards so that they can protect our environment and provide safe food and drinking water to Alaskans.

Division of Water

The mission is to improve and protect water quality. In keeping with this mission, the division:

- Establishes standards for water cleanliness;
- Regulates discharges to waters and wetlands;
- Provides financial assistance for water and wastewater facility construction, and water body assessment and remediation;
- Trains, certifies and assists water and wastewater system operators; and
- Monitors land reports on water quality.

Division of Air Quality

This is designed around three programs: managing non-point and mobile sources of air pollution; managing stationary out-of-stack discharges of air pollution through a permit and compliance program; and field air monitoring to measure progress and understand problems.

Department of Fish & Game

Department of Health & Social Services

Division of State Health Planning and Development

The division requires plans and specifications for health facilities be reviewed by architects; must conform to the International Building Code, and in some cases, Life Safety Code 101; that hospitals be capable of continuing services to the public after a disaster. Design should allow for safe exits from the facility in event of an earthquake. Approach is similar to the Hospital Seismic Safety Act adopted in California.

Department of Law

Office of the Attorney General

Provides legal advice to the governor and other state officers and has the duties and powers listed in AS 44.23.020. Apart from advising other state agencies, the Department of Law is not engaged in activities and programs to decrease vulnerability to hazards identified in the State All-Hazard Risk Mitigation Plan.

Department of Military & Veterans Affairs

Division of Homeland Security & Emergency Management

Has responsibility for disaster preparedness including preparation of a comprehensive state emergency plan, assisting local governments in designing emergency response plans, distribution of food and supplies during disasters, and establishing public information education programs. DHS&EM is responsible for recommending land-use and building regulations to communities to reduce the impacts and cost of disasters. DHS&EM coordinates with Tsunami Warning Center, Alaska State Troopers, State Emergency Response Commission, and local communities. Included in DHS&EM duties are the preparation and maintenance of a state emergency plan which shall include recommendations for zoning, building and other land use controls; safety measures for securing mobile homes and other nonpermanent or semi-permanent structures; and other preventive and preparedness measures designed to eliminate or reduce disasters or their impact.

Department of Natural Resources

Division of Geological & Geophysical Surveys (DGGS)

Collects, evaluates, and distributes geologic data and information on earthquakes, volcanoes, and engineering geology. DGGS conducts geological and geophysical studies to determine potential geological hazards to buildings, roads, bridges and other installations and structures. Publishes maps and reports on the geology of Alaska, including location and severity of geologic hazards.

Division of Forestry

As a Division within the Department of Natural Resources, Forestry protects water quality, fish and wildlife habitat, and other forest values through appropriate forest practices and administration of the Forest Resources and Practices Act. In cooperation with federal agencies, Forestry manages a wildland fire program on 150 million acres of land. Forestry is responsible to oversee and control the fire protection obligation on all state, private, and municipal lands in the State of Alaska on behalf of the Department.

Alaska is the only state with an interagency fire plan. This plan divides the state into fire protection levels based on major natural firebreaks and the objectives of land managers. Firefighting resources can be allocated to the highest priority areas--those areas where communities and valuable resources are located. It also gives options for lower cost strategies in remote and unpopulated areas.

Urban interface areas are growing as the population increases. This will present increased potential for losses from wildland fire. Increased fire prevention activities continue to educate the public on its responsibility to be prepared for fire.

Authority for managing wildland fire is derived from AS 41.15.10. - 41.15.170.

Department of Public Safety

AS 18.76.010 Statutory responsibility for Alaska Avalanche Warning System, part of the Alaska Avalanche and Fire Weather Forecast System. Located within Alaska Department of Public Safety, in cooperation with a municipality or federal agency, shall participate in the development and implementation of a statewide avalanche warning system. The statewide system shall:

a) establish & maintain a service center and primary and supplementary field stations to gather information and data concerning ground water conditions, snow pack and avalanche activity;
b) forecast snow avalanche conditions statewide;
c) coordinate a public awareness program;
d) catalog a comprehensive atlas of avalanche paths and slide occurrences; and assist local governments and state agencies in identifying hazardous zones and in developing snow avalanche zoning regulations.

Division of Alaska State Troopers

Division of Fire Prevention

Statute reference AS 18.70

Division of Fish & Wildlife Protection

Department of Transportation & Public Facilities

The Department of Transportation and Public Facilities (DOT/PF) personnel provide technical assistance to the various emergency management programs, to include mitigation. This assistance is addressed in the DHS&EM-DOT/PF Memorandum of Agreement and includes, but is not limited to:

- Environmental reviews;
- Archaeological surveys
- Historic preservation reviews

In addition, DOT/PF and DHS&EM coordinate buyout projects to ensure that there are no potential right-of-way conflicts with future use of land for bridge and highway projects, and collaborate on earthquake mitigation.

Additionally, DOT/PF provides safe, efficient, economical and effective operation of the State's highways, harbors and airports. The Department uses it's Planning, Design & Engineering, Maintenance & Operations and Intelligent Transportation Systems resources to identify the hazard, plan and initiate mitigation activities to meet the transportation needs of Alaskans and make Alaska a better place to live and work. The Department budgets for the temporary replacement bridges and materials necessary to make the multi-model transportation system operational following a natural disaster.

Division of Design & Engineering Services

Airports, M&O, Bridge Design (seismic issues, flooding issues, FEMA, channel design, etc)

Other State Organizations

There are a number of Boards and Commissions which can assist in refining hazard mitigation strategies for communities including the Alaska Coastal Policy Council, State Emergency Response Commission, Safety Advisory Council, Alaska Science and Technology Council, and Alaska Water Resources Board.

University of Alaska Fairbanks

UAF/GI

Alaska Earthquake Information Center

The center is a cooperative project with USGS and the University of Alaska, Geophysical Institute. Formed in 1989 monitor's seismicity within the state using a network of 180 seismograph stations.

Federal

Federal Emergency Management Agency

U. S. Geological Survey

The agency deals with a wide range of natural hazards like earthquakes, floods, volcanic eruptions, landslides, coastal erosion, wildlife diseases, wildland fires, and geomagnetic storms. These "natural events" inflict damage on people and property that costs the nation on average $50 billion per year. [USGS Fact Sheet 188-97, December 1997]

USGS works extensively with local, state and federal agencies to reduce the loss from natural hazards. Collaborative processes have included stream and precipitation gauges on the Kenai Peninsula, volcano hazard monitoring, and improved seismic sensors.

Alaska Volcano Observatory (AVO)

The observatory is a joint program of USGS, the University of Alaska Fairbanks Geophysical Institute, and Alaska Division of Geological and Geophysical Surveys. AVO monitors and studies Alaska's volcanoes to predict and record eruptive activity and informs and advises on volcanoes. Three primary objectives: conduct monitoring and other scientific investigations to assess the nature, timing, and likelihood of activity; assess volcanic hazards associated with anticipated activity, including kinds of events, effects and areas of risk; and provide timely and accurate information on volcanic hazards and warnings of impending activity.

U.S. Army Corps of Engineers

Department of the Interior

Economic Development Administration

Environmental Protection Agency

Farm Service Agency

U.S. Fish and Wildlife Service

U.S. Forest Service

Federal Highway Administration

U.S. Department of Housing and Urban Development

Bureau of Land Management

National Marine Fisheries Service

National Park Service

Natural Resources Conservation Service

National Weather Service

U.S. West Coast/Alaska Tsunami Warning Center

NOAA's tsunami mission is to provide reliable tsunami forecasts and warnings and to promote community resilience.

The primary operational warning system objectives for carrying out this mission are to rapidly locate, size, and otherwise characterize major earthquakes, determine their tsunamigenic potential, predict tsunami arrival times, predict coastal runup when possible, and disseminate appropriate warning and informational products based on this information.

NOAA operates two tsunami warning centers in the United States: the West Coast/Alaska Tsunami Warning Center and the Richard H. Hagemeyer Pacific Tsunami Warning Center. The West Coast/Alaska Tsunami Warning Center area-of-responsibility (AOR) consists of Canadian coastal regions and the ocean coasts of all U.S. States except Hawaii. The Pacific Tsunami Warning Center AOR consists of Hawaii, other U.S. interests in the Pacific Basin, countries participating in the Tsunami Warning System in the Pacific, and on an interim basin Indian Ocean and Caribbean Sea countries.

Rural Development (US Department of Agriculture)

Small Business Administration

Other Stakeholders...

Tanana Chiefs Conference

Alaska Inter-Tribal Conference

Denali Commission

American Red Cross

Alyeska Pipeline

Alaska Municipal League

Interagency Hydrology Committee for Alaska (IHCA) – state/federal

A technical advisory committee to the Water Resources Board but since there is in reality no Board, there is a severe disconnect in advising the Governor's Office on water related issues.

APPENDIX 5 - ASSISTANCE PROGRAMS

Please note: Only the main grant programs will be described in this appendix.

Federal Programs

FEMA Programs

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) was created in November 1988 by the Stafford Act, Section 404. Its goal is to helps states and communities to implement long-term hazard mitigation measures following a Presidential Disaster Declaration.

Eligible applicants include:

- State and local governments
- Native American tribes and Alaskan Native Villages (not Alaskan Native corporations with ownership vested in private individuals)
- Certain non-profit organizations and institutions

Businesses and homeowners may not apply directly for HMGP funding but their community can apply on their behalf.

HMGP activities are managed by DHS&EM. The state develops the administrative plan for implementing the HMGP, solicits projects, provides technical assistance, and establishes priorities, as well as selecting and forwarding projects to FEMA for final approval.

The state also acts as a grantee by receiving the funds from FEMA and disbursing them to the successful projects. The funding is determined by calculating a percentage of the federal funds spent on each disaster. The standard percentage is 15% but this can be increased to 20% if the State has met the Enhanced Mitigation Plan criteria established by the Disaster Mitigation Act of 2000.

The federal cost share is 75% of the project's eligible costs. The other 25% must come from non-federal sources and can come from cash and in-kind sources. The only exception is that funding provided from the Community Development Block Grant (CDBG) program from the Department of Housing and Urban Development (HUD) can be used for the 25%.

HMGP funds are to be used on projects that reduce or eliminate the losses from future disasters by providing long-term solutions and where the potential savings are greater than the cost to implement the project. Examples of HMGP projects are:

- Acquisition of real property
- Elevation of flood prone structures
- Localized flood control projects

5% Discretionary Funding

Sometimes, it is hard to evaluate mitigation measures using traditional cost benefit criteria. Consequently, 5% of HMGP funds awarded to a State may be used to finance non-traditional hazard mitigation projects such as the development of the local hazard mitigation plan or the installation of a warning system.

7% Planning Funding

With the increasing emphasis on mitigation planning, 7% of the HMGP funds awarded to a State must be used to develop or improve State, local or tribal mitigation plans.

Flood Mitigation Assistance

The Flood Mitigation Assistance Program (FMA) provides pre-disaster grants to state and local governments for planning and implementation. It was created by the National Flood Insurance Reform Act of 1994. Its goal is to reduce or eliminate NFIP claims so this program is only available to NFIP participating communities.

It gets about $20 million per year from the National Flood Insurance Fund. The funds are to help States and communities implement mitigation measures to eliminate or reduce long-term risk of flood damage to structure insurable under NFIP.

State agencies and NFIP communities or local organizations are eligible except those that have been suspended or on probation from NFIP. Individuals are not eligible to apply directly for FMA funds but may be able to go through their community.

There are three types of grants available:

- Planning: To prepare or update Flood Mitigation Plans must be an NFIP participating community
- Project: To implement mitigation measures identified in the community's approved Flood Mitigation Plan

  Project criteria:
  - Cost effective
  - Cost beneficial to NFIP
  - Technically feasible
  - Physically located within an NFIP community or reduce future flood damage in an NFIP community
  - Conforms with the minimum standards of the NFIP Floodplain Management Regulations
  - Conforms with the applicant's Flood Mitigation Plan
  - Conforms with all applicable laws and regulations
- Technical Assistance: To help the State in providing technical assistance or to implement approved projects.

The program is currently emphasizing the need for States and local communities to address repetitive loss properties. These include structures with 4 or more losses and structures with 2 or more losses where the insurance payments have exceeded the property's value.

FEMA may contribute 75% of the total eligible costs. The remaining 25% must come from a non-federal source and only half of that 25% can be provided as in-kind contributions from third parties. There are limits to the frequency of grants and the amount of funding that can be awarded to a State or community in any 5-year period.

Increased Cost of Compliance

Increased Cost of Compliance Program (ICC) coverage is available on NFIP policies written or renewed on or after June 1, 1997. The ICC is designed to help flood insurance policy holders take the steps required to reduce future flood damage to their homes or businesses by bringing their home or business into compliance with their community's floodplain ordinance. ICC assistance is available to each applicant only once, because the property owner is expected to achieve compliance with the first claim.

ICC coverage, which was mandated under the National Flood Insurance Reform Act of 1994, may pay up to $20,000 to offset costs associated with the following kinds of construction associated with buildings that are substantially damaged or subject to repetitive flood loss:

- **Elevation-** Raising the home or business to or above the flood elevation adopted by the community.
- **Relocation-** Moving the home or business out of harm's way.
- **Demolition-**Tearing down and removing flood damaged buildings.
- **Flood-proofing-** Is an option available primarily for nonresidential buildings. It involves making a building watertight through a combination of adjustments or additions of features to the building that reduces potential for flood damage.

ICC coverage is only available for buildings that the community has designated as suffering substantial damage or repetitive loss. Policy holders with such property can only file a claim for the increased costs associated with repairing the building to flood-safe standards. This coverage is adjusted separately from the flood damage claim filed under the standard flood insurance policy.

You are eligible to get ICC assistance if your property meets one of the following two conditions:

- **Substantial damage** exists when the policy holder's community certifies that a home or business has been damaged by flooding to the point hat repairs will cost 50 percent or more of the building's pre-damage market value.
- **Repetitive loss** is only available in a community that has incorporated a repetitive loss provision in its floodplain management ordinance. Such a community must determine that the policy holder's home or business was damaged by a flood two times in the past 10 years. In each case, the cost of repairing the flood damage, on the average must have equaled or exceeded 25 percent of the market value of the property at the time of the flood. This is called repetitive damage. Additionally, there must have been flood insurance claim payments for each of the two flood losses.

Small Business Administration

Business Physical Disaster Loans

The Business Physical Disaster Loans are for businesses or non-profit organizations affected by a Presidential or SBA declared disaster. A loan can be increased by up to 20% for products that mitigation real property damage caused by the same type of disaster.

Other Federal Programs

Numerous resources are available through other federal departments and agencies to assist in support of mitigation objectives:

Department of Agriculture

- Natural Resource Conservation Service
- U. S. Forest Service

Department of Commerce

- National Oceanic & Atmospheric Administration
- National Weather Service
- National Hurricane Service
- Office of Coastal Resources Administration

Department of Defense

- Army Corps of Engineers

Department of Health, Education & Welfare

- Center for Disease Control

Department of Housing & Urban Development

- Community Development Block Grant
- HOME Program

Department of the Interior

- U.S. Geological Survey
- Fish & Wildlife Service
- Bureau of Reclamation
- Bureau of Land Management
- Bureau of Indian Affairs

Environmental Protection Agency

Department of Transportation

- Federal Highway Administration
- Federal Aviation Administration
- National Aeronautics & Space Administration

National Flood proofing Committee

National Trust for Historic Preservation

State Of Alaska

Division of Homeland Security and Emergency Management

Disaster Relief Fund

The Governor can spend up to $1.0 million to assist in case of a disaster and to alleviate the effects of a disaster by making grants or loans to individuals or communities.

Fuel Emergency Fund

When the governor declares there is a severe shortage of fuel in a community the community may apply for a grant to purchase emergency fuel.

Department of Commerce, Community & Economic Development

Community Development Block Grants

Provide financial assistance to communities for public facilities and planning activities to address issues detrimental to health and safety and reduce the cost of essential community services. All communities, except the Municipality of Anchorage, are eligible for grants. 51% of the individuals who benefit from the grant must be low and/or moderate income. (There is a separate CDBG program administered by HUD for Indian tribes and Alaska Native Villages.)

Alaska Regional Development Organizations (ARDORs)

The intent is to stimulate economic development and produce healthy, sustainable local economies.

Rural Development Assistance Mini-Grants

This fund is for strategic plan development, feasibility engineering studies, and seed money for capital projects.

Unincorporated Community Grants

Grants awarded by the legislature to unincorporated communities and/or nonprofits for projects such as health, fire and safety, water and sewer, construction of community facilities, & program operations.

Information about other grant programs may be found in these sources:

- *Disaster Assistance: A Guide to Recovery Programs*
- *A Guide to Federal Aid in Disasters*

- *Catalog of Federal Domestic Assistance*

  The Catalog of Federal Domestic Assistance Programs (CFDA) is a government-wide compendium of all Federal programs, projects, services, and activities that provide assistance or benefits to the American public. These programs provide grants, loans, loan guarantees, services, information, scholarships, training, insurance, etc., to millions of Americans every day.
  Available at http://aspe.os.dhhs.gov/cfda/cfda.htm

- *Alaska Economic Development Resource Guide*

  The Alaska Economic Development Resource Guide is designed to bring together in one place an inventory of programs and services that can provide economic development assistance to Alaska communities, businesses, organizations, and individuals.
  Available at http://www.commerce.state.ak.us/dca/edrg/EDRG.htm

- *Federal Programs Offering Floodplain Management Alternatives*

  This handbook is to provide information to local cooperators and other interested parties about Federal programs that support a non-structural approach to floodplain management. Included are broad strategies and specific Federal programs that could form the basis for a non-structural response to a flood event.
  Available at http://www.fema.gov/plan/prevent/floodplan/publications.shtm

Federal Mitigation Programs, Activities, & Initiatives

Source: FEMA, www.fema.gov/doc/fima/fmpai.doc

Program / Activity	Type of Assistance	Agency & Contact
Basic & Applied Research/Development		
Hazard Reduction Program	**Funding** for research and related educational activities on hazards.	National Science Foundation (**NSF**), Directorate for Engineering, Division of Civil and Mechanical Systems, Hazard Reduction Program: (703) 306-1360
Decision, Risk, and Management Science Program	**Funding** for research and related educational activities on risk, perception, communication, and management (primarily technological hazards)	**NSF** – Directorate for Social, Behavioral and Economic Science, Division of Social Behavioral and Economic Research, Decision, Risk, and Management Science Program (DRMS): (703) 306-1757 www.nsf.gov/funding/
Societal Dimensions of Engineering, Science, and Technology Program	**Funding** for research and related educational activities on topics such as ethics, values, and the assessment, communication, management and perception of risk	**NSF** – Directorate for Social, Behavioral and Economic Science, Division of Social, Behavioral and Economic Research, Societal Dimensions of Engineering, Science and Technology Program: (703) 306-1743
National Earthquake Hazard Reduction Program (NEHRP) in Earth Sciences	**Research** into basic and applied earth and building sciences.	**NSF** – Directorate for Geosciences, Division of Earth Sciences: (703) 306-1550
Technical and Planning Assistance		
Planning Assistance to States	**Technical and planning assistance** for the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources.	Department of Defense (**DOD**) US Army Corps of Engineers (**USACE**) Contact the Floodplain Management Staff in the Appropriate USACE Regional Office North Atlantic: (212) 264-7813

		South Atlantic: (404) 331-4441 Great Lakes and Ohio River: (513) 684-6050 Mississippi Valley: (601) 634-5827 Northwestern: (503) 808-3853 Southwestern: (214-767-2613 South Pacific: (415) 977-8164 Pacific Ocean: (808) 438-8863
Disaster Mitigation Planning and Technical Assistance	**Technical and planning assistance** grants for capacity building and mitigation project activities focusing on creating disaster resistant jobs and workplaces.	Department of Commerce (DOC), Economic Development Administration (EDA): (800) 345-1222 EDA's Disaster Recovery Coordinator: (202) 482-6225 www.doc.gov/eda
Watershed Surveys and Planning	**Surveys and planning studies** for appraising water and related resources, and formulating alternative plans for conservation use and development. Grants and advisory/counseling services to assist w/ planning and implementation improvement.	US Department of Agriculture (USDA) – National Resources Conservation Service (NRCS) Watersheds and Wetlands Division: (202) 720-4527 Deputy Chief for Programs: (202) 690-0848 www.nrcs.usda.gov
National Flood Insurance Program	**Formula grants** to States to assist communities to comply with NFIP floodplain management requirements (Community Assistance Program).	FEMA
Emergency Management / Mitigation Training	**Training** in disaster mitigation, preparedness, planning.	FEMA
National Dam Safety Program	**Technical assistance**, training, and grants to help improve State dam safety programs.	FEMA
National Earthquake Hazards Reduction Program	**Training, planning and technical assistance** under grants to States or local jurisdictions.	*FEMA; DOI-USGS* *USGS* Earthquake Program Coordinator: (703) 648-6785
Volcano Hazards Program	**Technical assistance**: Volcano hazard warnings and operation of four volcano observatories to monitor and assess volcano hazard risk.	*DOI-USGS* Volcanic Hazards Program Coordinator: (703) 648-6708 (650) 329-5228

Floodplain Management Services	**Technical and planning assistance** at the local, regional, or national level needed to support effective floodplain management.	*DOD-USACE* North Atlantic: (212) 264-7813 South Atlantic: (404) 331-4441 Great Lakes and Ohio River: (513) 684-6050 Mississippi Valley: (601) 634-5827 Northwestern: (503) 808-3853 Southwestern: (214-767-2613 South Pacific: (415) 977-8164 Pacific Ocean: (808) 438-8863
Watershed Protection and Flood Prevention Program	**Technical and financial assistance** for installing works of improvement to protect, develop, and utilize land or water resources in small watersheds under 250,000 acres.	*USDA-NRCS* Director, Watersheds and Wetlands Division: (202) 720-3042 (202) 690-4614 www.nrcs.usda.gov
Environmental Quality Incentives Program (EQIP)	**Technical**, educational, and limited **financial assistance** to encourage environmental enhancement.	*USDA-NRCS* NRCS County Offices Or NRCS EQUIP Program Manager: (202) 720-1834 www.nrcs.usda.gov
National Earthquake Hazard Reduction Program	**Technical and planning assistance** for activities associated with earthquake hazards mitigation.	FEMA, DOI-USGS Earthquake Program Coordinator: (703) 648-6785
Hazard ID & Mapping		
National Flood Insurance Program: Flood Mapping;	**Flood insurance rate maps** and flood plain management maps for all NFIP communities;	FEMA
National Flood Insurance Program: Technical Mapping Advisory Council	**Technical guidance and advice** to coordinate FEMA's map modernization efforts for the National Flood Insurance Program.	*DOI-USGS* **USGS** – National Mapping Division: (573) 308-3802
National Digital Orthophoto Program	Develops **topographic quadrangles** for use in mapping of flood and other hazards.	*DOI-USGS* **USGS** – National Mapping Division: (573) 308-3802
Streamgaging and Flood Monitoring Network	Operation of a **network of over 7,000 streamgaging stations** that provide data on the flood characteristics of rivers.	*DOE-USGS* Chief, Office of Surface Water, *USGS:* ***(703) 648-5303***

Mapping Standards Support	**Expertise in mapping and digital data** standards to support the National Flood Insurance Program.	*DOI-USGS* USGS – National Mapping Division: (573) 308-3802
Soil Survey	**Maintains soil surveys** of counties or other areas to assist with farming, conservation, mitigation or related purposes.	*USDA-NRCS* NRCS – Deputy Chief for Soil Science and Resource Assessment: (202) 720-4630
National Earthquake Hazards Reduction Program	**Seismic mapping for U.S.**	*DOI-USGS* USGS Earthquake Program Coordinator: (703) 648-6785
Project Support		
Aquatic Ecosystem Restoration	**Direct support** for carrying out aquatic ecosystem restoration projects that will improve the quality of the environment.	*DOD-USACE* Chief of Planning @ appropriate USACE Regional Office North Atlantic: (212) 264-7111 South Atlantic: (404) 331-4580 Great Lakes and Ohio River Chicago: (312) 886-5468 Cincinnati: (513) 684-3008 Mississippi Valley Division: (601) 634-7880 Northwestern Division Portland: (503) 808-3850 Omaha: (402) 697-2470 Southwestern Division: (214) 767-2314 South Pacific Division: (415) 977-8171 Pacific Ocean Division: (808) 438-3850
Beneficial Uses of Dredged Materials	**Direct assistance** for projects that protect, restore, or create aquatic and ecologically-related habitats, including wetlands, in connection with dredging an authorized Federal navigation project.	*DOD-USACE* Same as above
Wetlands Protection – Development Grants	**Grants** to support the development and enhancement of State and tribal wetlands protection programs.	US Environmental Protection Agency (**EPA**) EPA Wetlands Hotline: (800) 832-

		7828 Or EPA Headquarters, Office of Water Chief, Wetlands Strategies and State Programs: (202) 260-6045
Clean Water Act Section 319 Grants	**Grants to States** to implement non-point source programs, including support for non-structural watershed resource restoration activities.	*EPA* Office of Water Chief, Non-Point Source Control Branch: (202) 260-7088, 7100
Coastal Zone Management Program	**Grants** for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration.	Department of Commerce **DOC** National Oceanic and Atmospheric Administration (**NOAA**) National Ocean Service Office of Ocean and Coastal Resource Management Chief, Coastal Programs Division: (301) 713-3102
Community Development Block Grant (CDBG) State Administered Program	**Grants to States** to develop viable communities (e.g., housing, a suitable living environment, expanded economic opportunities) in non-entitled areas, for low- and moderate-income persons.	***US Department of Housing and Urban Development*** *(HUD)* State CDBG Program Manager Or State and Small Cities Division, Office of Block Grant Assistance, HUD Headquarters: (202) 708-3587
Community Development Block Grant Entitlement Communities Program	**Grants** to entitled cities and urban counties to develop viable communities (e.g., decent housing, a suitable living environment, expanded economic opportunities), principally for low- and moderate-income persons.	**HUD** City and county applicants should call the Community Planning and Development staff of their appropriate HUD field office. As an alternative, they may call the Entitlement Communities Division, Office of Block Grant Assistance, HUD Headquarters: (202) 708-1577, 3587
Emergency Watershed Protection Program	Provides **technical and financial assistance** for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events.	*USDA – NRCS* National Office – (202) 690-0848 Watersheds and Wetlands Division: (202) 720-3042

Rural Development Assistance -- Utilities	Direct and guaranteed rural economic **loans and business enterprise grants** to address utility issues and development needs.	**USDA**-Rural Utilities Service (RUS) Program Support: (202) 720-1382 Northern Regional Division: (202) 720-1402 Electric Staff Division: (202) 720-1900 Power Supply Division: (202) 720-6436
Rural Development Assistance – Housing	**Grants, loans, and technical assistance** in addressing rehabilitation, health and safety needs in primarily low-income rural areas. Declaration of major disaster necessary.	**USDA**-Rural Housing Service (RHS) Community Programs: (202) 720-1502 Single Family Housing: (202) 720-3773 Multi Family Housing: (202) 720-5177
Project Impact: Building Disaster Resistant Communities	**Funding and technical assistance** to communities and States to implement a sustained pre-disaster mitigation program.	*FEMA*
Flood Mitigation Assistance	**Grants to States** and communities for pre-disaster mitigation to help reduce or eliminate the long-term risk of flood damage to structures insurable under the National Flood Insurance Program.	*FEMA*
Hazard Mitigation Grant Program	**Grants to States and communities** for implementing long-term hazard mitigation measures following a major disaster declaration.	*FEMA*
Public Assistance Program (Infrastructure)	**Grants to States and communities** to repair damaged infrastructure and public facilities, and help restore government or government-related services. Mitigation funding is available for work related damaged components of the eligible building or structure.	*FEMA*

National Flood Insurance Program	Makes available **flood insurance** to residents of communities that adopt and enforce minimum floodplain management requirements.	*FEMA*
HOME Investments Partnerships Program	**Grants to States, local government** and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons.	*HUD* Community Planning and Development, Grant Programs, Office of Affordable Housing, HOME Investment Partnership Programs: (202) 708-2685 (202) 708 0614 extension 4594 1-800-998-9999
Disaster Recovery Initiative	**Grants** to fund gaps in available recovery assistance after disasters (including mitigation).	*HUD* Community Planning and Development Divisions in their respective HUD field offices or HUD Community Planning and Development: (202) 708-2605
Non-Structural Alternatives to Structural Rehabilitation of Damaged Flood Control Works	**Direct planning and construction grants** for non-structural alternatives to the structural rehabilitation of flood control works damaged in floods or coastal storms. $9 million FY99	*DOD-USACE* Emergency Management contact in respective **USACE** field office: North Atlantic: (718) 491-8735 South Atlantic: (404) 331-6795 Great Lakes and Ohio River: (513) 684-3086 Mississippi Valley: (601) 634-7304 Northwestern: (503) 808-3903 Southwestern: (214) 767-2425 South Pacific: (415) 977-8054 Pacific Ocean: (808) 438-1673
Partners for Fish and Wildlife	**Financial and technical assistance** to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.	Department of Interior (**DOI**) – Fish and Wildlife Service (**FWS**) National Coordinator, Ecological Services: (703) 358-2201 A list of State and Regional contacts is available from the National Coordinator upon request.

Project Modifications for Improvement of the Environment	Provides for **ecosystem restoration** by modifying structures and/or operations or water resources projects constructed by the USACE, or restoring areas where a USACE project contributed to the degradation of an area.	*DOD-USACE* Chief of Planning @ appropriate USACE Regional Office North Atlantic: (212) 264-7111 South Atlantic: (404) 331-6270 Great Lakes and Ohio River Chicago: (312) 886-5468 Cincinnati: (513) 684-3008 Mississippi Valley Division: (601) 634-5762 Northwestern Division Portland: (503) 808-3850 Omaha: (402) 697-2470 Southwestern Division: (214) 767-2310 South Pacific Division: (415) 977-8171 Pacific Ocean Division: (808) 438-8880
Post-Disaster Economic Recovery Grants and Assistance	**Grant funding** to assist with the long-term economic recovery of communities, industries, and firms adversely impacted by disasters.	Department of Commerce (**DOC**) – Economic Development Administration (**EDA**) EDA Headquarters Disaster Recovery Coordinator: (202) 482-6225
Public Housing Modernization Reserve for Disasters and Emergencies	**Funding** to public housing agencies for modernization needs resulting from natural disasters (including elevation, flood proofing, and retrofit).	*HUD* Director, Office of Capital Improvements: (202) 708-1640
Indian Housing Assistance (Housing Improvement Program)	**Project grants and technical assistance** to substantially eliminate sub-standard Indian housing.	Department of Interior (**DOI**)-Bureau of Indian Affairs (**BIA**) Division of Housing Assistance, Office of Tribal Services: (202) 208-5427
Land Protection	**Technical assistance** for run-off retardation and soil erosion prevention to reduce hazards to life and property.	*USDA-NRCS* Applicants should contact the National NRCS office: (202) 720-4527
North American Wetland Conservation Fund	**Cost-share grants** to stimulate public/private partnerships for the protection, restoration and management of wetland habitats.	*DOI-FWS* North American Waterfowl and Wetlands Office: (703) 358-1784

Land Acquisition	**Acquires or purchases easements** on high-quality lands and waters for inclusion into the National Wildlife Refuge System.	*DOI-FWS* Division of Realty, National Coordinator: (703) 358-1713
Federal Land Transfer / Federal Land to Parks Program	**Identifies, assesses, and transfers available Federal real** property for acquisition for State and local parks and recreation, such as open space.	*DOI-NPS* General Services Administration Offices Fort Worth, TX: (817) 334-2331 Boston, MA: (617) 835-5700 Or Federal Lands to Parks Leader **NPS** National Office: (202) 565-1184
Wetlands Reserve Program	**Financial and technical assistance** to protect and restore wetlands through easements and restoration agreements.	*USDA-NRCS* National Policy Coordinator NRCS Watersheds and Wetlands Division: (202) 720-3042
Transfers of Inventory Farm Properties to Federal and State Agencies for Conservation Purposes	Transfers title of certain inventory farm properties owned by FSA to Federal and State agencies for **conservation** purposes (including the restoration of wetlands and floodplain areas to reduce future flood potential)	***US Department of Agriculture (USDA) – Farm Service Agency (FSA)*** Farm Loan Programs National Office: (202) 720-3467, 1632
Financing and Loan Guarantees		
Physical Disaster Loans and Economic Injury Disaster Loans	**Disaster loans** to non-farm, private sector owners of disaster damaged property for uninsured losses. Loans can be increased by up to 20 percent for mitigation purposes.	***Small Business Administration (SBA)*** National Headquarters Associate Administrator for Disaster Assistance: (202) 205-6734
Conservation Contracts	**Debt reduction** for delinquent and non-delinquent borrowers in exchange for conservation contracts placed on environmentally sensitive real property that secures FSA loans.	*USDA-FSA* Farm Loan Programs FSA National Office: (202) 720-3467, 1632 or local FSA office

Clean Water State Revolving Funds	**Loans** at actual or below-market interest rates to help build, repair, relocate, or replace wastewater treatment plants.	*EPA* EPA Office of Water State Revolving Fund Branch Branch Chief: (202) 260-7359 A list of Regional Offices is available upon request
Section 108 Loan Guarantee Program	**Loan guarantees** to public entities for community and economic development (including mitigation measures).	*HUD* Community Planning and Development staff at appropriate HUD field office, or the Section 108 Office in HUD Headquarters: (202) 708-1871
Section 504 Loans for Housing	**Repair loans, grants and technical assistance** to very low-income senior homeowners living in rural areas to repair their homes and remove health and safety hazards.	US Department of Agriculture (**USDA**) – Rural Housing Service (**RHS**) Contact local RHS Field Office, or RHS Headquarters, Director, Single Family Housing Direct Loan Division: (202) 720-1474
Section 502 Loan and Guaranteed Loan Program	Provides **loans, loan guarantees, and technical assistance** to very low and low-income applicants to purchase, build, or rehabilitate a home in a rural area.	*USDA-RHS* Contact the Local RHS Field Office, or the Director, Single Family Housing Guaranteed Loan Division, RHS: (202) 720-1452
Rural Development Assistance -- Utilities	Direct and guaranteed **rural economic loans and business enterprise grants** to address utility issues and development needs.	**USDA**-Rural Utility Service (**RUS**) Contact Rural Development Field Offices, or RHS, Deputy Administrator, Community Programs Division: (202) 720-1490
Farm Ownership Loans	**Direct loans, guaranteed / insured loans, and technical assistance** to farmers so that they may develop, construct, improve, or repair farm homes, farms, and service buildings, and to make other necessary improvements.	*USDA-FSA* Director, Farm Programs Loan Making Division, FSA: (202) 720-1632

APPENDIX 6 – DISASTER DECLARATIONS

Before 1988 the insurance industry had never experienced a loss greater than $1 billion due to a single event. Since then there have been 15 natural disasters that have exceeded that amount. Hurricane Andrew had insured losses exceeding $15.5 billion while the Northridge earthquake damage was in the range of $13 billion. Most general homeowner insurance policies protect individuals from volcano, landslides (avalanche, mudslide), and wildfire. Separate coverage can be provided for flood, high winds and earthquakes.

Between 1989 and 1996 there were nine Presidential Disaster Declarations for the State of Alaska with total federal obligations of almost $100 million. Major federal expenditures have been for infrastructure grants with over $77 million expended; almost $12 million has been spent on Hazard Mitigation grants. Severe storms and flooding were responsible for three declarations; fires for four; ice jams and severe freezing for two. This does not include the 2000 Severe Winter Storm Disaster.

There have been eight State of Alaska disasters, between 1979 and February 2002, which the governor requested a presidential declaration but the requests were denied.

The following report, with accompanying tables, provides a list of State and Federal Disaster Declarations as well as Administrative Orders.

Disaster Cost Index #	Disaster Narrative	Community	Type	State, Federal, Local
78-1	**The Village of Karluk, January 21, 1978** As a result of a winter storm which struck Kodiak Island, wind driven waves broke over the top of a spit in Karluk and ultimately cut a channel through the spit. The storm destroyed a bridge connecting the mainland portion of the village with the spit, and thus isolated the only store and the post office from the rest of the community. The waves also washed away a 10,000 gallon fuel storage tank which provided the village's only fuel supply, and destroyed all but about 1,500 gallons of fuel. Loss of electric power destroyed frozen food stocks in the store and the owner subsequently went out of business. The loss of the bridge prevented some school children from walking from their homes to school, and in addition the new channel formed by the storm undercut the bank and threatened the village's community hall and an RCA antenna, as well as two private residences. In response to this Disaster Emergency, the State provided public assistance to restore the bridge and replace the village's fuel storage facility. A number of threatened houses were moved to safer locations. The Corps of Engineers conducted bank stabilization operations which alleviated the threat to the community hall and RCA antenna.	Kodiak Island Borough	Weather	State

78-2	**Campbell Creek (Anchorage), February 10, 1978** On this occasion the Governor proclaimed a Disaster Emergency as a result of flooding and glaciation in the south fork of Campbell Creek in Anchorage which affected an area bounded by East 8Oth Avenue, Spruce Avenue, Lake Otis Parkway, and Abbott Loop Road, threatening a number of homes in the area with water and ice, and contamination of surface and subsurface water. Public assistance was provided through private contractors and resources of the Alaska Department of Transportation (DOT) in order to thaw the stream bed and allow the water to flow and to remove the ice which had overflowed the creek's bank. Most of the property owners in the area were insured, and thus no form of assistance to individuals and families was necessary.	Municipality of Anchorage	Flooding	State
78-3	**Wrangell/Craig, November 6, 1978** During this period an intense storm occurred in the Wrangell/Craig area in Southeastern Alaska generating high winds, torrential rains and heavy sea waves. The storm caused considerable damage to both private and public property in the two communities. Subsequent to the Governor's Proclamation of Disaster Emergency, DES provided both public assistance and assistance to individuals and families to assist the communities in recovering from the disaster. SBA made disaster loans available to affected businesses and homeowners.	Southeast Island	Weather	State

79-4	**Matanuska-Susitna Borough, February 9, 1979** As a result of a winter storm generating high winds and drifting snow, many roads in the Matanuska-Susitna Borough were rendered impassable to all traffic, including emergency vehicles. DOT was tasked by DES and public assistance was provided to clear the roads; the Alaska National Guard conducted rescue operations to provide to isolated and stranded individuals. Subsequent to the Governor's request, the Small Business Administration made disaster loans available to some 44 residents and 24 businesses which suffered damage as a result of the storm. The State did not make any direct grants to individuals or families.	Matanuska-Susitna Borough	Weather	State
79-5	**Delta Fire, June 18, 1979** During the period from May to June of 1979, abnormally dry weather resulted in over 200 wild forest and grassland fires in the interior of Alaska. At that time the Alaska Department of Natural Resources (DNR) was conducting its fire suppression activities with funds contained in a special account created by the Legislature in 1978 in the amount of $750,000. When these funds were depleted, the Governor proclaimed a Disaster Emergency in order to permit the immediate transfer of funds from the Disaster Relief Fund to DNR's Fire Suppression Fund. This transfer thus represents public assistance provided through DES to a State agency, the Department of Natural Resources. In part as a result of this Disaster Emergency Proclamation and the depletion of DNR's Fire Suppression Fund, the Alaska Legislature increased the fund to $5,000,000 in 1980-81, and again to $9,000,000 in 1982. No assistance to individuals and families was provided as a result of this incident.	Delta/Greely	Wildland Fire	State

80-6	**West Coast Storm, November 23, 1979** A major sea storm on the west coast of Alaska caused extensive damage in 14 villages in the area. The Governor proclaimed a Disaster Emergency effective from Sheldon Point to Togiak. At the request of the Governor, the SBA authorized disaster loans to affected individuals and businesses, and the State provided grants to individuals and families as well as some public assistance related to a fuel spill at Togiak.	Southwest Region	Weather	State
80-7	**Willow Creek, December 20, 1979** Abnormal weather conditions, caused by a combination of extreme debris jams, abnormal temperature variations and glaciation caused flooding of Willow Creek in the Matanuska-Susitna Borough, rendering roads in the area impassable and threatening homes.	Matanuska-Susitna Borough	Weather	State
80-8	**Kodiak Island, February 5, 1980** The Governor proclaimed a Disaster Emergency subsequent to an intense winter storm which caused extensive damage to public and private properties on Kodiak Island during January and February of 1980. The storm caused damage to port facilities, docks and shoreline roadways in Kodiak, harbor facilities at Port Lions and Ouzinkie, and breakwaters at Old Harbor and Akhiok. On the day of his proclamation, the Governor requested that the President declare a Major Disaster in the area, but after an on-site inspection by officials of FEMA, this request was denied. The State provided disaster assistance for repair of the damaged public facilities. No grant assistance was provided to individuals and families.	Kodiak Island Borough	Weather	State

80-9	**Anchorage Windstorm, April 4, 1980** The Governor proclaimed a Disaster Emergency subsequent to a hurricane force windstorm which caused damage to over 5,000 residences and businesses in the Anchorage area and parts of the Matanuska-Susitna Borough. Though most of the residents were insured against their losses, the State provided a number of Individual and Family Grants and temporary housing, as well as public assistance to the Municipality. In addition, the SBA made disaster loans available to affected individuals.	Municipality of Anchorage	Weather	State
81-10	**Bristol Bay, September 2, 1980** Following a storm which generated high winds and heavy sea waves, causing damage to the equipment of numerous commercial fishermen, canneries and approximately 15 to 20 private houses, the Governor proclaimed a Disaster Emergency extending from Dillingham to Port Heiden. The State provided both public assistance to communities and grants to individuals and families; the SBA provided disaster loans to residents of the area. In addition, the State provided temporary housing assistance to one of the residents who were forced to relocate due to damage to his home.	Bristol Bay Borough, Lake & Peninsula Borough, & Southwest Region	Weather	State
81-11	**Copper Center, December 11, 1980** A Disaster Emergency was proclaimed as a result of flooding of the Klutina River at Copper Center due to extreme cold temperatures combined with lack of snow insulation and a high volume of water flow in the river. All structures in the area were threatened, including the Fire Hall. Public assistance was provided by DES to alleviate the situation and prevent damage. A major portion of the Disaster Relief Funds were provided to the Alaska Department of Transportation for the purpose of conducting drainage operations and performing the work necessary to recommence the normal flow of the river. No funds were necessary for grants to individuals and families.	Copper River	Flood	State

81-12	**Angoon, June 8, 1981** In May 1981, the community of Angoon experienced a catastrophic failure of its submerged water main resulting in a failure of the water system, the sewer system, and the interruption of fire fighting capabilities in the area. The Governor's Proclamation of a Disaster Emergency enabled DES to provide the community with the funds necessary to repair these systems and restore these services. Only public assistance was provided as damage to individual and family properties was not sufficient to warrant the institution of an Individual and Family Grant Program.	Chatham	Tech-nological	State
82-13	**Southcentral Alaska Rainstorm, July 22, 1981** A torrential rainstorm resulted in widespread flooding, stream over flow and damage to bridges and culverts in Southcentral Alaska. This condition made travel hazardous throughout the region and in some cases roads were impassable to all traffic, including emergency vehicles. The Governor's Proclamation of a Disaster Emergency enabled DES to provide the affected communities with immediate recovery assistance, resulting in the restoration of the area's transportation system. No direct assistance was provided to individuals and families.	Matanuska – Susitna Borough, Municipality of Anchorage, Kenai Peninsula Borough	Flood	State
82-14	**Emmonak, February 12, 1982** On February 7, 1982, a catastrophic fire destroyed the safe water facility in the community of Emmonak, situated at the mouth of the Yukon River, resulting in a shortage of potable water, causing a health hazard, and forcing the closure of schools. The Governor's Proclamation of a Disaster Emergency enabled DES to provide the community with the public assistance necessary to replace the destroyed facility.	Lower Yukon	Fire	State

82-15	**Fort Yukon, May 17, 1982** In May of 1982, ice jams, excessive stream flow and abnormal temperature variations resulted in flooding in the community of Ft. Yukon located at the juncture of the Porcupine and Yukon rivers. The flood resulted in extensive damage to public and private property and forced the dislocation of several hundred residents. The Governor's Proclamation of a Disaster Emergency enabled DES to draw on the Disaster Relief Fund to provide both public assistance and grants to individuals and families. In addition to State assistance, SBA made disaster loans in the area and the American Red Cross provided assistance using the organizations' Disaster Relief Fund.	Yukon Flats	Flood	State
83-16	**Russian Mission, Akiak, Akiachak, October 1, 1982** During September of 1982, severe windstorms generating high waves caused extensive damage in the villages of Russian Mission, Akiak and Akiachak. The Governor proclaimed a Disaster Emergency to exist in the three villages and the State, through DES, provided both public assistance and grants to individuals and families in the affected villages.	Yupiit & Lower Yukon	Weather	State
83-17	**Takotna, December 2, 1982** The Governor proclaimed a Disaster Emergency following a catastrophic fire at Takotna which destroyed the village's generator/equipment shop and storage facility. As a result of the fire, there was no electricity in the village, and heavy equipment necessary to maintain the airstrip and roads was damaged or destroyed. The Governor's proclamation provided public assistance from the Disaster Relief Fund to replace these facilities and equipment.	Iditarod Area	Fire	State

83-18	**Kipnuk, April 1, 1983** During the winter of 1982, the bridge connecting the village of Kipnuk with the community school was damaged by high water and ice flows, and thus rendered unsafe for use. The Governor's Proclamation of Disaster Emergency enabled the State to provide public assistance in order to replace the bridge. At the time the Alaska Department of Transportation was able to provide a bridge that was surplus to its needs. Disaster Relief Funds were used to reimburse the Alaska National Guard for expenses incurred in transporting the bridge to the village.	Lower Kuskokwim	Flood	State
83-19	**Aniak, June 15, 1983** Flooding during spring breakup caused by ice jams and excessive stream flow resulted in damage to a public roadway and a number of public buildings in Aniak. Several families were forced to temporarily relocate due to high water. The Governor's Proclamation of a Disaster Emergency provided public assistance for the purpose of restoring the roadway to its predisaster condition. No assistance was provided for individuals and families.	Kuspuk	Flood	State
84-20	**City of Ketchikan, August 29, 1983** On August 27, 1983, a ferry mishap occurred in the City of Ketchikan which caused damage to the ferry dock on Gravina Island. The dock is needed for transport of fuel and supplies, as well as emergency fire support, between the city and the airport. The Governor's Proclamation of a Disaster Emergency enabled the State to provide temporary alternate transport capabilities using manpower and equipment of the Alaska National Guard. Public assistance from the Disaster Relief Fund will defray in part the expenses involved in the use of this personnel and equipment.	Ketchikan Gateway Borough	Tech-nological	State
84-21	**Cordova, September 16, 1983** The Governor proclaimed a Disaster Emergency after a flash flood generated by heavy rainfall destroyed portions of a pipeline system which provides the City of Cordova with, approximately 60% of its water supply. Public assistance was provided for the purpose of repairing the city's water system.	Chugach	Flood	State

84-22	**Chefornak, November 17, 1983** As a result of failure of the primary electrical generator, the city was without power. Public assistance was granted to purchase and install a new generator.	Lower Kuskokwim	Tech-nological	State
84-23	**Unalakleet, March 5, 1984** Extreme cold for a period of 6-7 weeks caused a drastic reduction in the city water supply and eventual freezing of a major loop on the city water system. Public assistance has granted to repair/replace portions of the water system.	Bering Strait	Weather	State
84-24	**Mountain Village, March 8, 1984** Circumstances about the same as that in Unalakleet. Public assistance granted to repair/replace one loop of the city water system.	Lower Yukon	Weather	State
84-25	**Elim, March 9, 1984** A reduction in water from the village source resulted in freezing and rupture in portions of the water and sewer system. Public assistance was granted to replace frozen portions of the water system and to assist in repairing service lines.	Bering Strait	Weather & Tech-nology	State
84-26	**Kotzebue, April 30, 1984** The Governor declared a Disaster Emergency after prolonged cold weather caused freezing and ruptures in the city water system. A public assistance categorical grant was awarded to replace damaged portions of the system.	NorthWest Arctic Borough	Weather	State
84-27	**Cold Bay, May 5, 1984** Equipment failure of a private utility left the City of Cold Bay without electricity. Due to the critical needs of the residents, the Governor declared a Disaster Emergency to allow DES to transport a State-owned generator to the city for use on a temporary basis.	Alertians East Borough	Tech-nological	State
84-28	**Alakanuk, June 13, 1984** Ice jam caused flooding caused extensive damage to the village road system. Subsequent to the Governor's Proclamation, the State awarded a categorical grant to the city to repair the roads.	Lower Yukon	Flood	State

84-29	**Emmonak, June 15, 1984** The city requested disaster assistance to repair minor flood damage to a road. The State's categorical grant covered the cost of material to repair the road. The village provided manpower and equipment.	Lower Yukon	Flood	State
85-30	**Cold Bay, July 31, 1984** In Cold Bay, the owner of the private electrical utility was unwilling to make the repairs necessary to provide reliable service to residents. The Governor's Declaration of Disaster Emergency authorized a disaster loan that assisted a buyer in purchasing the company.	Alertians East Borough	Tech-nological	State
85-31	**Russian Mission, August 9, 1984** The Governor declared a Disaster Emergency after a fire destroyed the city power plant in Russian Mission. The State awarded a categorical grant to replace the plant.	Lower Yukon	Fire	State
85-32	**Southeast Alaska, November 26, 1984** A hurricane force windstorm and wind driven tides caused extensive damage to public and private property in five Southeast Alaskan communities. The State provided public and individual assistance grants and temporary housing in Juneau, Sitka, Kake, Angoon and Tenakee Springs. SBA provided disaster loan assistance and the American Red Cross made grants to meet immediate needs of victims. The Governor's request for a Presidential declaration was denied.	City & Borough of Juneau, City & Borough of Sitka, Southeast Island, & Chatham	Weather	State
85-33	**Haines, January 25, 1985** After prolonged and excessive rainstorms caused permanent damage to the city sewer system, the Governor proclaimed a Disaster Emergency to provide funds to repair the system through a categorical public assistance grant.	Haines Borough	Flood, Technolo-gical,& Econ-omic	State
85-34	**Savoonga, February 26, 1985** The Governor proclaimed a Disaster Emergency to repair damage caused by freezing to the village water and sewer system in Savoonga. A categorical grant provided funds to repair the system.	Bering Strait	Weather	State

85-35	**Gambell, May 17, 1985** Unanticipated needs for fuel in Gambell throughout the winter depleted stocks in the village before re-supply by barge was possible. Since the freight charges of air resupply were prohibitive for residents, the Governor declared a Disaster Emergency to pay freight charges through a public assistance grant to the City.	Bering Strait	Weather, Technolo -gical,& Econ- omic	State
85-36	**Buckland, May 30, 1985** Flooding of the Buckland River caused damage to public roads and public and private buildings in Buckland. The Governor's declaration provided a State grant to repair public property. American Red Cross disaster relief programs gave assistance to individuals and families.	NorthWest Arctic Borough	Flood	State
85-37	**Kobuk, May 30, 1985** Ice moving through the village when the Kobuk River overflowed its banks caused damage to the city-owned fuel storage and distribution center. The Governor's declaration resulted in a categorical public assistance grant to repair the facility and replace lost fuel.	NorthWest Arctic Borough	Flood	State
85-38	**Anvik, June 5, 1985** Flooding of the Yukon River caused damage to city roads and private property. The Governor's declaration provided a categorical grant to repair the roads. American Red Cross granted assistance to individuals and families.	Iditarod Area	Flood	State
85-39	**Emmonak, June 11, 1985** The Governor declared a Disaster Emergency after flooding caused damage to city roads. A categorical grant provided funds to assist in repairing the roads.	Lower Yukon	Flood	State
85-40	**Pilot Station, June 18, 1985** Flooding of the Yukon River damaged several city-owned buildings: a lodge, day care center, television station and warehouse. Subsequent to the Governor's declaration, the State provided a categorical grant to repair these facilities. American Red Cross provided assistance for individuals and families.	Lower Yukon	Flood	State

85-41	**Upper Kuskokwim River, June 18, 1985** The Governor signed a combined declaration to assist the communities of McGrath, Sleetmute and Red Devil in repairing flood damage to roads. In McGrath and Sleetmute, categorical grants assisted in restoring the roads to predisaster condition. The community of Red Devil elected to utilize a flexible funding option to construct an alternate road in a less hazardous location.	Iditarod Area	Flood	State
86-42	**Pitka's Point, July 9, 1985** Pans of river ice moving with flood waters destroyed the sewer leach field serving the village safe water facility and elementary school. A public assistance grant provided funds to replace the leach field.	Kuspuk	Flood	State
86-43	**Bethel, July 10, 1985** High water accompanying breakup of the Kuskokwim River caused erosion damage at the city petroleum dock and washout of fill at the end of the seawall. Undercutting of river bank also threatened eight private residences. The Governor's Proclamation of Disaster Emergency provided public assistance to replace fill at the petroleum dock and seawall end. The State also provided funds to relocate the endangered homes, with the provision that the City of Bethel guarantee that the threatened property remain undeveloped.	Lower Kuskokwim	Erosion	State
86-44	**Gambell, August 31, 1985** A fire originating in the power plant owned by Alaska Village Electric Cooperative (AVEC), destroyed the plant, the adjacent tank farm and city shop, and six private residences and buildings. The State provided temporary housing, public and individual and family assistance to replace uninsured losses. American Red Cross provided additional assistance to individuals and families.	Bering Strait	Fire	State
86-45	**Cordova, October 31, 1985** After heavy rains, a landslide destroyed water lines between Heney Creek catchment basin and the city. Disaster public assistance supported repair by the city.	Chugach	Ground Failure	State

86-46	**Manokotak, November 22, 1985** A fire destroyed the power plant, leaving the city without electricity. DES assistance provided emergency replacement of the primary generator and funding to repair the backup generator and power plant building.	Southwest Region	Fire	State
86-47	**Thorne Bay, December 5, 1985** Cold weather precipitated catastrophic failure of the city water system. The Governor's declaration of disaster provided emergency assistance to restore water service and long time recovery assistance.	Southeast Island	Weather	State
86-48	**Metlakatla, December 10, 1985** Lack of rainfall in the generally rainy village reduced water levels to the point that the hydroelectric system could not generate sufficient power. Public disaster assistance provided supplemental generating capability with diesel generators.	Annette Island	Weather, Technolo -gical,& Econ- omic	State
86-49	**Unalaska, December 13, 1985** A severe windstorm caused mudslides, road and port damage, and damage to public buildings. Public disaster assistance supplemented insurance settlements to assist in recovery.	Aleutian Region	Weather & Ground Failure	State
86-52	**Thorne Bay, February 3, 1986** Collapse of a public bridge isolated residents in sections of the village. DES provided public assistance to replace the bridge.	Southeast Island	Technolo -gical & Econ- omic	State
86-51	**Venetie, March 3, 1986** Catastrophic failure of the electrical power generating plant caused the village to declare a local disaster. The Governor's declaration provided a loan to replace the generator.	Yukon Flats	Technolo -gical & Econ- omic	State
86-52	**Pelican, March 19, 1986** A windstorm destroyed the roof of the Pelican public school. DES provided emergency assistance to repair the roof. After the city received an insurance settlement, it reimbursed the State for the insured portion of the costs.	Chatham	Weather	State

86-53	**Crown Point (Moose Pass), May 1, 1986** A railroad tanker car accident contaminated the Crown Point area with dangerous fumes. The disaster declaration provided IFG and temporary housing assistance for dislocated residents and public assistance for environmental quality monitoring.	Kenai Peninsula Borough	Tech-nological	State
86-54	**Napakiak, May 15, 1986** Severe bank erosion of the Kuskokwim River had reached a point where homes in Napakiak were in danger of falling in the river. The Governor's disaster declaration provided funds to move seven houses to a safe location.	Lower Kuskokwim	Weather	State
87-55	**Arctic (North Slope Major Disaster), September 25, 1986** After an intense windstorm generating wind driven tides and flooding, caused extensive damage to public property, the President declared a Major Disaster to assist the State and local governments in recovering.	North Slope Borough	Weather	Federal
87-56	**Southcentral Alaska Flood (Major Disaster), October 12, 1986** Record rainfall in Southcentral Alaska caused widespread flooding in Seward, Matanuska-Susitna Borough and Cordova. The President declared a Major disaster implementing all public and individual assistance programs, including SBA disaster loans and disaster unemployment insurance benefits.	Kenai Peninsula Borough, Matanuska - Susitna Borough, & Chatham	Flood	Federal
87-57	**Aniak, October 27, 1986** The city experienced a catastrophic failure of the sewer system serving the public day care center, laundry, library and home canning facility. Disaster assistance in the form of a loan to the City of Aniak.	Kuspuk	Tech-nological	State
87-58	**Venetie, January 9, 1987** A structural fire destroyed the village owned electric plant and heavy equipment required for road and airport maintenance. The Governor's declaration provided public assistance to help the village recover.	Yukon Flats	Fire	State

87-59	**Kotzebue, February 5, 1987** Freezing of the municipal water system reduced supplies to a level that posed a threat to public health and safety, motivating the city to declare a local disaster. The corresponding State declaration allocated public assistance from the Disaster Relief Fund to repair the system.	Northwest Arctic Borough	Weather	State
87-60	**Sleetmute/Red Devil, May 28, 1987** Ice jam caused flooding inundated the Red Devil electric plant and tank farm, causing damage also to heavy equipment and power poles stored in Red Devil by the City of Sleetmute. The disaster declaration provided funds to repair or replace these items and to implement mitigation measures designed to prevent damage in future years.	Kuspuk	Flood	State
87-61	**Delta Junction, May 28, 1987** When a wildland fire in the Delta Junction area threatened urban and developed property, DES joined the State Division of Forestry in responding. The Governor's disaster declaration covered DES costs in the response.	Delta/Greely	Wildland Fire	State
87-62	**Aniak, May 29, 1987** Flooding during breakup of the Kuskokwim River caused damage to the city dike, road system, waste dump and sewage lagoon. The city repaired these items using funds authorized by the Governor's Declaration of Disaster Emergency.	Kuspuk	Flood	State
87-63	**Buckland, June 16, 1987** Flooding damaged city roads and a number of private homes. Individual and family assistance was provided. Since flooding is frequent in Buckland, the State disaster declaration included funds to mitigate the impact of future events.	Northwest Arctic Borough	Flood	State
88-64	**Richardson Highway, July 24, 1987** The Governor declared a disaster after heavy rains washed out parts of the Richardson Highway. The declaration was required to obtain federal funds to repair the highway. No State funding was necessary.	Cooper River	Weather	State

88-65	**Wainwright School, October 6, 1987** A fire destroyed the high school and major source of power to the City of Wainwright. A State disaster declaration provided funds to fly in a temporary generator and to assist in the permanent replacement of both the school and power plant.	North Slope Borough	Fire	State
88-66	**Angoon, November 6, 1987** The City of Angoon sustained a threat to life and property as a result of damage to the fresh water transmission lines serving the community. The leaking lines threatened to deplete the city's entire water supply. State disaster funds were authorized to assist the community in repairing the water lines.	Chatham	Tech-nological	State
88-67	**Togiak, October 1987** The City of Togiak experienced a catastrophic loss of fuel. The funds were transferred from the Disaster Relief Fund to the Governor's Emergency Fuel Relief Fund for disbursement.	Southwest Region	Tech-nological & Econ-omic	State
88-68	**Klehini River Bridge, November 9, 1987** Bridge failure was experienced when a snow plow attempted to cross. This bridge is on the only access route to several small communities in the area. A State disaster declaration provided the funds necessary to repair the bridge.	Haines Borough	Tech-nological	State
88-69	**Barrow, February 16, 1988** A fire destroyed the only Early Childhood Education School in the city and damaged teachers living quarters. Two hundred thirty-five children were displaced from their classes. The State disaster declaration provided an initial $1 million to provide immediate assistance. The President declared a Major Disaster to assist the State and local governments in recovering.	North Slope Borough	Fire	Federal
88-70	**Haines, February 29, 1988** The city experienced severe damage to streets from flooding and runoff triggered by extremely heavy rainfall. The State made available $150,000 in disaster funds to assist in the repair of the city streets.	Haines Borough	Flood	State

88-71	**Beaver, March 8, 1988** The village of Beaver experienced total failure of their electrical distribution system when several transformers faltered. The State disaster declaration helped the village replace the defective transformers and restore power.	Yukon Flats	Tech-nological	State
88-72	**Chefornak, March 23, 1988** A fire destroyed the village's only electric generation plant leaving the community without power. State disaster funds were utilized to provide a replacement generator for the village.	Lower Kuskokwim	Fire	State
88-73	**Chenega Bay, March 25, 1988** The village experienced failure of one of their two generators and failure of the other was imminent. A State disaster declaration provided the funds for a replacement generator to insure continued power for the community.	Chatham	Tech-nological	State
88-74	**Pitka's Point, March 29, 1988** A fire caused major damage to the safe water facility supporting the village with potable water. The State provided $105,000 in disaster funds to help restore the facility.	Lower Yukon	Fire	State
88-75	**Nondalton, April 5, 1988** A fire destroyed the City Hall, fire station and fire fighting equipment. State disaster funds were made available to replace the facility and equipment.	Lake & Peninsula Borough	Fire	State
88-76	**Crooked Creek, May 12, 1988** After flooding of the Kuskokwim River caused extensive damage to village roads, utilities, and homes, the Governor declared a disaster providing public and individual assistance.	Kuspuk	Flood	State
88-77	**Napakiak/Napaskiak, May 24, 1988** Flood damage to roads in Napakiak and both roads and boardwalks in Napaskiak resulted in a declaration of Disaster Emergency. State disaster funds of $200,000 were made available for public assistance.	Lower Kuskokwim	Flood	State
89-78	**Kaltag, May 26, 1988** Flooding of the Yukon River and Tributaries washed out an essential bridge in the community of Kaltag. State disaster assistance provided funding to replace the bridge.	Yukon - Koyukuk	Flood	State

89-79	**Eagle, July 22, 1988** The village of Eagle experienced a catastrophic failure of it electrical utility. The Governor's declaration of disaster made funds available for emergency repair of the system.	Alaska Gateway	Tech-nological	State
89-80	**Shishmaref, August 5, 1988** In late July and early August a series of intense windstorms with sea surges caused extensive damage to the seawall and erosion protection structure in the village of Shishmaref, leaving a number of critical public and private buildings subject to imminent damage. State disaster assistance provided funding to repair the damage.	Bering Strait	Weather	State
89-81	**Klawock, October 17, 1988** In Klawock, a fire of unknown origin in the land fill caused a threat to public health. Disaster funding helped the community extinguish the fire by providing funding for equipment and manpower.	Southeast Island	Wildland Fire	State
89-82	**Yukon Flats, November 10, 1988** Council of Athabascan Tribal Governments requested assistance on behalf of trappers in the Yukon Flats for loss of trapping related essential items destroyed by the fires in the Summer of 1988.	Yukon Flats	Fire	State
89-83	**Omega Block Disaster, January 28, 1989** The Governor declared a statewide disaster to provide emergency relief to communities suffering adverse effects of a record breaking cold spell, with temperatures as low as -85 degrees. The State conducted a wide variety of emergency actions, which included: emergency repairs to maintain & prevent damage to water, sewer & electrical systems, emergency resupply of essential fuels & food, & DOT/PF support in maintaining access to isolated communities.	Statewide	Weather	Federal

89-84	**Northwest Arctic Borough, February 1, 1989** During the Omega Block cold spell, the City of Kotzebue and five other villages in the Northwest Arctic Borough suffered extensive permanent damage to water & sewer systems. The City of Buckland suffered a total loss of its electrical system. The Governor declared a disaster to assist the Borough in making permanent repairs to these facilities.	Northwest Arctic Borough	Weather	State
89-85	**St. George, February 9, 1989** A severe windstorm caused sinking of a landing barge used as a dock by the City of St. George. The incident resulted in a blockage of the port and a loss of the capability to off-load essential supplies. The Governor declared a disaster to provide State assistance in recovering the barge.	Pribilof Island	Weather	State
89-86	**Sand Point, February 27, 1989** After the Omega Block cold spell caused permanent damage to the water main serving the Sand Point boat harbor, the Governor declared a disaster to provide assistance in repairing the line & restoring services.	Aleutians East Borough	Weather	State
89-87	**Ahkiok, March 2, 1989** The Governor declared a disaster to assist the village of Ahkiok in replacing its electrical power generating plant, which had experienced irreparable damage caused by prolonged cold weather.	Kodiak Island Borough	Weather	State
89-88	**North Slope Borough, March 8, 1989** On February 24-28, 1989, a severe winter storm caused extensive damage to public and private property in North Slope Borough villages. The Governor's declaration of disaster authorized public, individual & family assistance in recovering.	North Slope Borough	Weather	State
89-89	**Valdez Oil Spill, March 26, 1989** The Governor's declaration provided needed funding for State agency operations mobilized in response to the "Exxon Valdez" oil spill. A request for federal assistance through a Presidentially declaration of disaster was denied.	Chatham	Tech-nological	State
89-90	**Galena, April 20, 1989** Declared as a result of the Omega Block Cold Spell (temperatures to -85 in Galena), which caused extensive damage to water and sewer utilities in Galena.	Yukon-Koyukuk	Weather	State

89-91	**Glennallen, May 6, 1989** Ice damaged a bridge across Moose Creek, preventing access to the community sewage lagoon and a small subdivision. The Declaration of Disaster funded replacement of the bridge.	Copper River	Weather	State
89-92	**Circle, May 6, 1989** Flooding of the Yukon River in Circle during Spring Breakup of 1989 caused damage to public and private property. Disaster was eventually included in the Presidential Declaration (#94 below).	Yukon Flats	Flood	State
89-93	**Ft. Yukon, May 6, 1989** Flooding of the Yukon River which occurred one day after the Circle flood, also included in the Presidential Declaration.	Yukon Flats	Flood	State
89-94	**Spring Floods, June 10, 1989** Presidential Declaration of Major Disaster, incorporated sixteen local declarations and applied to all communities on Yukon, Kuskokwim and Kobuk rivers and their tributaries. Provided public and individual assistance to repair damage.	Yukon-Koyukuk, & Northwest Arctic Borough	Flood	Federal
90-95	**Klawock, June 19, 1989** A heavy Fall rainstorm washed substantial materials into the city's water reservoir, reducing capacity to the extent that during the following summer water shortages threatened health and safety and economic losses due to closure of a local fish hatchery. The disaster declaration funded restoration of the reservoir to its original, pre-disaster capacity.	Southeast Island	Flood & Tech-nological	State
90-96	**Fairbanks/North Star Borough, August 1, 1989** Flash flooding along the Tanana River in the Borough caused damage to public and private property. The Governor's declaration authorized public and individual disaster assistance.	Fairbanks North Star Borough	Flood	State
90-97	**Mat-Su Borough, August 4, 1989** The Governor declared a disaster to mitigate a flood threat caused by high water in the Matanuska River and placed the Old Glenn Highway and private residences along the river at risk. Funding was applied towards construction of an earthen/gravel dike.	Matanuska-Susitna Borough	Flood	State

90-98	**Whittier, August 8, 1989** Provided funding to DOT/PF to repair the breakwater to the small boat harbor in Whittier, which was at risk of imminent collapse, threatening damage to the harbor itself and large numbers of privately owned boats.	Chatham	Economic & Tech-nological	State
90-99	**Municipality of Anchorage, August 30, 1989** The Declaration addressed widespread damage caused by heavy flooding along the drainage systems within the Municipality. State assistance was limited to public property damage, although the federal Small Business Administration implemented its Disaster Loan Programs for businesses and homeowners.	Municipality of Anchorage	Flood	State
90-100	**Seward/Kenai Peninsula Borough, August 30, 1989** This Declaration relates to the same storm and flooding incident that affected Anchorage. Primary area of damage was in the city of Seward. As in Anchorage, State disaster assistance was limited to public property damage, with SBA loans available for individuals and businesses.	Kenai Peninsula Borough	Flood	State
90-101	**Richardson Highway, September 13, 1989** The same torrential rains that impacted Anchorage and the Kenai Peninsula Borough caused extensive damage to the Richardson & Copper River Highways. The Governor's Declaration enabled DOT/PF to apply for and receive emergency assistance through the federal Dept. of Transportation. No State disaster funds were expended as a result of this Declaration.	Municipality of Anchorage, Kenai Peninsula Borough, & Chatham	Flood	State
90-102	**Search & Rescue, September 13, 1989** The Governor made this Declaration of Disaster for the purpose of providing emergency funding to the Dept. of Public Safety for conducting search and rescue operations. The appropriated operating budget for these activities was depleted only two months into the fiscal year.	Statewide	Economic	State

90-103	**Mt. Redoubt Volcano, December 20, 1989** When Mt. Redoubt erupted in December 1989, posing a threat to the Kenai Peninsula Borough, Mat-Su Borough, and the Municipality of Anchorage, and interrupting air travel, the Governor declared a Disaster Emergency. The Declaration provided funding to upgrade and operate a 24-hr. monitoring and warning capability.	Municipality of Anchorage, Kenai Peninsula Borough, & Matanuska-Susitna Borough	Volcano	State
90-104	**KPB-Mt. Redoubt, January 11, 1990** The Kenai Peninsula Borough, most directly affected by Mt. Redoubt, experienced extraordinary costs in upgrading air quality in schools and other public facilities throughout successive volcanic eruptions. The Borough also sustained costs of maintaining 24-hr. operations during critical periods. The Governor's declaration of Disaster Emergency supported these activities.	Kenai Peninsula Borough	Volcano	State
90-105	**Tatitlek, January 31, 1990** The Governor declared a disaster to assist in the restoration of electrical service in Tatitlek after a fire destroyed the village's generator plant.	Chatham	Fire	State
90-106	**Broadcast Emergency (KYUK/KDGL), February 22, 1990** Radio Station KYUK in Bethel, Alaska, a public radio station and the EBS station for a large portion of Western Alaska, experienced a failure in its transmission antenna. Concurrently, KDLG, the public radio station and EBS station for the Dillingham operational area, lost its source of emergency power. The Governor's declaration of disaster enabled these stations to immediately repair these shortfalls in their capability to serve as stations on the Emergency Broadcast System network.	Lower Kuskokwim	Tech-nological	State
90-107	**Kongiganak, March 2, 1990** Inclement weather and equipment failures prevented normal barge deliveries of winter fuel to the village of Kongiganak, causing a shortage as the winter progressed. The governor's declaration of disaster supported air delivery of supplies sufficient to last the winter.	Lower Kuskokwim	Weather	State

90-108	**Moose Feeding Project, March 28, 1990** Recorded snow depths in interior Alaska resulted in a situation where moose, unable to walk to areas of their natural feeding, were starving to death or browsing along the cleared railway, where they were killed by train. To prevent catastrophic loss of the moose population, the Governor declared a disaster. Funding provided under the declaration supported the clearing of trails and provision of alternative supplies of food.	Statewide	Weather & Econo-mic	State
90-109	**Manokotak, April 5, 1990** Due to an inadequate storage capacity for fuel and gasoline, the City of Manokotak experienced a shortage of fuel for resale to residents and for its own use. The Governor's declaration of disaster subsidized air transport of fuel.	Southwest Region	Weather & Econo-mic	State
90-110	**Stebbins, April 9, 1990** After a fire destroyed the high school in Stebbins, the Governor declared a disaster to support the design and construction of a new high school. The declaration stipulated that the design emphasize safety and the mitigation of damage by fire or other hazards.	Bering Strait	Fire	State
90-111	**89 Spring Floods Hazard Mitigation, April 14, 1990** The Major Disaster Declaration by the President in response to statewide flooding in the Spring of 1989 authorized the commitment of federal funds to projects designed to mitigate flood damage in future years. Since the federal funding required a State matching share, the Governor declared a disaster to provide these funds and authorize their expenditure.	Statewide	Flood	Federal
90-112	**Snow & Ice Removal, 1990** Because of record snowfalls in Southcentral Alaska, the Legislature appropriated a special grant to local governments affected in order to supplement normal snow and ice removal budgets. The Legislature directed that funds be managed by the Division of Emergency Services. No Disaster Declaration occurred.	Matanuska-Susitna Borough, Municipality of Anchorage, Kenai Peninsula Borough	Weather & Econo-mic	State

90-113	**McGrath, May 16, 1990** Ice jam flooding washed out an extensive section of Cranberry Ridge road. The Disaster declaration provided funds for repair of the road and for mitigation to prevent a recurrence of the same event in the future.	Iditarod Area	Flood	State
90-114	**Kobuk, May 17, 1990** Ice jam flooding threatened the City of Kobuk to the extent that the local government requested State assistance in evacuating the community. The Governor's declaration of disaster authorized this assistance.	Northwest Arctic Borough	Flood	State
90-115	**Fire Suppression, May 29, 1990** An early wildland fire season depleted the Alaska Dept. of Natural Resources' fund for wildland fire suppression. The Governor's declaration of disaster authorized transfer of funds from the Disaster Relief Fund to this account.	Statewide	Wildland Fire & Econo-mic	State
90-116	**Teklanika, May 31, 1990** Continued demands for suppressing early wildland fires resulted in a declaration of disaster authorizing transfer of additional money from the disaster relief fund to the Dept. of Natural Resources.	Statewide	Wildland Fire & Econo-mic	State
90-117	**Bethel, July 2, 1990** Abnormally high water in the Kuskokwim River during breakup and continuing for an extended period after breakup resulted in scouring of toe material along the Bethel bulkhead, dislocation of the pipe pilings that form the bulkhead, and loss of material behind these pilings. The disaster declaration supported repair of the bulkhead and placement of riprap material along the toe of affected sections.	Lower Kuskokwim	Flood	State
91-118	**Statewide Fires, July 4, 1990** The wildland fire season, with all-time records in the number and gravity of fires, caused fire suppression requirements beyond the normal capability of the Dept. of Natural Resources. The Governor declared a disaster in order to authorize the use of the resources of the Alaska National Guard in support of the State's wildland fire management programs. The Federal Emergency Management Agency authorized federal payment of up to 70% of fire expenditures that exceeded the average annual fire management budget.	Statewide	Wildland Fire & Econo-mic	State

91-119	**Hazard Mitigation Cold Weather, 1990** The Presidential Declaration of Major Disaster for the Omega Block cold spell of January and February 1989 authorized federal funds for mitigation of cold weather damage in future events. The Governor's declaration of disaster provided the State matching funds required for obtaining and using this federal money.	Statewide	Weather	State
91-120	**Lower Kuskokwim, September 4, 1990** A severe storm compounded by high tides caused extensive flooding in coastal communities of the Kuskokwim and Bristol Bay areas and along the lower Kuskokwim River. The flooding caused damage to both public and private property. The disaster declaration authorized assistance to local governments, individuals and families affected by the flooding.	Lower Kuskokwim & Bristol Bay Borough	Flood	State
91-121	**Kotzebue, September 4, 1990** An unseasonable storm and wind driven tides damaged public and private property in Kotzebue and surrounding traditional use areas. The Governor's declaration of disaster provided assistance to the City of Kotzebue and to individuals and families.	Northwest Arctic Borough	Weather	State
91-122	**Nome, September 10, 1990** An unseasonable sea storm caused the sinking & destruction of a transfer barge owned by the city. As a result the city was unable to receive essential goods that are customarily transported by sea. In addition the debris presents a hazard jeopardizing the structural integrity of the Nome causeway.	Bering Strait	Weather	State
91-123	**Teller, September 10, 1990** A storm on the Bering Sea caused major damage to the wood cribbing/gabion breakwater.	Bering Strait	Weather	State
91-124	**Lowell Creek Tunnel, September 27, 1990** A major rehabilitation of Lowell Creek Tunnel is required to insure continued protection of the City of Seward. This is a mitigation project.	Kenai Peninsula Borough	Flood	State
91-125	**Diomede, November 21, 1990** A severe early winter storm with waves up to 25 feet destroyed several fuel storage facilities. The resultant loss of critically needed petroleum products along with other equipment, required the declaration of disaster.	Bering Strait	Weather	State

91-126	**Eagle, December 28, 1990** A fire destroyed the privately owned power generation facility that services Eagle and Eagle Village. A temporary replacement generator was delivered and power restored on December 30, 1990.	Alaska Gateway	Fire	State
91-127	**Togiak, February 8, 1991** An electrical failure lasting four days, combined with extreme cold temperatures, caused damage to the Municipal water system and the plumbing and heating systems of public buildings. Disaster assistance supported emergency work and permanent repair work.	Sourhtwest Region	Weather & Tech-noligical	State
91-128	**Larsen Bay, February 14, 1991** Abnormal freezing conditions affected the City's water system, interrupting service to approximately fifty percent of the residents. The Governor's Declaration of Disaster enabled the City to obtain equipment and labor needed to restore service.	Kodiak Island Borough	Weather	State
91-129	**Karluk, February 22, 1991** A fuel shortage in the community threatened the loss of heat in private homes and the loss of electricity city-wide. The Governor declared a disaster to provide money to resupply the village with fuel. The funds were in the form of a disaster loan to the Village Council.	Kodiak Island Borough	Weather, Tech-noligical & Econo-mic	State
91-130	**Marshall, February 25, 1991** Contamination of the water supply system for Marshall resulted in declaration of February 25, 1991. Funding was provided to Public Health Service to ensure potable water availability for residents of Marshall.	Lower Yukon	Tech-noligical	State
91-131	**Angoon, May 3, 1991** Failure of an undersea water main reduced volume of water being provided to the city system to a critically low level. Declaration authorized public assistance to repair the main.	Chatham	Tech-noligical	State

91-132	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
91-133	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
91-134	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal

91-135	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
91-136	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
91-137	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal

91-138	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
91-139	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
91-140	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal

91-141	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
92-142	**Fairbanks/North Star Borough, Aniak, McGrath, Red Devil, Anvik, Grayling, Emmonak, Holy Cross, Alakanuk, Shageluk, Galena. May 3-23, 1991** Flooding. Record snowfalls in the interior combined with sudden Spring melt caused flooding all along the Yukon and Kuskokwim River systems. Numerous State Declarations were combined into a single Presidential Declaration of Major Disaster (FEMA-0909-AK) that authorized assistance for repair of public property only. State Disaster Relief Funds were used to implement the Individual and Family Grant Program in all of the communities included in the federal declaration.	Fairbanks North Star Borough, Lower Kuskokwim, Iditarod Area, Kuspuk & Lower Yukon	Flood	Federal
92-143	**Dept. of Natural Resources, July 11, 1991** A severe, early, and intense wildland fire season caused rapid depletion of the State fire suppression funds. The Governor's Declaration of Disaster was made to comply with requirements for receiving Federal wildland fire suppression funds.	Statewide	Wildland Fire	State
92-144	**Mat-Su Borough, July 18, 1991** Severe bank erosion near the Circle View Subdivision area along the Matanuska River destroyed one home and threatened several others, causing the Mat-Su Borough to support either construction of emergency bank protection measures or relocation of homes. The Governor's Declaration authorized a loan of up to $500,000 dollars to the Mat-Su Borough. The following year the legislature converted this loan to a grant.	Matanuska-Susitna Borough	Erosion	State

92-145	**Whitestone Farms, July 25, 1991** The electric plant in this community was destroyed by a fire thought to be caused by lightning. The Declaration authorized public assistance funds for replacement of the plant.	Chatham	Fire & Weather	State
92-146	**Little Diomede, July 25, 1991** Mechanical system problems and lack of rainfall caused a critical shortage of safe water in the village of Little Diomede. Public assistance made available by the Declaration funded desalination equipment used to fill the village's storage reservoirs with processed seawater.	Bering Strait	Weather & Tech-nological	State
92-147	**Aniak, August 7, 1991** At the recommendation of OMB, the Alaska Energy Authority and the Office of the Attorney General, the Governor declared a Disaster to authorize an emergency loan from the Disaster Relief Fund to the City of Aniak. Funds were for the purchase of fuel and for averting a general fiscal crisis in the City.	Kuspuk	Tech-nological & Econ-omic	State
92-148	**Diomede Fire, September 20, 1991** A fire in the City of Diomede destroyed the City electric plant and water treatment plant. Also damaged the water storage tank and destroyed equipment and materials essential to recovery from two previous disasters.	Bering Strait	Fire	State
92-149	**New Koliganek, October 14, 1991** The village of New Koliganek sustained flooding which resulted in damage to a bridge and severe threat to public safety of residents. Immediate repair of the bridge was necessary in order to allow residents, school children, to safely transit within the village.	Southeast Island	Flood	State
92-150	**Kodiak, November 2, 1991** Commencing on October 31, 1991, the City of Kodiak sustained severe damage and threats to life and property from heavy rains, flooding and landslides. The rains caused severe damage to the City's roads and buildings; and caused damage to homes, businesses and loss of personal property.	Kodiak Island Borough	Flood & Ground Failure	State

92-151	**Earthquake Mitigation, November 7, 1991** Under the authority granted in A.S.26.23.300, the Governor issued a declaration of emergency to prevent or minimize the effects of events that pose a direct and imminent threat of disaster to the State; and, to allow for training and exercise of State agency personnel, to familiarize responders with, and test the capabilities of the State's new Emergency Operations Center.	Statewide		State
92-152	**Seward Sewage Disaster, November 20, 1991** On August 26, 1991, the City of Seward sewage treatment lagoon located on Lowell Point Road suffered a catastrophic failure from undetermined causes.	Kenai Peninsula Borough		State
92-153	**Eagle City, May 19, 1992** On May 13, 1992, the ice jam precipitating the Eagle Village flood moved down to the City of Eagle flooding some private property and destroying an erosion control structure along the river front street. Both the public assistance and individual assistance programs were implemented as well as the SBA disaster loan program.	Alaska Gateway	Flood	State
92-154	**Eagle Village, May 19, 1992** On May 12 through 13, the Native Village of Eagle was inundated by ice jam flooding causing the entire town to be evacuated to local high ground. Flood waters caused damage to a majority of the homes, eroded the river front street and caused damage to the clinic, washeteria and tank farm. Both the public assistance and individual assistance programs were implemented as well as the SBA disaster loan program.	Alaska Gateway	Flood	State
92-155	**Galena-92 Flood** From May 26 through 29, 1992, both down town and up town Galena were flooded as a result of an ice jam at Bishop Rock several miles down stream of Galena. This was the third worst flood in recorded history for the community. Extensive damage to State road systems, City streets, electrical distribution system, sewage lagoon and the majority of homes in down town area resulted. Both the public assistance and individual assistance programs were implemented as well as the SBA disaster loan program.	Yukon-Koyukuk	Flood	State

92-156	**Flood Response, June 9, 1992** The Upper Yukon River drainage was experiencing the third worst snow melt flooding in recorded history according to the National Weather Service. The Declaration provided $100,000.00 from the Disaster Relief Fund to cover DES expenses that began to occur as a result of the need to provide response activities and surveillance. An RSA was established with the Division of Environmental Quality, DEC to respond to and test for environmental contamination for assurance of public health.	Yukon Flats	Flood	State
92-157	**Yukon River Flood, June 17, 1992** A very late spring combined with above average snow packs in the Canadian and U.S. portions of the Yukon drainage resulted in post-breakup (snow melt) flooding of the Yukon River and its tributaries from Fort Yukon to Rampart. Flood waters rose slowly over a period of days and receded gradually. The North Pole area was also included in this declaration due to effects from the Chena drainage causing the ground water to rise. The high ground water was exacerbated by the activation of the Moose Creek Diversion Dam (COE). Major damage was sustained by both public and private property. The IFG program was implemented in Fort Yukon, Beaver, Stevens Village and North Pole. No Public Assistance was implemented for the North Pole area. Rampart received only public damage. The Small Business Administration declared for the same geographic area and provided disaster loans.	Yukon Flats	Flood	State
93-158	**Fire Disaster, July 7, 1992** The Department of Natural Resources exhausted fire suppression funds prior to the end of the fire season. A total of $750,000 was appropriated from statewide funding lapse to the FY93 the Statewide Fire Suppression Program.	Statewide	Wildland Fire & Economic	State

93-159	**Norton Sound Herring Fishery Disaster, July 13, 1992** The Governor requested the Small Business Administration to declare an Economic Injury Disaster for Businesses and fishermen impacted by the failure of the Norton Sound herring fishery. Due to a very late spring, sea ice in the area did not breakup at the time the herring arrived in the Sound making them inaccessible to the fishermen. The Governor did not declare under AS 26.23.	Bering Strait	Economic	State
93-160	**Haines Highway Disaster, August 14,1992** This disaster was declared in order for the State DOT/PF to request $1.8 million in Federal Highway Administration emergency funds (under Title 23 U.S.C., Section 125) to repair damages relating to flooding of the Klehini River 30 miles north of Haines. No expenditure of State Disaster Relief Funds was required.	Haines Borough	Flood	State
93-161	**Mt. Spurr, September 21, 1992** Frequent eruptions and the possibility of further eruptions has caused health hazards and property damage within the local governments of the Municipality of Anchorage, Kenai Peninsula Borough and Mat-Su Borough. These eruptions caused physical damage to observation and warning equipment. Funds to replace equipment for AVO.	Matanuska-Susitna Borough, Municipality of Anchorage & Kenai Peninsula Borough	Volcano	State
93-162	**Nome Highway Disaster** On October 5, 1992, a major Bering Sea Storm with gale-force winds impacted the Norton Sound Coast of the Seward Peninsula in Western Alaska, producing an unusually high storm surge tide and very large waves, particularly in the Nome area. The high tidal waves severely damaged two federal-aide highways, isolating the mining community of Council and endangering the traveling public in the Nome area. DOT/PF will request emergency relief funds from Federal Highway Administration.	Bering Strait	Weather	State

94-163	**Kuskokwim Disaster** On July 19, 1993, the Governor's Task Force issued a disaster declaration of economic hardship to fishermen due to poor chum fishing in the Kuskokwim area.	Lower Kuskokwim	Economic	State
94-164	**Tenakee Springs Fire** On July 19, 1993, a community-wide fire destroyed 10 single family homes, the hotel and electrical poles/power lines.	Chatham	Fire	State
94-165	**Department of Natural Resources** On August 3, 1993, funds were allocated to DNR for fire suppression.	Statewide	Wildland Fire	State
94-166	**Shaker IV** Under the authority granted in AS 26.23.300, the Governor issued a declaration of emergency to prevent or minimize the effects of events that pose a direct and imminent threat of disaster to the State; and, to allow for training and exercise of State agency personnel, to familiarize responders with, and test the capabilities of the State's Emergency Operations Center.	Statewide		State
94-167	**Prince of Wales Island** On October 29, 1993, funds were made available through emergency highway funding assistance to all roads on Prince of Wales Island eligible under the Department of Transportation ICTEA provision due to heavy rains and numerous mud slides.	Southeast Island	Landslide	State
94-168	**Hazard Mitigation AK-0909** This is a pilot program in Ft. Yukon designed to confirm the need for long-range flood mitigation measures to prevent flooding.	Yukon Flats	Flood	State
94-169	**McGrath Road Disaster** On May 23, 1994, a disaster declaration was signed for the City of McGrath due to damages to approximately 1,147 linear feet of Cranberry Ridge Road. This road provides access to 3 subdivisions occupied by two family homes, the community rifle range, the rock quarry, and the emergency air strip.	Iditarod Area	Flood	State

94-170	**Galena Disaster** On May 10, 1994, the City of Galena sustained losses and threats to life and property resulting from flooding due to breakup. As a result of this disaster, roads and revetments suffered significant damage, and the sewer lagoon was breached.	Yukon-Koyukuk	Flood	State
95-171	**Cummings Road Flood** On July 13, 1994, Cummings Road was severely damaged by an overflow of waters from the Gerstle River. As a result of this disaster, families were isolated, which constituted a significant threat to the lives and safety of those individuals.	Delta/Greely	Flood	State
95-172	**Matanuska River Erosion** On July 1, 1994, Matanuska-Susitna Borough sustained serious damage and threats to life and property resulting from erosion of the Matanuska River, in the vicinity of Circle View Estates. As a result of this disaster authority was granted under Alaska Statutes, Section 26.23.020 to loan $500,000.00 from the Disaster Relief Fund to the Matanuska-Susitna Borough.	Matanuska-Susitna Borough	Erosion	State
95-173	**Fall Flood** On August 26, 1994, the Governor declared disaster emergencies for the communities of Kobuk, Kiana, and Kotzebue as a result of flood damage. As a result of this disaster, the conditions continue to create unprecedented losses of personal and public properties. The communities of Allakaket and Alatna had to be evacuated under emergency life-threatening conditions on Sunday, August 28, 1994, Hughes was also evacuated several days later. Also affected by this disaster were the communities of Bettles and Wiseman.	Yukon-Koyukuk & Northwest Arctic Borough	Flood	State
95-174	**Metlakatla Sea Storm** On November 10, 1994, the Governor declared that a condition of disaster exists in Metlakatla, as a result of high tides and storm driven waves that threaten coastal sections. The Metlakatla Community Senior Citizens Center and a nearby drainage culvert under the public right-of-way have been put at risk.	Annette Island	Weather	State

95-175	**Skagway Submarine Landslide** On November 16, 1994, the Governor declared that a condition of disaster emergency exist in the City of Skagway, as a result of a submarine landslide. As a result of this disaster damages to Alaska Marine Ferry facilities have interrupted normal service and require emergency repairs, and damages to the small boat harbor exceed the capability of the City of Skagway to repair in an urgent manner to preclude ongoing collateral damages.	Chatham	Ground Failure & Tsunami	State
95-176	**Yukon Kuskokwim Delta** On June 5, 1995, the Governor declared a condition of disaster emergency exist in the Cities of Akiak, Kwethluk, Napaskiak, Emmonak, and Alakanuk, as a result of inundation. As a result of this disaster roads, boardwalks, and other public works essential to vital community services were damaged.	Yupiit, Lower Yukon & Lower Kuskokwim	Flood	State
95-177	**Aniak Ice Jam Flood** On June 5, 1995, the Governor declared that a condition of disaster emergency exist in the City of Aniak, as a result of ice jam flooding of the Kuskokwim River and Aniak Slough. As a result of this disaster sections of Birch Road, Airport Boulevard, and the landfill access road were severely damaged.	Kuspuk	Flood	State
95-178	**Bethel Sinkhole Erosion** On June 5, 1995, the Governor declared that a condition of disaster emergency exist in the City of Bethel, as a result of erosion during spring breakup. As a result of this disaster the face of the protective sea wall was damaged causing erosion under the City Dock to create and expand sinkholes on the dock.	Lower Kuskokwim	Erosion	State
95-179	**Statewide Fire Suppression** On June 22, 1995, the Governor declared that a condition of disaster emergency exist in the State, as a result of insufficient money regularly appropriated to the Department of Natural Resources has been exhausted along with supplemental funds. As a result of this disaster authorization of sufficient funds were made available to continue fire suppression activities through June 30, 1995.	Statewide	Wildland Fire	State

96-180	**South-central Fall Floods:** On September 21, 1995, the Governor declared that a condition of disaster emergency exists in the State, as a result of heavy rainfall in South-central Alaska. As a result of this disaster the Kenai Peninsula Borough, Matanuska-Susitna Borough, and the Municipality of Anchorage were initially affected. Subsequently, on September 29, 1995, the Governor amended the original declaration to include Chugach, and the Copper River Regional Education Attendance areas, including the communities of Whittier and Cordova, and the Richardson, Copper River and Edgerton Highway areas which have suffered severe damage to numerous personal residences, flooding, eroding of public roadways, destruction and significant damage to bridges, flood control dikes and levees, water and sewer facilities, power and harbor facilities. On October 13, 1995, the President declared this event as a major disaster (AK-1072-DR) under the Robert T. Stafford Disaster Relief and Emergency Assistance Act.	Matanuska-Susitna Borough, Municipality of Anchorage & Kenai Peninsula Borough	Flood	Federal
96-181	**Millers Reach Fire** A fire which began on June 2,1996 near Houston, Alaska on Miller's Reach Road spread rapidly destroying 344 structures and burning 37,366 acres in the Houston-Big Lake area. Command and control of this fire was initially controlled from the Houston High School with a Type I Incident Management Team. Later a Unified Command structure was established at the Creekside Plaza Mall in Wasilla which consisted of Local, State and Federal representatives. On June 4th Governor Knowles declared a State Disaster Declaration and President Clinton signed the Federal Disaster Declaration (AK-1119-DR) on June 8 which provided the State with Federal Disaster relief funding for the incident. The fire was contained on June 10th and declared under control on June 15th.	Matanuska-Susitna Borough	Wildland Fire	Federal

96-182	**Southeast Storm (Pelican/Elfin Cove)**: On Wednesday, September 25,1996 a severe storm struck Southeast Alaska causing severe damage to some of the communities in the area. The community of Pelican sustained erosion damage to temporary construction (sandbags) placed to curtail erosion on Pelican Creek. The storm also caused additional erosion around the bridge that crosses the creek. In Elfin Cove the landslide damaged electrical distribution lines to homes, disrupted telephone service to 12 homes and caused remaining telephones to operate off battery power. Two homes sustained damage. Also the trail which provided the only means of access between the two sides of town was damaged causing residents to commute from one side of town to the other by boat. The Governor declared the area a disaster on November 1, 1996 due to the threat to life and property.	Chatham	Erosion	State
	DNR Fire Suppression: On July 14, 1997, the Governor made a finding that regularly appropriated fire suppression funds were depleted and disaster relief funds to be insufficient to prevent ongoing and new fires from threatening life and property. The Department of Natural Resources implemented funding via the disaster declaration process, as referenced by legislative intent in Chapter 98, SLA 1997, Sec. 7 Pg. 3, L21-29.	Statewide	Fire & Economic	State
98-184	**Bristol Bay Distressed Salmon:** On July 18, 1997 the Governor declared that as a result of low salmon harvest and depressed prices, municipalities in Bristol Bay and Kuskokwim river drainages suffered a sever reduction in anticipated fish tax revenue. DCRA was assigned the lead agency in a Coordinated Response Partnership of State agencies to act within their statutory authority to assist in restoring the economic health and stability in area communities and to develop goals and strategies for future economic development.	Southwest Region	Economic	State

97-185	**Eastern Tanana River:** Continuing heavy rains, glacial melt due to warm temperatures and glacial dam dumping in the Eastern Tanana and Northern Copper River Valleys produced unusually high volume of runoff. This caused severe flooding along the Taylor Highway, Alaska Highway, Nebesna Road, Tok Cutoff, Richardson Highway, Copper River Highway, and Northway Road. The Village of Northway was evacuated and several families remained in emergency housing for an extended period. All along these drainages, homes were flooded and public property was damaged.	Alaska Gateway & Copper River	Flood	State
98-186	**Shishmaref Sea Storm:** On October 6, 1997, under authority granted by the Alaska Statutes, Section 26.23.020, the Governor declared a condition existed in the City of Shishmaref to warrant a disaster declaration in order to provide for assistance. An unusually early sea storm caused severe damage resulting in homes being eroded into tidewater and being destroyed. Additional federal assistance under the Federal Emergency Management Agencies Flood Mitigation Assistance Grant in the amount of $600,000 was provided to complete the move of additional damaged structures. In addition the Alaska Housing Finance Corporation provided $200,000 in housing assistance for the match to the federal assistance.	Bering Strait	Weather	State
98-187	**DNR Fire Suppression:** On June 5, 1998, the Governor made a finding that insufficient money was regularly appropriated and money from the disaster relief fund was insufficient. DNR Commissioner was hereby authorized to utilize money made available necessary for fire protection and suppression for the balance of FY98 to prevent continuing and new fires from threatening life and property as referenced by legislative intent in sec 7(b), chapter 98, SLA 1997.	Statewide	Fire & Economic	State

98-188	**Endicott Mountains Flood 6/18/98:** On June 18, 1998, under the authority granted bythe Alaska Statues, Section 26.23.020, the Governor declared a disaster existed in the cities of Allakaket and Huslia, the communities of Wiseman and Evansville and along the Dalton Highway between Coldfoot and Atigun Pass. Acute erosion, flash flooding caused damaged to public infrastructures, fuel tank farms, private property, dikes and bridge abutment revetments.	Yukon-Koyukuk	Flood	State
99-189	**Western AK Fisheries Disaster:** On July 30, 1998, under the authority granted by Alaska Statute 26.23.020, the Governor declared a disaster existed in the Bering Sea that affected fishing communities along its coastal areas. The Bering Sea suffered a catastrophic rise in sea surface temperatures and as a result disrupted the salmon populations which in the food chain cause the starvation of seabirds and marine mammals. Families in this area depend on the salmon industry to earn salaries to pay for fuel oil to heat their homes, electricity, water and sanitation and food in the harsh winter climate. The Governor requested that the Small Business Administration made an administrative declaration of economic injury to provide loans to small businesses. On September 16, 1998 the Governor issued another declaration of disaster emergency adding the communities of Stebbins, St. Michaels, Minto and Manley Hot Springs. On October 16, 1998 the Governor amended his declaration of September 16, 1998 to include the communities of Nelson Lagoon, False Pass and Tyonek.	Kenai Peninsula Borough, Aleutians East Borough, & Yukon-Koyukuk	Economic	State

99-190	**Southeastern Storm:** On October 27, 1998, the Governor declared a disaster to exist in the communities of Haines and the City and Borough of Juneau for the purposes of accessing federal highway administration funds after the worst two-day rainfall in fifty years occurred in Southeast Alaska on October 19-20, 1998. Over 6 inches of rain fell within a 48-hour period. As a result, extensive damage to many road systems, public, private and non-profits properties was caused from mudslides and water erosion. On November 24, 1998, under the authority granted by Alaska Statute 26.23.020, the governor amended his declaration of disaster in the City and Borough of Juneau, the City and Borough of Haines, to include the Chilkat Indian Village (Community of Klukwan) in order for public (infrastructure) assistance to public property and individual and family grant assistance. The Governor also requested that the Small Business Administration declare an administrative declaration for physical disaster damages to provide low interest loans to businesses and private property owners.	City and Borough of Juneau, Haines Borough	Erosion	State

00-191	**Central Gulf Coast Storm:** On Feb 4 2000, the Governor declared a disaster due to high impact weather events throughout an extensive area of the state. The State began responding to the incident since the beginning of December 21, 1999. The declaration was expanded on February 8 to include City of Whittier, City of Valdez, Kenai Peninsula Borough, Matanuska-Susitna Borough and the Municipality of Anchorage. On February 17, 2000, President Bill Clinton determined the event disaster warranted a major disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288 as amended ("the Stafford Act). On March 17, 2000, the Governor again expanded the disaster area and declared that a condition of disaster exists in Aleutians East, Bristol Bay, Denali, Fairbanks North Star, Kodiak Island, and Lake and Peninsula Boroughs and the census areas of Dillingham, Bethel, Wade Hampton, and Southeast Fairbanks, which is of sufficient severity and magnitude to warrant a disaster declaration. Effective on April 4, 2000, Amendment No. 2 to the Notice of a Major Disaster Declaration, the Director of FEMA included the expanded area in the presidential declaration.	Matanuska-Susitna Borough, Municipality of Anchorage, Aleutians East Borough, Bristol Bay Borough, Denali Borough, Fairbanks Northstar Borough, Kodiak Island Borough, Lake & Peninsula Borough, Chugach, & Kenai Peninsula Borough	Weather & Avalan-che	Federal
00-192	00-192 **Fire Suppression:** Governor Knowles issued a disaster declaration on May 24, 2000 to make funds available for wildland fire fighting for the remainder of the fiscal year.	Statewide	Wildland Fire	State
00-193	00-193 **Fire Suppression:** On June 23, 2000, Governor Knowles writes to speaker of the House, Brian Porter mentioning the issuance of another fire suppression declaration, because the 30-day life period of his May 24, 2000 declaration had expired. Funding was still needed to fight fires through the end of Fiscal Year 2000.	Statewide	Wildland Fire	State

01-194	01-194 **Identified as YKN:** dated prior to Kake: On July 19, 2000 Governor Knowles declared a disaster due to failure of salmon returns to the Yukon, Kuskokwim and Norton Sound fishing districts. In some areas the return was significantly less than 50% of the long-term average. This catastrophic decline resulted in food shortages for subsistence fishermen and economic injury to businesses and individuals. The Governor initiated a coordination group named Operation Renew Hope (ORH) to manage this disaster. ORH was lead by DCED Deputy Commissioner Bernice Joseph. DES provided a full time Public Information Officer (Kerre Fisher) and Department liaison (Michael Bird) in support of this operation. The group was charged with securing basic needs such as heating fuel, essential utilities, USDA commodities and chum salmon from the Kotzebue fishery. At Governor Knowles request, the federal commerce Department issued a declaration of a fishery disaster under the Magnuson-Stevens Act. On October 24, 2000 the U.S. Small Business Administration issued a Declaration of Economic Injury Disaster #9J35. SBA tied this event to the 1995 Fall Flood Disaster. The Kenai Peninsula borough was the primary declaration area. The contiguous Boroughs of Mat-Su, Lake and Peninsula and the Regional Education Attendance Area #10 and the Municipality of Anchorage were eligible.	Matanuska-Susitna Borough, Municipality of Anchorage, Chugach, & Kenai Peninsula Borough	Econo-mic	State

01-195	01-195 **Kake Water Containment Failure:** On July 31, 2000 Governor Knowles submitted a financial plan in accordance with AS 26.23.020 (h) to the Alaska State House and Senate for immediate financial assistance to the City of Kake. As general fund appropriations were not made to the disaster relief fund for FY2001 to cover state costs to prevent, minimize or respond to an incident that poses direct and imminent threat to the community, a supplemental appropriation was submitted during the following legislative session. On July 27, 2000, the Mayor of Kake declared a disaster emergency due to public health threat resulting from the Gunnuck Creek Dam failure. The community does not have a potable drinking source available and was seeking assistance to fund an interim water supply system until the Alpine Lake Water Pipeline under construction and projected to be operational Spring 2001 was completed.	Southeast Island	Econo-mic	State
01-196	01-196 **Middle Yukon Flood:** On May 31, 2001 Governor Knowles declared a disaster for the communities of Koyukuk and Nulato due to ice jams on the Yukon River. The first jam occurred at 5-Mile Island, which eventually released and reformed at Halfway Island. Both Individual Assistance and Public Assistance programs were implemented.	Yukon-Koyukuk	Flood	State
	*****Tracking of Administrative Orders and other means of access to the Disaster Relief Fund begin at this point in chronicling major events.*****			

02-197	**02-197 KOTZ AM Radio (Admin Order 191):** On August 13, 2001, the radio tower antenna for KOTZ AM, the radio station serving the northwest arctic area, was destroyed in a fatal aircraft accident. Because the radio station disseminates event warnings and notifications to local villages and numerous subsistence and hunting camps by way of the Emergency Alert System and programmed messaging services, the governor signed Administrative Order No. 191 on August 24, 2001. The prescribed assistance was to provide this essential service through several low-watt FM stations placed in 6 villages. KOTZ AM Radio is part of the Public Broadcasting System and is a non-profit entity. The Northwest Arctic Borough acted as the applicant in this incident.	Norhtwest Arctic Borough	Technolo -gical	State
02-198	**02-198 Shishmaref Seawall (Admin Order 194):** Winds and high tides combined to strike the Shishmaref coastline from October 5 through October 7, 2001 and eroded inward as much as 50 feet. Some sections of the sand scarp were undercut as much as 16 to 20 feet due to the surf melting the underlying permafrost. In order to prevent further destruction of the coastline due to storms prior to tidewater freeze up, Governor Knowles issued Administrative Order No. 194 on October 27, 2001 which was not to exceed $110,00 (including DES administrative costs). These Public Assistance funds were to be used to establish a sacrificial sandbag revetment to last through the storm season.	Bering Strait	Weather	State

02-199	**02-199 Sleetmute Core Service Facility Fire (Admin Order 196)** At approximately midnight December 20th a fire destroyed the community building in Sleetmute. The building housed the clinic, Council Office, VPSO office, washeteria and the TV equipment for the ARCS station. The Disaster Policy Cabinet recommended that disaster assistance be provided to Sleetmute for, "full recovery or temporary measures only as appropriate for the parameters that will provide for a safe, secure and sanitary community by measures that are unable to be addressed through other State (non-DRF), and federal and non-profit agency's emergency funding resources." On May 24, 2002, the Governor signed AO 196 and provided funding not to exceed $150K. This was the unfunded balance after all other grant sources were exhausted. Total recovery costs for the village were estimated to be $2.26M. Disaster Relief Funds provided were an " improved project" category.	Kuspuk	Fire	State

02-200	**02-200 02 Interior Floods (AK-DR-1423) Declared May 30, 2001 by Gov Knowles then FEMA Declared May 29,2002 -** Flooding occurred in various interior and western Alaska river drainages, including the Tanana, Kuskokwim, Nushagak, Susitna and Yukon River drainages beginning on April 27, 2002 and continuing. The floods caused widespread damage to and loss of property in the Fairbanks North Star Borough (Tanana River drainage); in McGrath, Lime Village, Sleetmute, Red Devil, Crooked Creek, Aniak and Kwethluk (Kuskokwim River drainage); Ekwok and New Stuyahok (Nushagak River drainage); in the Susitna River drainage from Chase to Montana Creek; and in Emmonak (Yukon River drainage). The following conditions exist as a result of this disaster: widespread damage to public facilities and infrastructure, including damage to public airports, roads, and buildings; to public utilities, including water , sewer, and electrical utilities; to personal residences, in some areas requiring evacuation and sheltering of residents; to commercial operations; and to other public and private real and personal property. Public & Individual Assistance provided as well as the 404 Mitigation Program.	Kuspuk, Iditarod Area, Lower Yukon, Southwest Region	Flood	Federal

03-201	**03-201 Northwest Fall Sea Storm Declared October 23, 2002 -** Coastal storm surge flooding occurred in communities on the Northwestern coast of Alaska commencing on October, 8, 2002. A fall sea storm with 18-20 foot seas, extremely high winds, and strong tidal action caused severe damage. This storm was caused by a low pressure system moving down from the Arctic Ocean and settling over the Chuckchi Sea and the Kotzebue Sound resulting in widespread damage to infrastructure, including damage to public roads and other public real property. The Governor declared a disaster for the cities of Kotzebue, Kivalina, Shishmaref and the Northwest Arctic Borough. The Northwest Arctic Borough (NWAB) provided funds to the City of Kotzebue ($10,000) and the City of Kivalina ($5,000). NWAB was provided a grant to reimburse funds given to those communities. Shishmaref did not have any eligible damage or expenses.	Northwest Arctic Borough & Bering Strait	Weather	State

03-202	**03-202 Kenai Peninsula Borough Flooding (AK-DR-1445) Declared November 6, 2002 by Governor Knowles then FEMA Declared December 4, 2002. FEMA amended the Declaration to extend the incident period to December 20th**–Starting October 23, 2002 through November 12, 2002, heavy rains (from three inches to fifteen inches) caused widespread damage, school closures, road washouts and stranded residents & hunters throughout the Kenai Peninsula Borough, the Kodiak Borough and the Chignik Bay area, including Chignik Lake and Chignik Lagoon. The driving rain continued for an extended time frame with multiple storm fronts. Although damages were widespread, the Kenai Peninsula Borough received the most damages. Damages in the Kenai Peninsula Borough consisted of road washouts, culvert damages, bridge damage at several locations, and private home damages caused by overflowing rivers and streams. The Kodiak Borough damages included road washouts, culvert damages, river spike damage, and damages to a pier caused by sea surge. The Four Dam Pool Power Agency received damages to their facility. The Chignik Bay area, including Chignik Lake and Chignik Lagoon damage consisted of sea surge damage to docks and piers, damage a fuel of loading facility and dump truck, damage to a bridge in Chignik, and damage to the Department of Transportation-Chignik Lagoon Airport. The Kodiak Borough and Chignik Bay area also experienced private home damages. Federal Disaster Assistance for Individual Assistance, Debris Removal, Emergency Protective Measures and all categories of Permanent Work were provided under the Public Assistance Program. FEMA also authorized 404 Hazard Mitigation funding.	Kenai Peninsula Borough	Flood	Federal

03-203	**03-203 Denali Fault Earthquake (AK-DR-1440) Declared November 6, 2002 by Governor Knowles then FEMA Declared November XX, 2002** - A major earthquake with a preliminary magnitude of 7.9 occurred on the Denali Fault in Interior Alaska on November 3, 2002, with strong aftershocks. The earthquake caused severe & widespread damage and loss of property, and threat to life & property in the Fairbanks North Star Borough, the Denali Borough, the Matanuska-Susitna Borough, and numerous communities within the Delta Greely, Alaska Gateway, Copper River, and Yukon-Koyukuk Regional Education Attendance Areas including the cities of Tetlin, Mentasta Lake, Northway, Dot Lake, Chistochina and Tanacross, and the unincorporated communities of Slana and Tok. The areas experienced severe damage to numerous personal residences requiring evacuations and sheltering of residences; extensive damage to primary highways including the Richardson Highway, the Tok Cutoff, the Parks Highway and road links to communities including the road to Mentasta and Northway. Damage to supports for the Trans-Alaska Pipeline necessitated the shutdown of the pipeline. Additionally; fuel spills from residential storage tanks, significant damage to water, septic, sewer and electrical systems also occurred. Not all of the areas listed in the State disaster were included in the Federal Individual Assistance Program. Assistance to those areas was thought the State Individual Assistance Program. Additionally, not all of the areas listed in the State declaration were eligible for all categories of assistance under the federal Public Assistance Program. Those areas were only eligible for Debris Removal & Emergency Protective Measures under the Federal Public Assistance Program but were eligible for all Permanent Work categories under the State public Assistance Program. FEMA also authorized 404 Mitigation money.	Fairbanks North Star Borough, Denali Borough, Matanuska-Susitna Borough, Alaska Gateway, Delta/Greely, Cooper River & Yukon-Koyukuk	Earth-quake	Federal

03-204	**03-204 South-central Windstorm (AK-DR-1461) Declared March 28, 2003 by Governor Murkowski then FEMA declared April 26, 2003**-A major windstorm with sustained and severe winds that exceeded 100 mph occurred between March 6 and March 14, 2003. The windstorm affected the Matanuska-Susitna Borough, the Municipality of Anchorage, and the Kenai Peninsula Borough. Severe damage occurred to numerous personal residences and local businesses; extensive damage occurred to public facilities (i.e. schools, libraries, community centers, airports, buildings and utilities) in the Matanuska-Susitna Borough, Municipality of Anchorage and the Kenai Peninsula Borough. Although damages were widespread, Anchorage facilities received the most damages. Federal Disaster Assistance for Debris Removal, Emergency Protective Measures and all Permanent Work categories were approved under the Public Assistance Program. FEMA also authorized 404 Mitigation funding and individual assistance under the Individual and Household Program.	Matanuska-Susitna Borough, Municipality of Anchorage, & Kenai Peninsula Borough	Weather	Federal

03-205	**03-205 Salcha Flood 2003 State Disaster (AK-03-205) Declared May 21, 2003 by Governor Murkowski**-Warm temperatures in Central Alaska triggered an ice blockage on the Tanana River. The subsequent flooding in the unincorporated community of Salcha impacted 100 homes and caused the evacuation of approximately 40 residents. Salcha is located in the jurisdictional boundaries of the Fairbanks North Star Borough (FNSB). Flooding began on April 29, 2003. Flood water continued to rise and fall through May 7, 2003 as the water volume changed and ice jams dislodged and reformed. An emergency shelter was opened by the American Red Cross at the Salcha School. The Shelter was never used because displaced residents chose to stay with family and friends. The FNSB Emergency Manager requested assistance from the State; an Emergency Management Specialist was dispatched to assist. The Civil Air Patrol was used to gather reconnaissance photos of the ice blockages and flooded area. During the incident period, a community meeting was held to listen to resident's concerns. Participants included the Commissioner for the Department of Transportation, the Commander for the Army corps of Engineers, and the Division of Emergency Management. Damages included residential homes, roads (local and state), culverts (local and state) and damage to a dike. Disaster Assistance for Debris Removal, Emergency Protective Measures and Permanent Work category C were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested.	Fairbanks North Star Borough	Flood	State

04-206	**04-206 03 July Riverine Flooding (AK-04-206)** **Administrative Order Number 212 by Governor Murkowski**- Heavy flooding during the period July 14, 2003 through August 3, 2003 caused damages to the Department of Transportation roads and bridges, local businesses and some residential homes. The Denali Borough declared a local disaster and requested assistance from the State. An Emergency Management Specialist and Assistant were sent to assess damages. The Division of Emergency Services procured and provided 2000 sandbags and 24 potable water containers to the Denali Borough for emergency response. The Department of Transportation damages included areas on the Chena Hot Springs Road, the Elliot Hwy, and the Parks Hwy at Honolulu Creek and Carlo Creek. Several businesses in the affected area were damaged. The American Red Cross responded to the area but residents did not require services. The Small Business Administration provided financial counseling to local residents and businesses. The Denali Borough's request for state assistance, beyond what was provided for emergency response, was denied by the Governor. Disaster Assistance for Debris Removal, Emergency Protective Measures and Permanent Work category C were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested.	Denali Borough	Flood	State

04-207	**04-207 03 Fall Flood (AK-04-207) Declared November 3, 2003 by Governor Murkowski**-Unseasonable amount of rain during the period of September 26 through October 3, 2003 caused heavy flooding in the Lake and Peninsula Borough, the Kenai Borough and the Kodiak Island Borough. The Lake and Peninsula Borough declared a local disaster emergency. The Kenai Borough did not declare a disaster emergency but extended a letter of support for the Lake and Peninsula Borough declaration. The heavy rains resulted in localized flash flooding and some general flooding. The Department of Transportation experienced extensive damage on the Chiniak Hwy in Kodiak and to multiple locations on the Williamsport-Pile Bay road in the Lake & Peninsula Borough and the Kenai Borough. The Department of Transportation requested emergency repair funds for the Chiniak Hwy; they will use Statewide Transportation Improvement Program funds for the permanent repair. Other damage to Department of Transportation facilities included damage at Pedro Bay and South Naknek airports. The Department of Transportation used in-house and deferred maintenance funds to make repairs to the damages at the airports. The Tanalian Electric Cooperative in Port Alsworth experienced damage to overhead power lines resulting in power failures. Disaster Assistance for Emergency Protective Measures and Permanent Work category C were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested.	Lake and Peninsula Borough, Kenai Borough, & Kodiak Island Borough	Flood	State

04-208	**04-208 03 Kasaan Landslide (AK-04-208) Declared January 29, 2004 by GovernorMurkowski-**On October 17, 2003 a stream debris basin failure caused a large landslide that damaged the City of Kasaan's potable water system. The land/debris slide caused damage to the water treatment facility by washing out the road to the water treatment plant, filled the stream impoundment with rocks and debris, exposed a buried water transmission line, destroyed a small stringer bridge, and deposited debris around the water treatment plant preventing normal access. The City of Kasaan declared a local disaster emergency and requested State assistance. Although the water treatment plant was still operational, the repair of the system was beyond the ability of the community. The State did send a Department of Transportation hydrologic engineer to assess the damages. Emergency Protective Measures and Permanent Work-category C were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested.	Southeast Island	Ground Failure	State

04-209	**04-209 03 Fall Sea Storm (AK-04-209) Declared January 29, 2004 by Governor Murkowski**-A series of sea storms with high winds and tidal surge during the period of November 1 to November 24, 2003 caused damages in the communities of Unalakleet, Diomede, and Port Heiden. Damage was also reported by the Department of Transportation. The City of Unalakleet and Port Heiden declared local emergencies and Diomede requested assistance in a letter to the Division of Emergency Services. The Department of Transportation reported damages in Nome on the Nome-Counsel Road (MP 22 and 23.8) and at the Unalakleet airport. The City of Unalakleet had a large quantity of debris deposited throughout the road system. Damages to a gabion protection wall, roads and exposure of a water line were also experienced. Port Heiden experienced tidal erosion that exposed two grave sites, a power line and endangered a road. The US Air Force, under the coordination of the Division of Homeland Security and Emergency Management, addressed the issue of the two grave sites. Disaster Assistance for Emergency Protective Measures and Permanent Work category C for the City of Port Heiden, the Department of Transportation and Unalakleet, category F for Port Heiden and debris removal for Unalakleet were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested.	Bering Strait & Lake & Peninsula Borough	Weather	State

04-210	**04-210 Interior Fires (DNR-Declared):** On June 29, 2004 declaration was made for DNR to provide fire suppression activities to prevent continuing and new fires from threatening life and property. On July 1, 2004 the Fairbanks North Star Borough (FNSB), the Alaska Department of Natural Resources (DNR) and the Alaska Interagency Coordination Center (AICC) requested that the Alaska Division of Homeland Security and Emergency Services (DHS&EM) assist with evacuation of local residents threatened by growing wildfires. On July 1, 2004 the Alaska Department of Natural Resources and DHS/EM staff on scene determined that local resources, both within FNSB and the surrounding unorganized borough were becoming overwhelmed by the five major fires burning in the region. Dense smoke has limited visibility, hampered air operations in the region and prompted health warnings for residents of Interior Alaska. The funding and assistance for this disaster is administered by DNR; therefore, DHS/EM has no data on applicants or total amount of funding.	Fairbanks North Star Borough	Fire	Undeclared

05-211	**05-211 2004 Bering Strait Sea Storm declared October 28, 2004 by Governor Murkowski then FEMA declared (DR-1571) on November 15, 2004. Amended declaration to extend incident to October 24, 2004:** Between October 18 and 20, 2004, a severe winter storm with strong winds and extreme tidal surges occurred along the Western Alaska coastline, which resulted in severe damage and threat to life and property, specifically in the Bering Strait Regional Educational Attendance Area (REAA), including Elim, Nome, Koyuk, Shaktoolik, Unalakleet, and other communities; in the Northwest Artic Borough, including Kivalina, Kotzebue, and other communities; and in the City of Mekoryuk; with potenally unidentified damages in adjacent areas, and additional storm surges likely from continuing weather patterns in this area Alaska. Conditions that exist in the coastal communities of the Northwest Artic Borough as a result of this disaster: severe damage to roadways, power distribution systems, and drain fields. Conditions that exist in the coastal communities of the Bering Strait REAA as a result of this disaster: severe damage to gabions (used to protect shoreline), major damage to coastal highways and roads, damage to water and septic systems, damage to a bridge, damage to power distribution systems, damage to fuel storge tanks, fuel spills, and property damage. Conditions that exist in the City of Mekoryuk as a result of this disaster: major damage to sea wall and damage to roadways. On November 16, 2004, the declaration was amended to reflect a more accurate timeframe of the disaster. The City of St. George appealed the denial of funding decision for the breakwater.	Northwest Arctic Borough, Bering Strait REAA	Weather	Federal

05-212	**05-212 2005 Kaktovik Winter Storm declared January 15, 2005 by Governor Murkowski Murkowski then FEMA declared (DR-1584) on March 14, 2005:** Over a week-long period beginning on January 7, 2005, a severe winter storm with extremely low temperatures, 60-knot winds, and blizzard conditions enveloped the coastal city of Kaktovik, Alaska. The high winds blew down several power lines and caused the backload and subsequent shut down of the main electrical grid and generators. On January 8, 2005, approximately 60% of the city was without power. Attempts to restore power at the main power plant continued over the next day with intermittent success; however, power was lost to the entire city, including 107 homes, and the airport, by late afternoon on January 9, 2005. At 1700 hours, the North Slope Borough (NSB), which provides all public utilities for the city, notified the State Emergency Coordination Center (SECC) and Division of Homeland Security & Emergency Management (DHS&EM) that the city was in danger of city-wide freezing damage to water and sewer transmission pipelines, and requested emergency transportation of life safety repair technicians and repair equipment to the city of Kaktovik.	North Slope Borough	Weather	Federal

05-213	**05-213 2005 Spring Floods (AK-05-213) declared July 20, 2005 by Governor Murkowski** Beginning May 13, 2005, a large ice jam blocked the mouth of the Lower Yukon River and caused widespread flooding to the cities of Emmonak and Alakanuk. In both cities, several roads were inundated and eroded by the floodwaters. Floodwaters also inundated city infrastructure to include the above-ground circulating water and vacuum sewage systems which were displaced and/or knocked off their mounting supports. Both cities have submitted local disaster declarations requesting State assistance. There were no life safety issues during this event. Floodwaters subsequently subsided to normal levels within the river banks on or about May 18, 2005. Additionally, in the city of McGrath, beginning on May 3, 2005, ice jam flooding eroded several local roads, including Takotna Avenue and Cranberry Ridge Road, and unusually high water levels threatened city infrastructure and private homes, in the City of McGrath. The city infrastructure at risk included: the City Office building which housed the water plant, health clinic, fire station, laundromat, and State Trooper Office; the utility corridor containing power and water lines; two marine fuel headers and associated tank farms; and Federal and State offices and housing. Several private homes were cut off from emergency services due to impassable roads. Takotna Avenue is a main transportation avenue in town. The road also serves as a levee against rising river water that if breeched, would threaten a large portion of the City of McGrath. The City of McGrath signed a local disaster declaration and requested State assistance on May 13, 2005. The high water levels at McGrath receded slowly from May 14 to 18, 2005.	Iditarod Area, Lower Yukon	Flood, Erosion	State

06-214	**06-214 2005 Bristol Bay Storm (AK-06-214) declared October 03, 2005 by Governor Murkowski:** On August 23, 2005, a strong storm with high winds combined with high tides produced storm surges of 2 to 3 feet above the high tide levels and caused widespread coastal flooding in the upper Bristol Bay area. Public infrastructure, commercial property, and personal property damages were reported in the City of Clark's Point, the nearby unincorporated community of Ekuk, and the City of Togiak. Damages were also reported in Lake and Peninsula Borough, Bristol Bay Borough and the City of Dillingham. Lake and Peninsula Borough, Bristol Bay Borough and the City of Dillingham elected not to declare local disasters and are not seeking assistance. Clark's Point and Togiak have each signed local disaster declarations and are asking for state Individual Assistance and Public Assistance in response and recovery from this storm.	Lake & Peninsula Borough, Bristol Bay Borough	Flooding , Weather	State

06-215	**06-215 2005 West Coast Storm declared October 24, 2005 by Governor Murkowski then FEMA declared (DR-1618) on December 9, 2005:** Beginning on September 22, 2005 and continuing through September 26, 2005, a powerful fall sea storm produced high winds combined with wind-driven tidal surges resulting in severe and widespread coastal flooding and a threat to life and property in the Northwest Arctic Borough, and numerous communities within the Bering Strait (REAA 7), the Kashunamiut (REAA 55), the Lower Yukon (REAA 32) and the Lower Kuskokwim (REAA 31) Rural Education Attendance Areas including the cities of Nome, Kivalina, Unalakleet, Golovin, Tununak, Hooper Bay, Chevak, Mekoryuk and Napakiak. The following conditions existed as a result of this disaster: sever damage to personal residences requiring evacuation and sheltering of the residents; to businesses; to drinking water systems, electrical distribution systems, local road systems, airports, seawalls, and other public infrastructure; and to individual personal and real property; necessitating emergency protective measures and temporary and permanent repairs. On October 25, 2005, a request for a federal time extension was submitted. On December 9, 2005 a presidential disaster was declared (DR-1618) for Public Assistance for the Northwest Arctic Boro, Bering Strait REAA, Kashunamiut REAA (Chevak) and the Lower Kuskokwim REAA however they failed to include the Lower Yukon REAA in the federal declaration.	Northwest Arctic Borough, Bering Strait REAA, Lower Yukon REAA, Lower Kuskowim REAA, Kashunamiut REAA	Flooding, Weather	Federal

06-216	**06-216 2005 Southeast Storm (AK-06-216) declared December 23, 2005 by Governor Murkowski:** Beginning on November 18, 2005 and continuing through November 26, 2005, a strong winter storm with high winds and record rainfall occurred in the City/Borough of Juneau, the City/Borough of Haines, the City/Borough of Sitka, the City of Pelican, the City of Hoonah, and the City of Skagway, which resulted in widespread coastal flooding, landslides, and severs damage and threat to life and property, with the potential for further damage. The following conditions exist as a result of this disaster: severe damage to personal residences requiring evacuation and relocation of residents; to individuals personal and real property; to businesses; and to a marine highway system dock, the road systems eroded and blocked by heavy debris that prohibited access to communities and residents, and other public infrastructures, necessitating emergency protective measures and temporary and permanent repairs.	City and Boroughs of Juneau, Haines, and Sitka	Flood, Weather, Erosion	State

06-217	**06-217 2006 South Central Storm (AK-06-217) declared March 13, 2006 by Governor Murkowski:** Beginning on February 5, 2006 and continuing through February 11, 2006, a series of strong winter storms with high winds, heavy snow, and freezing rain occurred in the City of Seward and surrounding areas of the Kenai Peninsula Borough in South Central Alaska, causing avalanches that severely damaged power lines and other infrastructures, blocked roads, and threatened further damages. As a result of the disaster, there was severe damage to power transmission and distribution lines supplying the City of Seward and surrounding areas; disruption of normal power supply requiring the prolonged use of emergency backup generators with extraordinary expensive operation costs; and damage and threat to public and private property as a result of power disruption. On March 13, 2006, a letter was submitted to request a federal time extension of 30 days. As of 3/20/06, the decision is pending. Decision made not to seek Federal assistance. Current estimated cost for repairs is $1,254,730; however, this does not include the ongoing cost of line repair. No federal declaration was sought; therefore, the State is limited to public assistance only (no HM or IA).	Kenai Peninsula Borough	Avalanche, Weather	State

06-218	**06-218 2006 Spring Floods (AK-06-218) declared June 27,2006 by Governor Murkowski then FEMA declared (DR-1657) on August 04, 2006** Beginning May 5, 2006 continuing through May 30, 2006, the National Weather Service (NWS) issued flooding warnings and watches across the state as excessive snowmelt and ice jams caused flooding along the Yukon, Kuskokwim, and Koyukuk river drainages. The most serious impacts were reported in the communities of Hughes, Koyukuk, Kwethluk, Alakanuk, and Emmonak, along with substantial damage to State-maintained airports, roads, and highways. In each community, large portions of the village, city infrastructure, and several roads were inundated and eroded by the floodwaters.	Yukon-Koyukuk, Lower Kuskokwin	Flood	Federal

07-219	**07-219 2006 Hooper Bay Fire (AK-07-219) declared August 6, 2006 by Governor Murkowski then FEMA declared (DR-1666) on October 27, 2006** Beginning on August 3, 2006 and continuing through August 4, 2006, the Second Class City of Hooper Bay, Alaska sustained severe losses and threats to life and property from a community structure fire that has destroyed the elementary school, the high school, school support facilities, and 14 homes. As a result of this disaster the homes and personal property of 17 families consisting of 66 people are lost and 400 students do not have educational facilities. There are also potential water contamination and air quality issues.	Lower Yukon	Fire	Federal

07-220	**07-220 2006 August Southcentral Flooding (AK-07-220) declared August 29,2006 by Governor Murkowski then FEMA declared (DR-1663) on October 16,2006** Beginning on August 18, 2006 and continuing through August 24, 2006, a strong weather system centered causing severe flooding resulting in severe damage and threats to life and property, in the Southcentral part of the State including the Matanuska-Susitna Borough, the City of Cordova and the Copper River Highway area in the Chugach Rural Education Attendance Area (REAA), the Richardson Highway area in the Copper River REAA and Delta/Greely REAA, the Denali Highway area, and the Alaska Railroad and Parks Highway areas in the Matanuska-Susitna Borough and the Denali Borough. Damage cost estimates are near $21 million in Public Assistance primarily for damage to roads, bridges and rail lines. Individual Assistance estimates are near $2 million.	Matanuska-Susitna Borough, Chugach REAA, Copper River REAA, Delta/Greely REAA, Denali, Borough	Flood	Federal

07-221	**07-221 2006 October Southern Alaska Storm (AK-07-221) declared October 14, 2006 by Governor Murcowski FEMA declared (DR-1669) on December 8, 2006** Beginning on October 8, 2006 and continuing through October 13, 2006, a strong large area of low pressure that developed in the Northern Pacific and moved into the Southwest area of the state, produced hurricane force winds throughout much of the state and heavy rains in the Southcentral and Northern Gulf coast areas, which resulted in severe flooding and wind damage and threats to life in the Southern part of the state, to include the Kenai Peninsula Borough including the Cities of Seward and Seldovia, the Chugach Rural Education Area including the City of Cordova and the City of Valdez, and the Copper River Rural Education Area including the Richardson Highway to the Glenallen and highways and drainages in the McCarthy areas. Initial total damages are estimated at $557,415 with a public assistance estimate of $456,855. Federal declaration was made December 2006 including assistance for Public Assistance and Hazard Mitigation but not including Individual Assistance.	Chugach REAA, Kenai Peninsula Borough, Copper River REAA	Flood, Weather	Federal

07-222	**07-222 2006 October Kivalina Storm, Administrative Order #231, issued November 19, 2006 by Governor Frank H. Murkowski** October 11, 2006 through October 13, 2006 a fall sea storm with sustained high surf and storm surge caused severe wave damage and coastal erosion in the City of Kivalina. Through local declarations on October 19, 2006 the Northwest Arctic Borough and the City of Kivalina requested assistance to repair the seawall and protect community infrastructure. The Alaska village Electric Cooperative also requested state disaster emergency. In accordance with AS 26.23.020(h) assistance from the disaster relief fund was found appropriate by Governor Murkowski to cover eligible emergency response costs and emergency protective measures. Permanent repairs to or replacement of the seawall were not found to be appropriate for funding. The amount of funding was not to exceed $235,000 including administrative fees. Governor Murkowski also directed the Department of Commerce, Community, and Economic Development (consistent with AO#175) to coordinate with other state and federal agencies to propose long-term solutions to the ongoing erosion issues in Kivalina and other coastal communities in the state of Alaska.	Northwest Arctic Borough	Weather, Erosion	State

DISASTER	DSTR #	IFG TOTAL	# OF GRANTS	IFG (AVERAGE)	PUBLIC ASST	Hazard Mitigation	DHS&EM Admin Allowance	TOTAL	FED REVENUE	FED %
Karluk	78-1				168,207.00		3,366.00	171,573.00	-	0%
Campbell Creek, Anchorage	78-2				10,728.00		83.00	10,811.00	-	0%
Wrangell/Craig	78-3	6,975.00	19	$367	381,075.00		3,950.00	392,000.00	-	0%
Matanuska-Susitna Borough	79-4				50,000.00		-	50,000.00	-	0%
Delta Fire	79-5				3,250,000.00		-	3,250,000.00	-	0%
West Coast	80-6	80,582.00	154	$523	23,635.00		17,135.00	121,352.00	-	0%
Willow Creek	80-7				19,923.00		195.00	20,118.00	-	0%
Kodiak Island	80-8				165,275.00		6,496.00	171,771.00	-	0%
Anchorage Windstorm	80-9	38,536.00	66	$584	416,775.00		6,137.00	461,448.00	-	0%
Bristol Bay	81-10	18,605.00	23	$809	81,207.00		13,271.00	113,083.00	-	0%
Copper Center	81-11				12,900.00		268.00	13,168.00	-	0%
Angoon	81-12				10,080.00		907.00	10,987.00	-	0%
Southcentral	82-13				275,000.00		13.00	275,013.00	-	0%
Emmonak	82-14				257,406.00		2,217.00	259,623.00	-	0%
Fort Yukon	82-15	79,449.00	49	$1,621	706,487.00		25,387.00	811,323.00	-	0%
Russian Mission	83-16	119,391.00	64	$1,865	14,166.00		7,767.00	141,324.00	-	0%
Takotna	83-17				352,000.00		6,650.00	358,650.00	-	0%
Kipnuk	83-18				905.00		-	905.00	-	0%
Aniak	83-19				71,573.00		4,041.00	75,614.00	-	0%
Ketchikan	84-20				1,000.00		-	1,000.00	-	0%
Cordova	84-21				122,938.00		2,839.00	125,777.00	-	0%
Chefornak	84-22				26,949.00		5,244.00	32,193.00	-	0%
Unalakleet	84-23				721,000.00		5,865.00	726,865.00	-	0%
Mountain Village	84-24				964,860.00		21,567.00	986,427.00	-	0%
Elim	84-25				379,670.00		4,918.00	384,588.00	-	0%
Kotzebue	84-26				662,800.00		10,301.00	673,101.00	-	0%
Cold Bay	84-27				-		1,345.00	1,345.00	-	0%
Alakanuk	84-28				271,560.00		5,984.00	277,544.00	-	0%
Emmonak	84-29				20,400.00		2,484.00	22,884.00	-	0%
Cold Bay	85-30				CLOSED		CLOSED	740,000.00	-	0%

Russian Mission	85-31				86,898.00	2,427.00	89,325.00	-	0%
Southeast Alaska	85-32	$26,000.00 (TH) $312,000.00 (IFG)	82	$3,805	582,077.00	38,442.00	958,519.00	-	0%
Haines	85-33				1,576,423.00	5,083.00	1,581,506.00	-	0%
Savoonga	85-34				251,275.00	4,679.00	255,954.00	-	0%
Gambell	85-35				33,600.00	73.00	33,673.00	-	0%
Buckland	85-36				75,875.00	7,710.00	83,585.00	-	0%
Kobuk	85-37				13,320.00	4,659.00	17,979.00	-	0%
Anvik	85-38				11,061.00	6,817.00	17,878.00	-	0%
Emmonak	85-39				64,520.00	8,312.00	72,832.00	-	0%
Pilot Station	85-40				33,666.00	1,070.00	34,736.00	-	0%
Upper Kuskokwim River	85-41				49,499.00	7,327.00	56,826.00	-	0%
Pitka's Point	86-42				11,106.00	1,634.00	12,740.00	-	0%
Bethel	86-43				466,372.00	9,135.00	475,507.00	-	0%
Gambell	86-44	19,200.00	6	$3,200	173,606.00	8,887.00	201,693.00	-	0%
Cordova	86-45				15,751.00	711.00	16,462.00	-	0%
Manakotak	86-46				67,575.00	1,874.00	69,449.00	-	0%
Thorne Bay	86-47				254,726.00	3,786.00	258,512.00	-	0%
Metlakatla	86-48				89,378.00	1,169.00	90,547.00	-	0%
Unalaska	86-49				175,524.00	6,413.00	181,937.00	-	0%
Thorne Bay (Bridge)	86-52				10,560.00	1,218.00	11,778.00	-	0%
Venetie	86-51				50,000.00	4,615.00	54,615.00	-	0%
Pelican	86-52				16,277.00	1,747.00	18,024.00	-	0%
Crown Point	86-53	$363,252.00 (TH) $105,201.00 (IFG)	42	$2,505	216,587.00	27,057.00	712,097.00	-	0%
Napakiak	86-54				15,000.00	-	15,000.00	-	0%
Chukchi Sea Storm	87-55				3,746,091.00	44,935.00	3,791,026.00	2,252,618.00	59%
Southcentral AK Flood	87-56	$318,000.00 (FED) $83,000.00 (ST)	136 35	$2,338.00 $2,371.00	8,099,618.00	141,822.00	8,642,440.00	5,375,542.00	62%
Aniak (Sewer)	87-57				50,000.00	2,500.00	52,500.00	-	0%
Venetie	87-58				83,000.00	3,000.00	86,000.00	-	0%
Kotzebue	87-59				1,228,070.00	3,540.00	1,231,610.00	-	0%

Sleetmute/Red Devil	87-60				47,545.00	4,057.00	51,602.00	-	0%
Delta Junction	87-61				19,196.00	3,061.00	22,257.00	-	0%
Aniak	87-62				977,670.00	16,191.00	993,861.00	-	0%
Buckland	87-63	154,521.00	7	$22,074	41,699.00	7,328.00	203,548.00	-	0%
Richardson Highway	88-64				-	-	-	-	0%
Wainwright Fire	88-65				2,165,125.00	21,806.00	2,186,931.00	-	0%
Angoon	88-66				29,250.00	264.00	29,514.00	-	0%
Togiak	88-67				34,000.00	1,000.00	35,000.00	-	0%
Klehini River Bridge	88-68				81,500.00	10,982.00	92,482.00	-	0%
Barrow School Fire	88-69				2,387,379.00	22,780.00	2,410,159.00	1,396,822.00	58%
Haines Flooding	88-70				64,803.00	13,787.00	78,590.00	-	0%
Beaver	88-71				21,941.00	1,049.00	22,990.00	-	0%
Chefornak	88-72				270,703.00	2,032.00	272,735.00	-	0%
Chenega Bay	88-73				34,688.00	1,735.00	36,423.00	-	0%
Pitka's Point	88-74				95,254.00	2,507.00	97,761.00	-	0%
Nondalton	88-75				763,766.00	13,131.00	776,897.00	-	0%
Crooked Creek	88-76	27,383.00	7	$3,912	94,338.00	11,509.00	133,230.00	-	0%
Napakiak/Napaskiak	88-77				114,310.00	10,982.00	125,292.00	-	0%
Kaltag	89-78				22,750.00	6,133.00	28,883.00	-	0%
Eagle	89-79				2,018.00	6,224.00	8,242.00	-	0%
Shishmaref	89-80				305,479.00	12,593.00	318,072.00	-	0%
Klawock	89-81				43,243.00	4,914.00	48,157.00	-	0%
Yukon Flats	89-82	60,226.00	14	$4,302	-	24,531.00	84,757.00	-	0%
Omega Block(Cold Wthr)	89-83				1,007,741.00	311,915.00	1,319,656.00	881,288.00	67%
Northwest Arctic Borough	89-84				4,947,366.00	27,542.00	4,974,908.00	3,672,967.00	74%
St. George	89-85				227,464.00	2,389.00	229,853.00	170,598.00	74%
Sand Point	89-86				21,565.00	1,497.00	23,062.00	16,174.00	70%
Ahkiok	89-87				42,575.00	3,362.00	45,937.00	31,931.00	70%
North Slope Borough	89-88	53,985.00	53	$1,019	-	59,379.00	113,364.00	-	0%
Valdez Oil Spill	89-89				CLOSED	CLOSED	361,679.00	-	0%
Galena	89-90				172,353.00	2,771.00	175,124.00	129,265.00	74%
Glennallen	89-91				15,000.00	-	15,000.00	-	0%
Circle	89-92		25		189,319.00	7,338.00	196,657.00	-	0%
Ft. Yukon	89-93		51		186,068.00	8,744.00	194,812.00	-	0%
89 Spring Floods	89-94	411,847.00	178	$2,314	3,998,593.00	329,441.00	4,739,881.00	3,232,831.00	68%
Klawock	90-95				8,798.00	1,129.00	9,927.00	-	0%
Fairbanks North Star Boro	90-96	54,610.00	33	$1,655	3,315.00	7,715.00	65,640.00	-	0%
Mat-Su Borough	90-97				354,084.00	4,688.00	358,772.00	-	0%

Whittier	90-98				634,103.00	-	634,103.00	-	0%
Municipality of Anchorage	90-99				2,244,730.00	16,885.00	2,261,615.00	-	0%
Seward/Kenai Peninsula	90-100				510,693.00	18,859.00	529,552.00	-	0%
Richardson Highway	90-101				-	-	-	-	0%
Search and Rescue	90-102				CLOSED	CLOSED	100,000.00	-	0%
Mt. Redoubt	90-103				255,946.00	13,940.00	269,886.00	-	0%
KPB Mt. Redoubt	90-104				149,403.00	-	149,403.00	-	0%
Tatitlek	90-105				89,508.00	2,734.00	92,242.00	-	0%
Broadcasting	90-106				130,000.00	-	130,000.00	-	0%
Kongiganak	90-107				20,000.00	-	20,000.00	-	0%
Moose	90-108				196,500.00	22.00	196,522.00	-	0%
Manakotak	90-109				15,000.00	-	15,000.00	-	0%
Stebbins	90-110				-	1,000,000.00	1,000,000.00	-	0%
Hazard Mit. 89 Spring Flood	90-111				457,563.00	162,265.00	619,828.00	328,472.00	53%
Snow and Ice Removal	90-112				CLOSED	CLOSED	2,000,000.00	-	0%
McGrath	90-113				38,958.00	451.00	39,409.00	-	0%
Kobuk	90-114				6,153.00	-	6,153.00	-	0%
Fire Suppresion	90-115				1,000,000.00	-	1,000,000.00	-	0%
Teklanika Fire	90-116				1,000,000.00	-	1,000,000.00	-	0%
Bethel	90-117				585,176.00	15,000.00	600,176.00	-	0%
Statewide Fires	91-118				1,986,009.00	9,905.00	1,995,914.00	1,021,500.00	51%
Hazard Mitigation C.W.	91-119				517,094.00	39,660.00	556,754.00	264,985.00	48%
Lower Kuskokwim	91-120	559,645.00	256	$2,186	191,767.00	83,885.00	835,297.00	-	0%
Kotzebue Tide	91-121	124,893.00	59	$2,117	180,000.00	23,952.00	328,845.00	-	0%
Nome	91-122				105,000.00	-	105,000.00	-	0%
Teller	91-123				171,500.00	2,223.00	173,723.00	-	0%
Lowell Creek Tunnell	91-124				369,547.00	239.00	369,786.00	-	0%
Diomede	91-125				588,496.00	34,098.00	622,594.00	-	0%
Eagle	91-126				32,985.00	189.00	33,174.00	-	0%
Togiak	91-127				49,761.00	1,623.00	51,384.00	-	0%
Larsen Bay	91-128				20,000.00	-	20,000.00	-	0%
Karluk	91-129				22,000.00	-	22,000.00	-	0%
Marshall	91-130				15,741.00	-	15,741.00	-	0%
Angoon	91-131				87,500.00	3,968.00	91,468.00	-	0%
Fairbanks North Star Boro	91-132	377,603.00	146	$2,586	830,605.00	456,170.00	1,664,378.00	663,286.00	40%
Aniak	91-133	23,601.00	7	$3,372	526,488.00	-	550,089.00	230,666.00	42%
McGrath	91-134	127,232.00	36	$3,534	481,159.00	-	608,391.00	298,071.00	49%
Red Devil	91-135	28,041.00	8	$3,505	211,912.00	-	239,953.00	130,379.00	54%

Anvik	91-136	45,984.00	12	$3,832	135,716.00	-	181,700.00	41,971.00	23%
Grayling	91-137	71,004.00	19	$3,737	7,626.00	-	78,630.00	3,569.00	5%
Emmonak	91-138	142,854.00	60	$2,381	255,392.00	-	398,246.00	191,544.00	48%
Holy Cross	91-139	20,265.00	5	$4,053	-	-	20,265.00	-	0%
Alakanuk	91-140	112,298.00	42	$2,674	98,208.00	-	210,506.00	55,034.00	26%
Shageluk	91-141	35,018.00	8	$4,377	22,849.00	-	57,867.00	9,321.00	16%
Galena	92-142				67,061.00	-	67,061.00	-	0%
DNR	92-143				CLOSED	CLOSED	-	-	0%
Mat-Su Borough	92-144				511,000.00	4,900.00	515,900.00	-	0%
Whitestone	92-145				162,997.00	5,703.00	168,700.00	-	0%
Little Diomede	92-146				57,303.00	10,381.00	67,684.00	-	0%
Aniak Loan	92-147				-	5,082.00	5,082.00	-	0%
Diomede Fire	92-148				940,872.00	33,300.00	974,172.00	-	0%
New Koliganek	92-149				54,725.00	12,801.00	67,526.00	-	0%
Kodiak	92-150	$50,483.00 (TH) $66,218.00 (IFG)	9 23	$5,609.00 $2,875.00	1,375,448.00	72,808.00	1,564,957.00	-	0%
Earthquake Mitigation	92-151				-	225,748.00	225,748.00	-	0%
Seward Sewage	92-152				744,091.00	10,450.00	754,541.00	-	0%
Eagle Village Flood	92-153	77,672.00	22	$3,531	90,848.00	15,210.00	183,729.00	-	0%
Eagle City Flood	92-154	5,000.00	2	$2,500	50,200.00	5,947.00	61,147.00	-	0%
Galena Ice Jam Flood	92-155	139,523.00	46	$3,033	277,050.00	26,042.00	442,615.00	-	0%
Flood Response	92-156				-	22,059.00	22,059.00	-	0%
Yukon River Flood	92-157	655,326.22	110	$5,958	418,601.00	93,869.00	1,167,796.22	-	0%
Fire Disaster	93-158				-	-	-	-	0%
Norton Sound Herring Fish	93-159				-	-	-	-	0%
Haines Highway Disaster	93-160				-	-	-	-	0%
Mt. Spurr	93-161				282,741.00	5,105.00	287,846.00	-	0%
Nome	93-162				-	-	-	-	0%
Kuskokwim Chum	94-163				-	-	-	-	0%
								-	0%
Tenakee Springs Fire	94-164	$4,650.00 (TH) $13,939.00 (IFG)	2 7	$2325.00(TH) $1991.00(IFG)	126,647.00	24,134.00	169,369.00		
Department of Natural Res	94-165				1,000,000.00	-	1,000,000.00	-	0%
Shaker IV	94-166				116,485.00	241,293.00	357,778.00	-	0%
Prince of Wales Island	94-167				-	-	-	-	0%
Fort Yukon Haz Mit	94-168				346,613.00	10,152.00	356,765.00	166,000.00	47%

McGrath Road Disaster	94-169				165,000.00		5,999.00	170,999.00	-	0%
Galena Flood	94-170				607,885.00		6,120.00	614,005.00	-	0%
Cummins Road	95-171				36,837.00		1,973.00	38,810.00		0%
Mat-Su Borough Loan	95-172				500,000.00		-	500,000.00		0%
1994 Falls Floods	95-173	1,184,053.00	138	$8,580	58,890,932.00		808,437.00	60,883,422.00	52,558,473.00	87%
1994 Koyukuk Flood Hmit	95-173				11,402,495.00		-	11,402,495.00	8,551,871.00	75%
1994 Koyukuk Flood TH	95-173				335,616.00		-	335,616.00	335,616.00	100%
Metlakatla	95-174				30,900.00		963.00	31,863.00		0%
Skagway	95-175				111,800.00		986.00	112,786.00		0%
Yukon-Delta Kuskokwim	95-176				205,201.00		2,651.00	207,852.00		0%
Aniak	95-177				208,326.95		1,887.00	210,213.95		0%
Bethel	95-178				127,450.00		1,411.00	128,861.00		0%
Statewide Fire	95-179				-		-	-		
1995 Southcentral Flood	96-180	699,713.22	160	$4,364.03	7,965,942.09	1,208,499.61	652,807.23	10,526,962.15	7,244,498.00	70%
Miller's Reach Fire	96-181	1,868,250.34 IFG 3,210.00 TH	425	$4,395.88	5,108,137.78	1,748,653.00	623,784.49	9,352,035.61	6,722,470.51	73%
96 Southeast Storm	97-182				486,163.55		42,017.25	528,180.80		
Bristol Bay Fish 1997	98-184	500,000.00	446	$1,121.08	1,500,000.00		7,846.00	2,007,846.00		75%
Tanana/Copper River Flood	98-185	104,877.86			794,346.76		46,919.70	946,144.32		
Shishmaref 1997	98-186	16,295.52	6	$2,716	1,211,839.95	50,000.00	184,652.64	1,462,788.11	800,000.00	0%
DNR Fire Suppression	98-187									
Endicott Mtn Flooding	98-188	-			659,724.10		8,181.82	667,905.92		0%
WAFD- FEDA	98-189	15,002,649.38	4807	$1,500.00			2,997,350.62	18,000,000.00	18,000,000.00	0%
WAFD- ELE	98-189	4,412,859.75			347,774.00		1,346,117.60	6,106,751.35		
Southeastern Storm	98-190	166,505.98	54	$3,083.00	828,062.73		125,359.23	1,119,927.94		0%
CGCS	00-191				12,810,668.17	2,020,852.00	829,820.38	15,661,340.55	12,391,860.60	
Operation Renew Hope	01-194	75,000.00					672,122.10	747,122.10		
Kake Water	01-195				404,746.71		4,899.77	409,646.48		
Middle Yukon	01-196	207,295.00	61	3,398.28	200,854.00		37,138.00	445,287.00		
Kotzebue Radio	02-197				35,914.37		5,312.40	41,226.77		
Shishmaref Erosion	02-198				78,139.33		9,719.41	87,858.74		
Sleetmute Fire	02-199				142,971.00		7,029.00	150,000.00		
02 Interior Flood	02-200	292,400.00	60	4,873.33	4,417,900.00	724,800.00	698,547.43	6,133,647.43	4,541,300.00	
Northwest Fall Sea Storm	03-201				343,976.64		38,055.96	382,032.60		
KPB Flood	03-202	41,571.00			16,443,510.00	1,931,867.0	801,411.00	19,218,359.00	15,136,347.00	

						0			
Denali Earthquake	03-203	67,086.06	12	3,628.36	24,802,028.20	3,248,713.0 0	946,694.02	29,064,521.28	21,764,017.00
03 Southcentral Windstorm	03-204	47,605.33			2,560,031.09	532,096.00	330,218.41	3,469,950.83	2,452,548.00
Salcha Flood	03-205	117,898.76	31	3,803.19	229,788.53		78,361.50	426,048.79	
Riverine Flood	04-206				314,833.83		25,007.87	339,841.70	
2003 Fall Flood	04-207				290,629.00		51,508.00	342,137.00	
Kasaan Landslide	04-208				428,332.85		15,534.52	443,867.37	
03 Fall Seastorm	04-209				505,427.00		21,539.00	526,966.00	
2004 Interior Fires	04-210								
04 Bering Strait Sea Storm	05-211	1,000,600.00	232	4,312.93	13,178,757.00	1,152,732.0 0	684,981.00	16,017,070.00	11,173,567.00
Kaktovik Winter Storm	05-212	85,000.00	77	1,103.90	5,391,837.00	611,512.00	661,210.00	6,749,559.00	5,151,711.00
05 Spring Flood	05-213	520,000.00	60	8,666.67	600,983.00		172,042.00	1,293,025.00	
05 Bristol Bay Storm	05-214	140,000.00	34	4,117.65	156,500.00		79,315.00	375,815.00	
05 West Coast Storm	06-215	809,930.00	181	4,474.75	3,621,430.00	254,732.00	646,447.00	5,332,539.00	3,067,816.00
05 Southeast Storm	06-216	350,000.00	52	6,730.77	1,238,193.00		279,705.00	1,867,898.00	
06 Southcentral Storm	06-217				1,307,832.00		157,489.00	1,465,321.00	
06 Spring Flood	06-218	485,000.00	85	5,705.88	2,012,928.00	94,218.00	324,806.00	2,916,952.00	1,047,453.00
06 Hooper Bay Fire	07-219	437,016.00	50	8,740.32	11,169,674.00	1,725,715.0 0	1,824,125.00	15,156,530.00	8,987,178.00
06 Southcentral Flood	07-220	860,000.00	121	7,107.44	13,395,577.00	2,062,201.0 0	2,209,212.00	18,526,990.00	12,134,768.00
06 Oct Southern AK Storm	07-221	1,345,045.00	113	11,903.05	12,630,363.00	1,951,256.0 0	2,140,577.00	18,067,241.00	11,461,624.00

Alaska Division of Homeland Security & Emergency Management
Summary of Federal & State Declared Disasters (January 1978 to Present)

DISASTER	DSTR #	Category	Total Cost State/Fed	On the GAO Study	Total Disasters / Percentage & Cost
Flood, Storm Surge, Erosion, and Landslide					
Karluk/January 21, 1978	78-1	A	$171,573.00	☑	
Campbell Creek(Anchorage), February 10, 1978	78-2	A	$10,811.00	▯	
Wrangell/Craig	78-3	A	$392,000.00	☑	
West Coast Storm/November 23, 1979	80-6	A	$121,352.00	☑	
Willow Creek/December 20, 1979	80-7	A	$20,188.00	▯	
Kodiak Island/February 5, 1980	80-8	A	$171,771.00	☑	
Bristol Bay/September 2, 1980	81-10	A	$113,083.00	☑	
Copper Center/December 11, 1980	81-11	A	$13,168.00	☑	
Southcentral AK Rainstorm/July 22, 1981	82-13	A	$275,013.00	▯	
Fort Yukon/May 17, 1982	82-15	A	$811,323.00	☑	
Russian Mission/October 1, 1982	83-16	A	$141,324.00	☑	
Kipnuk/April 1, 1983	83-18	A	$905.00	☑	
Aniak/June 15, 1983	83-19	A	$75,614.00	☑	
Cordova/September 16,1983	84-21	A	$125,777.00	☑	
Southeast Alaska/November 26, 1984	85-32	A/B	$958,519.00	☑	
Unalaska/December 13, 1985	86-49	A/B	$181,937.00		
North Slope Borough/March 8, 1989	89-88	A/B	$113,364.00	☑	
Alakanuk/June 13,1984	84-28	A	$277,544.00	☑	
Emmonak/June 15, 1984	84-29	A	$22,884.00	☑	
Haines/January 25, 1985	85-33	A	$1,581,506.00		
Buckland/May 30, 1985	85-36	A	$83,585.00	☑	
Kobuk/May 30, 1985	85-37	A	$17,979.00	☑	
Anvik/June 5, 1985	85-38	A	$17,878.00	☑	
Emmonak/June 11, 1985	85-39	A	$72,832.00	☑	
Pilot Station/June 18, 1985	85-40	A	$34,736.00	☑	
Upper Kuskokwim River/June 18, 1985	85-41	A	$56,826.00	☑	
Pitka's Point/July 9, 1985	86-42	A	$12,740.00	☑	
Bethel/July 10, 1985	86-43	A	$475,507.00	☑	
Cordova/October 31, 1985	86-45	A	$16,462.00		
Napakiak/May 15, 1986	86-54	A	$15,000.00	☑	
Artic (North Slope) Sea Storm/September 25,	87-55	A	$3,791,026.00	☑	
Southcentral AK Flood/October 12, 1986	87-56	A	$8,642,440.00		
Sleetmute/Red Devil/May 28, 1987	87-60	A	$51,602.00	☑	
Aniak/May 29, 1987	87-62	A	$993,861.00	☑	
Buckland/June 16, 1987	87-63	A	$203,548.00	☑	
***DOT - July 24, 1987	88-64	A	N/A		
Haines Flooding/February 29, 1988	88-70	A	$78,590.00		
Crooked Creek/May 12, 1988	88-76	A	$133,230.00	☑	
Napakiak/Napaskiak/May 24, 1988	88-77	A	$125,292.00	☑	
Kaltag/May 26, 1988	89-78	A	$28,883.00	☑	
Shishmaref/August 5, 1988	89-80	A	$318,072.00	☑	
Glennallen/May 6, 1989	89-91	A	$15,000.00		
Circle/May 6, 1989	89-92	A	$196,657.00	☑	
Ft. Yukon/May 6, 1989	89-93	A	$194,812.00	☑	
89 Spring Floods/June 10, 1989	89-94	A	$4,739,881.00	☑	
Klawock/June 19, 1989	90-95	A	$9,927.00		
Fairbanks North Star Boro/August 4, 1989	90-96	A	$65,640.00		
Mat-Su Borough/August 4, 1989	90-97	A	$358,772.00		
Municipality of Anchorage/August 30, 1989	90-99	A	$2,261,615.00		
Seward/Kenai Peninsula/August 30, 1989	90-100	A	$529,552.00		
***DOT - September 13, 1989	90-101	A	N/A		
Hazard Mit. 89 Spring Flood/April 14, 1990	90-111	A	$619,828.00		

McGrath/May 16, 1990	90-113	A	$39,409.00	☑	
Kobuk/May 17, 1990	90-114	A	$6,153.00	☑	
Bethel/July 2, 1990	90-117	A	$600,176.00	☑	
Lower Kuskokwim/September 4, 1990	91-120	A	$835,297.00	☑	
Kotzebue/September 4, 1990	91-121	A	$328,845.00	☑	
Nome/September 10, 1990	91-122	A	$105,000.00		
Teller/September 10, 1990	91-123	A	$173,723.00	☑	
Diomede/November 21, 1990	91-125	A	$622,594.00	☑	
Fairbanks North Star Boro/May 3-23, 1991	91-132	A	$1,664,378.00	☑	
Aniak/May 1991	91-133	A	$550,089.00	☑	
McGrath/May 1991	91-134	A	$608,391.00	☑	
Red Devil/May 1991	91-135	A	$239,953.00	☑	
Anvik/May 1991	91-136	A	$181,700.00	☑	
Grayling/May 1991	91-137	A	$78,630.00	☑	
Emmonak/May 1991	91-138	A	$398,246.00	☑	
Holy Cross/May 1991	91-139	A	$20,265.00	☑	
Alakanuk/May 1991	91-140	A	$210,506.00	☑	
Shageluk/May 1991	91-141	A	$57,867.00	☑	
Galena/May 1991	92-142	A	$67,061.00	☑	
Mat-Su Borough/July 18, 1991	92-144	A	$515,900.00		
New Koliganek/October 14, 1991	92-149	A	$67,526.00	☑	
Kodiak/November 2, 1991	92-150	A	$1,564,957.00	☑	
Eagle Village Flood/ May 19, 1992	92-153	A	$183,729.00	☑	
Eagle City Flood/May 19, 1992	92-154	A	$61,147.00	☑	
Galena Ice Jam Flood/May 26-29, 1992	92-155	A	$442,615.00	☑	
Flood Response/June 9, 1992	92-156	A	$22,059.00		
Yukon River Flood/June 17, 1992	92-157	A	$1,167,796.22	☑	
***DOT - August 14,1992	93-160	A	N/A		
***DOT - October 5, 1992	93-162	A	N/A	☑	
***DOT - October 29, 1993	94-167	A	N/A		
Fort Yukon Haz Mit/1993	94-168	A	$356,765.00		
McGrath Road Disaster/May 23, 1993	94-169	A	$170,999.00		
Galena Flood/May 10, 1994	94-170	A	$614,005.00	☑	
Cummins Road/ July 13, 1994	95-171	A	$38,810.00		
Mat-Su Borough Loan/July 1, 1994	95-172	A	$500,000.00		
1994 Falls Floods/August 24, 1994	95-173	A	$60,883,422.00	☑	
1994 Koyukuk Flood Hmit/August 24, 1994	95-173	A	$11,402,495.00	☑	
1994 Koyukuk Flood TH/August 24, 1994	95-173	A	$335,616.00	☑	
Metlakatla/November 10, 1994	95-174	A	$31,863.00	☑	
Skagway/November 16, 1994	95-175	A	$112,786.00		
Yukon-Delta Kuskokwim/June 5, 1995	95-176	A	$207,852.00	☑	
Aniak/June 5, 1995	95-177	A	$210,213.95		
Bethel/June 5, 1995	95-178	A	$128,861.00	☑	
1995 Southcentral Flood/September 21, 1995	96-180	A	$10,526,962.15		
96 Southeast Storm/September 25, 1996	96-182	A	$528,180.80		
Tanana/Copper River Flood/1997	97-185	A	$946,144.32	☑	
Shishmaref/October 6, 1997	98-186	A	$1,462,788.11	☑	
Endicott Mtn Flooding/June 18, 1998	98-188	A	$667,905.92	☑	
Southeastern Storm/October 27, 1998	99-190	A	$1,119,927.94	☑	
***Central Gulf Coast Storm/February 4, 2000**	**00-191**	**A**	**$15,661,340.55**		
***Middle Yukon flood/May 31, 2001**	**01-196**	**A**	**$445,287.00**	☑	
Shismareff Erosion/October 27, 2001	02-198	A	$87,858.74	☑	
***Interior Flood/May 30, 2002**	**02-200**	**A**	**$6,133,647.43**	☑	
***Northwest Fall Sea Storm/ October 23, 2002**	**03-201**	**A**	**$382,032.60**	☑	
***Kenai Peninsula Flooding/ November 2002**	**03-202**	**A**	**$19,964,989.82**		122 Disasters
Salcha Flood/ 2003	03-205	A	$426,048.79		53% of total
***July Riverine Flood/ July 2003**	**04-206**	**A**	**$339,841.70**		
***2003 Fall Flood/November 3, 2003**	**04-207**	**A**	**$342,137.00**		Total Cost:
***2003 Fall Sea Storm/January 29, 2004**	**04-209**	**A**	**$526,966.00**		
***2004 Bering Strait Sea Storm/Oct. 28, 2004**	**05-211**	**A**	**$16,017,070.00**		
***Kaktovik Winter Storm/January 15, 2005**	**05-112**	**A**	**$70,049,559.00**		
***2005 Spring Floods/July 20, 2005**	**05-213**	**A**	**$1,293,025.00**		
***2005 Bristol Bay Storm/October 03, 2005**	**05-214**	**A**	**$375,815.00**		
***2005 West Coast Storm/October 24, 2005**	**05-215**	**A**	**$5,332,539.00**		
***2005 Southeast Storm/Dec. 23, 2005**	**06-216**	**A**	**$1,867,898.00**		
2006 Southcentral Storm/March 13, 2006	06-217	A	$1,465,321.00		
***2006Spring Flood/June 27, 2006**	**06-218**	**A**	**$2,916,952.00**		
***2006 Southcentral Flood/August 29, 2006**	**07-220**	**A**	**$18,526,990.00**		
***2006 Oct. Southern Alaska Storm/Oct. 14,**	**07-221**	**A**	**$18,067,241.00**		
***2006 Oct. Kivalina StormNov. 19, 2006**	**07-222**	**A**	**$0.00**		$311,023,598.04

Extreme Freezing Temps, Snow & High Winds

Matanuska-Susitna/February 9, 1979	79-4	B	$50,000.00		
Anchorage Windstorm/April 4, 1980	80-9	B	$461,448.00		
Unalakleet/March 5, 1984	84-23	B	$726,865.00		
Mountain Village/March 8, 1984	84-24	B	$986,427.00		
Elim/March 9, 1984	84-25	B	$384,588.00		
Kotzebue/April 30, 1984	84-26	B	$673,101.00		
Savoonga/February 26, 1985	85-34	B	$255,954.00		
Thorne Bay/December 5, 1985	86-47	B	$258,512.00		
Pelican/March 19, 1986	86-52	B	$18,024.00		
Kotzebue/February 5, 1987	87-59	B	$1,231,610.00		
Omega Block(Cold Wthr)/January 28, 1989	89-83	B	$1,319,656.00		
Northwest Arctic Borough/February 1, 1989	89-84	B	$4,974,908.00		
St. George/February 9, 1989	89-85	B	$229,853.00		
Sand Point/February 27, 1989	89-86	B	$23,062.00		
Ahkiok/March 2, 1989	89-87	B	$45,937.00		
Galena/April 20, 1989	89-90	B	$175,124.00		21 Disasters
Hazard Mitigation C.W./1990	91-119	B	$556,754.00		9% of total
Togiak/February 8, 1991	91-127	B	$51,384.00		
Larsen Bay/February 14, 1991	91-128	B	$20,000.00		Total Cost:
***South-central Windstorm/March 2003**	**03-204**	**B**	**$3,469,950.83**		
***Kaktovik Winter Storm/Febuary 2005**	**05-212**	**B**	**$7,049,559.00**		$22,962,716.83

Fire: Wild Land & Structural

Delta Fire/ June 18, 1979	79-5	C	$3,250,000.00		
Emmonak/February 12, 1982	82-14	C	$259,623.00		
Takotna/December 2, 1982	83-17	C	$358,650.00		
Russian Mission/August 9, 1984	85-31	C	$89,325.00		
Gambell/August 31, 1985	86-44	C	$201,693.00		
Manakotak/November 22, 1985	86-46	C	$69,449.00		
Venetie/January 9, 1987	87-58	C	$86,000.00		
Delta Junction/May 28, 1987	87-61	C	$22,257.00		
Wainwright Fire/October 6, 1987	88-65	C	$2,186,931.00		
Barrow School Fire/February 16, 1988	88-69	C	$2,410,159.00		
Chefornak/March 23, 1988	88-72	C	$272,735.00		
Pitka's Point/March 29, 1988	88-74	C	$97,761.00		
Nondalton/April 5, 1988	88-75	C	$776,897.00		
Klawock/October 17, 1988	89-81	C	$48,157.00		
Yukon Flats/November 10, 1988	89-82	C	$84,757.00		
Tatitlek/January 31, 1990	90-105	C	$92,242.00		
Stebbins/April 9, 1990	90-110	C	$1,000,000.00		
Fire Suppresion/May 30, 1990	90-115	C	$0.00		
Teklanika Fire/May 31, 1990	90-116	C	$0.00		
Statewide Fires/July 4, 1990	91-118	C	$0.00		
Eagle/December 28, 1990	91-126	C	$33,174.00		
DNR/July 11, 1991	92-143	C	N/A		
Whitestone/July 25, 1991	92-145	C	$168,700.00		
Diomede Fire/September 20, 1991	92-148	C	$974,172.00		
**DNR Fire Disaster/July 7, 1992	93-158	C	N/A		
Tenakee Springs Fire/July 19, 1993	94-164	C	$169,369.00		
Department of Natural Res/August 3, 1993	94-165	C	$0.00		
**DNR Statewide Fire/June 22, 1995	95-179	C	N/A		
***Miller's Reach Fire/June 2, 1996**	**96-181**	**C**	**$9,352,035.61**		
**DNR Fire Suppression/July 14, 1997	96-183	C	N/A		36 Disasters
**DNR Fire Suppression/June 5, 1998	98-187	C	N/A		16% of total
**DNR Fire Suppression/May 24, 2000	00-192	C	N/A		
**DNR Fire Suppression/June 23, 2000	00-193	C	N/A		Total Cost:
***Sleetmute Fire/December 20, 2001**	**02-199**	**C**	**$150,000.00**		
Interior Fires/2004	04-210	C	N/A		
***2006 Hooper Bay Fire/August 6, 2006**	**07-219**	**C**	**$15,156,530.00**		$37,310,616.61

Earthquakes, Volcanoes, Landslides & Avalanches					
Mt. Redoubt/December 20, 1989	90-103	D	$269,886.00		6 Disasters
KPB Mt. Redoubt/January 11, 1990	90-104	D	$149,403.00		3% of total
Earthquake Mitigation/November 7, 1991	92-151	D	$225,748.00		
Mt. Spurr/September 21, 1992	93-161	D	$287,846.00		Total Cost:
***Denali Earthquake/November 6, 2002**	**02-203**	**D**	**$29,064,521.28**		
Kassan Landslide/ 2003	04-208	D	$443,867.37		$30,441,271.65
Utilities (Not caused by Natural Disaster Events)					
Angoon/June 8, 1981	81-12	E-1	$10,987.00		
Chefornak/November 17, 1983	84-22	E-1	$32,193.00		
Cold Bay/May 5, 1984	84-27	E-1	$1,345.00		
Cold Bay/July 31, 1984	85-30	E-1	$740,000.00		
Metlakatla/December 10, 1985	86-48	E-1	$90,547.00		
Venetie/March 3, 1986	86-51	E-1	$54,615.00		
Aniak (Sewer)/October 27, 1986	87-57	E-1	$52,500.00		
Angoon/November 6, 1987	88-66	E-1	$29,514.00		
Beaver/March 8, 1988	88-71	E-1	$22,990.00		
Chenega Bay/March 25, 1988	88-73	E-1	$36,423.00		
Eagle/July 22, 1988	89-79	E-1	$8,242.00		
Marshall/February 25, 1991	91-130	E-1	$15,741.00		
Angoon/May 3, 1991	91-131	E-1	$91,468.00		16 Disasters
Little Diomede/July 25, 1991	92-146	E-1	$67,684.00		8% of total
Seward Sewage/November 20, 1991	92-152	E-1	$754,541.00		Total Cost:
Kake Water Incident/July 31, 2000	01-195	E-1	$409,646.48		$2,418,436.48
Public Services					3 Disasters
Search and Rescue/September 13, 1989	90-102	E-2	$100,000.00		1% of total
Snow and Ice Removal/1990	90-112	E-2	$2,000,000.00		Total Cost:
Shaker IV/ 1993	94-166	E-2	$357,778.00		$2,457,778.00
Fuel Shortages					
Gambell/May 17, 1985	85-35	E-3	$33,673.00		
Togiak/October 1987	88-67	E-3	$35,000.00		6 Disasters
Kongiganak/March 2, 1990	90-107	E-3	$20,000.00		3% of total
Manakotak/April 5, 1990	90-109	E-3	$15,000.00		
Karluk/February 22, 1991	91-129	E-3	$22,000.00		Total Cost:
Aniak Loan/August 7, 1991	92-147	E-3	$5,082.00		$130,755.00
Other Infrastructure					
Ketchikan(Ferry)/August 29, 1983	84-20	E-4	$1,000.00		
Thorne Bay (Bridge)/February 3, 1986	86-50	E-4	$11,778.00		
Klehini River Bridge/November 9, 1987	88-68	E-4	$92,482.00		7 Disasters
Whittier/August 8, 1989	90-98	E-4	$634,103.00		3% of total
Broadcasting/February 22, 1990	90-106	E-4	$130,000.00		
Lowell Creek Tunnell/September 27, 1990	91-124	E-4	$369,786.00		Total Cost:
Kotzebue Radio Tower/August 13, 2001	02-197	E-4	$41,226.77		$1,280,375.77
Environmental & Economic Disasters					
Crown Point/May 1, 1986	86-53	E-5	$712,097.00		
Valdez Oil Spill/March 29, 1989	89-89	E-5	$361,679.00		
Moose/March 28, 1990	90-108	E-5	$196,522.00		9 Disasters
Norton Sound Herring Fish/July 13, 1992	93-159	E-5	$0.00		4% of total
Kuskokwim Chum/July 19, 1993	94-163	E-5	$0.00		
Bristol Bay Fish/July 18, 1997	98-184	E-5	$2,007,846.00		
WAFD/July 30, 1998/FEDA	99-189	E-5	$18,000,000.00		
WAFD/July 30, 1998/ELE	99-189	E-5	$6,106,751.35		Total Cost:
Operation Renew Hope/July 19, 2000	01-194	E-5	$747,122.10		$28,132,017.45

Legend:

A = Flood, Storm Surge, Erosion, and Landslide Type Events	122 Events	53%
B = Extreme Freezing Cold Temps & High Winds	21 Events	9%
C = Fire: Wild Land & Structural	36 Events	16%
D = Earthquakes, Volcanoes, Landslides and Avalanches	6 Events	3%
E = Other		
E-1: Utilities (Not caused by Natural Disaster Events)	16 Events	8%
E-2: Public Services	3 Events	1%
E-3: Fuel Shortages	6 Events	3%
E-4: Other Infrastructure	7 Events	3%
E-5: Environmental & Economic	9 Events	4%

20 Year Disaster Total:	168
All Disaster Total : (Two did not have actual disaster declarations signed):	226
Total Cost All Events:	$436,157,565.83

* Disaster listed in **BOLD** are Authorized Costs for the disaster based on Damage Estimates authorized in the Disaster Declaration, all others are actual costs.

** DNR Fire Suppression Disasters are tracked and reported on by DNR.

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APPENDIX 7 – CRITICAL FACILITIES

Alaska has a significant investment in facilities throughout the State. This appendix represents the initial effort to document these facilities and the hazards they are exposed to.

Critical facilities types in this appendix include:

- Public Schools
- Airports
- Harbors
- Ferry Terminals
- Fire Stations
- Police Stations
- Ambulance Stations
- Acute Care Centers
- Emergency Care Centers
- Electrical Generation Utilities
- Railroad Facilities
- Railroad Bridges
- Detainment Facilities
- Microwave Towers
- Public Post-Secondary Education Facilities
- Dams
- Coast Guard Facilities
- Military Installations

For all facility types, information about hazard exposure is incomplete. For some facility types, the list of facilities is incomplete.

Access to the facilities list is restricted for security reasons.

The list is on file in DHS&EM Office.

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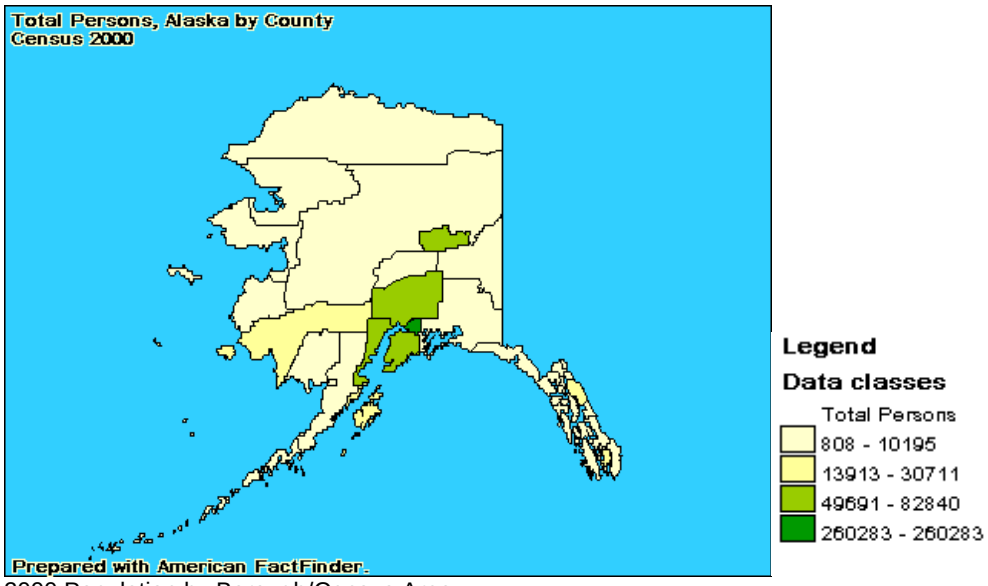
APPENDIX 8 – TRENDS

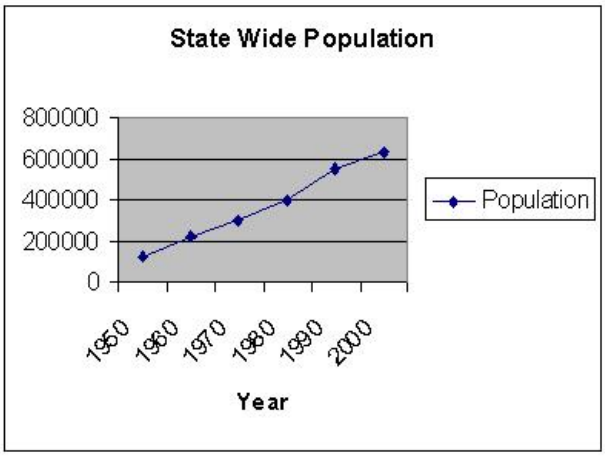
Population Trends

According to the 2000 U.S. Census, Alaska had 626,932 residents. They are not distributed equally over the state. Most people reside in the Municipality of Anchorage, the Matanuska-Susitna Borough, Fairbanks North Star Borough, and the Kenai Peninsula Borough also have sizable populations. Most of the growth has occurred in the last half of the 20th century. In fact, Alaska has almost five times as many residents as it did in 1950.



2000 Population by Borough/Census Area

Year	1950	1960	1970	1980	1990	2000
Population	128,643	226,167	300,382	401,851	550,074	626,932



Population Growth.

The population is continuing to grow. In fact, there was a 14% increase in population from 1990 to 2000. The Alaska Department of Labor expects the State to have over 775,000 residents by 2018.

This population increase is not occurring equally across the state. Some areas are experiencing significant population increases while other areas are actually losing population

The Matanuska-Sustina Borough had just under a 50% increase in population over the last decade. The Aleutians West Census Area lost over 40% of its population during the same time frame. Table 1.1 shows the population changes in all areas from 1990 to 2000.

	Census Population		Change, 1990 to 2000	
Name	April 1, 1990	April 1, 2000	Number	Percent
Aleutians East Borough	2,464	2,697	233	9.5
Aleutians West Census Area	9,478	5,465	-4,013	-42.3
Municipality of Anchorage	226,338	260,283	33,945	15.0
Bethel Census Area	13,656	16,006	2,350	17.2
Bristol Bay Borough	1,410	1,258	-152	-10.8
Denali Borough	1,764	1,893	129	7.3
Dillingham Census Area	4,012	4,922	910	22.7
Fairbanks North Star Borough	77,720	82,840	5,120	6.6
Haines Borough	2,117	2,392	275	13.0
City and Borough of Juneau	26,751	30,711	3,960	14.8
Kenai Peninsula Borough	40,802	49,691	8,889	21.8
Ketchikan Gateway Borough	13,828	14,070	242	1.8
Kodiak Island Borough	13,309	13,913	604	4.5
Lake and Peninsula Borough	1,668	1,823	155	9.3
Matanuska-Susitna Borough	39,683	59,322	19,639	49.5
Nome Census Area	8,288	9,196	908	11.0
North Slope Borough	5,979	7,385	1,406	23.5
Northwest Arctic Borough	6,113	7,208	1,095	17.9
Prince of Wales-Outer Ketchikan Census Area	6,278	6,146	-132	-2.1
City and Borough of Sitka	8,588	8,835	247	2.9
Skagway-Hoonah-Angoon Census Area	3,680	3,436	-244	-6.6
Southeast Fairbanks Census Area	5,913	6,174	261	4.4
Valdez-Cordova Census Area	9,952	10,195	243	2.4
Wade Hampton Census Area	5,791	7,028	1,237	21.4
Wrangell-Petersburg Census Area	7,042	6,684	-358	-5.1
City and Borough of Yakutat	705	808	103	14.6
Yukon-Koyukuk Census Area	6,714	6,551	-163	-2.4

Population Change 1990-2000 by Borough/Census Area.

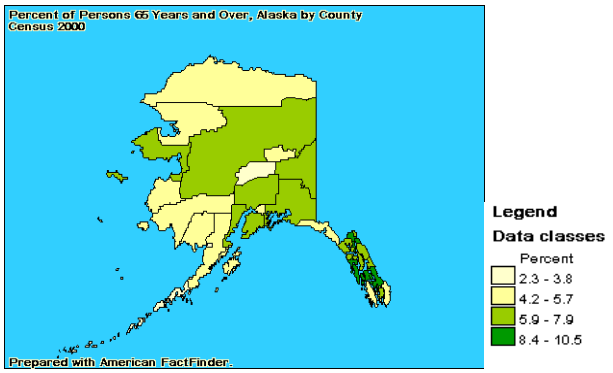
The Alaska Department of Labor predicts that the Matanuska-Susitna Borough will continue to have the highest growth rate in the State for the next several years. Other areas with expected growth are the Wade Hampton Census Area, North Slope Borough and City and Borough of Yakutat.

Population declines between 1998 and 2018 are expected in the Valdez-Cordova Census Area, Yukon-Koyukuk Census Area, City and Borough of Sitka, Skagway-Hoonah-Angoon Census Area, Wrangell-Petersburg Census Area, and Aleutians East Borough.

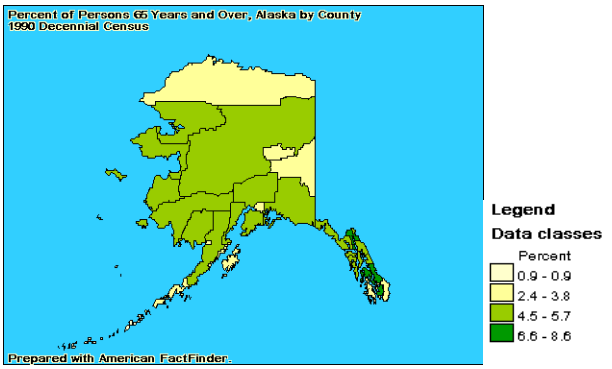
In general, the State's population is aging. It is expected that over 13% of the population will be over 65 years old in 2018 compared to only 8.8% of the State in 1998. Most will be living in

Anchorage but they will have a notable presence in the Matanuska-Susitna Borough, the Fairbanks North Star Borough and the Kenai Peninsula Borough.

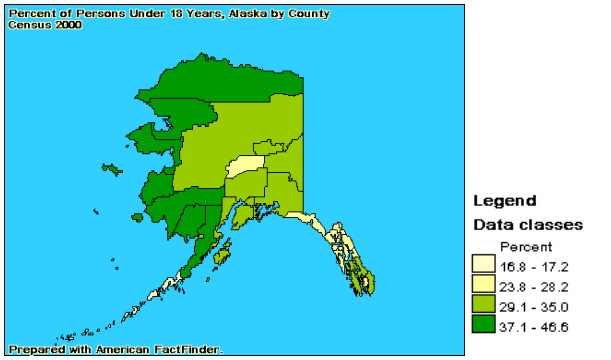
The areas with the largest percentage of elderly are all located in Southeast Alaska. Haines Borough tops the list with 10.5% of its year 2000 population being over 65 years. Next is the Wrangell-Petersburg Census Area with 9.5% and the City and Borough of Sitka with 8.4%. The 1990 census had no area having more than 8% of its population over 65. The following maps show how most of the State has 5.7% or less of its population over the age of 65 in 1990. There is a significant portion of the state being over that percentage in 2000. There are also many parts of the state with a significant number of children.



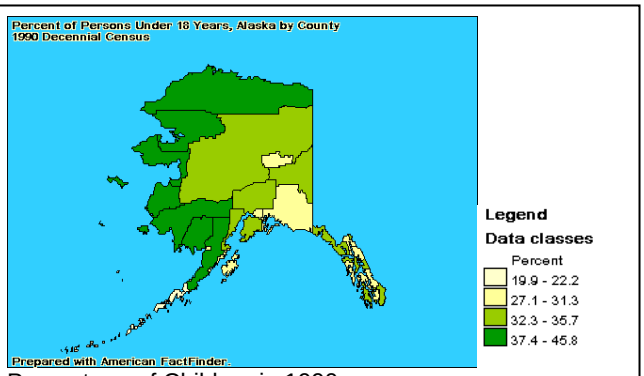
Percentage of Population over 65 in 2000.



Percentage of Population over 65 in 1990.



Percentage of Children in 2000.



Percentage of Children in 1990.

In 2000, the Wade Hampton Census Area and the Northwest Arctic Borough had over 40% of their total population being under the age of 18. In 1990, no area had over 40% of their total population in this age range. In contrast, in 1990, only the Aleutians West Census Area had less than 20% of its population, at 19.9%, as under the age of 18. By 2000, 2 areas, the Aleutians East Borough and the Aleutians West Census Area had less than 20%, with 16.8% and 17.2% respectively.

With respect to school age children, between the ages of 5 and 17, the Alaska Department of Labor estimates the number should increase 12.9% by 2018. Numerically, the largest increases will by in the Matanuska-Susitna Borough, Kenai Peninsula Borough, Bethel Census Area, Wade Hampton Census Area, Fairbanks North Star Borough, Nome Census Area, and North Slope Borough.

The school age population is expected to decline in the Municipality of Anchorage, Yukon-Koyukuk Census Area, City and Borough of Sitka, Wrangell-Petersburg Census Area, Valdez-Cordova Census Area, Skagway-Hoonah-Angoon Census Area, Aleutians West Census Area, Aleutians East Borough, Prince of Wales-Outer Ketchikan Census Area and Kodiak Island Borough.

Groups

Over 3% of Alaska's population lives in group quarters, not a typical household setting. This population can be divided into two groups: institutionalized and non-institutionalized. The institutionalized population is usually restricted to a facility (or require escorts or passes to leave) and is under the care of trained staff who are responsible for their supervision. Examples include people in correctional facilities and nursing homes. The non-institutionalized population includes people who reside in group quarters other than institutions such as college dorms or military housing but includes other groups such as "community-based" homes for the mentally retarded or physically handicapped.

The institutionalized population is of interest because they require special attention for emergency management purposes. For example, this population has special evacuation needs, requiring increased supervision; limited destination options; and transportation problems to address. As a result, these issues make these facilities targets for mitigation. Potential mitigation activities include structural reinforcement, roof and foundation strapping, facility relocation, and non-structural mitigation projects.

Geographic area	Institutionalized population				Non-institutionalized population		
	Correctional Institutions	Nursing Homes	Juvenile Institutions	Other Institutions	College Dormitories	Military Quarters	Other non-institutional group quarters
Alaska	3,331	803	427	263	1,748	3,970	8,807
BOROUGH OR CENSUS AREA							
Aleutians East Borough	0	0	0	0	0	0	1,283
Aleutians West Census Area	0	0	0	0	0	64	2,203
Municipality of Anchorage	1,169	291	264	191	622	1,980	2,497
Bethel Census Area	169	0	25	0	14	0	33
Bristol Bay Borough	0	0	0	0	0	0	0
Denali Borough	0	0	0	0	0	104	0
Dillingham Census Area	0	7	0	0	0	0	26
Fairbanks North Star Borough	285	81	41	0	743	1,543	387

Geographic area	Institutionalized population				Non-institutionalized population		
	Correctional Institutions	Nursing Homes	Juvenile Institutions	Other Institutions	College Dormitories	Military Quarters	Other non-institutional group quarters
Haines Borough	0	0	0	0	0	0	5
City and Borough of Juneau	158	39	32	0	136	3	310
Kenai Peninsula Borough	825	100	5	5	85	26	282
Ketchikan Gateway Borough	52	64	0	0	0	42	72
Kodiak Island Borough	0	19	5	0	0	90	224
Lake and Peninsula Borough	0	0	0	0	0	0	0
Matanuska-Susitna Borough	574	74	40	7	0	0	290
Nome Census Area	92	0	14	15	0	21	81
North Slope Borough	0	0	0	0	14	0	89
Northwest Arctic Borough	3	0	0	14	0	0	302
Prince of Wales-Outer Ketchikan Census Area	0	0	0	0	0	0	76
City and Borough of Sitka	0	96	0	28	82	21	44
Skagway-Hoonah-Angoon Census Area	0	0	0	0	0	0	20
Southeast Fairbanks Census Area	0	0	0	0	0	51	248
Valdez-Cordova Census Area	0	10	1	3	52	21	95
Wade Hampton Census Area	0	0	0	0	0	0	10
Wrangell-Petersburg Census Area	4	22	0	0	0	4	40
City and Borough of Yakutat	0	0	0	0	0	0	122
Yukon-Koyukuk Census Area	0	0	0	0	0	0	68

City Level

According to DCCED, approximately half of Alaska's residents reside in the Anchorage area. Fairbanks and Juneau are the next most populous cities with just under 31,000 residents each. Over 50 communities have populations between 1,000 and 10,000. Two hundred (200) communities have populations between 100 and 1,000. Over 100 communities have less than 100 residents.

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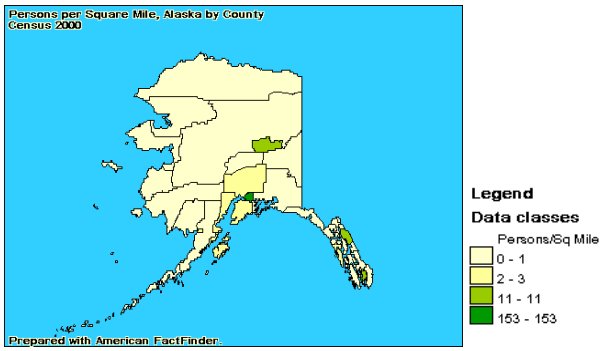
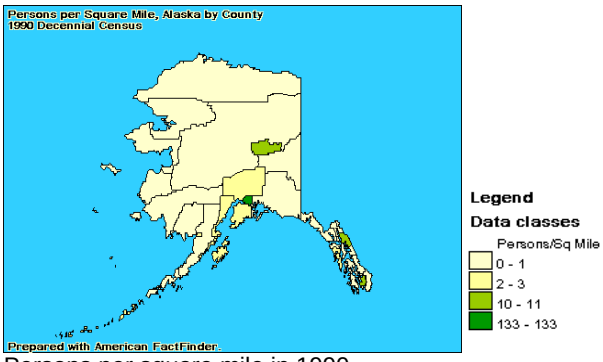
Development Trends

Alaska only has 1.1 persons per square mile. This is quite low compared to the national average of 79.6. The highest density is seen in the Municipality of Anchorage. Fairbanks North Star Borough, City and Borough of Juneau, and the Ketchikan Gateway Borough also have a higher density.



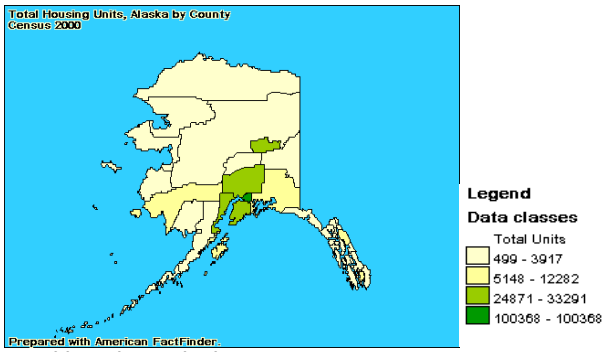
Persons per square mile in 2000.



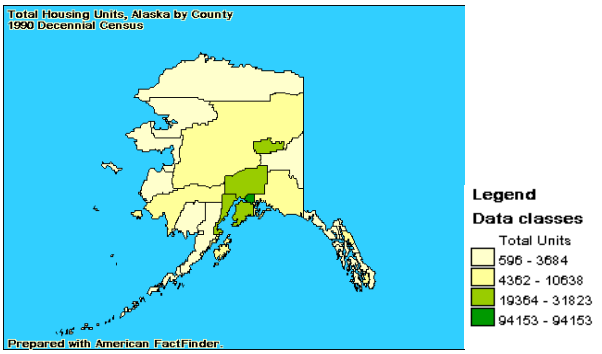
Persons per square mile in 1990.

Housing Units

The Nome Census Area and the Valdez-Cordova Census Area saw a decline in the total number of housing units. Most of the increases in total housing units occurred in the Municipality of Anchorage, the Matanuska-Susitna Borough and the Fairbanks North Star Borough as each area had over 5,000 more housing units in 2000 than 1990. However, two other areas had significant growth. The Bristol Bay Borough and the Lake and Peninsula Borough had over 50% growth rate during this period. In these two areas, half or less are occupied on a full time basis. They have very high seasonal, recreational or occasional use rates. (93.6% & 77.9% respectively) implying a large increase in temporary visitors/residents. The Kenai Peninsula Borough and the Matanuska-Susitna Borough also appear to have high amounts of seasonal, recreational or occasional use housing.



Total housing units in 2000.



Total housing units in 1990.

This can be interesting as this means the population of those areas can fluctuate significantly over the course of a year. Also, they will not be as familiar with the area leading to problems with knowing what hazards exist in the area and what to do during a hazard event.

Borough/Census Area	2000 Housing Units	1990 Housing Units	change	% growth
Aleutians East Borough	724	693	31	4.47
Aleutians West Census Area	2,234	2,051	183	8.92
Municipality of Anchorage	100,368	94,153	6,215	6.60
Bethel Census Area	5,188	4,362	826	18.94
Bristol Bay Borough	979	596	383	64.26
Dillingham Census Area	2,332	1,691	641	37.91
Fairbanks North Star Borough	33,291	31,823	1,468	4.61
Haines Borough	1,419	1,112	307	27.61
City and Borough of Juneau	12,282	10,638	1,644	15.45
Kenai Peninsula Borough	24,871	19,364	5,507	28.44
Ketchikan Gateway Borough	6,218	5,463	755	13.82
Kodiak Island Borough	5,159	4,885	274	5.61
Lake and Peninsula Borough	1,557	991	566	57.11
Matanuska-Susitna Borough	27,329	20,953	6,376	30.43
Nome Census Area	3,649	3,684	-35	-0.95
North Slope Borough	2,538	2,153	385	17.88
Northwest Arctic Borough	2,540	1,998	542	27.13
Prince of Wales-Outer Ketchikan Census Area	3,055	2,543	512	20.13
City and Borough of Sitka	3,650	3,222	428	13.28
Valdez-Cordova Census Area	5,148	5,196	-48	-0.92
Wade Hampton Census Area	2,063	1,882	181	9.62
Wrangell-Petersburg Census Area	3,284	3,005	279	9.28

**For this table, Denali Borough, City & Borough of Yakutat, Yukon-Koyukuk Census Area, Skagway-Hoonah-Angoon Census Area was not compared. Juneau was left in.
***Percentage growth was calculated by ((2000 housing units – 1990 housing units)/1990 housing units) * 100%

Information about housing conditions was not available for 2000 when this section was developed. The 2000 Census information about housing units with plumbing and kitchen facilities, telephone access, etc. should be included when that information is released.

One thing to note about using census data. Alaska has 16 boroughs, which are roughly equivalent to counties in other states. However, a large part of the state is considered to be the “unorganized borough”. This “unorganized borough” has been divided into eleven Census Areas for data reporting purposes. The Census Area boundaries roughly follow the Native Regional Corporate boundaries and approximate the 1970 Census Division boundaries when possible. At the time of the 1990 Census, the Denali Borough (primarily created from the Yukon-Koyukuk Census Area and a small portion of the Southeast Fairbanks Census Area) and the Borough of Yakutat (created from the Skagway-Yakutat-Angoon Census Area which was renamed the Skagway-Hoonah-Angoon Census Area) had not been created. In addition, part of the Skagway-Hoonah-Angoon Census Area was annexed into the City and Borough of Juneau.

Taxable Value

The taxable value of an area can provide useful information about the area at risk. However, not all jurisdictions in Alaska have a property tax so this information is limited. In addition, not all land uses are taxable even in jurisdictions with a property tax. For example, most government property is not taxed.

Parcel Count and Valuation Breakdown

		Residential	Vacant	Farm	Commercial	Industrial	Apartments	Condos	Mobile Home Parks	Mobile Homes	Other	Sum of Real Prop Parcels
Municipality of Anchorage	**Parcels**	54,955	14,763	-	5,955	-	2,529	10,410	100	394	3,382	92,488
	Value	8,417,024,159	691,196,652		3,070,746,948	-	802,024,914	702,702,631	75,799,200	5,164,369	10,335,627	13,774,994,500
Fairbanks North Star Borough	**Parcels**	19,453	14,705	114	972	672	557	793	18	1,635	535	39,454
	Value	1,974,769,669	254,297,594	5,718,206	593,494,638	632,107,775	275,596,107	61,495,700	4,161,178	39,701,617	11,889,542	3,853,232,026
Haines Borough	**Parcels**	1,006	1,916	-	172	20	7	-	7	73	-	3,201
	Value	63,636,850	50,121,620	-	22,617,750	11,037,700	3,494,750	-	1,081,200	3,191,050		155,180,920
City and Borough of Juneau	**Parcels**	6,805	1,548	12	750	113	103	941	15	983	185	11,455
	Value	1,357,432,200	128,919,200	957,700	481,623,000	92,612,300	66,838,900	82,153,600	15,307,100	28,556,900	10,847,000	2,265,247,900
Kenai Peninsula Borough	**Parcels**	15,307	35,644	64	1,807	74	75	135	40	2,708	4,305	60,159
	Value	1,518,900,200	445,513,600	3,271,400	446,634,547	359,139,600	27,720,500	7,436,100	6,715,100	68,646,200	149,307,850	3,033,285,097
Ketchikan Gateway Borough	**Parcels**	2,989	1,652	-	419	204	36	526	11	219	119	6,175
	Value	540,705,900	74,008,300	-	163,728,200	128,189,200	20,045,000	0	1,752,700	1,083,100	11,685,400	941,197,800
Kodiak Island Borough	**Parcels**	2,532	1,402	9	382	105	32	47	17	391	307	5,224
	Value	347,012,514	59,417,136	1,267,600	109,933,400	65,876,596	18,061,400	1,786,607	2,670,400	16,672,105	14,722,100	637,419,858
Matanuska-Susitna Borough	**Parcels**	26,287	38,200	-	No other breakdowns							64,487

Parcel Count and Valuation Breakdown

		Residential	Vacant	Farm	Commercial	Industrial	Apartments	Condos	Mobile Home Parks	Mobile Homes	Other	Sum of Real Prop Parcels
					provided							
	Value	2,063,713,100	966,998,600		No other breakdowns provided							3,030,711,700
North Slope Borough	**Parcels**	1,667	2,089	-	255	120	52	-	-	-	1,156	5,084
	Value	150,303,751		No other breakdowns provided		29,164,200	No other breakdowns provided					179,467,951
City and Borough of Sitka	**Parcels**	2,041	874	-	138	71	37	24	21	353	71	3,630
	Value	362,072,565	35,652,000	-	75,002,000	36,137,320	14,831,000	1,499,000	6,760,000	6,169,138	1,605,500	539,728,523
City and Borough of Yakutat	**Parcels**	266	177	0	45	10	0	0	0	0	0	498
	Value	11,302,490	1,737,370	-	9,162,510	11,005,200	-	-	-	-	-	33,207,570
Aleutians East Borough												
Aleutians West Census Area	**Parcels**	256	176	-	68	31	15	-	1	15	-	562
	Value	38,891,900	19,680,000	-	45,829,976	118,472,626	11,202,196	-	142,800	506,700	-	234,726,198
Bethel Census Area												
Bristol Bay Borough												
Denali Borough												
Dillingham Census Area	**Parcels**	453	226	-	55	3	24	-	-	-	-	761
	Value	39,921,750	5,377,500	-	23,056,450	9,275,650	10,095,450	-	-	-	-	87,726,800
Lake and Peninsula												

Parcel Count and Valuation Breakdown

Borough		Residential	Vacant	Farm	Commercial	Industrial	Apartments	Condos	Mobile Home Parks	Mobile Homes	Other	Sum of Real Prop Parcels
Nome Census Area	**Parcels**	524	493	-	574	-	17	-	-	-	-	1,608
	Value	73,875,903	8,651,299	-	45,810,554	-	9,109,900	-	-	-	-	137,447,656
Northwest Arctic Borough												
Prince of Wales-Outer Ketchikan Census Area	**Parcels**	227	74	-	65	43	2	-	5	158	12	586
	Value	27,652,644	3,778,000	-	20,442,200	17,561,100	553,500	-	2,975,600	2,694,500	48,000	75,705,544
Skagway-Hoonah-Angoon Census Area	**Parcels**	392	169	-	152	26	8	-	1	37	-	785
	Value	47,691,100	10,977,500	-	48,899,799	61,123,200	1,543,300	-	254,200	2,675,600	-	173,164,699
Southeast Fairbanks Census Area												
Valdez-Cordova Census Area	**Parcels**	1,293	1,534	-	391	22	17	261	19	754	10	4,301
	Value	156,025,201	15,722,721	-	93,498,320	28,979,868	8,286,765	6,114,920	4,319,700	15,562,546	266,700	328,776,741
Wade Hampton Census Area												
Wrangell-Petersburg Census Area	**Parcels**	1,777	870	-	331	69	35	-	51	289	417	3,839
	Value	168,430,338	24,863,636	-	60,596,422	22,185,000	5,795,632	-	2,290,805	3,080,150	700,800	287,942,783
Yukon-Koyukuk Census Area	**Parcels**											
	Value											

Please note that the above table does not include oil and gas values in Prudhoe Bay, the pipeline or the Valdez terminal. Some of the information was gathered by combining community property tax records and does not include the entire borough or census area.

This information was provided by the State Tax Assessor.
A statewide summary of taxable value.

	Summary	
Category	**Parcel Count**	**Value**
Residential	138,230	$ 17,359,362,234
Vacant	116,512	$ 2,796,912,728
Farm	199	$ 11,214,906
Commercial	12,531	$ 5,311,076,714
Industrial	1,583	$ 1,622,867,335
Apartments	3,546	$ 1,275,199,314
Condos	13,137	$ 863,188,558
Mobile Home Parks	306	$ 124,229,983
Mobile Homes	8,009	$ 193,703,975
Other	10,499	$ 211,408,519
Total	304,552	$ 29,769,164,266

APPENDIX 9- SMALL AND IMPOVERISHED COMMUNITIES

See following spreadsheet

SMALL, IMPOVERISHED CRITERIA

ELIGIBLE			<= 3000	<=29020.8	4.4% >= 5.4%	
Community	**Incorporation Type**	**Census Area**	**2006 Department of Labor Population Estimate**	**2000 Census Per Capita Income**	**2000 Census % Unemployed**	**Eligible Based on 2006 Pop & Required Thresholds**
Akhiok	2nd Class City	Kodiak Island	44	$8,472	14.29%	Yes
Akiachak	Unincorporated	Bethel	633	$8,321	25.50%	Yes
Akiak	2nd Class City	Bethel	367	$8,326	16.48%	Yes
Akutan	2nd Class City	Aleutians East	741	$12,259	83.89%	Yes
Alakanuk	2nd Class City	Wade Hampton	663	$6,884	21.47%	Yes
Alatna	Unincorporated	Yukon-Koyukuk	33	$14,109	14.29%	Yes
Aleknagik	2nd Class City	Dillingham	241	$10,973	21.59%	Yes
Aleutians East Borough	2nd Class Borough	Aleutians East	2643	$18,421	41.42%	Yes
Allakaket	2nd Class City	Yukon-Koyukuk	94	$10,912	39.13%	Yes
Ambler	2nd Class City	Northwest Arctic	277	$13,712	27.88%	Yes
Anaktuvuk Pass	2nd Class City	North Slope	299	$15,283	33.33%	Yes
Andreafsky	Unincorporated, in St. Mary's	Wade Hampton	140	$12,161	14.93%	Yes
Angoon	2nd Class City	Skagway-Hoonah-Angoon	482	$11,357	12.95%	Yes
Aniak	2nd Class City	Bethel	512	$16,550	13.11%	Yes
Anvik	2nd Class City	Yukon-Koyukuk	88	$8,081	27.50%	Yes
Arctic Village	Unincorporated	Yukon-Koyukuk	146	$10,761	16.67%	Yes
Atmautluak	Unincorporated	Bethel	304	$8,501	10.83%	Yes
Atqasuk	2nd Class City	North Slope	237	$14,732	5.71%	Yes
Beaver	Unincorporated	Yukon-Koyukuk	72	$8,441	17.91%	Yes
Bristol Bay Borough	2nd Class Borough	Bristol Bay	1060	$22,210	10.48%	Yes
Buckland	2nd Class City	Northwest Arctic	418	$9,624	33.80%	Yes
Cantwell	Unincorporated	Denali	204	$22,615	11.03%	Yes
Central	Unincorporated	Yukon-Koyukuk	89	$22,593	13.79%	Yes
Chefornak	2nd Class City	Bethel	460	$8,474	11.94%	Yes
Chenega Bay	Unincorporated	Valdez-Cordova	69	$13,381	14.81%	Yes
Chevak	2nd Class City	Wade Hampton	908	$7,550	15.07%	Yes
Chickaloon	Unincorporated	Matanuska-Susitna	282	$14,755	24.18%	Yes
Chignik	2nd Class City	Lake & Peninsula	85	$16,166	35.19%	Yes
Chignik Lake	Unincorporated	Lake & Peninsula	120	$13,843	8.57%	Yes
Chistochina	Unincorporated	Valdez-Cordova	103	$12,362	41.18%	Yes
Chitina	Unincorporated	Valdez-Cordova	116	$10,835	32.69%	Yes
Circle	Unincorporated	Yukon-Koyukuk	95	$6,426	24.00%	Yes
Clark's Point	2nd Class City	Dillingham	69	$10,989	10.71%	Yes
Coffman Cove	2nd Class City	Prince of Wales-Outer Ketchikan	162	$23,249	10.48%	Yes

SMALL, IMPOVERISHED CRITERIA

ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Cold Bay	2nd Class City	Aleutians East	87	$20,037	33.33%	Yes
Copper Center	Unincorporated	Valdez-Cordova	402	$15,152	26.83%	Yes
Copperville	Unincorporated	Valdez-Cordova	191	$21,733	14.29%	Yes
Cordova	Home Rule City	Valdez-Cordova	2211	$25,256	6.86%	Yes
Covenant Life	Unincorporated	Haines	310	$14,325	6.25%	Yes
Craig	1st Class City	Prince of Wales-Outer Ketchikan	1105	$20,176	8.99%	Yes
Crooked Creek	Unincorporated	Bethel	122	$6,495	42.00%	Yes
Cube Cove	Unincorporated	Skagway-Hoonah-Angoon	0	$27,920	6.00%	Yes
Deering	2nd Class City	Northwest Arctic	138	$11,000	16.98%	Yes
Diamond Ridge	Unincorporated	Kenai Peninsula	690	$23,864	9.96%	Yes
Dillingham	1st Class City	Dillingham	2397	$21,537	7.11%	Yes
Dot Lake	Unincorporated	Southeast Fairbanks	32	$19,406	40.00%	Yes
Eagle	2nd Class City	Southeast Fairbanks	100	$20,221	14.29%	Yes
Eagle Village	Unincorporated	Southeast Fairbanks	70	$13,886	56.67%	Yes
Eek	2nd Class City	Bethel	287	$8,957	17.91%	Yes
Egegik	2nd Class City	Lake & Peninsula	76	$16,352	27.59%	Yes
Ekwok	2nd Class City	Dillingham	111	$11,079	20.00%	Yes
Elfin Cove	Unincorporated	Skagway-Hoonah-Angoon	25	$15,089	23.08%	Yes
Elim	2nd Class City	Nome	294	$10,300	26.02%	Yes
Emmonak	2nd Class City	Wade Hampton	757	$9,069	23.05%	Yes
Excursion Inlet	Unincorporated	Haines	8	$18,188	50.00%	Yes
Eyak	Unincorporated, in Cordova	Valdez-Cordova	130	$18,241	10.26%	Yes
Ferry	Unincorporated	Denali	31	$18,323	60.87%	Yes
Fort Yukon	2nd Class City	Yukon-Koyukuk	596	$13,360	17.99%	Yes
Gakona	Unincorporated	Valdez-Cordova	234	$18,143	14.86%	Yes
Galena	1st Class City	Yukon-Koyukuk	636	$22,143	8.74%	Yes
Gambell	2nd Class City	Nome	643	$8,764	19.48%	Yes
Game Creek	Unincorporated	Skagway-Hoonah-Angoon	21	$11,221	7.69%	Yes
Goodnews Bay	2nd Class City	Bethel	242	$6,851	13.24%	Yes
Grayling	2nd Class City	Yukon-Koyukuk	174	$7,049	20.00%	Yes
Gulkana	Unincorporated	Valdez-Cordova	177	$13,548	38.89%	Yes
Gustavus	2nd Class City	Skagway-Hoonah-Angoon	441	$21,089	14.03%	Yes
Haines	Unincorporated	Haines	1492	$22,505	13.55%	Yes
Haines Borough	Home Rule Borough	Haines	2241	$22,090	13.66%	Yes

SMALL, IMPOVERISHED CRITERIA

ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of (<= 3000)	2000 Census Per (<=29020.8)	2000 Census % (4.4% >= 5.4%)	Eligible Based on
Healy	Unincorporated	Denali	993	$28,225	8.85%	Yes
Healy Lake	Unincorporated	Southeast Fairbanks	46	$18,128	17.86%	Yes
Holy Cross	2nd Class City	Yukon-Koyukuk	204	$8,542	28.21%	Yes
Hoonah	1st Class City	Skagway-Hoonah-Angoon	829	$16,097	20.55%	Yes
Hooper Bay	2nd Class City	Wade Hampton	1157	$7,841	37.27%	Yes
Hughes	2nd Class City	Yukon-Koyukuk	68	$10,194	14.29%	Yes
Huslia	2nd Class City	Yukon-Koyukuk	259	$10,983	18.26%	Yes
Hydaburg	1st Class City	Prince of Wales-Outer Ketchikan	352	$11,401	31.30%	Yes
Hyder	Unincorporated	Prince of Wales-Outer Ketchikan	92	$11,491	46.67%	Yes
Kake	1st Class City	Wrangell-Petersburg	536	$17,411	24.85%	Yes
Kaktovik	2nd Class City	North Slope	288	$22,031	15.22%	Yes
Kaltag	2nd Class City	Yukon-Koyukuk	199	$9,361	29.90%	Yes
Kasaan	2nd Class City	Prince of Wales-Outer Ketchikan	59	$19,744	20.00%	Yes
Kasigluk	Unincorporated	Bethel	542	$7,194	21.31%	Yes
Kiana	2nd Class City	Northwest Arctic	401	$11,534	11.61%	Yes
King Cove	1st Class City	Aleutians East	807	$17,791	6.44%	Yes
King Salmon	Unincorporated	Bristol Bay	409	$26,755	8.86%	Yes
Kipnuk	Unincorporated	Bethel	668	$8,589	33.98%	Yes
Kivalina	2nd Class City	Northwest Arctic	391	$8,360	25.45%	Yes
Klawock	1st Class City	Prince of Wales-Outer Ketchikan	776	$14,621	15.65%	Yes
Klukwan	Unincorporated	Skagway-Hoonah-Angoon	112	$11,612	44.83%	Yes
Kokhanok	Unincorporated	Lake & Peninsula	168	$7,732	11.36%	Yes
Koliganek	Unincorporated	Dillingham	165	$13,242	13.16%	Yes
Kotlik	2nd Class City	Wade Hampton	611	$7,707	24.37%	Yes
Koyuk	2nd Class City	Nome	368	$8,736	34.58%	Yes
Koyukuk	2nd Class City	Yukon-Koyukuk	88	$11,342	23.08%	Yes
Kwethluk	2nd Class City	Bethel	721	$6,503	15.76%	Yes
Kwigillingok	Unincorporated	Bethel	378	$7,577	28.44%	Yes
Lake & Peninsula Borough	Home Rule Borough	Lake & Peninsula	1557	$15,361	14.31%	Yes
Lake Louise	Unincorporated	Matanuska-Susitna	89	$11,056	41.67%	Yes
Larsen Bay	2nd Class City	Kodiak Island	90	$16,227	10.26%	Yes
Lower Kalskag	2nd Class City	Bethel	269	$7,654	42.05%	Yes
Lutak	Unincorporated	Haines	44	$20,928	14.29%	Yes
Manley Hot Springs	Unincorporated	Yukon-Koyukuk	78	$21,751	10.00%	Yes
Manokotak	2nd Class City	Dillingham	423	$9,294	13.73%	Yes
Marshall	2nd Class City	Wade Hampton	387	$9,597	18.52%	Yes
McCarthy	Unincorporated	Valdez-Cordova	60	$16,045	80.00%	Yes
McGrath	2nd Class City	Yukon-Koyukuk	321	$21,553	10.43%	Yes

SMALL, IMPOVERISHED CRITERIA

ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
McKinley Park	Unincorporated	Denali	145	$27,255	14.74%	Yes
Mekoryuk	2nd Class City	Bethel	217	$11,957	19.79%	Yes
Mendeltna	Unincorporated	Valdez-Cordova	62	$11,289	33.33%	Yes
Mentasta Lake	Unincorporated	Valdez-Cordova	114	$11,274	28.00%	Yes
Metlakatla	Unincorporated, Indian Reservation (Federal)	Prince of Wales-Outer Ketchikan	1377	$16,140	20.85%	Yes
Minto	Unincorporated	Yukon-Koyukuk	186	$9,640	40.85%	Yes
Mosquito Lake	Unincorporated	Haines	158	$16,415	25.00%	Yes
Mountain Village	2nd Class City	Wade Hampton	796	$9,653	30.77%	Yes
Naknek	Unincorporated	Bristol Bay	577	$21,182	9.38%	Yes
Napakiak	2nd Class City	Bethel	370	$7,319	22.31%	Yes
Naukati Bay	Unincorporated	Prince of Wales-Outer Ketchikan	129	$15,949	29.09%	Yes
Nelchina	Unincorporated	Valdez-Cordova	51	$10,743	15.00%	Yes
Nelson Lagoon	Unincorporated	Aleutians East	63	$27,596	46.15%	Yes
New Allakaket	Unincorporated	Yukon-Koyukuk	34	$5,578	38.46%	Yes
New Stuyahok	2nd Class City	Dillingham	472	$7,931	9.20%	Yes
Newhalen	2nd Class City	Lake & Peninsula	167	$9,447	31.25%	Yes
Newtok	Unincorporated	Bethel	323	$9,514	24.63%	Yes
Nightmute	2nd Class City	Bethel	237	$9,396	16.04%	Yes
Nikolai	2nd Class City	Yukon-Koyukuk	98	$11,029	37.93%	Yes
Noatak	Unincorporated	Northwest Arctic	470	$9,659	25.35%	Yes
Nondalton	2nd Class City	Lake & Peninsula	196	$8,411	37.33%	Yes
Noorvik	2nd Class City	Northwest Arctic	636	$12,020	19.56%	Yes
Northway	Unincorporated	Southeast Fairbanks	79	$16,429	13.51%	Yes
Northway Junction	Unincorporated	Southeast Fairbanks	61	$16,440	6.25%	Yes
Northway Village	Unincorporated	Southeast Fairbanks	87	$10,300	31.82%	Yes
Nuiqsut	2nd Class City	North Slope	417	$14,876	8.81%	Yes
Nulato	2nd Class City	Yukon-Koyukuk	290	$8,966	41.94%	Yes
Nunam Iqua	2nd Class City	Wade Hampton	156	$6,725	40.68%	Yes
Nunapitchuk	2nd Class City	Bethel	547	$8,364	17.18%	Yes
Old Harbor	2nd Class City	Kodiak Island	192	$14,265	22.97%	Yes
Ouzinkie	2nd Class City	Kodiak Island	193	$19,324	11.63%	Yes
Perryville	Unincorporated	Lake & Peninsula	120	$20,935	11.11%	Yes
Pilot Point	2nd Class City	Lake & Peninsula	66	$12,627	7.69%	Yes
Pilot Station	2nd Class City	Wade Hampton	574	$7,311	32.12%	Yes

SMALL, IMPOVERISHED CRITERIA

ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Pitkas Point	Unincorporated	Wade Hampton	109	$10,487	25.00%	Yes
Platinum	2nd Class City	Bethel	38	$7,632	27.27%	Yes
Point Hope	2nd Class City	North Slope	737	$16,641	25.71%	Yes
Port Alexander	2nd Class City	Wrangell-Petersburg	64	$14,767	9.38%	Yes
Port Graham	Unincorporated	Kenai Peninsula	136	$13,666	22.37%	Yes
Port Heiden	2nd Class City	Lake & Peninsula	79	$20,532	16.67%	Yes
Quinhagak	2nd Class City	Bethel	648	$8,127	15.44%	Yes
Rampart	Unincorporated	Yukon-Koyukuk	21	$12,439	31.82%	Yes
Red Devil	Unincorporated	Bethel	29	$5,515	36.36%	Yes
Ruby	2nd Class City	Yukon-Koyukuk	183	$9,544	23.61%	Yes
Russian Mission	2nd Class City	Wade Hampton	329	$8,358	21.70%	Yes
Saint Mary's	1st Class City	Wade Hampton	551	$15,837	11.34%	Yes
Saint Michael	2nd Class City	Nome	446	$10,692	21.24%	Yes
Saint Paul	2nd Class City	Aleutians West	460	$18,408	14.98%	Yes
Sand Point	1st Class City	Aleutians East	890	$21,954	30.79%	Yes
Savoonga	2nd Class City	Nome	712	$7,725	37.36%	Yes
Scammon Bay	2nd Class City	Wade Hampton	520	$7,719	12.80%	Yes
Selawik	2nd Class City	Northwest Arctic	841	$8,170	34.34%	Yes
Seldovia	1st Class City	Kenai Peninsula	287	$23,669	10.42%	Yes
Seldovia Village	Unincorporated	Kenai Peninsula	159	$21,396	10.45%	Yes
Shageluk	2nd Class City	Yukon-Koyukuk	124	$7,587	27.42%	Yes
Shaktoolik	2nd Class City	Nome	214	$10,491	27.66%	Yes
Shishmaref	2nd Class City	Nome	615	$10,487	16.43%	Yes
Shungnak	2nd Class City	Northwest Arctic	260	$10,377	27.52%	Yes
Silver Springs	Unincorporated	Valdez-Cordova	113	$23,464	8.62%	Yes
Skagway	1st Class City	Skagway-Hoonah-Angoon	854	$27,700	14.10%	Yes
Slana	Unincorporated	Valdez-Cordova	94	$20,019	46.94%	Yes
Sleetmute	Unincorporated	Bethel	91	$8,150	27.59%	Yes
South Naknek	Unincorporated	Bristol Bay	74	$13,019	24.14%	Yes
Stebbins	2nd Class City	Nome	612	$8,249	22.60%	Yes
Stevens Village	Unincorporated	Yukon-Koyukuk	63	$7,113	38.89%	Yes
Stony River	Unincorporated	Bethel	53	$5,469	38.10%	Yes
Sutton-Alpine	Unincorporated	Matanuska-Susitna	1278	$20,436	7.42%	Yes
Talkeetna	Unincorporated	Matanuska-Susitna	840	$23,695	14.42%	Yes
Tanacross	Unincorporated	Southeast Fairbanks	146	$9,429	57.14%	Yes

SMALL, IMPOVERISHED CRITERIA

ELIGIBLE			<= 3000	<=29020.8	4.4% >= 5.4%	
Community	**Incorporation Type**	**Census Area**	**2006 Department of Labor Population Estimate**	**2000 Census Per Capita Income**	**2000 Census % Unemployed**	**Eligible Based on 2006 Pop & Required Thresholds**
Tanana	1st Class City	Yukon-Koyukuk	261	$12,077	23.66%	Yes
Tatitlek	Unincorporated	Valdez-Cordova	117	$13,014	7.89%	Yes
Tazlina	Unincorporated	Valdez-Cordova	188	$23,992	12.82%	Yes
Teller	2nd Class City	Nome	258	$8,618	14.71%	Yes
Tenakee Springs	2nd Class City	Skagway-Hoonah-Angoon	109	$20,483	13.73%	Yes
Tetlin	Unincorporated	Southeast Fairbanks	149	$7,371	46.88%	Yes
Thorne Bay	2nd Class City	Prince of Wales-Outer Ketchikan	482	$20,836	14.60%	Yes
Togiak	2nd Class City	Dillingham	783	$9,676	26.84%	Yes
Tok	Unincorporated	Southeast Fairbanks	1347	$18,521	17.99%	Yes
Toksook Bay	2nd Class City	Bethel	598	$8,761	15.31%	Yes
Tonsina	Unincorporated	Valdez-Cordova	90	$13,390	28.00%	Yes
Trapper Creek	Unincorporated	Matanuska-Susitna	415	$18,247	8.09%	Yes
Tuluksak	Unincorporated	Bethel	493	$7,132	16.00%	Yes
Tuntutuliak	Unincorporated	Bethel	407	$7,918	14.66%	Yes
Tununak	Unincorporated	Bethel	333	$7,653	19.81%	Yes
Tyonek	Unincorporated	Kenai Peninsula	199	$11,261	27.27%	Yes
Unalakleet	2nd Class City	Nome	727	$15,845	14.57%	Yes
Upper Kalskag	2nd Class City	Bethel	271	$7,859	12.09%	Yes
Venetie	Unincorporated	Yukon-Koyukuk	187	$7,314	36.23%	Yes
Wainwright	2nd Class City	North Slope	517	$16,710	21.84%	Yes
Wales	2nd Class City	Nome	139	$14,877	18.92%	Yes
White Mountain	2nd Class City	Nome	224	$10,034	18.75%	Yes
Whittier	2nd Class City	Valdez-Cordova	117	$25,700	15.89%	Yes
Willow Creek	Unincorporated	Valdez-Cordova	193	$18,242	16.00%	Yes
Wrangell	Home Rule City	Wrangell-Petersburg	1911	$21,851	8.48%	Yes
Yakutat	Home Rule Borough	Yakutat	634	$22,579	7.76%	Yes
NOT ELIGIBLE						
Adak	2nd Class City	Aleutians West	146	$31,747	7.55%	No
Afognak	Unincorporated	Kodiak Island	0	NO DATA	0.00%	No
Alcan Border	Unincorporated	Southeast Fairbanks	12	$21,938	0.00%	No
Aleneva	Unincorporated	Kodiak Island	46	$3,707	0.00%	No
Alpine	Unincorporated	North Slope	0	$0	0.00%	No
Anchor Point	Unincorporated	Kenai Peninsula	1803	$18,668	13.37%	No

SMALL, IMPOVERISHED CRITERIA

NOT ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Anchorage	Unified Home Rule Municipality	Anchorage	282813	$25,287	6.76%	No
Anderson	2nd Class City	Denali	279	$23,837	10.19%	No
Atka	2nd Class City	Aleutians West	73	$17,079	0.00%	No
Attu Station	Unincorporated	Aleutians West	20	$26,964	0.00%	No
Barrow	1st Class City	North Slope	4065	$22,902	12.74%	No
Bear Creek	Unincorporated	Kenai Peninsula	1922	$20,947	7.45%	No
Belkofski	Unincorporated	Aleutians East	0	$0	0.00%	No
Beluga	Unincorporated	Kenai Peninsula	21	$0	0.00%	No
Bethel	2nd Class City	Bethel	5812	$20,267	8.95%	No
Bettles	2nd Class City	Yukon-Koyukuk	25	$19,586	0.00%	No
Big Delta	Unincorporated	Southeast Fairbanks	728	$14,803	24.72%	No
Big Lake	Unincorporated	Matanuska-Susitna	3082	$19,285	13.52%	No
Bill Moore's Slough	Unincorporated	Wade Hampton	0	NO DATA	0.00%	No
Birch Creek	Unincorporated	Yukon-Koyukuk	29	$5,952	0.00%	No
Brevig Mission	2nd Class City	Nome	324	$7,278	2.44%	No
Buffalo Soapstone	Unincorporated	Matanuska-Susitna	755	$18,021	7.29%	No
Butte	Unincorporated	Matanuska-Susitna	3166	$22,522	8.88%	No
Chalkyitsik	Unincorporated	Yukon-Koyukuk	65	$11,509	0.00%	No
Chase	Unincorporated	Matanuska-Susitna	30	$16,000	0.00%	No
Chicken	Unincorporated	Southeast Fairbanks	22	$65,400	0.00%	No
Chignik Lagoon	Unincorporated	Lake & Peninsula	70	$28,940	0.00%	No
Chiniak	Unincorporated	Kodiak Island	44	$22,211	0.00%	No
Chisana	Unincorporated	Valdez-Cordova	9	$0	0.00%	No
Chuathbaluk	2nd Class City	Bethel	95	$10,100	5.36%	No
Chuloonawick	Unincorporated	Wade Hampton	0	NO DATA	0.00%	No
Clam Gulch	Unincorporated	Kenai Peninsula	165	$17,983	26.92%	No
Cohoe	Unincorporated	Kenai Peninsula	1260	$19,059	16.33%	No
Coldfoot	Unincorporated	Yukon-Koyukuk	13	$42,620	0.00%	No
College	Unincorporated	Fairbanks North Star	11825	$23,381	9.74%	No
Cooper Landing	Unincorporated	Kenai Peninsula	357	$24,795	0.00%	No
Council	Unincorporated	Nome	9	NO DATA	0.00%	No
Crown Point	Unincorporated	Kenai Peninsula	81	$17,498	38.46%	No
Delta Junction	2nd Class City	Southeast Fairbanks	1039	$19,171	11.63%	No
Deltana	Unincorporated	Southeast Fairbanks	1896	$18,446	12.75%	No

SMALL, IMPOVERISHED CRITERIA

NOT ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Denali Borough	Home Rule Borough	Denali	1795	$26,251	11.57%	No
Diomede	2nd Class City	Nome	110	$9,944	2.17%	No
Dot Lake Village	Unincorporated	Southeast Fairbanks	22	$7,476	0.00%	No
Douglas	Unincorporated,in Juneau	Juneau	4850	NO DATA	0.00%	No
Dry Creek	Unincorporated	Southeast Fairbanks	94	$7,779	0.00%	No
Eagle River-Chugiak	Unincorporated,in Muni of Anch.	Anchorage	30000	NO DATA	0.00%	No
Edna Bay	Unincorporated	Prince of Wales-Outer Ketchikan	41	$58,967	0.00%	No
Eielson AFB	Unincorporated	Fairbanks North Star	4447	$11,512	7.75%	No
Eklutna	Unincorporated,in Muni of Anch.	Anchorage	368	$29,375	5.83%	No
Ekuk	Unincorporated	Dillingham	0	$25,000	0.00%	No
Ester	Unincorporated	Fairbanks North Star	1938	$29,155	4.42%	No
Evansville	Unincorporated	Yukon-Koyukuk	18	$15,745	0.00%	No
Fairbanks	Home Rule City	Fairbanks North Star	30552	$19,814	10.88%	No
Fairbanks North Star Borough	2nd Class Borough	Fairbanks North Star	87849	$21,553	9.11%	No
False Pass	2nd Class City	Aleutians East	54	$21,465	0.00%	No
Farm Loop	Unincorporated	Matanuska-Susitna	1255	$20,880	2.70%	No
Fishhook	Unincorporated	Matanuska-Susitna	2917	$20,042	6.55%	No
Flat	Unincorporated	Yukon-Koyukuk	0	$0	0.00%	No
Fort Greely	Unincorporated	Southeast Fairbanks	756	$12,368	3.17%	No
Four Mile Road	Unincorporated	Yukon-Koyukuk	39	$28,466	13.64%	No
Fox	Unincorporated	Fairbanks North Star	369	$22,689	5.73%	No
Fox River	Unincorporated	Kenai Peninsula	639	$7,963	3.95%	No
Fritz Creek	Unincorporated	Kenai Peninsula	1723	$18,937	13.35%	No
Funny River	Unincorporated	Kenai Peninsula	729	$22,648	23.05%	No
Gateway	Unincorporated	Matanuska-Susitna	3830	$24,548	7.40%	No
Georgetown	Unincorporated	Bethel	3	$0	0.00%	No
Girdwood	Unincorporated,in Muni of Anch.	Anchorage	236	NO DATA	0.00%	No
Glacier View	Unincorporated	Matanuska-Susitna	264	$14,855	0.00%	No
Glennallen	Unincorporated	Valdez-Cordova	525	$17,084	5.02%	No
Golovin	2nd Class City	Nome	154	$13,281	3.51%	No
Halibut Cove	Unincorporated	Kenai Peninsula	24	$89,895	0.00%	No
Hamilton	Unincorporated	Wade Hampton	0	NO DATA	0.00%	No
Happy Valley	Unincorporated	Kenai Peninsula	472	$19,377	16.67%	No
Harding-Birch Lakes	Unincorporated	Fairbanks North Star	245	$24,443	11.30%	No
Hobart Bay	Unincorporated	Skagway-Hoonah-Angoon	2	$34,900	0.00%	No

SMALL, IMPOVERISHED CRITERIA

NOT ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Hollis	Unincorporated	Prince of Wales-Outer Ketchikan	156	$17,278	3.08%	No
Homer	1st Class City	Kenai Peninsula	5454	$21,823	8.95%	No
Hope	Unincorporated	Kenai Peninsula	143	$9,079	13.33%	No
Houston	2nd Class City	Matanuska-Susitna	1537	$17,213	17.67%	No
Igiugig	Unincorporated	Lake & Peninsula	53	$13,172	0.00%	No
Iliamna	Unincorporated	Lake & Peninsula	82	$19,741	0.00%	No
Ivanof Bay	Unincorporated	Lake & Peninsula	0	$21,983	0.00%	No
Jakolof Bay	In Kenai Peninsula Borough	Kenai Peninsula	39	NO DATA	0.00%	No
Juneau	Unified Home Rule Municipality	Juneau	30650	$26,719	5.35%	No
Kachemak	2nd Class City	Kenai Peninsula	458	$21,030	4.48%	No
Kaguyak	Unincorporated	Kodiak Island	0	NO DATA	0.00%	No
Kalifornsky	Unincorporated	Kenai Peninsula	6914	$23,898	9.16%	No
Kanatak	Unincorporated	Kodiak Island	0	NO DATA	0.00%	No
Karluk	Unincorporated	Kodiak Island	27	$13,736	0.00%	No
Kasilof	Unincorporated	Kenai Peninsula	547	$21,211	0.00%	No
Kenai	Home Rule City	Kenai Peninsula	6864	$20,789	12.44%	No
Kenai Peninsula Borough	2nd Class Borough	Kenai Peninsula	51268	$20,949	11.44%	No
Kenny Lake	Unincorporated	Valdez-Cordova	414	$13,121	3.77%	No
Ketchikan	Home Rule City	Ketchikan Gateway	7622	$22,484	8.17%	No
Ketchikan Gateway Borough	2nd Class Borough	Ketchikan Gateway	13174	$23,994	7.65%	No
King Island	Unincorporated	Nome	0	NO DATA	0.00%	No
Knik River	Unincorporated	Matanuska-Susitna	652	$19,104	21.14%	No
Knik-Fairview	Unincorporated	Matanuska-Susitna	11238	$20,895	13.45%	No
Kobuk	2nd Class City	Northwest Arctic	135	$9,845	0.00%	No
Kodiak	Home Rule City	Kodiak Island	5937	$21,522	4.98%	No
Kodiak Island Borough	2nd Class Borough	Kodiak Island	13506	$22,195	5.18%	No
Kodiak Station	Unincorporated	Kodiak Island	1941	$14,234	6.06%	No
Kongiganak	Unincorporated	Bethel	411	$9,881	3.50%	No
Kotzebue	2nd Class City	Northwest Arctic	3104	$18,289	9.80%	No
Kupreanof	2nd Class City	Wrangell-Petersburg	32	$26,651	0.00%	No
Lake Minchumina	Unincorporated	Yukon-Koyukuk	20	$26,780	0.00%	No
Lakes	Unincorporated	Matanuska-Susitna	7901	$23,485	6.96%	No
Lazy Mountain	Unincorporated	Matanuska-Susitna	1347	$22,789	10.78%	No
Levelock	Unincorporated	Lake & Peninsula	61	$12,199	0.00%	No
Lime Village	Unincorporated	Bethel	25	$0	0.00%	No

SMALL, IMPOVERISHED CRITERIA

NOT ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Livengood	Unincorporated	Yukon-Koyukuk	25	$21,215	0.00%	No
Lowell Point	Unincorporated	Kenai Peninsula	76	$45,790	17.07%	No
Mary's Igloo	Unincorporated	Nome	0	NO DATA	0.00%	No
Matanuska-Susitna Borough	2nd Class Borough	Matanuska-Susitna	77174	$21,105	10.30%	No
Meadow Lakes	Unincorporated	Matanuska-Susitna	6492	$17,295	9.72%	No
Meyers Chuck	Unincorporated	Prince of Wales-Outer Ketchikan	11	$31,660	0.00%	No
Miller Landing	Unincorporated,in Homer	Kenai Peninsula	0	$19,587	16.28%	No
Moose Creek	Unincorporated	Fairbanks North Star	578	$17,980	8.93%	No
Moose Pass	Unincorporated	Kenai Peninsula	204	$28,147	0.00%	No
Mud Bay	Unincorporated	Haines	136	$24,720	2.56%	No
Nanwalek	Unincorporated	Kenai Peninsula	228	$10,577	5.06%	No
Napaimute	Unincorporated	Bethel	0	NO DATA	0.00%	No
Napaskiak	2nd Class City	Bethel	464	$8,162	2.94%	No
Nenana	Home Rule City	Yukon-Koyukuk	359	$17,334	23.77%	No
Nikiski	Unincorporated	Kenai Peninsula	4179	$20,129	15.67%	No
Nikolaevsk	Unincorporated	Kenai Peninsula	297	$10,390	23.48%	No
Nikolski	Unincorporated	Aleutians West	31	$14,082	0.00%	No
Ninilchik	Unincorporated	Kenai Peninsula	784	$18,463	17.98%	No
Nome	1st Class City	Nome	3540	$23,402	10.96%	No
North Pole	Home Rule City	Fairbanks North Star	1710	$21,426	12.10%	No
North Slope Borough	Home Rule Borough	North Slope	6807	$20,540	14.94%	No
Northwest Arctic Borough	Home Rule Borough	Northwest Arctic	7334	$15,286	15.55%	No
Ohogamiut	Unincorporated	Wade Hampton	0	NO DATA	0.00%	No
Oscarville	Unincorporated	Bethel	64	$5,825	0.00%	No
Paimiut	Unincorporated	Wade Hampton	2	$0	0.00%	No
Palmer	Home Rule City	Matanuska-Susitna	5574	$17,203	10.84%	No
Pauloff Harbor	Unincorporated	Aleutians East	0	NO DATA	0.00%	No
Paxson	Unincorporated	Valdez-Cordova	28	$26,071	0.00%	No
Pedro Bay	Unincorporated	Lake & Peninsula	55	$18,419	0.00%	No
Pelican	1st Class City	Skagway-Hoonah-Angoon	106	$29,347	7.95%	No
Petersburg	Home Rule City	Wrangell-Petersburg	3129	$25,827	10.28%	No
Petersville	Unincorporated	Matanuska-Susitna	20	$43,200	50.00%	No
Pleasant Valley	Unincorporated	Fairbanks North Star	683	$18,633	8.46%	No
Point Baker	Unincorporated	Prince of Wales-Outer Ketchikan	16	$12,580	0.00%	No
Point Lay	Unincorporated	North Slope	235	$18,003	4.00%	No

SMALL, IMPOVERISHED CRITERIA

NOT ELIGIBLE

Community	Incorporation Type	Census Area	2006 Department of Labor Population Estimate	2000 Census Per Capita Income	2000 Census % Unemployed	Eligible Based on 2006 Pop & Required Thresholds
			<= 3000	<=29020.8	4.4% >= 5.4%	
Point MacKenzie	Unincorporated	Matanuska-Susitna	232	$23,227	0.00%	No
Pope-Vannoy Landing	Unincorporated	Lake & Peninsula	6	$4,325	0.00%	No
Port Alsworth	Unincorporated	Lake & Peninsula	112	$21,716	4.92%	No
Port Clarence	Unincorporated	Nome	23	$35,286	0.00%	No
Port Lions	2nd Class City	Kodiak Island	211	$17,492	4.21%	No
Port Protection	Unincorporated	Prince of Wales-Outer Ketchikan	59	$12,057	0.00%	No
Port William	Unincorporated	Kodiak Island	0	NO DATA	0.00%	No
Portage Creek	Unincorporated	Dillingham	20	$8,010	0.00%	No
Primrose	Unincorporated	Kenai Peninsula	79	$18,904	11.59%	No
Prudhoe Bay	Unincorporated	North Slope	2	$19,880	0.00%	No
Red Dog Mine	Unincorporated	Northwest Arctic	33	$34,438	0.00%	No
Ridgeway	Unincorporated	Kenai Peninsula	1961	$23,225	1.44%	No
Saint George	2nd Class City	Aleutians West	120	$21,131	3.80%	No
Salamatof	Unincorporated	Kenai Peninsula	906	$16,306	15.24%	No
Salcha	Unincorporated	Fairbanks North Star	946	$22,616	4.86%	No
Saxman	2nd Class City	Ketchikan Gateway	422	$15,642	25.62%	No
Seward	Home Rule City	Kenai Peninsula	2627	$20,360	17.18%	No
Shemya Station	Unincorporated	Aleutians West	27	NO DATA	0.00%	No
Sitka	Unified Home Rule Municipality	Sitka	8833	$23,622	7.78%	No
Skwentna	Unincorporated	Matanuska-Susitna	71	$23,995	0.00%	No
Soldotna	1st Class City	Kenai Peninsula	3807	$21,740	8.91%	No
Solomon	Unincorporated	Nome	2	$0	0.00%	No
Sterling	Unincorporated	Kenai Peninsula	5036	$20,741	9.70%	No
Sunrise	Unincorporated	Kenai Peninsula	22	$56,000	0.00%	No
Susitna	Unincorporated	Matanuska-Susitna	24	$17,356	0.00%	No
Takotna	Unincorporated	Yukon-Koyukuk	53	$13,143	0.00%	No
Tanaina	Unincorporated	Matanuska-Susitna	6987	$23,967	9.26%	No
Telida	Unincorporated	Yukon-Koyukuk	3	$0	0.00%	No
Thom's Place	Unincorporated	Wrangell-Petersburg	7	$16,086	0.00%	No
Tolsona	Unincorporated	Valdez-Cordova	24	$10,000	0.00%	No
Twin Hills	Unincorporated	Dillingham	77	$16,856	0.00%	No
Two Rivers	Unincorporated	Fairbanks North Star	627	$24,351	4.17%	No
Ugashik	Unincorporated	Lake & Peninsula	17	$12,530	0.00%	No
Umkumiute	Unincorporated	Bethel	0	NO DATA	0.00%	No
Unalaska	1st Class City	Aleutians West	3940	$24,676	13.40%	No

SMALL, IMPOVERISHED CRITERIA

NOT ELIGIBLE			**<= 3000**	**<=29020.8**	**4.4% >= 5.4%**	
Community	**Incorporation Type**	**Census Area**	**2006 Department of Labor Population Estimate**	**2000 Census Per Capita Income**	**2000 Census % Unemployed**	**Eligible Based on 2006 Pop & Required Thresholds**
Unga	Unincorporated	Aleutians East	0	NO DATA	0.00%	No
Valdez	Home Rule City	Valdez-Cordova	3690	$27,341	6.20%	No
Wasilla	1st Class City	Matanuska-Susitna	6775	$21,127	11.16%	No
Whale Pass	Unincorporated	Prince of Wales-Outer Ketchikan	61	$24,041	0.00%	No
Whitestone Logging Camp	Unincorporated	Skagway-Hoonah-Angoon	0	$21,810	3.57%	No
Willow	Unincorporated	Matanuska-Susitna	1973	$22,323	11.72%	No
Wiseman	Unincorporated	Yukon-Koyukuk	22	$8,211	0.00%	No
Womens Bay	Unincorporated	Kodiak Island	703	$27,746	5.43%	No
Woody Island	Unincorporated	Kodiak Island	0	NO DATA	0.00%	No
Y	Unincorporated	Matanuska-Susitna	1085	$15,437	24.25%	No

Source information is provided by DCCED
Note: *The SOA does not have an official definition of "rural". This classification is for program purposes only and is not intended to represent the SOA or any of its Departments in any official capacity.

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APPENDIX 10 – SHMAC MEETING SCHEDULE & PUBLIC PARTICIPATION LOG

See following page

Alaska State All-Hazard Risk Mitigation Plan
Public Involvement Process Log & SHMAC Meetings
Community Opportunities for Review

Date	Event Title	Number in attendance	Approx. number directly contacted
Continuously available on the web page for comment at www.ak-prepared.com			
November 1, 2001	SHMAC Teleconference	29	-
December 3, 2001	SHMAC Teleconference	3	-
December 18, 2001	SHMAC Teleconference	12	-
January 11 2002	SHMAC Teleconference	11	-
March 5, 2002	SHMAC Teleconference	16	-
April 2, 2002	SHMAC Teleconference	14	-
May 14, 2002	SHMAC Teleconference	7	-
July 25, 2002	SHMAC Teleconference	20	-
June 14 - 15, 2003	Kenai River Festival	4000 - 4500	40
June 28 - 29, 2003	Elmendorf AFB Air Show	145,000	29
July 19, 2003	Governor's Picnic	8000	12
Aug 1 - 9, 2003	Tanana Valley Fair (Fairbanks)	124,000	10
Aug 21 - Sep 1, 2003	Alaska State Fair (Palmer)	307,000	20
April 14, 2004	SHMAC Teleconference	16	-
May 5, 2004	SHMAC Teleconference	11	-
June 9, 2004	SHMAC Teleconference	17	-
July 8, 2004	SHMAC Teleconference	11	-
July 28, 2004	SHMAC Teleconference	13	-
September 3, 2004	SHMAC e-mail for SHMP Draft review		
January 17, 2007	SHMAC Teleconference	18	39

Alaska State All-Hazard Risk Mitigation Plan
Public Involvement Process Log & SHMAC Meetings
Community Opportunities for Review

Date	Event Title	Number in attendance	Approx. number directly contacted
February 21, 2007	SHMAC Teleconference	11	44
March 13, 2007	SHMAC Participation letter	39 Mailed	39
March 21, 2007	SHMAC Teleconference	15	48

March 13, 2007

Name of recipient
Title of recipient
Organization Name
Street address
City, State and Zip code

RE: State Hazard Mitigation Advisory Committee (SHMAC)

Dear Mr./Ms. Last Name

The United States Department of Homeland Security's Federal Emergency Management Agency (FEMA) requires Standard State Hazard Mitigation Plans to be updated every three years to receive future assistance under the Stafford Act.

The Division of Homeland Security & Emergency Management asks SHMAC members for continued involvement with the 2007 revision to accomplish the update needed for the Alaska State All-Hazard Risk Mitigation Plan. Membership participation is important to show FEMA the State has continuing agency and community support for the revision.

DHS&EM requests you complete the following activities and tasks.

- Review and update agency appropriate sections of the State All-Hazard Risk Mitigation Plan.
- Review and update the Capability Assessment Questionnaire.
- Review and update agency goals, objectives, and actions.
- Review and update agency descriptions.
- Actively participate in SHMAC teleconferences and email coordination.

The SHMAC membership brings a wealth of knowledge to the revision process. The mitigation team has a tremendous amount of respect for, and extends its gratitude towards, the SHMAC members for their efforts in the 2004 accomplishments. DHS&EM appreciates your continued cooperation with this endeavor.

Sincerely,

John W. Madden
Director

jwm:krp

APPENDIX 11 - STATE HAZARD MITIGATION ADVISORY COMMITTEE (SHMAC) MEMBERS & CORRESPONDENCE LOG

STATE AGENCIES

State Hazard Mitigation Officer	Alaska Division of Homeland Security & Emergency Management
Mitigation Specialist	Alaska Division of Homeland Security & Emergency Management
State Coordinator	Department of Commerce, Community & Economic Development Division of Community Advocacy
Insurance Market Analyst Market Conduct Section	Department of Community & Economic Development Division of Insurance
Environmental Program Specialist, Disaster Response Coordinator	Department of Environmental Conservation Statewide Services/ State Emergency Response Commission
Statewide Safety Coordinator	Department of Transportation & Public Facilities
Planner II	Department of Health & Social Services
Operations Forester	Department of Natural Resources Division of Forestry
National Fire Plan Coordinator	DOI/USDA Forest Services State of Alaska Division of Forestry
Deputy Director	Department of Natural Resources Division of Geologic and Geophysical Survey
Chief of Operations	Division of Mining, Land, and Water Management (Land Section)
State Fire Marshall	Department of Public Safety Division of Fire Prevention
EOC/SAR Supervisor	Alaska State Troopers
Assistant Attorney General	Department of Law Civil Division Governmental Affairs Section
State Seismologist	UAF – Geophysical Institute
School Finance Specialist II, Senior Safety Officer	Department of Education & Early Development
Director Emergency Preparedness	UA-Statewide Office of Risk Managements

Risk Manager	Department of Administration, Division of Risk Management
State Seismologist	UAF-Geophysical Institute
Dam Safety Engineer	Department of Natural Resources Division of Mining, Land & Water Dam Safety and Construction Unit
Acting Director	Department of Natural Resources Office of Project Management $ Permitting

LOCAL ORGANIZATIONS

Fire Chief	City of Seward Fire Department
Director	Municipality of Anchorage Office of Emergency Management
Director	Fairbanks North Star Borough Department of Emergency Operations
Director	Matanuska Susitna Borough Department of Emergency Services
Associate Planner	Kodiak Island Borough
Emergency Management Coordinator	Kenai Peninsula Borough Office of Emergency Management
Chairman	Alaska Seismic Hazards Safety Commission

TRIBAL REPRESENTATIVES

Director of Environmental Health	Tanana Chiefs Conference
Executive Director	Alaska Inter Tribal Council

FEDERAL AGENCIES

Assistant to the State Director	Department of Agriculture Rural Development
Regional Environmental Officer & Assistant	Department of the Interior
Member-at-Large	Alaska Fire Service
Scientist-in-Charge	Alaska Volcano Observatory

Director	West Coast & Alaska Tsunami Warning Center
Chief, Environmental & scientific Division	National Weather Service
State Conservationist	National Resource Conservation Service
Member-at-Large	Army Corps of Engineers

ADDITIONAL COORDINATION

Risk Manager	Alaska Municipal League
Director of Programs	Denali Commission
Project Manager	Chugach Electric
President	Carver Geologic Inc.

2007 AGENCY CONTACT CORRESPONDENCE			
DATE	**AGENCY**	**POC**	**DESCRIPTION OF CONVERSATION**
01/05/06	FEMA	J Huff	Request & Rec. 2004 Final Review Doc.
02/02/07	DCCED	T Boothby	Request info. on NFIP in AK data
02/06/07	DCCED	T Boothby	Rec. info on NFIP in AK
02/12/07	DCCED	C Ulmann	Reminder Cap. Assessment Q & A email
02/12/07	DEC	A Wien	Reminder Cap. Assessment Q & A email sent and received completed.
02/12/07	State Fire Marshall	S Belanger	Request to review 04 goal and review Earthquake and Wildland fire sections
02/12/07	DNR/Dam Safety	C Cobb	Dam Hazard section sent for revision
02/21/07	DEC	A Wien	Spoke with about draft MOU concerns
02/21/07	DOT & PF	D Monteleone	Spoke with about draft MOU concerns
02/22/07	DNR/Dam Safety	C Cobb	Request to update Cap. Assessment Q & A
02/22/07	DOT & PF	D Monteleone	Request to update Cap. Assessment Q & A
02/22/07	City of Seward	D Squires	Request to update Cap. Assessment Q & A
02/22/07	DHSS	T Smith	Request to update Cap. Assessment Q & A
02/22/07	DNR/DGGS	R Combellick	Request to update Cap. Assessment Q & A
02/22/07	Mat-Su Borough	D Brodigan	Request to update Cap. Assessment Q & A
02/22/07	AVO	C Neal	Request to update Cap. Assessment Q & A
02/22/07	DCCED/Div. of Ins.	C Ulmann	Request to update Cap. Assessment Q & A
02/23/07	Mat-Su Borough	D Brodigan	Rec. updated Cap. Assessment Q & A
02/23/07	DNR/Project Mang.	R Bates	Request to update Cap. Assessment Q & A
02/23/07	DNR/DGGS	R Combellick	He wanted to know if P Burns was included in teleconference email/ Response back YES
02/23/07	Denali Commission	T Rinner	Rec. updated Cap. Assessment Q & A
02/23/07	Denali Commission	T Rinner	Forward & CC (rec. to DHS&EM) to J Hall
02/26/07	DNR/DGGS	R Combellick	Rec. updated Q & A
02/26/07	Risk Management	S Jordon	Request State Facility information/ Rec. info.
02/28/07	DHSS	T Smith	Rec. web address for Dept. of Public Health
03/01/07	Risk Management	S Jordon	Request location/zip of specific buildings/Rec. location information
03/02/07	City of Seward	D Squires	Received updated Q & A

DATE	AGENCY	POC	DESCRIPTION OF CONVERSATION
03/06/07	NOAA/NWS	J Partain	Request to review weather section and all regional climate change info in revision
03/06/07	DNR/Dam Safety	C Cobb	He needed State Plan web site information
03/06/07	DNR/Dam Safety	C Cobb	Rec. updated Q & A
03/06/07	NOAA/NWS	J Partain	Will forward info to Regional Climate Specialist
03/120/7	DNR/DOF	T Kurth	Reminder of Q & A, agency desc. and update 2004 Wildland goals
03/12/07	DEC	A Wien	Reminder to update Q & A, agency desc. and Oil and Hazards Waste section review
03/12/07	DOT&PF	D Monteleone	Reminder to update Q & A, agency desc. and hazard goals
03/12/07	DCCED	T Boothby	Reminder to update Q & A, agency desc. and Flood section and goals
03/13/07	NOAA/NWS	Gary Hufford	Regional climate change info received
03/13/07	DNR/DGGS	R Combellick	Tsunami & Seiches section sent for review
03/13/07	UAF-Geophysical Ins.	R Hanson	Tsunami & Seiches section sent for review
03/13/07	NOAA/NWS	J Partain	Weather section sent for review
03/130/7	UAF-Geophysical Ins.	R Hanson	Earthquake section sent for review
03/13/07	DNR/DGGS	R Combellick	Snow Avalanche section sent for review
03/13/07	DOF	D Cooper	Wildland Fire section sent for review
03/13/07	AVO	C Neal	Volcanoes section sent for review
03/13/07	DCCED	T Boothby	Request info on ACMP
03/13/07	DCCED	T Boothby	Rec. info on ACMP
03/13/07	AVO	C Neal	Reminder to update Cap. Assessment Q & A
03/15/07	DCCED/Div. of Ins.	C Ulmann	Rec. agency description
03/15/07	DEC	A Wien	Received updated Oil and Hazardous Material section, agency desc, and new goals
03/15/07	DHS&EM	Dennis Lundine	Request to review Tech, and Human caused Terrorism hazard section
03/16/07	DCCED	T Boothby	Request to help ID 2004 hazard section authors
03/19/07	DCCED	T Boothby	Received info on 2004 hazard section authors
03/19/07	DOT & PF	D Monteleone	Rec. updated Q & A, request to send agency desc. and revision of goals
03/19/07	Denali Commission	J Hall	2nd req. to update Q & A and got response back she will complete

DATE	AGENCY	POC	DESCRIPTION OF CONVERSATION
03/19/07	DCCED	B Allen	Email and Vmail to ask if he could help with the Economic section review
03/19/07	Army Corp. of Eng.	B Sexauer	Erosion section sent for review
03/19/07	DCCED	S Cox	ACMP Q & A review if possible
03/19/07	DHS&EM	S Simmons	DHS&EM goals need to be updated
03/20/07	NOAA/Tsunami Warning Center	P Whitmore	Rec. agency description
03/20/07	DHS&EM	P Winn	Request to review DPC info. for accuracy and her response (YES)
03/20/07	NOAA/WCTWC	P Whitmore	Rec. updated Q & A
03/20/07	DCCED	B Allen	Spoke about email on Economic section review he agreed to revise
03/20/07	DHS&EM	S Simmons	Request PDM section revision
03/21/07	DOT&PF	D Monteleone	Rec. updated goal information
03/21/07	Denali Commission	J Hall	Rec. teleconference request for success stories, no grant funding changes, and 07 goals to be determined in agency review
03/21/07	AVO	C Neal	Rec. updated Q & A
03/21/07	DNR/DGGS	R Combellick	Rec. updated agency description
03/21/07	AVO	T Murray	Rec. updated goals accomplishments
03/22/07	Carver Geology	G Carver	Spoke about receiving SHMAC letter
03/22/07	Denali Commission	J Hall	Requested agency description
03/23/07	DCCED/Div. of Ins.	C Ulmann	Verify mailing address for SHMAC letter
03/23/07	AVO	T Murray	Spoke with about goal accomplishment revisions
03/26/07	Denali Commission	J Hall	Rec. agency description
03/27/07	DEC	A Wien	Rec. additional updated info. on Oil and Hazardous Waste section
03/27/07	AVO	C Neal	Rec. all Volcanoes section info. revised
03/27/07	NOAA/WCTWC	P Whitmore	Rec. web link to Augustine information03/29/07
03/29/07	DCCED	E Hunsinger	Interpret census info. for understanding
03/29/07	DCCED	E Hunsinger	Req. community development trends sources/ Rec. web links
03/29/07	DCCED	I Arriaga	Req. development trends data sets
03/30/07	DOF	D Cooper	Reminder to review Wildland Fire section
03/30/07	DCCED	T Boothby	Req. small and impoverished community data sets
04/02/07	NOAA/NWS	J Partain	Reminder to review Weather section
04/03/07	UAF-Geophysical Ins.	R Hanson	Reminder to review Earthquake, Tsunami & Seiches hazard sections
04/03/07	DNR/Dam Safety	C Cobb	Reminder to review Dam section
04/03/07	NOAA/NWS	J Partain	Spoke with him about drought threat in AK, all sections and some possible help

DATE	AGENCY	POC	DESCRIPTION OF CONVERSATION
04/03/07	DNR/DGGS	R Combellick	Reminder to review Snow Avalanche, and Tsunami & Seiches sections/response partial complete will finish soon and send
04/04/07	NOAA/NWS	J Partain	Req. and sent format for goals in 07 revision
04/04/07	DNR/Dam Safety	C Cobb	Spoke about Dam revision and timeline
04/04/07	EPA	J Poston	Inquire if she can help with Erosion section review as per J Partain suggestion
04/04/07	BLM	S Allen	Inquire if she can help with Wildland Fire section review as per J Partain suggestion
04/04/07	UAF-Geophysical Ins.	R Hanson	Will review sections he has been out of town
04/04/07	DCCED	T Boothby	She suggests I Arriaga should have data set for small and impoverished comm.
04/04/07	DCCED	T Boothby	Thank you for info. with reminder of Flood section review.
04/04/07	State Fire Marshall	Dave Tyler	Welcome as newest SHMAC member, sent information on DPS goals review
04/04/07	DCCED	I Arriaga	Response to help with data set, needing criteria for small and impoverished comm.
04/05/07	DCCED	I Arriaga	Sent criteria for data set after talking to team members and 44 CFR requirements
04/05/07	Carver Geology	G Carver	Request to review Ground Failure section with Earthquake and Tsunami.
04/06/07	DCCED	T Boothby	Request to review Appendices 4
04/06/07	Tsunami Warning Center	P Whitmore	Request to review Appendices 4
04/09/07	DOF	D Cooper	Response to review with look at request for second eyes/I have also asked Sharon Alden to review waiting for response from BLM
04/09/07	DCCED	I Arriaga	Rec. data for Small and Impoverished comm.
04/09/06	DCCED	I Arriaga	I sent email about calling her on 04/12/07
04/09/07	USGS	C Neal	She sent additional active volcano info./thank you response in return
04/10/07	USGS	T Murray	He may have additions to Christina's info soon/thank you response sent in return
04/11/07	DHS&EM	P Winn	Verify SERC info/rec update
04/12/07	DCCED	I Arriaga	Spoke about Small and Impoverished Comm. data
04/12/07	DNR	W Menefee	Spoke about land development trends

DATE	AGENCY	POC	DESCRIPTION OF CONVERSATION
04/13/07	DCCED	B Allen	Economic section review update
04/16/07	Army Corps of Engineers	M Harrop B Kerr B Sexauer	Can anyone help with the Erosion Section Review?
04/16/07	DNR	R Combellick	Reply he will do Ground Failure Section review and sent Thank You
04/13/07	SHMAC	All members	Postpone next teleconference
04/16/07	State Farm	D Maxwell	Need Development trends
04/17/07	Chugach Electric	G Archibald	Welcome to SHMAC w/attachments
04/17/17	DCCED	I Arriaga	We spoke about criteria needed for Small and Impoverished data set request/ I sent her the needed info.
04/17/07	DCCED	I Arriaga	Rec. data info and reply Thank You sent
04/18/07	DPS-Fire Marshall	D Tyler	We spoke about the 04 revision and Civil disturbance info being added.
04/18/07	DHSEM	S Simmons G Gould D Lundine	Sent message w/ CC about Civil Disturbance info. from DPS
04/18/07	UAF	R Forkel	GPS/GIS information request for all UAA buildings of responsibility
04/18/07	DEED	D Carney	GPS/GIS information request for all State buildings of responsibility
04/19/07	MOA Emergency Manager	H Handyside	Rec. letter of support for 07 revision
04/23/07	DGGS	R Combellick	Tsunami & Seiches revision complete
04/23/07	DGGS	R Combellick	Thank You and sent Ground Failure Sec.
04/23/07	DCCED	I Arriaga	Small & Impoverish explanation
04/25/07	KPB Tax Assessor	S Haron	Requesting Development trend info.
04/26/07	DGGS	R Combellick	Ground Failure Revision Complete/Thank You sent in response
04/30/07	DOF	D Cooper	Status of Wildland Fire Section Review?
04/30/07	DCCED	B Allen	Status of Economic Section Review?
04/30/07	Army Corps	B Sexauer	Spoke with him about the Status Erosion Section Review?
05/3/07	DCCED	S Cox	We spoke about the Economic section revision.
05/04/07	KPB	S Haron	Received development trend information for KPB
05/07/07	DOI	D Mutter	Spoke with him and he is sending comments by 25 May
05/08/07	DCCED	T Boothby	Received the Flood 5-2 edits
05/14/07	DHS&EM	B Nichols	Request for AVEC and AK Energy information needed.
05/14/07	MOA	K Taylor	Request for contact for development trend information needed.
05/14/07	AKRR	K Rogge	Request for information and participation on the 2007 SHRMP review.

DATE	AGENCY	POC	DESCRIPTION OF CONVERSATION
04/14/07	MOA	K Taylor	Development Trends data needed.
05/14/07	DCCED	S Cox	Request for contact information for reviewer of Economic Section.
05/17/07	DCCED	M Hanzuk	We spoke about the Economic Section
05/17/07	AKRR	M Peterburg	Called to get additional information that is needed in regards to AKRR
05/18/07	AKRR	L Johnson	Called to say she will be suppling AKRR information.
05/21/07	DOF	D Cooper	I called her to see about the Wildland Fire section/need information soon
05/21/07	DCCED	M Hanzuk	Will send Economic section with corrections for review.
05/22/07	DNR	F Cole	We spoke about the Wildland Fire section he will review, I email section
05/22/07	BLM	S Alden	We spoke about the Wildland Fire section
05/22/07	UAF	V Romanovsky	Sent email req for APO desc. he called and we spoke program then he email info. to me for use
05/22/07	DHS&EM	M Sutton	Req and rec. 07 AK Shield description
05/23/07	DCCED	M Hanzuk	Sent revised Economic section for review
05/23/07	Army Corp of Eng.	B Sexauer	Sent Erosion section for revision
05/23/07	MOA	K Taylor	Called left message about dev. Trends info. request
05/23/07	DGGS	R Combellick	Define and explain Eolian deposits
05/29/07	DCCED	M Hanzuk	We spoke about the changes to the Economic section he reviewed
05/29/07	DHS&EM	W Rush	SVA program description
05/30/07	DIO	P Bergmann	Suggestions on revisions
05/30/07	DHS&EM	Tech Support	Request to create mapping email global list
05/31/07	SHMAC	SHRMP Mapping	Request for GIS mapping for HVA
06/06/07	DNR	F Cole	Received Mapping E-Mail links
06/07/07	DNR	F Cole	We spoke about the Fire section and links
06/07/07	DHSS	J Mackin	He gave permission to use pictures from Pan Flu brochure used for Enviro. Health
06/07/07	DHS&EM	W Rush	We spoke about Mit. Success Story needs
06/08/07	DGGS	R Combellick	Req. for mapping-he sent link to shp/metadata files
06/08/07	AKRR	L Johnson	Request to receive RR information
06/12/07	DEC	A Wien	Request and received caption for pics
06/13/07	DCCED	T Boothby	Received Agency Description
06/18/07	DNR	C Cobb	Questions on goals needed/emailed

DATE	AGENCY	POC	DESCRIPTION OF CONVERSATION
06/19/07	DNR	C Cobb	Will complete request first week of July
06/20/07	DHS&EM	W Rush	Received ATAACA information needed
06/21/07	DHS&EM	R Nelson	Request for photo
07/10/07	SHMAC	ALL	Request for Legislation
07/16/07	DNR	CCobb	Request for goals clarification
07/17/07	Chugach Electric	GArchibald	Request for Energy information
07/17/07	Oregon PUC	JMurray	Request for Utility Information
07/17/07	Oregon EM	JMurray	Request for Utility Information

APPENDIX 12 –MODEL VILLAGE FLOODPLAIN AND DAMAGE PREVENTION ORDINANCES

MODEL
FLOOD DAMAGE PREVENTION ORDINANCE

Adoption of this ordinance will comply with the standards for participation in the National Flood Insurance Program. The model includes standards and provisions that encourage sound flood plain management and if implemented allows property owners to obtain flood insurance at a more affordable rate FEMA recommends that non-residential construction have the lowest floor elevated one foot above the base flood elevation; or that the area below one foot above the base flood elevation be floodproofed.

The minimum requirement for participation in the NFIP non-residential construction requires that the lowest floor be elevated to or above the base flood elevation or that the area below the base flood elevation be floodproofed. Even though the minimum standards only require elevation to the base flood elevation, it is recommended that communities adopt the higher standard because elevating one foot above the base flood elevation will allow your industries and businesses to receive a substantial reduction in the cost of their flood insurance. Also, as increased development happens, flood elevations can increase, and the one foot above standard allows for an additional margin of safety.

Because of the substantial number of manufactured homes that have experienced foundation failure, this model recommends that dry stacked blocks not be used to support manufactured homes in areas of high velocity and/or high water depths.

The model ordinance also includes a section for development in Shallow Flooding Areas (AO Zones). If your community does not have this zone designated on your Flood Insurance Rate Map, it is not necessary to adopt these sections of the model ordinance.

If you have any questions concerning adoption of this model or participation in the NFIP, please contact our Regional Office at (425) 487-4677. Items in *red underlined italics* (on electronic copies) or *underlined italics* (on paper copies) of the ordinance need to be filled in by the community.2

MODEL
FLOOD DAMAGE PREVENTION ORDINANCE

SECTION 1.0
STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE, AND OBJECTIVES

1.1 STATUTORY AUTHORIZATION

The Legislature of the (State) has in (statutes) delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the city*/town/county/tribe* of (local unit), (State) does ordain as follows:

1.2 FINDINGS OF FACT

(1) The flood hazard areas of *city/town/county/tribe* are subject to periodic inundation which results in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

(2) These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when

inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to the flood loss.

1.3 STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

(1) To protect human life and health;

(2) To minimize expenditure of public money and costly flood control projects;

(3) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) To minimize prolonged business interruptions;

(5) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;3

(6) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

(7) To ensure that potential buyers are notified that property is in an area of special flood hazard; and,

(8) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

1.4 METHODS OF REDUCING FLOOD LOSSES

In order to accomplish its purposes, this ordinance includes methods and provisions for:

(1) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;

(2) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(3) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;

(4) Controlling filling, grading, dredging, and other development which may increase flood damage; and

(5) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or may increase flood hazards in other areas.

SECTION 2.0

DEFINITIONS

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted, so as to give them the meaning they have in common usage and to give this ordinance it's most reasonable application.

"ACCESSORY STRUCTURES" means low cost buildings such as detached garages, boathouses, small pole barns and storage sheds (should be classified as minimum investment to be determined by the community), not to be used for human, habitation, shall be constructed and placed on the building site so as to offer minimum resistance to the flow of floodwaters; shall be anchored to prevent floatation which may result in damage to other structures; service utilities such as electrical and heating equipment shall be elevated or flood-proofed. (If the community's ordinance does not contain the

above provisions for accessory structures, then a variance will be needed to be issued to exempt accessory structures, the 1st floor elevation or flood-proofing requirement.)[4]
"APPEAL" means a request for a review of the interpretation of any provision of this ordinance or a request for a variance.
"AREA OF SHALLOW FLOODING" means a designated AO, or AH Zone on the Flood Insurance Rate Map (FIRM). The base flood depths range from one to three feet; a clearly defined channel does not exist; the path of flooding is unpredictable and indeterminate; and, velocity flow may be evident. AO is characterized as sheet flow and AH indicates ponding.
"AREA OF SPECIAL FLOOD HAZARD" means the land in the flood plain within a community subject to a one percent or greater chance of flooding in any given year. Designation on maps always includes the letters A or V.
"BASE FLOOD" means the flood having a one percent chance of being equaled or exceeded in any given year. Also referred to as the "100-year flood." Designation on maps always includes the letters A or V.
"BASEMENT" means any area of the building having its floor subgrade (below ground level) on all sides.
"CRAWLSPACE" is an enclosed area below the base flood elevation and as such, must have openings that equalize hydrostatic pressures by allowing for the automatic entry and exist of floodwaters.
"CRITICAL FACILITY" means facilities for which even a slight chance of flooding might be too great. Critical facilities include, but are not limited to schools, nursing homes, hospitals police, fire and emergency response installations, installations which produce, use or store hazardous materials or hazardous waste.
"DEVELOPMENT" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within the area of special flood hazard.
"ELEVATED BUILDING" means for insurance purposes, a non basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.
"EXISTING MANUFACTURED HOME PARK OR SUBDIVISION" means a manufactured home park subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the adopted floodplain management regulations.[5]
"EXPANSION TO AN EXISTING MANUFACTURED HOME PARK OR SUBDIVISION" means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).
"FLOOD" OR "FLOODING" means a general and temporary condition of partial or complete inundation of normally dry land areas from:
(1) The overflow of inland or tidal waters and/or
(2) The unusual and rapid accumulation of runoff of surface waters from any source.

“FLOOD INSURANCE RATE MAP (FIRM)” means the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.
“FLOOD INSURANCE STUDY” means the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map, and the water surface elevation of the base flood.
“FLOODWAY” means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.
“LOWEST FLOOR” means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building’s lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of his ordinance found at Section 5.2-1(2).
“MANUFACTURED HOME” means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term “manufactured home” does not include a “recreational vehicle.”
“MANUFACTURED HOME PARK OR SUBDIVISION” means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.
“NEW CONSTRUCTION” means structures for which the “start of construction” commenced on or after the effective date of this ordinance.
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“NEW MANUFACTURED HOME PARK OR SUBDIVISION” means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of adopted floodplain management regulations.
“RECREATIONAL VEHICLE” means a vehicle, which is:
(a) Built on a single chassis;
(b) 400 square feet or less when measured at the largest horizontal projection;
(c) Designed to be self-propelled or permanently towable by a light duty truck; and
(d) Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.
“REPETITIVE LOSS” means flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such flood event, on the average, equals or exceeds 25 percent of the market value of the structure before damage occurred.
“START OF CONSTRUCTION” includes substantial improvement, and means the date the building permit was issued provided the actual start of construction, repair, reconstruction, placement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement

of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

"STRUCTURE" means a walled and roofed building including a gas or liquid storage tank that is principally above ground.

"SUBSTANTIAL DAMAGE" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. 7

"SUBSTANTIAL IMPROVEMENT" means any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either:

(1) Before the improvement or repair is started; or

(2) If the structure has been damaged and is being restored, before the damage occurred. For the purposes of this definition, "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

The term does not, however, include either:

(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or

(2) Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

"VARIANCE" means a grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by this ordinance.

"WATER DEPENDENT" means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

SECTION 3.0

GENERAL PROVISIONS

3.1 LANDS TO WHICH THIS ORDINANCE APPLIES

This ordinance shall apply to all areas of special flood hazards within the jurisdiction of *city/town/county/tribe*.

3.2 BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD

The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for the *city/town/county/tribe – use county if FIRMs are in countywide format*," dated *month day*, 20*yr*, and any revisions thereto, with accompanying Flood Insurance Maps, and any revisions thereto, are hereby 8 adopted by reference and

declared to be a part of this ordinance. The Flood Insurance Study is on file at *location*. The best available information for flood hazard area identification as outlined in Section 4.3-2 shall be the basis for regulation until a new FIRM is issued which incorporates the data utilized under section 4.3-2.

3.3 PENALTIES FOR NONCOMPLIANCE

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this ordinance and other applicable regulations. Violations of the provisions of this ordinance by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this ordinance or fails to comply with any of its requirements shall upon conviction thereof be fined not more than *$ amount* or imprisoned for not more than *number* days, or both, for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the *city/town/county/tribe* from taking such other lawful action as is necessary to prevent or remedy any violation.

3.4 ABROGATION AND GREATER RESTRICTIONS

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

3.5 INTERPRETATION

In the interpretation and application of this ordinance, all provisions shall be:

(1) Considered as minimum requirements;

(2) Liberally construed in favor of the governing body; and,

(3) Deemed neither to limit or repeal any other powers granted under State statutes.

3.6 WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of *city/town/county/tribe*, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

SECTION 4.0

ADMINISTRATION

4.1 ESTABLISHMENT OF DEVELOPMENT PERMIT

4.1-1 Development Permit Required

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in Section 3.2. The permit shall be for all structures including manufactured homes, as set forth in the “DEFINITIONS,” and for all development including fill and other activities, also as set forth in the “DEFINITIONS.”

4.1-2 Application for Development Permit

Application for a development permit shall be made on forms furnished by the

dept., e.g. Planning, Engineering, etc. and may include but not be limited to plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

(1) Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;

(2) Elevation in relation to mean sea level to which any structure has been floodproofed;

(3) Certification by a registered professional engineer or architect that the floodproofing methods for any nonresidential structure meet the floodproofing criteria in Section 5.2-2; and

(4) Description of the extent to which a watercourse will be altered or relocated as a result of proposed development.

4.2 DESIGNATION OF THE *local administrator*

The *local administrator* is hereby appointed to administer and implement this ordinance by granting or denying development permit applications in accordance with its provisions.

4.3 DUTIES AND RESPONSIBILITIES OF THE local administrator

Duties of the *local administrator* shall include, but not be limited to:

4.3-1 Permit Review

(1) Review all development permits to determine that the permit requirements of this ordinance have been satisfied.

(2) Review all development permits to determine that all necessary permits have been obtained from those Federal, State, or local governmental agencies from which prior approval is required.

(3) Review all development permits to determine if the proposed development is located in the floodway. If located in the floodway, assure that the encroachment provisions of Section 5.3(1) are met.

4.3-2 Use of Other Base Flood Data (In A Zones)

When base flood elevation data has not been provided (A Zones) in accordance with Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD, the (local administrator) shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, in order to administer Sections 5.2, SPECIFIC STANDARDS, and 5.3 FLOODWAYS.

4.3-3 Information to be Obtained and Maintained

(1) Where base flood elevation data is provided through the Flood Insurance Study, FIRM, or required as in Section 4.3-2, obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement.

(2) For all new or substantially improved floodproofed structures where base flood elevation data is provided through the Flood Insurance Study, FIRM, or as required in Section 4.3-2:

(i) Verify and record the actual elevation (in relation to mean seal level), and

(ii) Maintain the floodproofing certifications required in Section 4.1-2(3).

(3) Maintain for public inspection all records pertaining to the provisions of this ordinance.
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4.3-4 Alteration of Watercourses
(1) Notify adjacent communities and the Department of Land Conservation and Development prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.
(2) Require that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.
4.3-5 Interpretation of FIRM Boundaries
Make interpretations where needed, as to exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in Section 4.4.
NOTE: If you do not include Section 4.4 (Variance Procedure), end the above sentence after the word “interpretation,” and add the following sentence: “such appeals shall be granted consistent with the standards of Section 60.6 of the
Rules and Regulations of the National Flood Insurance Program (44 CFR 59-
76).
4.4 VARIANCE PROCEDURE
4.4-1 Appeal Board
(1) The *governing body, e.g. council* as established by *ordinance* shall hear and decide appeals and requests for variances from the requirements of this ordinance.
(2) The *governing body, e.g. council* shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the *city/town/county/tribe* in the enforcement or administration of this ordinance.
(3) Those aggrieved by the decision of the *governing body, e.g. council*, or any taxpayer, may appeal such decision to the *court*, as provided in *ordinance*.
(4) In passing upon such applications, the *governing body, e.g. council* shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and:
(i) The danger that materials may be swept onto other lands to the injury of others;
(ii) The danger to life and property due to flooding or erosion damage;
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(iii) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
(iv) The importance of the services provided by the proposed facility to the community;
(v) The necessity to the facility of a waterfront location, where applicable;
(vi) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
(vii) The compatibility of the proposed use with existing and anticipated development;
(viii) The relationship of the proposed use to the comprehensive plan and flood plain management program for that area;
(ix) The safety of access to the property in times of flood for ordinary and emergency vehicles;

(x) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and,
(xi) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.
(5) Upon consideration of the factors of Section 4.4-1(4) and the purposes of this ordinance, the *governing body, e.g. council* may attach such conditions to the granting of variances as it deems necessary to further the purposes of this ordinance.
(6) The *clerk, planning dept., engineering dept., etc* shall maintain the records of all appeal actions and report any variances to the Federal Insurance Administration upon request.
4.4-2 Conditions for Variances
(1) Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (i-xi) in Section 4.4-1(4) have been fully considered. As the lot size increases the technical justification required for issuing the variance increases.
(2) Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in this section.
(3) Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.[13]
(4) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
(5) Variances shall only be issued upon:
(i) A showing of good and sufficient cause;
(ii) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
(iii) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public as identified in Section 4.1-4(4), or conflict with existing local laws or ordinances.
(6) Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece or property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.
(7) Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except 4.4-2(1), and otherwise complies with Sections 5.1-1 and 5.1-2 of the GENERAL STANDARDS.
(8) Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood

elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

SECTION 5.0

PROVISIONS FOR FLOOD HAZARD REDUCTION

5.1 GENERAL STANDARDS

In all areas of special flood hazards, the following standards are required:

5.1-1 Anchoring

(1) All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

(2) All manufactured homes must likewise be anchored to prevent flotation, collapse, or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques).

5.1-2 AH Zone Drainage

Adequate drainage paths are required around structures on slopes to guide floodwaters around and away form proposed structures.

5.1-3 Construction Materials and Methods

(1) All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.

(2) All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

(3) Electrical, heating, ventilation, plumbing, and air-conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

5.1-4 Utilities

(1) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;

(2) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters; and,

(3) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

5.1-5 Subdivision Proposals

(1) All subdivision proposals shall be consistent with the need to minimize flood damage;

(2) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage;

(3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and,

(4) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or
5 acres (whichever is less).

5.1-6 Review of Building Permits

Where elevation data is not available either through the Flood Insurance Study, FIRM, or from another authoritative source (Section 4.3-2), applications for building permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

5.2 SPECIFIC STANDARDS

In all areas of special flood hazards where base flood elevation data has been provided (Zones A1-30, AH, and AE) as set forth in Section 3.2, BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD or Section 4.3-2, Use of Other Base Flood Data (In A Zones), the following provisions are required:

5.2-1 Residential Construction

(1) New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated at or above the base flood elevation.

(2) Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters.

Designs for meeting this requirement must be either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(i) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

(ii) The bottom of all openings shall be no higher than one foot above grade.

(iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

(iv) Below grade, crawlspaces are prohibited at sites where the velocity of floodwaters exceeds five (5) feet per second.

(v) All building utility systems within the crawlspace shall be elevated above base flood elevation or be designed so that floodwaters cannot enter or accumulate within the system component during flood conditions.

(vi) The interior of a crawlspace below the base flood elevation must not be more than 2 feet below the lowest adjacent exterior grade (LAG) and the height of the below grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation must not exceed 4 feet at any point.

(vii) Below grade, crawlspaces constructed in accordance with the requirements listed in this subsection shall not be considered basements. However, applicants who construct buildings that have below grade crawlspaces are hereby advised that such buildings will have higher flood insurance premiums than buildings that have crawlspaces with interior elevations at or above the lowest adjacent grade.

5.2-2 Nonresidential Construction

New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated

at or above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:
(1) Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
(2) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;
(3) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans.
Such certifications shall be provided to the official as set forth in Section 4.3-3(2);
(4) Nonresidential structures that are elevated, not floodproofed, must meet the same standards for space below the lowest floor as described in 5.2-1(2);
(5) Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g. a building floodproofed to the base flood level will be rated as one foot below.
5.2-3 Manufactured Homes
(1)All manufactured homes to be placed or substantially improved on sites:
(i) Outside of a manufactured home park or subdivision,
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(ii) In a new manufactured home park or subdivision,
(iii) In an expansion to an existing manufactured home park or subdivision, or
(iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred “substantial damage” as the result of a flood; shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated at or above the base flood elevation and be securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.
(2) Manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A1-30, AH, and AE on the community’s FIRM that are not subject to the above manufactured home provisions be elevated so that either:
(i) The lowest floor of the manufactured home is elevated at or above the base flood elevation, or
(ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.
5.2-4 Recreational Vehicles
Recreational vehicles placed on sites are required to either:
(i) Be on the site for fewer than 180 consecutive days,
(ii) Be fully licensed and ready for highway use, on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or
(iii) Meet the requirements of 5.2-3 above and the elevation and anchoring requirements for manufactured homes.

5.3 BEFORE REGULATORY FLOODWAY

In areas where a regulatory floodway has not been designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE on the community's FIRM, unless
it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

5.4 FLOODWAYS

Located within areas of special flood hazard established in Section 3.2 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

(1) Prohibit encroachments, including fill, new construction, substantial improvements, and other development unless certification by a registered professional civil engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge. (2) If Section 5.4(1) is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazard reduction provisions of Section 5.0, PROVISIONS FOR FLOOD HAZARD REDUCTION.

5.5 STANDARDS FOR SHALLOW FLOODING AREAS (AO ZONES)

Shallow flooding areas appear on FIRMs as AO zones with depth designations.
The base flood depths in these zones range from 1 to 3 feet above ground where a clearly defined channel does not exist, or where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is usually characterized as sheet flow. In these areas, the following provisions apply:

(1) New construction and substantial improvements of residential structures and manufactured homes within AO zones shall have the lowest floor (including basement) elevated above the highest grade adjacent to the building, one foot or more above the depth number specified on the FIRM (at least two feet if no depth number is specified).

(2) New construction and substantial improvements of nonresidential structures within AO zones shall either:

(i) Have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, one foot or more above the depth number specified on the FIRM (at least two feet if no depth number is specified); or

(ii) Together with attendant utility and sanitary facilities, be completely flood proofed to or above that level so that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect as in section 5.2-2(3).

(3) Require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.

(4) Recreational vehicles placed on sites within AO Zones on the community's FIRM either:

(i) Be on the site for fewer than 180 consecutive days,
(ii) Be fully licensed and ready for highway use, on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or
(iii) Meet the requirements of 5.5 above and the elevation and anchoring requirements for manufactured homes.

5.6 CRITICAL FACILITY

Construction of new critical facilities shall be, to the extent possible, located outside the limits of the Special Flood Hazard Area (SFHA) (100-year floodplain). Construction of new critical facilities shall be permissible within the
SFHA if no feasible alternative site is available. Critical facilities constructed within the SFHA shall have the lowest floor elevated three feet or to the height of the 500-year flood, whichever is higher. Access to and from the critical facility should also be protected to the height utilized above. Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base flood elevation shall be provided to all critical facilities to the extent possible.

APPENDIX 13 – CAPABILITY ASSESSMENT QUESTIONNAIRES

Agency	Completed 2004	Revised 2007	Completed 2007
Department of Military & Veteran's Affairs			
Division Homeland Security & Emergency Management	☒	☒	☐
Department of Commerce, Community & Economic Development			
Division of Insurance	☒	☒	☐
Department of Environmental Conservation			
Division of Spill Prevention and Response (SPAR)	☒	☒	☐
Department of Health & Social Services			
Community Health and Emergency Medical Services	☒	☐	☐
Department of Fish & Game	☐	☐	☐
Department of Natural Resources			
Division of Forestry	☐	☐	☐
Division of Geological & Geophysical Surveys	☒	☒	☐
Division of Mining, Land & Water	☒	☒	☐
Department of Public Safety			
Division of Fire Protection	☐	☐	☐

Agency	Completed 2004	Revised 2007	Completed 2007
Alaska State Troopers	☐	☐	☐
Department of Law	☐	☐	☐
Department of Education & Early Development	☐	☐	☐
Department of Corrections	☐	☐	☐
Department of Transportation			
Division of Design & Engineering Services, Bridge section	☒	☒	☐
National Oceanic & Atmospheric Administration			
Tsunami Warning Center	☐	☐	☒
Office of the Governor			
Office of Governmental Coordination	☒	☐	☐
University of Alaska – Fairbanks	☐	☐	☐
United States Geological Survey	☒	☒	☐
Mat-Su Borough	☐	☐	☐
Planning Department	☒	☒	☐
City of Seward	☒	☒	☐
Denali Commission	☒	☐	☐

ALASKA DIVISION ON HOMELAND SECURITY AND EMERGENCY MANAGEMENT

2007 AGENCY CAPABILITY ASSESSMENT QUESTIONNAIRE:

U.S.GEOLOGICAL SURVEY

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

As the science agency for the Department of the Interior (DOI), the USGS collects, monitors, analyzes, and provides scientific information in support of sound management of our nation's earth and biological resources and in support of public safety.

In Alaska, the USGS plays a key role in hazard mapping, identification, and early warning for many natural hazards addressed in the State plan with a primary focus on floods, earthquakes, volcanic eruptions, landslides, and tsunami. Much of this work is carried out in cooperation with other Federal and state agencies. In addition, USGS science programs in biological sciences provide key baseline and monitoring data regarding ecosystem health and other key biological indicators of potential ecological disasters. For all hazards, USGS can provide a wide array of geospatial data and information management expertise to facilitate hazard identification, mitigation planning, and all phases of emergency response and recovery.

USGS conducts research activities that support hazard characterization or mitigation concerning eruptions, earthquakes, tsunamis, landslides, floods, ground water quantity and quality, droughts, coastal storms, wildfires, geomagnetic storms, fish and wildlife diseases, climate change, and invasive species. USGS science assesses where natural hazards may occur and what the risks are to people, property, and ecosystems in harm's way. The USGS works cooperatively with Federal, State, and local agencies to assist in early warning and emergency response when natural catastrophes strike. USGS provides information needed by the public to understand the hazards in and around their community and to help mitigate losses and damages when they occur.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

Decrease

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

<u>Earthquakes:</u>

USGS provides significant funding to the Alaska Earthquake Information Center at the

Geophysical Institute in Fairbanks (AEIC) and operates the national equivalent, NEIC (the USGS National Earthquake Information Center) in Golden, Colorado. Both groups detect, and report the size and location of significant earthquakes in Alaska. USGS has a close working relationship with the

West Coast/Alaska Tsunami Warning Center (WCATWC), sharing data and working together on common data acquisition and analysis needs. The WCATWC routinely locates earthquakes in Alaska as part of their mission to detect and warn of earthquake-generated tsunamis.

USGS also disseminates educational information about Alaska earthquakes and seismic hazard to the public, media, and other government agencies. As part of this effort, USGS scientists conduct outreach to educate the public and private sector about earthquake hazards. A notable accomplishment in this area was the USGS role in production of an informative earthquake-hazard newspaper insert that appeared in the Anchorage Daily News and is now easily available on-line at

USGS is the lead agency behind the Advanced National Seismic System (ANSS), an ongoing program to modernize the nation's seismograph networks in order to provide real time ground shaking analysis for emergency response agencies, to provide detailed site response information for improving earthquake engineering and building codes, and to provide high quality data to seismologists studying earth processes and earthquake dynamics. ANSS is a cooperative program and, in Alaska, USGS works in partnership with a broad cross section of agencies and organizations including ADGGS, AEIC, WCATWC, emergency management agencies, and a variety of private engineering firms. In 2001, ANSS upgraded existing urban seismic stations operated by the USGS National Strong Motion Program and, along with AEIC, is providing support to integrate that data with the Anchorage Strong Motion project operated by the UAFGI and largely funded by the now defunct Alaska Science and Technology Foundation.

In support of seismic hazard mapping, USGS has published probabilistic seismic hazard maps for the state of Alaska. Through its National Earthquake Hazard Reduction Program (NEHRP), USGS contributes to an ongoing ADGGS project to compile geotechnical borehole data and deep water well logs for the Anchorage area. In addition, USGS funding supports UAFGI and ADGGS effort to compile a modern seismic microzonation map for the Anchorage municipality. Important revisions to the 1999 seismic hazard map for Alaska (led by Robert Wesson, USGS Golden, CO) are nearing completion.

USGS earth scientists, in cooperation with state, private, and academic institutions, conduct scientific research and geological mapping that improve our understanding of seismogenic potential and earthquake history in Alaska. Current projects focus on understanding the seismic hazards associated with the Denali Fault system – understanding its slip rate, timing of the most recent earthquakes and amount of slip in those earthquakes. Work in the near future will focus on the hazard of the eastern Denali Fault system, parallel to one of the proposed natural gas pipeline routes.

Finally, as outlined in the Federal Response Plan (FEMA: 9230.1-PL, April 1999), USGS will play a significant role in the federal government's planning for and response to any earthquake disaster in Alaska. Additional duties of USGS as part of a coordinated Department of the

Interior Natural Disaster Response Plan for Alaska focus on (1) minimizing the loss of DOI life and property and (2) assisting the State of Alaska with Federal response activities.

Wildfires:

USGS mitigation-related programs related to wildfire hazards include on-demand acquisition, analysis, and production of imagery and maps for fire planning and response, as well as research into the effects of wildfires on ecosystems. The National Mapping Discipline of USGS has the capacity to generate a wide variety of image and map information that can provide Federal and State managers with assessments of vegetation characteristics pre- and post-fire, as well as snapshot views of ongoing fires of interest.

In Alaska and in the lower 48 states as well, USGS produces a composite vegetation greenness map every two weeks that provides wildland fire agencies with up-to-date information on the status of vegetation in terms of its relative capacity to burn. The Normalized Derived Vegetation Index (NDVI) map is produced by analyzing NOAA AVHRR satellite imagery for a two week period and producing a composite map that shows the relative green-up and/or senescence of vegetation over large regional areas. When combined with current weather and fuel moisture information, fire management agencies are able to provide warnings on the relative fire danger as well as plan for response if a fire is started.

The USGS is also involved in the development of remote sensing technologies through the National Land-Fire Program that will provide much more accurate, cost effective, and timely maps of fire fuel types and quantities. By correlating recent Landsat-7 Satellite imagery with ground truth information from samples from across the landscape, scientists are developing fuel maps that provide information on community type, community canopy structure, and fuel size that will provide fire planners with the most accurate maps for large regional areas that have ever existed. These maps will allow for better prescriptions for fuels management, fire prevention, fire response and management. When combined with accurate and current ortho-imagery, roads, trails and terrain information, a whole new generation of decision support tools will be available.

USGS scientists also examine wildfire impacts to inform fire management policies of other agencies. The USGS-Alaska Science Center and the Alaska Department of Fish and Game-Division of Wildlife Conservation (ADF&G) is conducting a 5-year investigation of the impact of boreal forest fires on the Nelchina Caribou Herd in south-central and interior Alaska. This collaborative effort will evaluate relationships between fire history and lichen abundance; caribou habitat selection relative to lichen abundance; and caribou nutritional performance relative to habitat selection, lichen abundance, and spatial distribution. Results of this study will provide information directly applicable to caribou and fire management in Alaska.

Floods:

USGS hydrologists in Alaska have a comprehensive program of stream gauging to determine water levels, discharge, and assessment of flood impacts statewide. This information is used to determine flood frequencies and magnitudes along rivers and streams throughout the state.

The USGS currently maintains about 88 full time stream-gauging stations in Alaska and about 40 "partial-record" stations used for peak flow data collection. The data for some of these sites is available in real-time and is used by other agencies to issue official flood warnings. Historical surface-water data are available in a computerized data base for about 2,600 sites. Stream flow data collected by the USGS are used by Federal, State and local water-resource managers for fisheries management, flood forecasting, and low-flow water availability information, as well as by recreational users such as rafters, kayakers, and fishermen. USGS surface-water data are used to help design bridges and culverts and are used for flood-frequency calculations needed by Federal, State and local planners.

USGS hydrologic monitoring and research efforts also focus on the hazard associated with glacier outburst floods, a process of special concern in Alaska. USGS hydrologists are continually refining models for flood generation and potential inundation to improve the ability to assess risk and guide development planning.

USGS hydrologists in Alaska also conduct surveys of bridge sites to analyze the status and potential for damaging bridge-scour. Such information helps in assessment of bridges vulnerability during future floods.

Volcano Hazards

The USGS is the lead partner in the Alaska Volcano Observatory (AVO) a joint program of the USGS, the Geophysical Institute of the University of Alaska Fairbanks (UAFGI), and the State of Alaska Division of Geological and Geophysical Surveys (ADGGS). AVO was formed in 1988, and uses federal, state, and university resources to monitor and study Alaska's hazardous volcanoes, to predict and record eruptive activity, and to mitigate volcanic hazards to life and property.

AVO has three primary objectives related to volcano hazard mitigation:

- To conduct monitoring and other scientific investigations in order to assess the nature, timing, and likelihood of volcanic activity;
- To assess volcanic hazards associated with anticipated activity, including kinds of events, their effects, and areas at risk; and
- To provide timely and accurate information on volcanic hazards, and warnings of impending dangerous activity, to local, state, and federal officials and the public.

As of December 2006, AVO maintains seismic monitoring networks on 30 of Alaska’s more than 40 active volcanoes. Data from these networks are recorded 24 hours per day and examined for precursory signs of eruptive activity. Several times a day, AVO also examines satellite images of Alaskan and Russian volcanoes for signs of eruptive activity or possible precursory heating of the ground. These two primary data streams are used routinely to assess the likelihood and character of volcanic activity. Additional monitoring methods such as space-based satellite radar interferometry and real-time GPS, are increasingly promising techniques.

AVO maintains a close operational link to the Kamchatkan Eruption Response Team (KVERT) located in Petropavlovsk-Kamchatsky and with the Sakhalin Eruption Response Team (SVERT) in Yuzhno-Sakhalinsk. AVO assists KVERT in satellite monitoring of Kamchatkan volcanoes

and also plays a key role in disseminating eruption warnings from Kamchatka and the Kuriles.

AVO scientists publish scientific research on volcanic processes and individual hazard assessments of dangerous Alaskan volcanoes. Hazard assessments have been published for 15 Alaskan volcanoes and all are available for download on the AVO web site. Each report contains a description of the hazards posed by these volcanoes and the likely effects of future eruptions.

AVO regularly disseminates information about the status of volcanoes in Alaska and neighboring Kamchatka. Each week, AVO distributes a written status report to more than 100 recipients at federal, state, local agencies, the media and the public via Internet, fax, our web site, and recorded message line. During volcanic crises or if precursors to eruptive activity are noted, AVO follows a rigid emergency call-down protocol as well as Internet and fax outlets to notify authorities, the media, the aviation industry, and the public. These procedures are codified in an Alaska Interagency Plan for Volcanic Ash Episodes (signatories include USGS, National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS), Federal Aviation Administration (FAA), Department of Defense/US Air Force (DOD/USAF), and the Alaska Department of Emergency Services (AKDES) and the US Coast Guard (USCG). AVO scientists also engage in a vigorous outreach program to classrooms, communities, and other agencies to inform and update awareness of volcano hazards in the region.

Of particular note is the special hazard Alaskan volcanoes pose to aircraft over flying the North Pacific and/or landing at Ted Stevens International Airport, one of the busiest air cargo hubs in the world. Each day, more than 20,000 passengers and many millions of dollars in cargo fly in corridors potentially affected by sudden explosive eruptions in Alaska or neighboring Kamchatka. AVO's early warning and response program is specifically geared to address this hazard and it has become a model emulated at many observatories around the world.

Landslides:

As one of a number of hazards being evaluated, USGS is working cooperatively with ADGGS and many local, corporate, and community representatives to identify geological hazards and engineering issues, including the potential for landslide events, along the State of Alaska-preferred gas-line route. This work began with surficial geologic mapping and will be expanded in coming years to include development of a digital database of maps and three-dimensional GIS coverages related to sound management of this economically critical corridor. A map of potential earthquake-induced landslide susceptibility in the Anchorage bowl is also in preparation and is being led by Randy Jibson of the USGS.

Tsunami:

Tsunami warning is the responsibility of NOAA's West Coast/Alaska Tsunami Warning Center (WCATWC) in Palmer and tsunami hazard assessment and potential inundation mapping in Alaska is primarily a partnership between NOAA's Tsunami Mitigation Program and the Alaska Earthquake Information Center at the University of Alaska Fairbanks. USGS assists in the mission of WCATWC by sharing earthquake location technology and in evaluating non-seismogenic tsunami processes (e.g. volcanic landslides and debris flows) that can also

generate hazardous waves. USGS scientists are working on identifying and modeling several possible paleo-tsunamis in Alaska. This work will improve our understanding of tsunami recurrence and potential inundation zones. Importantly, in 2006, USGS worked with the WCATWC to develop tsunami alert protocols for erupting Augustine Volcano in lower Cook Inlet.

An underappreciated hazard is submarine landslide induced tsunamis, which the WCATWC can not provide advanced warning for. These killed more people in the 1964 earthquake than any other single cause. The USGS has been studying these landslides to understand their origin and the likelihood of future slides. This work is in support of the Alaska Tsunami Inundation Project and in collaboration with the UAF/GI, where the data we obtain on the 1964 slides are being used as test cases to examine the predictive ability of computer models of tsunami inundation. The USGS is also providing integrated topographic and bathymetric data sets.

Erosion:

USGS hydrologists are actively engaged in studies related to riverbank erosion in selected high-use systems (e.g. the Alagnak, Kenai Rivers) and bridge scour at selected sites chosen in cooperation with state and local partners.

Biological:

Ongoing USGS scientific programs in the biological sciences pertain to many important ecological issues in Alaska such as ecosystem change, environmental toxins, impacts of hatchery enhancement on wild stocks of Pacific salmon, and other key aspects of overall health of the Alaska environment. While not related to acute hazards to life and property in Alaska, these studies pertain to potentially severe, long term biological and economic hazards threaten our State. Much of this work is done cooperatively with other agencies and university researchers.

For example, in order to better understand the significance of modern ecological perturbations, USGS researchers are engaged in studies of Holocene Alaskan climate and ecosystem change as expressed in the floral and faunal record. Significant USGS resources are devoted to gathering baseline data for ongoing monitoring of such important ecological indicators as carbon and nitrogen phases in river water and population trends of indicator species in both marine and terrestrial arctic and sub arctic environments in Alaska.

A number of USGS science programs also examine the origin, mobility, and toxicity of potentially dangerous trace elements and metals such as arsenic, mercury, cadmium, lead, selenium.

4. Does your organization own or manage lands or buildings in:
   a) 100-yr floodplain
   b) earthquake fault area
   c) landslide/mudslide area
   d) coastal area

e) areas subject to other hazards

If the answer is yes, what measures are being taken to protect these investments or structures?

No, the U.S. Geological Survey is not a land or building management agency. The General Services Administration is responsible for our building usage.

5. With what Federal, state, local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

PARTIAL LISTING:

Federal:

National Oceanic and Atmospheric Administration/National Weather Service
West Coast/Alaska Tsunami Warning Center
Federal Aviation Administration
Department of Defense/US Air Force
US Coast Guard
US Fish and Wildlife Service
National Park Service
Environmental Protection Agency
US Agency for International Development

State:

Alaska Earthquake Information Center
University of Alaska Anchorage
University of Alaska Fairbanks
Department of Environmental Quality
Geophysical Institute University of Alaska Fairbanks
State of Alaska Division of Geological and Geophysical Surveys
Alaska Department of Fish and Game-Division of Wildlife Conservation
Alaska Department of Emergency Services
Alaska Department of Transportation
Ted Stevens International Airport

Borough/Municipal:

Municipality of Anchorage
Kenai Borough
Lake and Peninsula Borough
Mat-Su Borough

Local/Private/Hybrid/Other:

Many individual communities, school districts in Alaska
Many Alaska Native Corporations in southwest Alaska and the Aleutians
Anchorage Daily News
Local radio and community/regional newspapers

Many Individual Air Carriers, local, regional, national, international
Drift River Oil Terminal
Canneries
Advanced National Seismic System
Anchorage Geotechnical Commission
Alaska Air Carriers Association

International:

Kamchatka Volcanic Eruption Response Team
Sakhalin Volcanic Eruption Response Team
Russian Academy of Sciences
International Civil Aviation Organization
Airline Pilots Association
Air Transport Association

6. Describe any problems in coordination among Federal, state, and local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

No answer

7. What are your organization's authorities?

Congress included natural hazard mitigation in the USGS' mandate in 1974 with passage of the Stafford Disaster Relief and Emergency Assistance Act. The Act, as amended, states, "The Director of the USGS, though the Secretary of Interior, has been delegated the responsibility to issue disaster warnings…for an earthquake, volcanic eruption, landslide, or other geological catastrophe."

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

No answer

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

See prior answers.

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

USGS is a signatory and participant in the Alaska DOI Disaster Response Plan that entails actions that USGS representatives take following natural disasters.

11. Are public opinion and input used to build support for the agency's mitigation programs?

Yes; various communities and industry sectors in Alaska and the North Pacific are primary supporters of our hazard mitigation work on a day to day basis. Residents of communities at risk from natural hazards and affected by natural events communicate with USGS staff directly, helping to shape our priorities and to justify our work.

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

No answer

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives are funding solutions should be explored to expand funding availability?

No answer

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

Alaska generally lacks detailed, modern, stereo aerial photography of many regions of interest to USGS scientists evaluating various hazards. Concurrently, Alaska lacks adequate topographic maps at scales necessary to conduct detailed investigations including the generation of high quality digital elevation models. This is especially true of remote areas such as the volcanic islands of the Aleutians and vast regions of the interior. Similarly, baseline geologic studies are for most places complete at a reconnaissance level only.

15. List any other issues, problems, or ideas related to the following categories:
    a) materials incidents
    b) Communication and warning
    c) Dam safety
    d) Emergency preparedness
    e) Floodplain management
    f) Geologic hazard mitigation
    g) Hazardous Land use
    h) Public information/education

No answer

16. Please include any general observations or problems which may not have been covered by this questionnaire.

No answer

ALASKA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MINING, LAND AND WATER

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

The Dam Safety and Construction Unit (Dam Safety) "supervises the safety of dams and reservoirs" in order to "ensure that the design, construction, enlargement, alteration, repair, maintenance, operation, and removal of dams and reservoirs is consistent with the protection of life and property" (AS46.17). The published mission statement of the Alaska Dam Safety Program is "to protect life and property in Alaska through the effective collection, evaluation, understanding and sharing of the information necessary to identify, estimate and mitigate the risks created by dams." Article 3, Dam Safety, of Chapter 93 in Title 11 of the Alaska Administrative Code includes a hazard potential classification based on the risks created by the dam and reservoir. In practice, the higher risk structures are subjected to a greater degree of regulatory review, thereby decreasing the vulnerability to a relatively high, technological hazard. Dam Safety is responsible for issuing certificates of approval to construct, operate, modify, repair, remove or abandon a dam. Dam Safety promotes public awareness of this technological risk through a variety of methods including websites, publications, classroom lectures, and multimedia presentations.

Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

The responsibilities briefly outlined under #1 serve to decrease and mitigate the potential for future losses to natural disasters in Alaska by influencing the design standards for dams and reservoirs subject to natural disasters such as floods and earthquakes.

2. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

The Alaska Dam Safety Program is responsible for supervising the safety of approximately 85 dams under state jurisdiction, including applications for new construction of state-jurisdictional dams. Non jurisdictional dams that are known to exist are periodically reviewed to determine if a change in jurisdiction has occurred, for example, due to new development downstream of an existing dam.

3. Does your organization own or manage lands or buildings in:
   a) 100-yr floodplain,
   b) earthquake fault area
   c) landslide/mudslide area
   d) coastal area

e) areas subject to other hazards

If the answer is yes, what measures are being taken to protect these investments or structures?

Yes to (a) through (e). Dam Safety is responsible for the supervision of the safety of dams across the state of Alaska. The natural hazards associated with the locations of these dams are not catalogued; however, the permitting process is intended to identify and mitigate the risks created by these types of hazards through a technical review of hydrology, geology, seismic zone, and other technical considerations. New construction must meet new design standards. Existing dams are reviewed through a periodic safety inspection that is required every three to five years. The purpose of the periodic safety inspection is to identify potential problems that could lead to the failure of the dam and determine if remediation or mitigation is required.

4. With what Federal, State, Local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

Dam Safety regularly works with FEMA and the Association of State Dam Safety Officials (ASDSO) on a national level and occasionally with the National Weather Service. On a state level, Dam Safety works with the ADHS&ES, the ADEC and the ADF&G. Locally, Dam Safety tries to work with local emergency response agencies through dam owners and operators who are required to develop and exercise an Emergency Action Plan for Class I (high) and Class II (significant) hazard potential dams. Dam Safety encourages dam owners and operators to include local emergency response agencies as key players in responding to real and simulated emergencies associated with the dam.

5. Describe any problems in coordination among Federal, State, and Local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

The technological hazard created by dams often seems to be overlooked or underestimated. There is a serious need for mitigation funding for the rehabilitation of deteriorating or poorly designed dams.

The biggest problem in working with the various federal, state, and local agencies is communicating and understanding the roles that various parties play. This is most acute at a local level where perceived priorities, project understanding, and financial and human resources limit the ability of the various participants to coordinate effectively.

6. What are your organization's authorities?

The Alaska Dam Safety Program mitigates the technological hazard of dams through a regulatory process that includes maintaining an inventory of dams in Alaska, issuing permits for the construction, operation, repair, modification, removal and abandonment of dams, and supervising the periodic safety inspection and emergency action planning for dams. If necessary, the State Dam Safety Engineer is authorized to seek legal injunctions through the Attorney General's office or, in an emergency, to enter property and take whatever action is deemed as necessary to "protect life and property from the risks posed by the dam's operation

or potential failure".

7. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

AS 46.17 and Article 3 of 11 AAC 93 establishes the authority of the Alaska Dam Safety Program. Originally effective in 1987 and 1989 respectively, the regulations were revised extensively in 2003 and 2004 and the current version of the regulations became effective in October 2004.

8. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

The Alaska Dam Safety Program includes technical review of dam projects to determine the ability of the structure to withstand extreme natural occurrences such as low frequency rainfall or seismic events. The possibility always exist that a natural event occurs that exceeds the limit of the structure, possibly resulting in the compounding effect of a technological disaster on top of a natural disaster.

9. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

Current dam safety regulations require owners and operators of dams to develop and exercise emergency action plans at Class I and II dams. These plans are intended to anticipate an emergency condition at a dam from various causes, including natural disasters, in order to prevent or reduce the potential losses from a partial or complete failure of the dam.

Dam Safety recently published "Guidelines for Cooperation with the Alaska Dam Safety Program" (2005). This document is a compendium of information regarding the Alaska Dam Safety Program and includes recommendations for minimum standards for dam design, construction and operation such as hydrologic and seismic evaluations, construction quality assurance and emergency action planning.

10. Are public opinion and input used to build support for the agency's mitigation programs?

The focus of Dam Safety is primarily on a technical perspective of dams and reservoirs. Consideration of the social and economic impacts of a dam is not within the scope of the Alaska Dam Safety Program. Consequently, there is no public comment opportunity in the permitting process. However, the proposed revisions to the dam safety regulations were released for public review and comment. In addition, the program is administered on a cooperative basis in order to foster communication and good will. Public awareness of the concept of dam safety is promoted.

11. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

The staff of Dam Safety consists of one Technical Engineer II. This individual is responsible for supervising the safety of over 80 dams in Alaska, as well as the technical review of all applications for new construction that may be submitted. The result is a "fireman's job" where limited resources must be allocated to projects with a perceived high priority. AS 46.17 authorizes Dam Safety to retain a contractor to assist with technical reviews; however, this is practical only with a new application that has a sufficient fee to cover the associated costs. (This also adds administrative responsibilities to the workload that further interferes with the technical engineering responsibilities of the job.)

Because the number of dams in Alaska is small in comparison to other states, a large dam safety staff is not be justified. However, an Engineering Assistant I or II would be a direct benefit with mitigating affects on dam hazards. This would result in a total staff of two engineers in the Alaska Dam Safety Program. The additional cost would be associated salary and benefits. The risk associated with limited technical staff was identified in a peer review of the Alaska Dam Safety Program conducted by ASDSO in 2002.

12. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives or funding solutions should be explored to expand funding availability?

Existing funding for the Alaska Dam Safety Program is not adequate for the salary and benefits of the current staff level of one Technical Engineer II. Additional funds are necessary for travel expenses to allow reasonable and regular field inspections. Field inspections are imperative in order to evaluate site conditions and increase project understanding. At a minimum, the state general fund budget should fully support this important hazard mitigation program.

Current financial assistance through the National Dam Safety Program is limited. The Small Watershed Rehabilitation Act was recently funded, but Alaska does not have any dams that qualify for financial assistance under the bill. Similar financial support for a more broad range of dams in need of hazard mitigation related rehabilitation is a current subject of discussion on a national level, and should be discussed on a state level also.

13. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

Yes. Determining the risk associated with a particular facility requires access to a broad range of technical information that is often not available. Obtaining this information can be a costly and time-consuming operation. For example, construction records may not be available for an old dam. To fully understand the ability of the structure to withstand an earthquake may require a geotechnical investigation of the dam and its foundation, a site specific seismic assessment, and a structural stability evaluation. Collecting this type of information could easily cost over $100,000. A number of dam owners in Alaska simply lack the funding to fully understand the

risks created by their dams.

14. List any other issues, problems, or ideas related to the following categories:

    a) Communication and warning:
    b) Dam safety:
    c) Emergency preparedness:
    d) Floodplain management:
    e) Geologic hazard mitigation:
    f) Hazardous materials incidents:
    g) Land use:
    h) Public information/education:

All of the subjects listed under this question are related to the Alaska Dam Safety Program to a degree, as indicated in the following discussion.

Dam Safety is strong advocate of communication as the key to a safe dam. Effective communication must occur between regulatory agencies and the dam owners and operators during all phases of a project, from conception through construction and during operation. In addition, potentially affected parties must be included during emergency planning and response. The requirement for an emergency action plan is the first step in emergency preparedness, which is an important element in the emergency action planning process.

Floodplain management and land use are important considerations in dam hazard mitigation. Dams have the potential for dramatic impacts on floodplains, both positive and negative, and should be considered in any floodplain management plan. Class I dams in Alaska are being required to follow FEMA guidelines for emergency action plans, which includes a downstream inundation map. Restrictions on downstream development based on this information would be a positive contribution to dam hazard mitigation. However, the pros and cons of this concept are subject to much discussion and controversy. Nevertheless, including dams and dam inundation zones on FEMA floodplain maps and requiring consideration of dams to be included in real estate disclosure laws could accomplish this objective.

Hydrologic and geologic hazards are considered in the technical review of dams during the design and periodic safety inspection processes. However, a comprehensive assessment of these hazards on all of the dams in the state inventory is incomplete.

Hazardous materials incidents are related to dam safety with respect to tailings dams at mines. The nature of these dams is typically such that a failure has the potential for adverse environmental impacts. Hazardous material incidents could also occur during construction of a dam, however, Dam Safety typically relies on other authorities such as oil spill regulations to address this hazard although a pollution control plan may be required as a condition to a certificate of approval for construction of a dam.

The concept of dam safety in Alaska currently suffers from relative obscurity from a public awareness perspective. Many Alaskans are not aware of dams in Alaska or the Alaska Dam Safety Program. Dam Safety has increased public awareness by promoting the National Dam Safety Awareness Day, hosting the Western Region Conference of the Association of State

Dam Safety Officials, and providing local training opportunities for dam owners and operators, consultants, regulators, and emergency managers.

15. Please include any general observations or problems which may not have been covered by this questionnaire.

No further comments.

DEPARTMENT OF COMMERCE, COMMUNITY & ECONOMIC DEVELOPMENT

DIVISION OF INSURANCE

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc

The Division of Insurance provides consumers with assistance and referrals in finding insurance for dwellings and against most of the named perils. Some perils are excluded from most policy coverage such as landslides and earth movements, we then can advise the consumers of the non-standard markets that may offer some of the needed coverage. In addition, we do provide policy makers with critical information as to the availability of coverage and the health of the insurance markets. In cases where the insurance market has identified high risk through lack of availability and higher prices, the Division has testified to policymakers on ways to reduce the underlying risks.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

Our actions decrease the potential for future financial losses from natural disasters for our consumers.

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

The Division of Insurance provides information to the public for knowledgeable management of their insurance affairs. With the information people can obtain insurance and financially protect themselves from the consequences of some the hazards.

4. Does your organization own or manage lands or buildings in:
   a) 100-yr floodplain
   b) earthquake fault area
   c) landslide/mudslide area
   d) coastal area
   e) areas subject to other hazards

If the answer is yes, what measures are being taken to protect these investments or structures?

The Division of Insurance does not own or manage lands.

5. With what Federal, state, local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

The Division of Insurance is not involved in these activities.

6. Describe any problems in coordination among Federal, state, and local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

The Division of Insurance is not involved in these activities.

7. What are your organization's authorities?

The Division of Insurance regulates the insurance industry. Our regulations and statutes provide for the public protection in regards to the way insurance companies handle claims and provide insurance to the Alaska consumers.

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

The Division of Insurance's statutes and regulation deal indirectly with the above mentioned situations through the regulation of insurers. We believe that our regulations are adequate to accomplish this task.

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

The Division of Insurance has no direct involvement in these matters.

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

The Division of Insurance has internal procedures to assure the continuation of the operation of this Division in case of a natural disaster and requires insurance agencies and insurers to be prepared for a natural disaster to be able to serve the public.

11. Are public opinion and input used to build support for the agency's mitigation programs?

This question is not applicable to the Division of Insurance.

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

The Division of Insurance staff absorbs present mitigation activities into their daily workload.

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives are funding solutions should be explored to expand funding availability?

The Division of Insurance's limited mitigation activity is not directly funded but is included in the Divisions' operation.

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

The Division of Insurance does not experience any difficulties in this matter.

15. List any other issues, problems, or ideas related to the following categories:

a) Communication and warning
b) Dam safety
c) Emergency preparedness
d) Floodplain management
e) Geologic hazard mitigation
f) Hazardous materials incidents
g) Land use
h) Public information/education

The Division of Insurance has no comments

16. Please include any general observations or problems which may not have been covered by this questionnaire.

The Division of Insurance has no comments

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPIL PREVENTION AND RESPONSE (SPAR)

2007 ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding

of housing or infrastructure, development of codes or standards, public education, etc.

It is the policy of the state to conserve, improve, and protect its natural resources and environment and control water, land, and air pollution, in order to enhance the health, safety, and welfare of the people of the state and their overall economic and social well being.

DEC's Division of Spill Prevention and Response (SPAR) prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment. The three goals of SPAR's mission are:

1. Spill prevention – making the system safer,
2. Preparedness – making industry and government's ability to prepare and respond to spills "better", and
3. Response – keeping Alaska cleaner.

DEC's Division of Environmental Health (EH) deals with the basics: safe drinking water, food and sanitary practices. EH's goal is to provide businesses with clear standards so that they can protect our environment and provide safe food and drinking water to Alaskans.

DEC's Division of Water mission is to improve and protect water quality. In keeping with this mission, the division:

- Establishes standards for water cleanliness;
- Regulates discharges to waters and wetlands;
- Provides financial assistance for water and wastewater facility construction, and waterbody assessment and remediation;
- Trains, certifies and assists water and wastewater system operators; and
- Monitors land reports on water quality.

DEC's Division of Air Quality is designed around three programs: managing non-point and mobile sources of air pollution; managing stationary out-of-stack discharges of air pollution through a permit and compliance program; and field air monitoring to measure progress and understand problems.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

ADEC encourages consideration of the impacts of potential natural disasters through the plan review process for regulated construction projects and contingency plans, however, we do not have the regulatory authority to mandate mitigation measures.

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

ADEC encourages consideration of the impacts of potential natural disasters through the plan review process for regulated construction projects and contingency plans, however, we do not have the regulatory authority to mandate mitigation measures.

4. Does your organization own or manage lands or buildings in:
   a) 100-yr floodplain,
   b) earthquake fault area
   c) landslide/mudslide area
   d) coastal area
   e) areas subject to other hazards

If the answer is yes, what measures are being taken to protect these investments or structures?

No.

5. With what Federal, State, Local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

ADEC works with all other State and Federal agencies, and local jurisdictions as needed.

6. Describe any problems in coordination among Federal, State, and Local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

N/A

7. What are your organization's authorities?

Alaska Statutes, Title 46.

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

ADEC has adequate authority to carry out its mission.

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

No

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

N/A

11. Are public opinion and input used to build support for the agency's mitigation programs?

N/A

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

N/A

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives or funding solutions should be explored to expand funding availability?

N/A

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

N/A

15. List any other issues, problems, or ideas related to the following categories:
    a) Communication and warning:
    b) Dam safety:
    c) Emergency preparedness:
    d) Floodplain management:
    e) Geologic hazard mitigation:
    f) Hazardous materials incidents:
    g) Land use:
    h) Public information/education:

None

16. Please include any general observations or problems which may not have been covered by this questionnaire.

None

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

According to Alaska statute 41.08.020, the Division of Geological & Geophysical Surveys (DGGS) is charged with conducting "...geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources; the locations and supplies of groundwater and construction materials; the potential geologic hazards to buildings, roads, bridges and other installations and structures..." With regard to geologic hazards, the Division identifies, describes, and maps geologic hazards in areas where it is funded to do so by the legislature or external sources. The Division's activities also include identification of some geologic hazards on geologic maps that it produces for other purposes such as mineral or energy resource assessment.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

The responsibilities of DGGS with regard to mapping and identifying natural hazards will, if the information is properly used, decrease potential for future losses to natural disasters by improving public knowledge about the location and nature of hazards. This information is useful for prioritizing mitigation resources by identifying areas where the resources should be concentrated to reduce risks.

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

DGGS produces maps and reports that identify, locate, and describe hazards from earthquakes, volcanoes, landslides, active faults, tsunamis, and snow avalanches, as well as general engineering-geologic information on rocks and soils. Knowing where hazards are and their severity is the first step in reducing vulnerability.

4. Does your organization own or manage lands or buildings in:
   a) 100-yr floodplain - No
   b) earthquake fault area - No
   c) landslide/mudslide area - No
   d) coastal area - No
   e) areas subject to other hazards - No
   If the answer is yes, what measures are being taken to protect these investments or structures?

5. With what Federal, state, local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?
   - Division of Homeland Security & Emergency Management (DMVA)
   - Department of Commerce, Community and Economic Development
   - Department of Transportation and Public Facilities
   - State Pipeline Coordinators Office (DNR)
   - Division of Mining, Land, and Water (DNR)
   - Office of Project Management and Permitting/ACMP (DNR)
   - Municipality of Anchorage Geotechnical Advisory Commission
   - Other municipal governments

- Native corporations
- Geological and engineering consultants
- U.S. Geological Survey
- Federal Emergency Management Agency
- National Oceanic & Atmospheric Administration

6. Describe any problems in coordination among Federal, state, and local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

These activities can always be better coordinated.

7. What are your organization's authorities?

The Division of Geological & Geophysical Surveys receives its authority from Alaska statute:

AS 41.08.020 Powers and duties. (a) The state geologist shall conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources; the locations and supplies of groundwater and construction materials; the potential geologic hazards to buildings, roads, bridges, and other installations and structures; and shall conduct such other surveys and investigations as will advance knowledge of the geology of the state. With the approval of the commissioner, the state geologist may acquire, by gift or purchase, geological and geophysical reports, surveys, and similar information.

(b) In addition, the division of geological and geophysical surveys shall [with regard to geologic hazards]: (6) collect, evaluate, and distribute geologic data on seismic events and engineering geology of the state; (7) identify potential seismic hazards that might affect development in the state; (8) inform public officials and industry about potential seismic hazards that might affect development in the state.

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

Current statutory authorities and regulations are adequate for the activities of this division with regard to natural hazards.

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

DGGS publishes maps and reports containing information on the location and severity of geologic hazards in Alaska. This information can be used by the public and appropriate authorities help reduce potential losses from natural disasters. DGGS also provides consultation to other agencies and the public on geologic-hazards issues for which there may not be published information.

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

No to both

11. Are public opinion and input used to build support for the agency's mitigation programs?

Yes

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

Maps and reports on geologic hazards could be produced at a faster rate with additional staff and operational funding. Long-term support would have to come from the state legislature.

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives are funding solutions should be explored to expand funding availability?

See response to question 11

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

Some data sources that could be valuable for assessing hazards to public safety are proprietary because they were developed by private-sector consultants for private clients (for example, geologic data in possession of Alyeska Pipeline Service Company).

15. List any other issues, problems, or ideas related to the following categories:
    a) Communication and warning
    b) Dam safety
    c) Emergency preparedness
    d) Floodplain management
    e) Geologic hazard mitigation
    f) Hazardous materials incidents
    g) Land use
    h) Public information/education

No answer

16. Please include any general observations or problems which may not have been covered by this questionnaire.

No Answer

DEPARTMETN OF MILITARY & VETERANS AFFAIR

DIVISION ON HOMELAND SECURITY & EMERGENCY MANAGEMENT

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

The Division of Homeland Security & Emergency Management (DHS&EM) protects lives and property from Natural Hazards and Terrorism and provides rapid recovery from all disaster events. Through various means of public outreach, DHS&EM provides hazards awareness to the citizens of Alaska. The State Emergency Response Commission (SERC) coordinates directly with State and Federal agencies, boroughs, organized communities and the Local Emergency Planning Committees to reduce vulnerability to hazards. The SERC provides funding for preparedness, planning, hazards analysis, and (CRTK) inventories. DHS&EM acquires grant monies in order to accomplish mitigation projects throughout the State such as hazard mapping and public education. By means of the Disaster Policy Cabinet, State agencies can influence changes in State statutes to further mitigation efforts. The Governor, using the Administration Order process, can also direct State agencies to implement mitigation changes e.g. the State Erosion Policy.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

Through the processes provided by State policy (planning, statutory changes, public education, preventive mitigation efforts), DHS&EM can decrease the potential for future losses resulting from natural or technological disasters in Alaska.

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

DHS&EM is a key organization in decreasing vulnerability to hazards through public education, prior planning, and mitigation project funding.

4. Does your organization own or manage lands or buildings in:

    a) 100-yr floodplain
    b) earthquake fault area
    c) landslide/mudslide area
    d) coastal area
    e) areas subject to other hazards

If the answer is yes, what measures are being taken to protect these investments or structures?

NO

5. With what Federal, State, local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

List the agencies that are participating in developing the State Hazard Mitigation Plan. Check to ensure that also includes the SERC members.

State of Alaska

Office of the Governor

Division of Governmental Coordination

- Alaska Coastal Management Program (ACMP)
- Coastal Impact Assistance Program (CIAP)

Department of Administration

Division of Risk Management

Department of Commerce, Community and Economic Development

Division of Insurance

Division of Community and Business Development (DCBD)

Department of Education and Early Development

Department of Environmental Conservation

Division of Air Quality

Division of Water Quality

Division of Environmental Health

Division of Spill Prevention and Response

Department of Fish & Game

Department of Health & Social Services

Division of State Health Planning and Development

Department of Law

Department of Military & Veterans Affairs

Division of Homeland Security and Emergency Managements

Department of Natural Resources

Division of Geological & Geophysical Surveys (DGGS)

Division of Mining, Land, and Water Management

- Alaska Dam Safety Program [AS 46.17 and Article 3 of 11 AAC 93].

Division of Forestry

Department of Public Safety

Division of Alaska State Troopers

Division of Fire Prevention

Division of Fish & Wildlife Protection

Department of Transportation & Public Facilities

Division of Statewide Planning

Division of Statewide Design & Engineering Services

University of Alaska Fairbanks

UAF/GI

Alaska Earthquake Information Center

State Emergency Response Commission

Federal

Federal Emergency Management Agency

U. S. Geological Survey

Alaska Volcano Observatory

U.S. Army Corps of Engineers

Department of the Interior

Economic Development Administration

Environmental Protection Agency

Farm Service Agency

U.S. Fish and Wildlife Service

U.S. Forest Service

Federal Highway Administration

U.S. Department of Housing and Urban Development

Bureau of Land Management

National Marine Fisheries Service

National Park Service

Natural Resources Conservation Service

National Weather Service

U.S. West Coast/Alaska Tsunami Warning Center.

Rural Development (US Department of Agriculture)

Small Business Administration

Other Stakeholders

Tanana Chiefs Conference

Alaska Inter-Tribal Conference

Denali Commission

American Red Cross

Alyeska Pipeline

Alaska Municipal League

Interagency Hydrology Committee for Alaska (IHCA)

6. Describe any problems in coordination among Federal, state, and local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

The most recurring problems result when communities are required to complete very detailed grant applications that involve processes they are unfamiliar with e.g. Construction projects must have engineering studies, environmental assessments, and historical artifact determinations completed before the applications are approved for funding. Most rural communities do not have the expertise available, nor, the knowledge to make accurate determinations. Consequently, accurate Benefit Cost Analyses can not be developed showing the benefit of the activity.

Furthermore, future funding constraints for other State agencies may eliminate personnel positions and programs supporting mitigation efforts. Problems also occur due lack of qualified personnel available to complete applications who also have time to provide sufficient factual data to satisfy FEMA grant requirements and benefit/cost analysis.

Additionally, Alaska is a “home rule” State making this a sensitive political issue. Existing State Statutes prohibit agencies from directing community activities or government. Funding is not available for State level mitigation activities. Thus, lack of funding exacerbates this problem i.e., Alaska currently does not fund the State Seismic Safety Council due to budget shortfalls.

7. What are your organization’s authorities?

Alaska Statute 26.23, 44 CFR, Robert T. Stafford Act and Disaster Mitigation Act of 2000. (Probably some statutes in DCCED, DOT, DEC, etc. that also apply).

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization’s activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization’s efforts in decreasing vulnerability?

Alaska is a “home rule” State making this a sensitive political issue. Existing State statutes prohibit agencies from directing community activity or government. Funding difficulties exacerbate this problem i.e., Alaska currently does not fund the State Seismic Safety Council nor do we have funding available for mitigation programs associated with State level disasters.

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

DHS&EM team works with the Alaska National Weather Service to conduct two weather

related, warning dissemination implementation plans for rural communities: the River Watch Plan and the Fall Sea Storm Plan.

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

Yes, the State All-Hazard Risk Mitigation Plan, SECC SOPs, EAS and NAWAS SOPs for warning etc.

11. Are public opinion and input used to build support for the agency's mitigation programs?

Yes, Input is encouraged during Local community meetings, local government interaction, and public outreach activities. Local All-Hazard Mitigation Plans are evaluated and information is used to refine the State's All-Hazard Risk Mitigation Plan.

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

We currently have four staff assigned to the mitigation section as follows:

- The State Hazard Mitigation Officer oversees all mitigation activities to include The Earthquake, Tsunami, Natural Disaster, and Pre-Disaster Mitigation Program.
- The Mitigation Specialist (Emergency Management Specialist) is responsible for working HMGP and PDM projects related to Federally declared disasters and supervising the Earthquake Program outreach activities.
- A Pre-Disaster Mitigation Officer (Emergency Management Specialist) is responsible for coordinating Local/Tribal All-Hazard Mitigation Plan development state-wide. With additional duties related to Tsunami programs.
- The Mitigation Specialist (Emergency Management Specialist II) is responsible for coordinating all activities involved with editing and updating the 2004 State All-Hazard Mitigation Plan to fulfill the criteria for the 2007 State All-Hazard Risk Mitigation Plan review.
- The Mitigation Grant Administrator is responsible for assisting in all grant functions including site visits and closeout.

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives or funding solutions should be explored to expand funding availability?

There is not enough funding to conduct hazard mitigation throughout the State. The State does not reserve funding for mitigation programs. As disasters occur, we solicit legislative support for funding the match for federal disaster funds.

The State provides the match for federal grants instead of passing those costs on to the communities or agencies affected. This allows greater benefit to those affected by the disaster. However, the State should consider setting aside mitigation funds to

encourage pre-disaster mitigation project development at the local level. Making funds available prior to disasters could greatly reduce the risks faced with future disasters. The problem is where to does the additional funding come from?

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

Currently, there is a drastic lack of mapped hazards to facilitate hazard vulnerability identification throughout the State and specifically at the community level. There is also a great lack of project development, engineering design and funding availability at the local community level. The lack of various levels of expertise dramatically reduces the chances of small communities receiving grants for construction projects. FEMA requires very precise, project specific information before benefit/cost project analysis can be completed. The majority of Alaska's communities are unable to accomplish the applications in an accurate and timely manner.

There appears to be a plethora of digitized information held by several agencies, but no method, protocol, or capability exists for sharing this information.

15. List any other issues, problems, or ideas related to the following categories:
    a) Communication and warning: Communities are too spread apart or are located in very remote locations preventing receipt of warning signals. Other communities have varying capability of obtaining communication or warning. Several communities experience black-outs after normal working hours.
    b) Dam safety: This section to be completed with coordination with The State Dam Safety Officer
    c) Emergency preparedness: Lack of funding or capability
    d) Floodplain management: Lack of desire by the community to create or enforce building code or zoning to prevent construction in hazard areas. Lack of funding to enable mitigation efforts
    e) Geologic hazard mitigation:
    f) Hazardous materials incidents:
    g) Land use: Lack of building code and zoning adoption or enforcement
    h) Public information/education:
16. Please include any general observations or problems which may not have been covered by this questionnaire.

None

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES, BRIDGE SECTION

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

Our mission is to provide for the movement of people and goods and the delivery of State services. We fulfill these requirements by maintaining approximately 700 Public Facilities, all State Equipment Fleet assets, Measurement Standards and Commercial Vehicle Enforcement responsibilities, Operating the Alaska Marine Highway System, Operating the Anchorage and Fairbanks International Airports, Performing Maintenance and Operational requirements at 258 rural airports and on six thousand miles of roads and highway.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

Decrease

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

The regular inspection and preventative maintenance of highways, bridges, harbors and airports ensures facilities and structures are in the best condition to withstand the effects of natural disaster

4. Does your organization own or manage lands or buildings in:

   a) 100-yr floodplain
   b) earthquake fault area
   c) landslide/mudslide area
   d) coastal area
   e) areas subject to other hazards

Yes

5. With what Federal, State, Local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

All Agencies having authority which may include: State of Alaska DHS/EM, State of Alaska DEC, Federal Highways Administration, Federal Emergency Management Administration and the Army Corps of Engineers

6. Describe any problems in coordination among Federal, State, and Local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

Problems include: an over abundant amount of paperwork issues which greatly impact the department's ability to move quickly in times of urgent need. A high turn over of staff within these agencies making it difficult to build continuity.

7. What are your organization's authorities?

DOT has statutory authority for all transportation issues.

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

Yes

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

Yes all critical nodes have programs in place for Prevention.

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

Yes written procedures are in place

11. Are public opinion and input used to build support for the agency's mitigation programs?

Yes public opinion is considered.

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

Yes however budget cuts threaten resource levels

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives or funding solutions should be explored to expand funding availability?

Full funding is needed annually to maintain initiatives. There is too much reliance on federal funding at this time. Inflation proofing needed in the general fund Program.

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

Continued upgrading of system components is needed.

15. List any other issues, problems, or ideas related to the following categories:
    a) Communication and warning: ALMR system upgrades ongoing. Need more repeaters
    b) Emergency preparedness: New Field Ops Guide (FOG) in place training needed.
    c) Floodplain management: Constant effort needed to manage this issue.

16. Please include any general observations or problems, which may not have been covered by this questionnaire.

None Noted

MATANUSKA-SUSITNA BOROUGH

PLANNING DEPARTMENT

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

MSB planning department includes planning, historic resources, air and water quality, platting, and code compliance divisions. Land use and development activities within the borough must comply with land use code, permitting, and conform to comprehensive planning.

We intend to incorporate standards and review procedures that will decrease the potential for loss due to natural hazards. We intend to use the Borough Hazard Mitigation plan as a guiding document, and incorporate Natural Hazard mitigation sections in future land use code requirements, platting standards, and comprehensive planning documents.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

Decrease

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

Planning and land use code, platting and development standards, and comprehensive planning

revisions will be reviewed and recommendations made to the Borough Assembly to approve amendments to comply with the State HMP.

4. Does your organization own or manage lands or buildings in:

    a) 100-yr floodplain

Yes, the Mat-Su Borough retains lands, and acquires lands and easements within the floodplain to protect against economic loss and to retain natural buffers.

    b) earthquake fault area

Most of the Core area of the Borough lies with the Castle Mountain fault zone.

    c) landslide/mudslide area

Borough properties in Hatcher Pass and in the Talkeetna range are subject to landslides and mass wasting as well as avalanches. Structures are not maintained there.

    d) coastal area

The Borough is a Coastal Management Plan district and has significant responsibility for compliance with ACMP.

    e) areas subject to other hazards

Areas of the Borough are subject to wildfires, high winds, volcanic fallout and air quality problems.

If the answer is yes, what measures are being taken to protect these investments or structures?

Current and future planning efforts, including plan revision and new code requirements and permitting will incorporate NHMP standards to require improved compliance with mitigation planning, building and construction standards, platting approval and develop, and comprehensive plan analysis.

5. With what Federal, state, local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

Federal Emergency Management Agency, (FEMA), Alaska Coastal Zone Management, Alaska Department of Natural Resources, Alaska National Guard, Alaska Division of Forestry, and Alaska State Fish & Game. The Borough cooperates with local cities for emergency response, rescue, medical, and fire and with the State on law enforcement, wildland fire suppression, and emergency planning.

6. Describe any problems in coordination among Federal, state, and local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

None at this time

7. What are your organization's authorities?

The MSB is a second class borough under the State statute the Borough has the authority for planning, platting, solid waste, taxation, land use, school funding and others common to 2nd class borough status.

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

Yes, for the most part. As a second-class borough, we have no law enforcement powers. Currently, in the unincorporated areas of the borough, law enforcement is provided by the Alaska State Troopers. It can be anticipated that in time of a major disaster, law enforcement resources would be quickly exhausted, and portions of the borough would not have adequate law enforcement resources to provide protection for the people and their property. The ultimate solution is to gain 1st-class status and establish a law enforcement agency, at this time we augment existing law enforcement with the Alaska State Defense Force, and the Alaska National Guard.

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

Some, Fire and rescue response and protection, flood zone management, air and water quality.

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

Flood zone protection is codified in MSB title 17, Zoning.

11. Are public opinion and input used to build support for the agency's mitigation programs?

The Borough uses significant public process in planning, platting and comprehensive plan review. Incorporation of NHMP in current and future plans and code revisions with require public review.

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

The borough has a minimal staff for the area and population, additional planning duties would likely require addition staff and resources. We would hope to share costs with other State and Federal agencies. Borough costs would likely be supported through property taxes and fee increases.

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives are funding solutions should be explored to expand funding availability?

No. Joint State/Federal/Municipal funding schemes. Grants and in-kind match with local government.

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

The Borough is in need of up to date high resolution satellite imagery that can be incorporated into the GIS database to identify changes to land use and development within hazard areas.

15. List any other issues, problems, or ideas related to the following categories:

    a) Communication and warning
    b) Dam safety
    c) Emergency preparedness
    d) Floodplain management

The Borough needs updates erosion and flood plain analysis, improved topography and elevation information and erosion modeling for the Matanuska river.

    e) Geologic hazard mitigation
    f) Hazardous materials incidents
    g) Land use
    h) Public information/education

16. Please include any general observations or problems which may not have been covered by this questionnaire.

No answer

CITY OF SEWARD

2007 REVISED ANSWERS

1. What are your organization's roles and responsibilities and how do the activities and programs of your organization serve to decrease vulnerability to hazards? Include information about hazard/mapping/identification, regulation of development, founding of housing or infrastructure, development of codes or standards, public education, etc.

The City of Seward responsibilities include; all emergency response activities within Seward City limits, and provision of providing additional aid to surrounding areas through mutual aid agreements with other agencies. The City of Seward's role within the boundaries is to; provide public education, development of City Ordinance, Codes or Standards, regulation of development by enforcement of Fire, Building and State codes, mapping and hazard identification within existing city limits and developing mitigation plans for existing problem areas.

2. Do the responsibilities listed in #1 act to increase or decrease the potential for future losses to natural disasters in your state?

City Officials continue to evaluate areas of the City where potential losses due to natural hazards or man-made situations made occur within the City. Potentially hazardous area have

been identified and zoned accordingly, providing a comprehensive reference for present and future land use within the City.

3. Briefly describe the role your organization plays in efforts to decrease vulnerability to the hazards identified in the State All-Hazard Risk Mitigation Plan.

The City of Seward working in conjunction with other regulatory agencies, developed mitigation plans for known hazards or dangers within its area. These plans are continuously updated. Examples of these plans are: Flood plain management ordinance and plan, Emergency Operation Plan, All Hazard Mitigation plan which is also referenced in the Comprehensive plan and Strategic plan.

4. Does your organization own or manage lands or buildings in:
   a) 100-yr floodplain,
   b) earthquake fault area
   c) landslide/mudslide area
   d) coastal area
   e) areas subject to other hazards

If the answer is yes, what measures are being taken to protect these investments or structures?

Yes, the City of Seward owns and manages both lands and buildings, known to be in potentially hazard areas, i.e. flood plain, earthquake faults landslide/mudslide and coastal areas. Additional hazards are associated with a diversion dam and tunnel located within the City. Protection of these areas is provided by zoning regulations, code enforcement and mitigation plans.

5. With what Federal, State, Local, or private agencies does your agency work in employing efforts to decrease vulnerability to the hazards listed in #3 above?

Agencies involved in reduction of vulnerability within the city area are: City of Seward, Kenai Peninsula Borough, State of Alaska Department of Homeland Security/ Emergency Management, Federal Emergency Management Agency, and the Army Corp of Engineers.

6. Describe any problems in coordination among Federal, State, and Local government officials and your organization with regard to assistance programs, mitigation responsibilities, funding, etc. How might these problems be remedied?

Permitting associated with the plan development becomes problematic when faced with many agencies having different time lines for permitting and processing of permits there are conflicting regulation(s) between agencies which slow down a permitting process or response.

7. What are your organization's authorities?

State Statutes & City Ordinances

8. Are existing statutory authorities, statutes, and regulations adequate to ensure that your organization's activities protect people and property from losses to natural disasters? If

authorities, statutes, and regulations are currently inadequate, how might they be expanded so as to assist your organization's efforts in decreasing vulnerability?

May be adequate, but usually have so many requirements for permits that the problems multiply. Coordination between agencies to streamline the permitting process would be helpful.

9. Does your agency have any programs or capabilities designed to reduce potential losses from natural disasters?

Our Comprehensive Plan and Strategic Plan references our All Hazard Mitigation plan as well as state statutes

10. Does your agency have written policies or procedures designed to reduce losses from natural disasters? Are written policies or procedures needed?

Written plans are in place to reduce potential loss from certain natural disasters for the area.

11. Are public opinion and input used to build support for the agency's mitigation programs?

Public opinion and input is solicited, accepted and integrated into programs for the area.

12. Are existing staffing levels adequate to carry out hazard mitigation activities? What problems and recommended solutions can your organization identify regarding staffing levels? If solutions to staffing problems have associated costs, what are those costs and what would be the likely funding source to meet cost requirement?

No, not fully. Currently staff spends approximately one eighth of their time on mitigation projects. There is not enough staff to assign to this project. Cost for additional personnel range from 1 person ($60,000. per year) to 3 personnel ($160,000. per year). Funding source has not been identified to accomplish the needs.

13. Are existing funding levels adequate to carry out hazard mitigation activities? What short-term and long-term initiatives or funding solutions should be explored to expand funding availability?

Not adequately. Short term, the City is doing what it can, when it can, with what is available. Long term, may be having funds accompany any disaster funds to accomplish mitigation initiatives. Reinstatement of the FEMA "Project Impact" program may prove to be beneficial to communities and the State.

14. Are there any problems with accessibility of data or information needed to carry out your agency's role in decreasing hazard vulnerability?

Yes, a lack of a coordinated information base and training, to use such a tool.

15. List any other issues, problems, or ideas related to the following categories:

    a) Communication and warning:

b) Dam safety:
c) Emergency preparedness:
d) Floodplain management:
e) Geologic hazard mitigation:
f) Hazardous materials incidents:
g) Land use:
h) Public information/education:

No current problem.

16. Please include any general observations or problems which may not have been covered by this questionnaire.

No comment

APPENDIX 14 – MAPS

The maps contained in this appendix are temporary and will be replaced with higher quality maps in the next version or as they become available.

Maps:

Borough/Census Areas
Organized Boroughs

The Community/Borough Map is available at ftp://ftp.dcbd.dced.state.ak.us/DCBD/comboro.pdf

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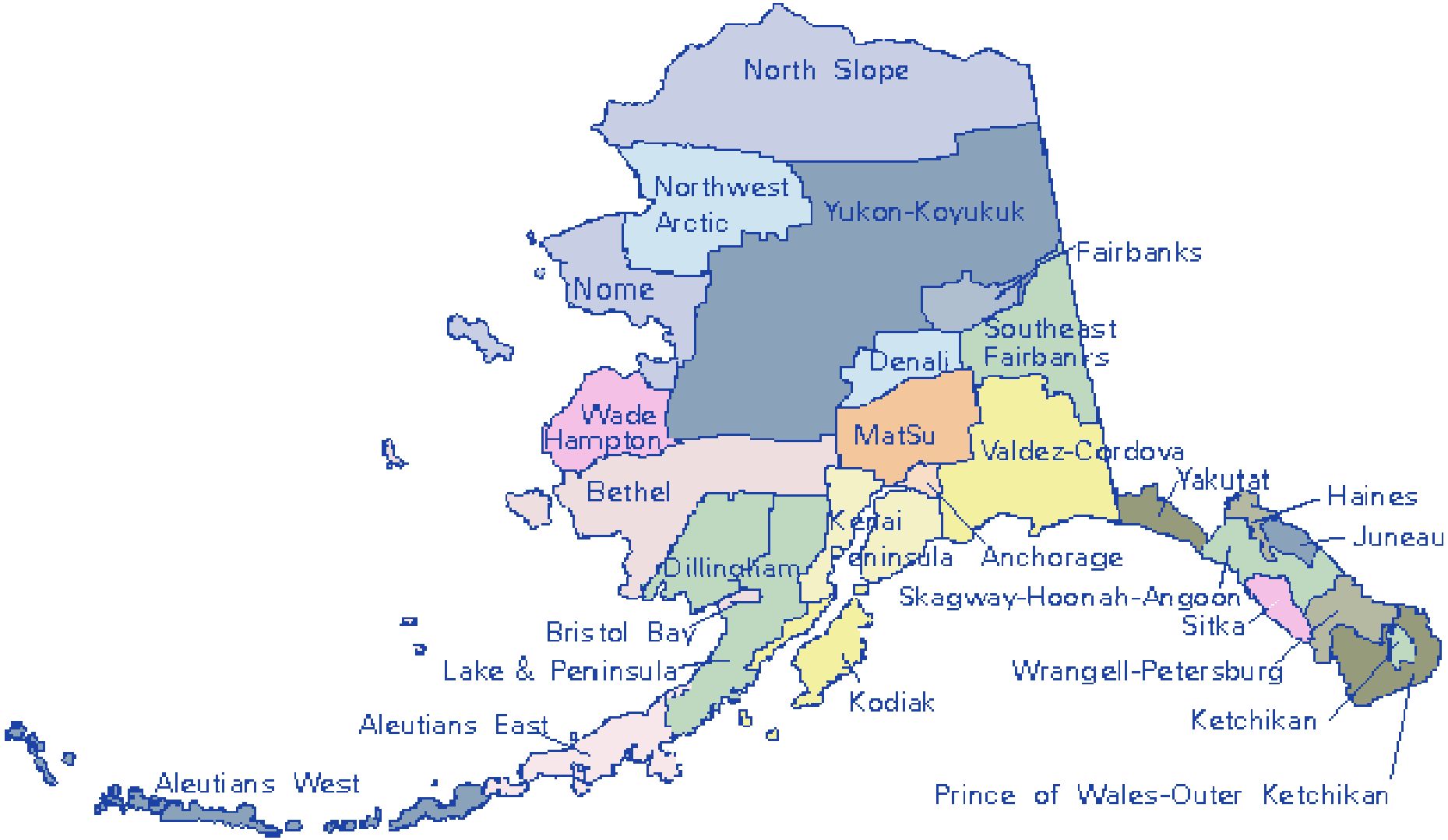
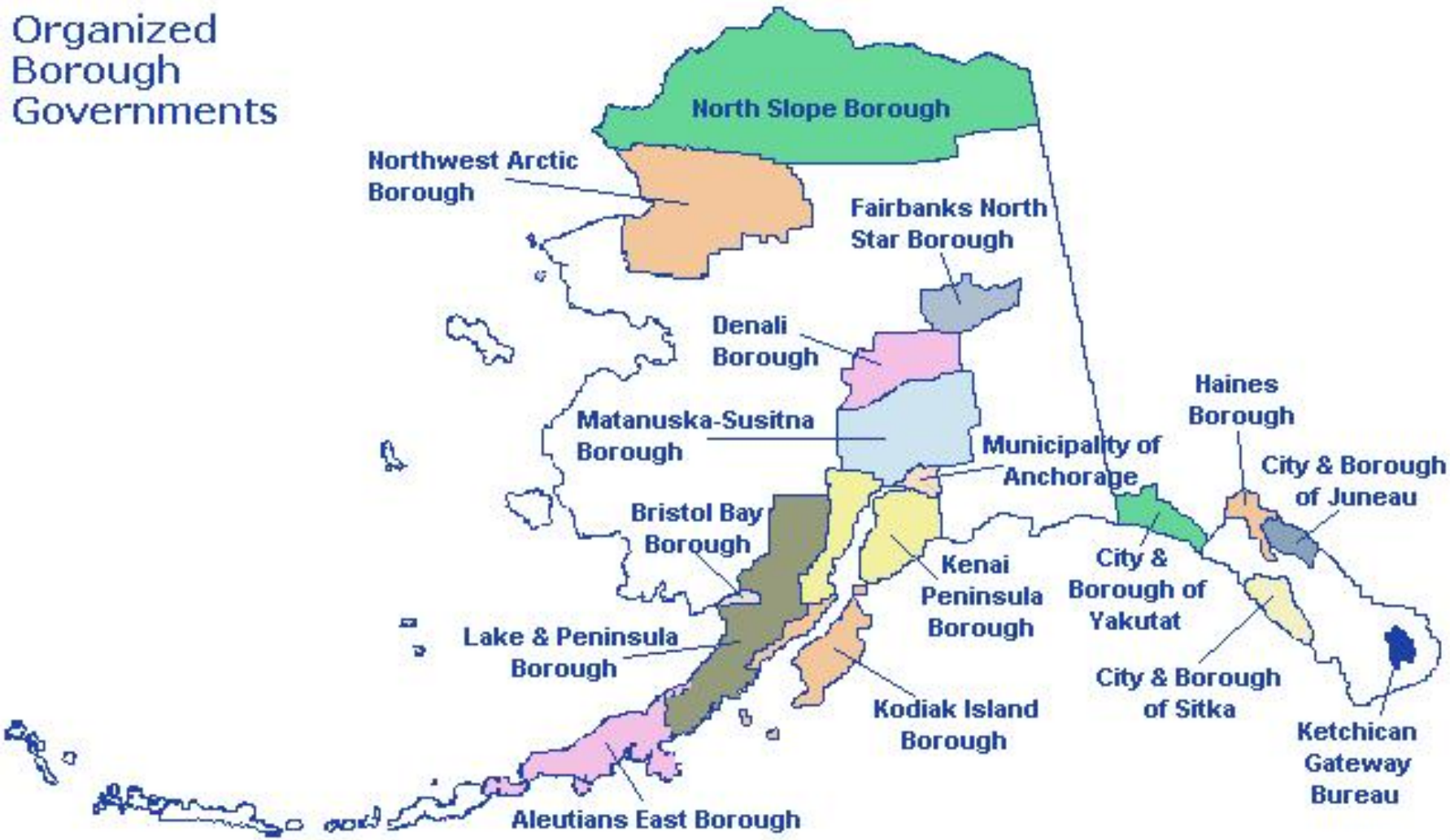


Boroughs and Census Areas, 2000.



Organized Boroughs, 2000.

APPENDIX 15 – HMGP & PDM PROJECT FUNDING

HMGP Obligated Projects

Year	Applicant	Status	Award Amount	Disaster #
2002	City of Seward, Hazard Mitigation Plan	Obligated 6/17/04	$15,000	AK-DR-1445 Kenai Peninsula Borough Flooding
2002	City of Homer, Hazard Mitigation Plan	Project Complete	$9,000	AK-DR-1445 Kenai Peninsula Borough Flooding
2002	City of Valdez, Hazard Mitigation Plan	Obligated	$10,000	AK-DR-1440 Denali Earthquake Disaster
2002	City of Alakanuk, Hazard Mitigation Plan	Obligated 7/27/05	$7,500	AK-DR-1440 Denali Earthquake Disaster
2002	City of Kotlik, Hazard Mitigation Plan	Obligated 9/01/05	$7,500	AK-DR-1440 Denali Earthquake Disaster
2002	City of Whittier, Hazard Mitigation Plan	Obligated	$10,000	AK-DR-1440 Denali Earthquake Disaster
2002	City of Nome, Mitigation Plan Update	Project Complete	$10,000	AK-DR-1440 Denali Earthquake Disaster
2002	City of Petersburg, Hazard Mitigation Plan	Obligated	$15,000	AK-DR-1440 Denali Earthquake Disaster
2003	City of Wasilla, Hazard Mitigation Plan	Project Complete	$10,000	AK-DR-1461 Southcentral Windstorm
2004	Mat-Su Borough, Hazard Mitigation Plan	Obligated 5/08/06	$15,000	DR-1571 Bering Strait Sea Storm Disaster
2004	Northwest Arctic Borough, Hazard Mitigation Plan	Obligated 5/08/06	$34,516	DR-1571 Bering Strait Sea Storm Disaster
2005	City of Golovin Mitigation Plan	Obligated 5/12/06	$10,000	DR-1584 Kaktovik Winter Storm
2005	Nunam Iqua Local All-Hazard Mitigation Plan	Obligated 5/12/07	$9,965	DR-1584 Kaktovik Winter Storm
Total			$163,481	

PDM Obligated Project

Year	Applicant	Status	Award Amount	Communities will use VRisk MitigationPlan.com
2005	DHS&EM Sub Grant for Planning Initiative	Obligated	$277,000	Red Devil
"	"	"	"	Sleetmute
"	"	"	"	Emmonak
"	"	"	"	Bethel
"	"	"	"	Kivalina
"	"	"	"	Kotzebue
"	"	"	"	Cordova
"	"	"	"	Unalaska
"	"	"	"	Newtok
"	"	"	"	Unalakleet
2005	Community Sub-Grantee	Obligated	$15,600	City of Hooper Bay and Painiut All-Hazards Mitigation Plan-VRISK
2005	Community Sub-Grantee	Obligated	$10,020	City of Dillingham Hazard Mitigation Plan-VRISK
2005	Community Sub-Grantee	Obligated	$55,631	Kodiak Island Borough Hazard Mitigation Plan-VRISK

Total **$358,251**

Grand Total HMGP & PDM **$521,732**

APPENDIX 16 – POTENTIAL HMGP PROJECTS UPDATED MARCH 2007

There are many potential mitigation projects in the State. Some which have been identified are listed here.

As additional projects are identified, they will be added to this list.

Potential Projects

Hazard	***Project***	***Applicant***	***Priority*** *High = 1, Medium = 2, Low = 3*	***Status*** ***Complete=1, On-going=2, Hold =3, No LHMP=4 Newly Identified=5 Previously Funded=6***
All Hazard	Install NOAA Weather Radio Transmitter in Bristol Bay Borough	Bristol Bay Borough	1	4
All Hazard	Install NOAA Weather Radio Transmitter in Delta Junction	Delta Junction LEPC	1	3
All Hazard	Install NOAA Weather Radio Transmitters across Alaska	ADES	1	3
All Hazard	Cooperative multi-departmental and municipality based mitigation publication as an outreach publication featuring natural disaster based mitigation information	Municipality of Anchorage (MOA)	3	5
All Hazard	Refurbish Hope Feeder Line by relocating a section to improve access, enhance right-of-way clearing and add insert poles to strengthen line reducing response and outage frequency and costs	Chugach Electric Association	1	5
Avalanche	Danger Tree Removal	Chugach Electric Association	1	On-going other areas

Hazard	***Project***	***Applicant***	***Priority*** *High = 1, Medium = 2, Low = 3*	***Status*** ***Complete=1, On-going=2, Hold =3, No LHMP=4 Newly Identified=5 Previously Funded=6***
Avalanche	Relocate development from the Behrends Avenue Avalanche Path. There are approximately 35 houses, a school, roads, and utility lines at high avalanche risk. Avalanches have gone to tidewater about 6 times since 1890. There was damage from avalanches in 1962 and 1985.	City of Juneau	1	3
Avalanche	Relocate and bury water line away from avalanche area	City of Cordova	1	4
Avalanche	Construct central avalanche office and secure howitzer storage facility in Girdwood	Alaska Railroad (AKRR)	2	3
Avalanche	Howitzer Plat forming and Protection	AKRR	2	3
Avalanche	Line switches at Summit Lake	Chugach Electric	2	3
Avalanche	Conductor Release Attachments	Chugach Electric	2	3
Avalanche	City of Hope Emergency Generator Tie-In	Chugach Electric	2	3
Avalanche	Reinforce high school gymnasium wall	City of Cordova	2	4
Avalanche	Add emergency generator circuitry to renovation project at the High School	City of Cordova	2	4
Avalanche	Relocate homes out of blue zone	City of Cordova	2	4
Avalanche	Relocate homes out of blue zone in Valdez	City of Valdez	2	Complete
Avalanche	Recreate State run avalanche safety center	Department of Public Safety	2	3
Avalanche	Construct Avalanche release gun pads	DOT&PF	2	3
Avalanche	Install precipitation collection site for accurate measurement and forecasting ability	DOT&PF	2	3

Hazard	***Project***	***Applicant***	***Priority*** *High = 1, Medium = 2, Low = 3*	***Status*** ***Complete=1, On-going=2, Hold =3, No LHMP=4 Newly Identified=5 Previously Funded=6***
Avalanche	Improve avalanche forecasting by installing a network of remote weather sites on the Seward Highway and instituting a GIS based avalanche occurrence reporting and prediction system	DOT&PF	2	3
Avalanche	Construct earthen berm at 28 mile Thompson Pass	DOT&PF	2	3
Avalanche	Construct earthen berm at 5 mile Cordova	DOT&PF	2	3
Avalanche	Data acquisition and management for avalanche forecasting	AKRR	3	3
Avalanche	Prototype avalanche detection	AKRR	3	3
Avalanche	Compile avalanche database of developed land in south central Alaska	Avalanche Safety Center	3	3
Avalanche	Update Avalanche Atlas	Chugach Electric	3	3
Avalanche	Hope Distribution Line	Chugach Electric	3	3
Avalanche	Move water impoundment structure away from avalanche area in Akutan	City of Akutan	3	4
Avalanche	Rebuild diversion dam	City of Cordova	3	4
Avalanche	Bury/protect power line	City of Cordova	3	4
Avalanche	Reroute creek diverted by avalanche	City of Cordova	3	4
Avalanche	Construct new howitzer pad near 52 mile of the Richardson Highway	DOT&PF	3	3
Avalanche	Modify howitzer mount from trailer mount to vehicle mount	DOT&PF	3	3
Avalanche	Install avalanche weather instrumentation on current communications sites through Thompson Pass	DOT&PF	3	3

Hazard	***Project***	***Applicant***	***Priority*** *High = 1, Medium = 2, Low = 3*	***Status*** ***Complete=1, On-going=2, Hold =3, No LHMP=4 Newly Identified=5 Previously Funded=6***
Avalanche	Install robotic remote control avalanche debris removal devices on the loader and bulldozer	DOT&PF	3	3
Avalanche	Install generators in the Cooper Landing and Girdwood shops	DOT&PF	3	3
Avalanche	Satellite imagery to update avalanche data/zones	MOA	3	3
Earthquake	Replace existing single pane glass windows at the East elementary School with upgraded mullion frames with dry gasket mounting and safety thermo pane glass.	Kodiak Island Borough	1	6
Earthquake	Install seismic gas shut-off valves at 21 prioritized critical MOA facilities	MOA	1	5
Earthquake	Address the mechanical, electrical and plumbing bracing and strapping for various Kodiak Island Schools	Kodiak Island Borough	1	5
Earthquake	Provide seismic sprinkler bracing for the Sullivan Arena identified as a critical facility designated as a mass care/shelter facility in a major disaster/event	MOA	1	5
Earthquake	Install seismic sprinkler system bracing at 8 prioritized critical facilities	MOA	1	5
Earthquake	Installation of sprinkler bracing and strapping for various Kodiak Island Schools	Kodiak Island Borough	1	5
Earthquake	Install non-structural seismic bracing for the Anchorage EOC computers, equipment, file cabinets and shelving units.	MOA	2	5

Hazard	***Project***	***Applicant***	***Priority*** *High = 1, Medium = 2, Low = 3*	***Status*** ***Complete=1, On-going=2, Hold =3, No LHMP=4 Newly Identified=5 Previously Funded=6***
Earthquake	Install non-structural seismic bracing and strapping along with bolting down equipment and generators.	MOA	2	5
Earthquake	To mitigate against seismic engineering issues found deficient in recent engineering studies	Kodiak Island Borough	2	5
Earthquake	Replace walls and load bearing structures within the part of the Peterson Elementary School built in 1946	Kodiak Island Borough	2	5
Earthquake	Seismic non-structural strap and brace of school equipment and contents of storage areas	Kodiak Island Borough	2	5
Erosion	Embankment Stabilization MP 260.3 to 260.35	AKRR	1	6
Erosion	Embankment Stabilization MP 259.3 to 259.4	AKRR	2	5
Erosion	Embankment Protection Project MP 238.6	AKRR	3	5
Erosion	Embankment Protection Project MP 255.0	AKRR	3	5
Erosion	Embankment Protection Project MP 247.2	AKRR	3	5
Erosion	Embankment Protection Project MP 246.3	AKRR	3	5
Erosion	Embankment Protection Project MP 240.0	AKRR	3	5
Erosion	Embankment Protection Project MP 224.5	AKRR	3	5
Erosion	Embankment Protection Project MP 244.7	AKRR	3	5
Erosion	Embankment Protection Project MP 254.8	AKRR	3	5
Erosion	Embankment Protection Project MP 223.7	AKRR	3	5
Erosion	Embankment Protection Project MP 259.15	AKRR	3	5

Hazard	***Project***	***Applicant***	***Priority*** *High = 1, Medium = 2, Low = 3*	***Status*** ***Complete=1, On-going=2, Hold =3, No LHMP=4 Newly Identified=5 Previously Funded=6***
Erosion	Embankment Protection Project MP 243.9	AKRR	3	5
Flood	Installation of Vertical Benchmarks	City of Seward	2	3
Flood	Erosion Repairs, Diversion Dam on Kodiak Island	Alaska Energy Authority	3	3
Flood	Access Roads – Terror Lake Project on Kodiak Island	Alaska Energy Authority	3	3
Flood	Eyak River Flood Mitigation	City of Cordova	3	4
Flood	Japanese Creek Canalization in Seward	City of Seward	3	3
Flood	Lowe River Flood Control – Dike Extension	City of Valdez	3	4
Flood	Reconstruct Alpine Woods Streets	City of Valdez	3	4
Weather	Install 65 power poles to shorten existing spans for improved icing and wind resistance	AVEC	1	3

Project Eligibility Criteria

All HMGP projects applied for must meet the following criteria. (Note: The selection process is competitive, and meeting these criteria does not guarantee selection.)

1. **Provides** beneficial impact on the designated disaster area.

2. **Solves** a problem independently or constitutes a functional portion of a solution.

3. **Conforms** with the State and Local Hazard Mitigation Plan.

4. **Conforms** with environmental laws and regulations.

5. **Is** cost effective.

Ineligible Projects

1. Projects that are already in progress.

2. Projects that do not independently solve a problem, and are not part of a larger project that will.

3. Projects that do not result in long-term risk reduction.

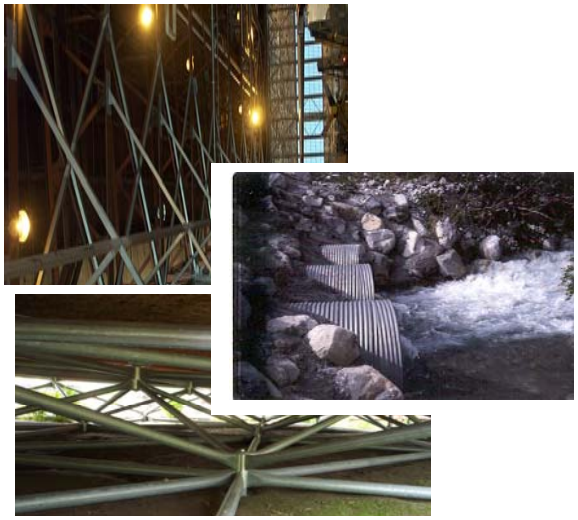
4. Projects that solely benefit religious organizations. (Such structures must have multiple-agency uses to be eligible.)

Project Suggestions

- Building elevation
  - Post and Pad
  - Driven Pile
  - Triodetics
- Strapping/anchoring
  - Lights
  - Equipment
  - Air ducts
  - Fuel and water tanks
- Bio-engineered Embankment Protection
- Culverts/culvert end sections
- Ditch lining
- Debris deflectors
- Flow diverters
- Replace pile with concrete
- Sewer drain backflow devices
- Install Superpoles
- Apply window film
- Install shear walls
- Install wall bracing
- Stiffen floors/anchor foundations
- Install vibration isolation bearings
- Install gas shut-off valves
- Relocate buildings
- Create fire breaks
- Convert land to open space

(Note: This list is not exhaustive. If you have a project idea not on this list, check it against the eligibility criteria and contact our office.)

Potential Mitigation Projects for Urban Areas



State of Alaska
Division of Homeland Security and Emergency Management
P.O. Box 5750
Fort Richardson, AK 99505-5750
Phone (800) 478-2337
Fax (907) 428-7009
Hazard Mitigation Grant Program (HMGP) Overview

SAVE YOURSELF!

The Hazard Mitigation Grant Program (HMGP) is designed to lessen the impact of future disasters by providing funds for projects that support this mission, from plans to construction projects. There are many hazards we face in Alaska, and even more ways to address these hazards. This brochure outlines the types of projects that are eligible, and will help you decide what mitigation projects would be most applicable and effective in your community.

Property Acquisition

HMGP funds can be used to acquire hazard-prone property, such as a floodway, under the restriction that the property must be converted into open space. Uses of the acquired property that are consistent with HMGP objectives include parks, athletic fields, or greenbelts.

Retrofitting

Retrofitting existing buildings to be more hazard resistant is a common mitigation need. HMGP provides funding for retrofit projects for disasters, such as flooding, earthquakes, or wind storms.

Elevation & Relocation

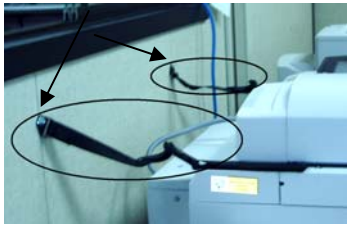
Flood-prone structures may sometimes be raised at their current site, or may need to be moved to a new location to remove them from the floodway.

Vegetative Management & Soil Stabilization

Fire risk can be increased due to excess dead biomatter, such as spruce bark beetle killed trees. Removing some of this fuel would fall under this category of HMGP projects, as would planting projects to slow hillside erosion.

Infrastructure Protection

Projects that protect infrastructure include such things as reinforcing or relocating power lines in avalanche-prone areas, creating jetties to protect barge landings, or installing debris reflectors on bridge supports.



Appendix 16

Even simple projects such as strapping down office equipment can be quite effective in mitigating against the effects of an earthquake.

Storm Water Management

Storm water can cause many problems, from overflowing culverts to flooding public buildings. Eligible HMGP projects include things like increasing culvert capacity or installing sump pumps in public facilities

Who Is Eligible

Eligible applicants are

- State and local governments
- Certain non-profit organizations

Communities must have a FEMA approved mitigation plan to be eligible.

Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf.

APPENDIX 17 – CRITERIA FOR EVALUATING PROPOSED HAZARD MITIGATION PROJECTS

Hazard Mitigation Project Prioritization

	Criteria	YES	NO
1.	Does the project complement existing State and Local mitigation goals and objectives?	☐	☐
2.	Is the project cost-effective based on applying the submitted project data to FEMA's BCA module?	☐	☐
3.	Are sufficient mitigation funds available to complete the project?	☐	☐
4.	Does the applicant have sufficient funds (if other funds are not available) to meet the local share of the project?	☐	☐
5.	Does the project solve a problem?	☐	☐
6.	Is the applicant located within the declared areas for the applicable disaster?	☐	☐
7.	Is the project priority **High**? (Life/Safety)	☐	☐
8.	Is the project priority **Medium**? (Planning/Education)	☐	☐
9.	Is the project priority **Low**? (Other Good Mitigation)	☐	☐

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APPENDIX 18 – FORMS

State All-Hazard Risk Mitigation Plan

Annual Evaluation Form

Evaluation Item	Yes	No
Are the goals and objectives still applicable?		
Do the plan objectives still correspond with state priorities?		
Are the problems the same?		
Are the problems different?		
Are there any new hazards not addressed in the plan?		
Are there any completed short term measures?		
Should there be any new short term measures?		
Should there be any new long term actions?		
Do existing measures need to be reprioritized for implementation?		
Is the plan appropriate for the available resources?		
Are there enough resources to implement the short term actions?		
Do additional sources of funding need to be identified?		
Do lead agencies need to be reassigned for implementation?		

Are there any problems with implementation, i.e. technical, political, and legal, etc.?		
Is agency coordination a problem?		
Is the political atmosphere preventing actions from being implemented?		
Is it still feasible to pursue implementing these actions?		
Have any of the agencies been re-organized?		
Are the outputs/outcomes as expected?		
Are any of the actions having unplanned negative consequences?		
Have the critical recommendations been implemented?		
Have state agencies actively participated in plan implementation?		

State All-Hazard Risk Mitigation Plan
Annual Progress Report

This form will be completed by all members of the State Hazard Mitigation Advisory Committee on an annual basis and submitted to the State Hazard Mitigation Officer. The completed forms will be used to help determine if the State Hazard Risk Mitigation Plan required revision.
Please complete this checklist and provide any additional information.

Organization Name: _____

Evaluation Item	**Yes**	**No**
Any completed short term measures?		
If yes, which ones?		
Do you have any new short term measures to propose?		
Have you started any long term actions?		
If yes, which ones?		
Have any long-term actions been completed?		
If yes, which ones?		
Any new long term actions?		
Are there enough resources to implement the short term actions?		
Do additional sources of funding need to be identified?		
Are there any actions where your organization should no longer be the lead agency?		
If yes, which ones?		
Should your organization be added or removed from being a support agency for any actions?		
If yes, which ones?		
Are there any problems with implementation, i.e. technical, political, legal, etc.?		
Is agency coordination a problem?		
Is the political atmosphere preventing actions from being implemented?		
Is it still feasible to pursue implementing these actions?		
Are any of the actions having unplanned negative consequences?		
Does your organization have any new mitigation programs?		
Does your organization have any new grant/funding programs that can be used for mitigation?		
Does your organization have any mitigation success stories to share?		

Alaska Division of Homeland Security and Emergency Management

Hazard Mitigation Grant Program

Project Application

Applicant _____

Project Location _____
(street, city ,borough, and state)

Project Title (descriptive) _____

Estimated Project Cost (total) _____

THIS SECTION FOR STATE USE ONLY
FEMA-DR_____AK

☐ **Standard HMGP**
☐ **HMGP 5% Initiative**
☐ **Other** _____

☐ **Initial Submission**
☐ **Resubmission**

☐ **Completeness Checklist**
☐ **State 409 Plan**
☐ **Eligible Applicant**

Project Type(s):
☐ Acquisition
☐ Relocation
☐ Demolition
☐ Elevation
☐ Drainage
☐ Wind Retrofit
☐ Seismic Retrofit
☐ Phase Funded
☐ Construction
☐ Engineering Study
☐ Other, Outreach, etc.

Community NFIP Status:
☐ Participating Community
ID #: _____
☐ CRS Participant
☐ In Good Standing
☐ Sanctioned

State Reviewer: _____ Reviewer Phor _____

Date Received: _____ Reviewer Fax _____

Reviewer E-ma _____

Federal Share (75% of project cost):	$	**$**
Other Federal Share:	$	**$**
State Share (25% of project cost):	$	**$**
Applicant's Share (Any amount available to supplement the project	$	**$**

cost):		
Other Non-Federal Shares (Describe):	$	**$**
Total funds required to complete project:	$	**$**

INTRODUCTION

The Hazard Mitigation Grant Program (HGMP) assists States and local communities in implementing long-term hazard mitigation measures following a major disaster. The funding for this program is based on a 75/25 Federal and State share. Further information concerning Alaska's involvement in the HMGP can be found in the current Alaska Hazard Mitigation Grant Administrative Plan at: www.ak-prepared.com/plans/mitigation/mitigationplan.htm or can be obtained by calling the Alaska State Hazard Mitigation Officer, Division of Homeland Security & Emergency Management (DHS & EM), at 800.478.2337 or 907.428.7000.

PROJECT ELIGIBILITY CRITERIA:

As the grantee, Alaska's DHS&EM is responsible for ensuring that applicants meet the eligibility requirements for subgrantees and for the selection of eligible projects for which funding is requested. All projects must meet the following criteria to be eligible for Hazard Mitigation funding. **Before you begin to fill out the attached application forms** check your proposed project for eligibility in the HMGP. This information can also be found in the State Hazard Mitigation Plan at the above referenced web address.

YES: ☐ NO: ☐ **1. HMGP Projects must be from an eligible applicant** (i.e.,Municipality/City/Special Districts/Tribe/Eligible Nonprofit Agency or Organization).

YES: ☐ NO: ☐ **2. HMGP Projects must comply with the State and Local Hazard Mitigation plans** developed as a requirement of the Disaster Mitigation Act of 2000, Section 322 for the declared disaster (see the Alaska State Hazard Mitigation Plan and applicable Local Hazard Mitigation Plan).

YES: ☐ NO: ☐ **3. HMGP Projects must meet all applicable codes and standards** for the project locale (i.e., construction, public notifications, etc.).

YES: ☐ NO: ☐ **4. HMGP Projects must have a direct beneficial impact upon the designated disaster area,** whether or not the project is located in the designated area.

YES: ☐ NO: ☐ **5. HMGP Projects must comply** with 44 CFR part 9, Floodplain Management and Protection of Wetlands; and 44 CFR, part 10, Environmental Considerations.

YES: ☐ NO: ☐ **6. HMGP Projects must solve a problem** independently or constitute a functional portion of a solution where there is assurance that the project as a whole will be completed. **Projects that merely identify or analyze hazards or problems are not eligible.**

YES: ☐ NO: ☐ **7. HMGP Projects must be cost effective** and substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster.

YES: ☐ NO: ☐ **8. HMGP Projects must provide the best solution.** Subgrantees must demonstrate that after consideration of a range of options for the mitigation measure, it has been determined that the proposed project is the most practical, effective, and environmentally sound solution.

YES: ☐ NO: ☐ **9. HMGP Projects must contribute to a long-term solution** that is the most practicable. Ideally, it should integrate hazard mitigation principles with existing programs and overall community planning.

YES: ☐ NO: ☐ **10. HMGP Projects must consider long-term effects.** Projects should address, when applicable, long-term changes to the areas and entities it protects, and ensure manageable future maintenance and modification requirements.

YES: ☐ NO: ☐ **11. HMGP Projects must address a problem** that has been repetitive or that possesses a significant risk if left unsolved.

YES: ☐ NO: ☐ **12. HMGP Projects must cost less** than the anticipated value of the reduction in both, direct damage and subsequent negative impacts to the area if future disasters occur.

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

ALASKA STATE MITIGATION GOALS

Does your project fulfill the following Alaska State Hazard Mitigation Plan's listed goals?

YES: ☐ NO: ☐ **1.** Reduce threat to life and safety posed by disasters.

YES: ☐ NO: ☐ **2.** Reduce the vulnerability of disaster damage to existing development, emphasizing public property.

YES: ☐ NO: ☐ **3.** Avoid damage to future public and private development.

YES: ☐ NO: ☐ **4.** Support the State's role in disaster planning and management to reduce costs from disaster losses and disaster relief efforts.

SIGNATURE OF AUTHORIZED AGENT:

The undersigned has the authority to commit the jurisdiction to completing this project and submits this application for financial assistance under the Alaska State Hazard Mitigation Grant Program. Further, the undersigned certifies that the applicant will fulfill all requirements of the State and Federal Hazard Mitigation Grant Program.

Print Name: _____

Signature: _____ Date: _____

_____

Title: _____

Information to assist in filling out this application:

Completely fill out this application and the accompanying *Project Schedule, Timeline, and Milestone Worksheet.* Provide a clear and concise Scope of Work. The areas within the electronic version of this application will expand to ensure you have sufficient space to completely provide detailed information for your proposed project.

If using the paper form of this application, please attach additional sheets as necessary and identify the applicable sections that the additional information addresses. Example: 2.1.1. Scope of Work: ----------

Note: When filling out your application, if an item clearly does not pertain to your project please write in "**NA**" or "**None**". If you have any doubts, you can call us and we will work with you to find the correct answer.

WHEN COMPLETED, THIS APPLICATION SHOULD BE RETURNED TO:

State of Alaska
Alaska Division of Homeland Security and Emergency Management
STATE HAZARD MITIGATION OFFICER (SHMO)
HMGP APPLICATION
P.O. Box 5750
FORT RICHARDSON, AK 99505-5750

1. APPLICATION DATA

1.1. Project Title: _____

1.2. Applicant Identification:

1.2.1. Name of Subgrantee Organization/Agency: _____

1.2.2. Check one:

☐ State Government ☐ Local Government ☐ Recognized Indian Tribe ☐ Private Non-Profit

1.2.2. Type of Organization/Agency: _____

Check one:

☐ Borough ☐ Municipality ☐ Tribal ☐ Private Non-Profit ☐ Special District

☐ Other: _____

1.2.3. Tax ID Number: _____

1.2.4. Flood Insurance PS Code: (If Known) _____

1.3. Applicant's Primary Representative: (The applicant's agent, project manager, or official contact).

Name: ☐ Ms. ☐ Mr. ☐ Mrs. _____

Title:

Address:

Business Phone:

FAX Number:

Email Address:

Applicant's Alternate Representative:

Name: ☐ Ms. ☐ Mr. ☐ Mrs. _____

Title: JK

Address:

Business Phone:

FAX Number:

Email Address:

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

Applicant's Chief Financial Officer:

Name: ☐ Ms. ☐ Mr. ☐ Mrs. _____

Title:

Address:

Business Phone:

FAX Number:

Email Address:

1.4. Overview of Past Damages:

Provide a detailed past history of damages in the area including approximate costs. Include information for Presidential or Federal level disasters as well State or local level declarations. ***Attach any supporting documents.*** Costs should include damages to structures and infrastructure in the project area as a result of the hazard. Additional costs should include the cost to the local government to respond to victims of the hazard in the project area, any interruption to local businesses, losses of public services, and costs for temporary housing of the affected population etc.

Note: Acquisition, Relocation, Elevation, or Demolition Project: Complete a listing of specific damages to each property on a separate spreadsheet and include as an attachment.

Date Level of Event Damages Indirect costs (describe)

[e.g.] 10/7/89 50 year flood or Evacuation of 58 4 foot above the road people $195,000 in damages to 16 homes in project area

[e.g.] 8/18/92 2 feet above the Emergency Evac of average first floor of the affected homes $1,895,000 in damages to 23 homes in project area 108 people

Date	Level of Event	Type or Extent of Damages	Indirect Costs

1.5. Provide information on projects linked to Public Assistance Project Worksheets (PWs):

Relevant information from a Federally declared disaster, such as the Disaster Project Worksheet may provide data so that the applicant does not have to duplicate its efforts. Additionally, a previous environmental review may have been performed and could possibly be used as a reference, reducing the review time.

1.5.1. PW Number(s) and Supplements: _____

1.5.2. Was the proposed hazard mitigation project a component of a Public Assistance PW? If so, what was the State or Federal determination regarding its eligibility? ☐ Yes ☐ No

Explain:

1.6. Hazards to be mitigated: (Select the type of hazard (s) the proposed project will mitigate)

☐ Flood ☐ Wildfire ☐ Seismic ☐ Volcano ☐ Snow Avalanche ☐ Tsunami

☐ Weather ☐ Ground Failure ☐ Erosion ☐ Drought ☐ Technological ☐ Economic

☐ Other (list) _____

1.7. Project Budget: Provide the details of all costs of the project. This information is used for the Benefit-Cost- Analysis (BCA). Organizations that have the expertise and capability, must accomplish a BCA. Reasonable cost estimates are essential. Project Administrative Allowances are calculated on a sliding scale; **do not** include this in the budget. **Do not include contingency costs in the budget**.

1.7.1. Materials and Equipment: (Expand as needed)

Item	Dimension	Quantity	Unit Cost	Total Cost

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

1.7.2. Labor: (Include equipment costs -- please indicate all "soft" or “in-kind” matches. Annotate if you included an operator in the equipment cost. If you list a crew, include number (#) of personnel. Expand as needed)

Description of Activities	Hours	Rate	Cost

1.7.3. Fees Paid: (Include any other costs associated with the project. Expand as needed)

Description of Task	Hours	Rate	Cost

Total Estimated Cost of Project: $_____

2. PROJECT ALTERNATIVES

2.1. Primary Project Requested: Provide a detailed proposed project Scope of Work. Also, explain how the proposed project will solve the problem(s) or reduce the hazard's effects and risks identified in Sections 1.4 and 1.6. Use separate pages as needed to ensure a complete project description.

2.1.1. Scope of Work:

2.1.2. Project Location:

Fully describe the location of the proposed project. Describe the area and/or population affected or protected by this project. Include the location if possible (street address with numbers or neighborhood, city, borough w/ zip codes, Lot, Block or Survey). **Provide GPS reading (Lat/Long) of the project site in degrees decimal minutes to 5 places if possible,** ie: 61.12345N 161.12345W**.** *This allows the environmental review to catalog and reference other disaster related projects. Data may be found in Public Assistance (PA) Project Worksheets (PW).*

2.1.2.1. Current Site Location:

Location: Latitude: _____ Longitude: _____

Description:

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

2.1.2.2. New Site Location: (if this is a relocation)

Location: Latitude: _____	_____ Longitude: _____
Description:	

2.1.3. Population and Structures Affected: Indicate the approximate number of people affected by this project to include residents, customers, commuters, or visitors, etc. Provide the **number** of each type of structure (listed below) in the project area. Include **all** structures directly affected in project area.

_____ Number of people affected

_____ Residential properties

_____ Businesses / Commercial properties

_____ Public buildings

_____ Schools

_____ Hospitals / Medical clinics

_____ Houses of Worship

_____ Other (List):

2.1.4. Project Eligibility: Using the eligibility criteria listed in the Introduction section of this document, list any eligibility issues or exceptions.

List:

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

2.1.5. Project Objective: Describe what mitigation benefit you hope to gain by doing this project.

Explain how this mitigation project meets the objectives of the State or Local Hazard Mitigation Plan. You can find the plan at: http://www.ak-prepared.com/plans/mitigation/mitigationplan.htm

Scope of Work:

2.2. Alternative Project:

Describe an alternative project. This project should be the next best solution if the primary alternative is not accomplished. This project could be an entirely different mitigation method or a significant modification to the design of the current proposed project. Please include a Scope of Work, engineering details (if applicable), estimated budget, and the impacts of this alternative. Provide enough detail to describe the project for the evaluation panel to decide the best course of action for the State. Also, explain how the proposed project will solve the problem(s) or reduce the hazard's effects and risks described in Section 2.1.

Use separate pages as needed to ensure a complete project description.

2.2.1. Scope of Work:

2.2.2. Project Location:

Fully describe the location of the proposed project. Describe the area and/or population affected or protected by this project. Include the location if possible (street address with numbers or neighborhoods, city, borough w/ zip codes, Lot, Block or Survey). **Provide GPS reading (Lat/Long) of the project site in degrees decimal minutes to 5 places if possible,** ie; 61.12345N 161.12345W. This allows the environmental review to catalog and reference other disaster related projects. Data may be found in Public Assistance (PA) Project Worksheets (PW).

2.2.2.1. Site Location:

New Location: Latitude: _____ Longitude: _____

Description:

2.2.2.2. Site Location: (if this is a relocation)

New Location: Latitude: _____ Longitude: _____

Description:

2.3. No Action Alternative: State or explain what the effect(s) will be if neither the primary nor the secondary project is funded.

Describe what will result:

2.4. Maps: In certain cases when there are no maps available, substitute with an overview photo, drawing or sketch. Ensure it is legible, shows magnetic north, and has major landmarks noted for orientation. Two maps must be provided with your application. One must show the general location of the project site and the other must show the specific project site.

2.4.1. Map Depicting Project Site: (check the box to indicate what type of map is attached)

2.4.1.1. ☐ City or Borough scale map showing the entire project area with the project site and structures marked on the map.

2.4.1.2. ☐ USGS 1:24,000 topographical map with project site marked on the map.

(Map depicting relationship to existing features – natural and otherwise)

a. Rivers, lakes, streams, wetlands, saltwater, etc.
b. Geologic features, steep slopes, unstable areas
c. Roads, bridges, buildings, etc.

2.4.1.3. ☐ For **acquisition** or **elevation** projects, include a copy of the Parcel Map (Tax Map, Property Identification Map, etc.) with each property in the project clearly marked on the map. Use SAME ID number as in the property worksheet.

On one or both of the maps and depending on the type of project, you may depict multiple requirements that are listed below, instead of a separate map for each.

2.4.2. Provide a map showing the new construction or elevation of structures.

2.4.2.1. Show where materials will be staged.

2.4.3. Provide a map showing the old and new site for any structure relocation.

2.4.3.1. Show the route of movement on the map with a dashed line and label it.

2.4.3.2. Show the new location on the map.

2.4.4. Provide a map showing where the demolished structure is located.

2.4.4.1. Show where the old foundation materials and debris will be disposed of.

2.4.4.2. Show where any hazardous materials are located or disposed of.

2.4.5. Provide a map showing where any wetlands are located.

2.4.6. Provide a map showing where any historic or archaeological sites are located.

2.5. Photos, Sketches, Drawings, Engineer Designs, etc: ***(Two copies*** for each project site)

These help clarify the project setting and the potential impacts of the project on the environment (soils, vegetation, hydrology, wildlife) and they assist in understanding the written description of the project, especially if contours and elevations are provided. If photos are provided, then FEMA may not need to conduct a site visit, thereby, reducing the review time. Include ALL engineering calculations and quantity determinations for this project. These are in addition to any map substitutions.

2.5.1. Attach overview photographs. The photographs should be representative of the project area, including any relevant streams, creeks, rivers, drainage areas, etc; which affect the project site or will be affected by the project.

2.5.2. Provide a sketch of the proposed foundation.

2.6. Flood Insurance Rate Map (FIRM):

Attach a copy of the panel(s) from the FIRM and the Floodway Map; if they are available, with the project site and structures marked on the map (FIRMs are available from the Department of Commerce, and Economic Development, State Floodplain Manager (DCCED/NFIP). Maps can also be ordered from the Map Service Center at 1-800-358-9616. For more information about FIRMs, contact your local agencies or visit the FIRM site on the FEMA web page at: http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1 . These maps can be downloaded.

2.6.1. Using the FIRM: Determine the flood zone(s) of the project site (Check all zones in the project area).

- ☐ VE or V 1-30
- ☐ AE or A 1-30
- ☐ AO or AH
- ☐ A (no base flood elevation given)

☐ B or X (shaded)

☐ C or X (un-shaded)

☐ Floodway

☐ Coastal Barrier Resource Act (CBRA) Zone
(Federal regulations strictly limit Federal funding for projects in this Zone; coordinate with your state agency before submitting an application for a CBRA Zone project)

2.6.2. ☐ Flood Hazard Boundary Map (FHBM) for your area with the project site and structures marked

2.6.3. ☐ Army Corp of Engineers, USGS, or other sources that may have a map of the floodplain.

2.6.4. ☐ No FIRM, FHBM or other floodplain map available

3. ENVIRONMENTAL CONCERNS

All projects must comply with the National Environmental Policy Act (NEPA). FEMA is responsible for preparing the necessary documentation; however the applicant is required to provide the necessary data. Provide a clear and concise description of the environmental concerns and impacts associated with the "Preferred Alternative Project".

The following types of projects **do not** require Environmental Documentation:

- Development of Mitigation Plans (Use separate HMGP Planning Application)
- Inspection and monitoring activities
- Studies involving only staff time and funding
- Training activities using existing facilities

Provide the following information to assist the Environmental Review Team in performing reviews for compliance with all applicable laws and regulations. Providing this information up front will expedite the team's consultation process with Other Federal Agencies (OFA) allowing them to complete their review in as short a time as possible. If this information is not provided, the team will need to contact the applicant, which could delay mitigation for the next disaster. The review process can not begin until this information is received. Supplying this information with this application will allow more time for completing the environmental compliance review.

Construction projects require certain environmental documentation depending upon the project type and its potential effects on the physical, biological, and construction environment. This information ***must*** be provided to FEMA before funding will be awarded! Coordinate with the State Historic Preservation Officer (SHPO) regarding all cultural (archeological and historical) resources.

The various types of projects and the required environmental documentation are:

3.1. Warning Systems, Shutters, and Communication Projects:

Provide the SHPO with:

- a description of the project referencing structure or site addresses
- several original photographs of the project site and adjacent area/structures

NOTE: See sections 2.4 through 2.6.4 and 3.4.

3.2. Acquisition/Demolition and Elevation Projects:

Residential Sites require coordination with the SHPO regarding cultural resources (archeological and historical).

Provide the SHPO with:

- a description of the project referencing structure or site addresses
- several original photographs of the project site and adjacent area and structures

Commercial/Industrial Sites also require:

- Coordination with the State Environmental Protection Agency (or equivalent) regarding hazardous waste and toxic materials

NOTE: See sections 2.4 through 2.6.4 and 3.4.

3.3. Residential Acquisition/Relocation and Storm Water Management Projects: (Road/Bridge/Culvert Repair, Retention Ponds, and Drainage)

Coordinate with the following Federal and State agencies:
Provide the SHPO with:

- Several original photographs of the project site and adjacent area and structures
- State Environmental Protection Agency (or equivalent) regarding required permits for erosion and sediment control, storm water management, water and air quality
- State Environmental Protection Agency (or equivalent) regarding hazardous and toxic materials
- U.S. Army Corp of Engineers District regarding Individual (404 Wetlands) Permit or approval under an existing Nationwide Permit
- U.S. Fish and Wildlife Service regarding Federal Threatened and Endangered Species
- State Fish and Game Agency regarding fish and wildlife
- State Natural Heritage Agency regarding State Threatened and Endangered Species

NOTE: see section 3.4.

3.4. Additional Documentation:

- *If the project involves five or more acres of land* – provide a National Pollutant Discharge Elimination System (NPDES) permit from the U.S. Environmental Protection Agency
- *If the project is located outside of town/city limits* - provide documentation from the USDA Natural Resources Conservation Service (Prime, Unique or other Important Farmlands)
- *If the project is located in a coastal area* provide letters from the:
  - State Coastal Management Agency (Coastal Zone Management Act)
  - U.S. Fish and Wildlife Service (Coastal Barrier Resources Act and Coastal Barrier Improvement Act)
  - U.S. Dept. of Commerce National Marine Fisheries Service (Commercial fishing and breeding grounds)
- *If the project will affect any low-income or minority groups in the project area* – provide applicable Environmental Justice information (census, economics, housing and employment)

NOTE: Contact the SHMO if you wish FEMA to provide additional Environmental Technical Assistance. The SHMO contact information is located on page 3 of this application.

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

3.5. Project setting and background information:

Please provide the following information to help the environmental reviewer determine the appropriate level of review needed for this project.

3.5.1. What are the ages of the structures involved in this project?

List:

3.5.2. What are the ages of the structures in the remainder of the community?

List:

3.5.3. Describe the project site(s).

Describe:

3.5.4. Describe the terrain and vegetation at the project site(s) (flat, gently sloping south, etc).

Describe:

3.5.5. What is the elevation in feet above Mean Sea Level (MSL) at the project site(s)?

List:

3.5.6. Describe the neighborhood or community setting.

Describe:

3.6. Does the Project Description show what the applicant proposes to do?

FEMA and Other Federal Agencies (OFA) need this information to conduct their reviews. Are there any wetlands (USACE) or endangered species (USFWS, NMFS) impacted? Please provide the following information to help the environmental reviewer determine and analyze the potential impacts of the project.

Answer only questions applicable to this project.

3.6.1. Why is this project a benefit?

Explain:

3.6.2. Why is elevating, relocating, or acquiring these structures appropriate? (Define why one method is more preferred over the others.)

Explain:

3.6.3. Is future construction allowed within this area?

Explain:

3.6.4. Describe the type, size, and dimensions of the structures identified in this project.

Describe:

3.6.5. Describe the type of service this (these) facility (ies) provide(s) if applicable. (home, business, city, office, etc.)

Describe:

3.6.6. Provide cost of relocating, replacing, or decommissioning utilities and/or fuel tanks etc.

List:

3.6.7. Provide a narrative describing the type of foundation(s) proposed.

List:

3.6.8. Provide the location information of where the families will be housed during construction.

List:

3.6.9. What special conditions or construction is required due to permafrost or other environmental factors?

Explain:

3.6.10. Describe any ancillary structures or equipment that may also need to be elevated, relocated, acquired, and/or demolished.

Describe:

3.6.11. Describe any clearing or grubbing activities that will take place.

Describe:

3.6.12. Describe the site control activities.

Describe:

3.6.13. Describe the construction methodology and sequence, the types of equipment used, and materials needed. (*Ensure that this information matches items in 1.8, Project Budget and Attachment 1 Timelines)*
*D*escribe:

3.6.14. List all other project types that may have an effect on your current project.
List:

3.7. Supplemental Information: The following information would be helpful in facilitating a quicker review; however, it is not needed to begin the review process. If it is not provided, the Environmental Reviewer will obtain the information.

3.7.1. Floodplain/Wetland information
This information is necessary to show compliance with the Executive Orders on Floodplain Management and Wetlands.

3.7.2. Are Wetlands located in the project area?

☐ No

☐ Yes Explain:

3.7.3. Critical Action: Describe what critical tasks have to take place to complete the project. (For example: 1. Acquire a US Army Corps of Engineers *(USACE) permit, 2. Remove hazardous materials, 3. Demolish structures and transport debris to the landfill located at 61.12345N 121.12345W, etc.)*
List and describe the critical actions involved with this project:

3.7.4. Public Notice: Was there any public involvement in developing the project or selecting the site? How did you notify the public of the project?
☐ No ☐ Yes Explain:

3.8. Endangered Species Information: (Provide if applicable)
This information is necessary to show compliance with the Endangered Species Act. The local government may know what types of projects have previously occurred in the vicinity of the proposed project. Incorporate information obtained from past

projects and required consultations with other federal agencies into your environmental review. (Check any that apply)

3.8.1. ☐ **U.S. Fish and Wildlife Service** (Terrestrial & Aquatic)
3.8.2. ☐ **National Marine Fisheries Service** (Marine & Anadromous)
3.8.3. ☐ **State Fish and Wildlife Service**

3.9. National Historic Preservation Act, Section 106 information: (Provide if applicable)

This information is necessary to show compliance with the National Historic Preservation Act (NHPA). Contact the State Historic Preservation Office to obtain information on any potential historic, cultural, or archaeological site within or near the project.

3.9.1. Are there any historic, archaeological, or cultural sites in or near the project area?
☐ No ☐ Yes Explain:

3.9.2. Are there any structures older than 50 years?
☐ No ☐ Yes Explain:

3.9.3. Does the project involve modification or alteration to undisturbed land?
☐ No ☐ Yes Explain:

3.9.4. Have you made contact with the State Historic Preservation Officer?
☐ No ☐ Yes Explain:

3.10. Environmental Information: Provide the following information to assist the environmental reviewer and prevent the duplication of work.

3.10.1. Environmental or SEPA documents:
☐ No ☐ Yes Explain:

3.10.2. Geological studies:
☐ No ☐ Yes Explain:

3.10.3. Biological assessments:
☐ No ☐ Yes Explain:

3.10.4. USACE or State permits:
☐ No ☐ Yes Explain:

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

4. CHECKLIST OF ATTACHMENTS REQUIRED

The following is a list of required attachments or documentation that will be used to process your Application. The paragraph numbers below correspond with their location within the Application. Upon review, it may be determined that additional information is required. Check all items that you have enclosed.

Supporting Documentation to Attach: Only enclose documents that pertain to your application.	**Enclosed**
1.4. Overview of Past Damages (reports, photos, news clippings, etc.)	☐
1.5. Project Assistance Worksheet (s) (copy of the narrative project summary sheet)	☐
2.4.1. Project site maps (1 Overview and 1 Specific site)	☐
2.4.1.1. City or Borough	☐
2.4.1.2. USGS topographical	☐
2.4.1.3. Parcel Map (Tax map, Property ID map, etc.)	☐
2.4.2. New Construction or Elevation depiction	☐
2.4.3. Structure Relocation depiction	☐
2.4.4. Demolished Structure depiction	☐
2.4.5. Wetlands	☐
2.4.6. Historic or Archaeological site depiction	☐
2.5. Photos, Sketches, Drawings, engineer Designs, etc. (2 copies)	
2.5.1. Overview Photograph	☐
2.5.2. Sketch of proposed foundation	☐
2.6. Flood Insurance Rate Map (FIRM)	☐
2.6.2. Flood Hazard Boundary Zones	☐
2.6.3. US Army Corps of Engineers (USACE), USGS, flood or erosions maps	☐
Other source maps: IE; Flood debris line depiction, etc.	☐
3.3. Residential Acquisition / Relocation and Storm Water Management Projects	
Photographs	☐
Environmental Protection Agency permits	☐
3.4. Additional Environmental Information	
National Pollution Discharge Elimination System (NPDES**)** permit (EPA)	☐
US Department of Agriculture (USDA) Natural Resources documentation	☐
State Coastal Management Agency letter	☐
US Fish and Wildlife Service letter	☐
Environmental Justice Information	☐
3.7. Supplemental Information	
3.7.1. Floodplain / Wetland information	☐
3.7.4. Public Notice documentation	☐
3.10. Environmental Information	
3.10.1 Environmental or State EPA documents	☐
3.10.2. Geological Studies	☐
3.10.3. Biological Assessments	☐
Benefit Cost Analysis (BCA) Worksheet (contact DHS&EM if not able to accomplish a BCA)	☐
Deed or Proof of Ownership of building or property	☐
Other:	☐

5. Maintenance Agreement

Only applicants whose proposed project involves the retrofit or modification of existing public property or whose proposed project would result in the public ownership or management of property, structures, or facilities, should sign the following agreement prior to submitting their application to FEMA.

(NOTE: those applicants whose project only involves the retrofitting, elevation, or other modification to private property where the ownership will remain private after project completion DO NOT have to complete this form.)

The _____, State of Alaska,
hereby agrees that if *(organization)*

it receives any Federal aid as a result of the attached project application, it will accept responsibility, at its own expense if necessary, for the **routine** maintenance of any real property, structures, or facilities acquired or constructed as a result of such Federal aid**.** Routine maintenance shall include, but not be limited to, such responsibilities as keeping vacant land clear of debris, garbage, and vermin; keeping stream channels, culverts, and storm drains clear of obstructions and debris; and keeping retention ponds free of debris, trees, and woody growth.

The purpose of this agreement is to make clear the Subgrantee's maintenance responsibilities following project award and to show the Subgrantee's acceptance of these responsibilities. It does not replace, supercede, or add to any other maintenance responsibilities imposed by Federal, State and Local laws or regulations and which are in force on the date of project award.

Print Name: _____

Signature: _____

Title: _____

this _____(*day*) of _____ (*month*),
_____*(year).*

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

6. Elevation, Acquisition, Relocation, and/or Demolition Certification

Each applicant whose proposed project involves elevation, relocation, acquisition, and/or demolition of one or more residential structures shall sign the following certification:

I, _____, _____, of
(*print name*) (*title)*
_____, certify that all owners of property
(organization)

identified in this project have been contacted and have voluntarily expressed a willingness to participate in the proposed elevation, relocation, or acquisition of his or her property.

Additionally, the _____ understands that
any and *(organization)*

all property acquired under the Hazard Mitigation Grant Program will be maintained by the applicant as open space. All property acquired in this project will be governed by the following guidelines from the Code of Federal Regulations, Section 209.10:

Subgrantees must enter into an agreement with the State, with the written concurrence of the FEMA Region X Director that provides the following assurances:
The following restrictive covenants must be conveyed in the deed to any property acquired, or accepted; or from which structures are removed.

6.1. The property must be dedicated and maintained in perpetuity for uses compatible with open space, recreational, or wetlands management practices; and

6.2. No new structure(s) will be built on the property except as indicated in this paragraph:

6.2.1. A public facility that is open on all sides and functionally related to a designated open space or recreational use;

6.2.2. A public rest room; or

6.2.3. A structure that is compatible with open space, recreational, or wetlands management usage and proper floodplain management policies and practices, which the Director approves in writing before the construction of the structure begins.

6.2.4. In general, allowable open space, recreational, and wetland management uses include parks for outdoor recreational activities, nature reserves, cultivation, grazing, camping (except where adequate warning time is not available to allow evacuation), temporary storage in the open of wheeled vehicles that are easily movable (except mobile homes), unimproved, permeable parking lots and buffer zones. Allowable uses generally do not include walled buildings, flood reduction levees, highways or other uses that obstruct the natural and beneficial functions of the floodplain.

6.3. Following completion of the acquisition project, no application for future disaster assistance will be made for any purpose with respect to the property to any Federal entity or source, and no Federal entity or source will provide such assistance, even for the allowable uses of the property described above.

6.4. Any future structures built on the property according to paragraph **6.1and/or 6.2** of this section, must be located to minimize the potential for flood damage; floodproofed; or elevated to the Base Flood Elevation plus one foot of freeboard.

6.5. The subgrantee or other public property owner will seek the approval of the State grantee agency and the Region X Director before conveying any interest in the property to any other party. The subgrantee or other public entity or qualified private non-profit organization must retain all development rights to the property.

The FEMA Region X Director will only approve the transfer of properties that meet the criteria identified in this paragraph.

6.6. In order to carry out tasks associated with monitoring, the subgrantee, or the State have the right to enter the parcel, with notice to the parcel owner, to ensure compliance with land use restrictions. Subgrantees may identify the open space nature of the property on local tax maps to assist with monitoring. Whether the subgrantee obtains full title or a conservation easement on the parcel, the State must work with subgrantees to ensure that the parcel owner maintains the property in accordance with land use restrictions.

Specifically, the State may:

6.6.1. Monitor and inspect the parcel every two years and certify that the owner continues to use the inspected parcel for open space or agricultural purposes; and

6.6.2. take measures to bring a non-compliant parcel back into compliance within 60 days of notice.

6.7. Only as a last resort, we reserve the right to require the subgrantee to bring the property back into compliance and transfer the title and easement to a qualified third party for future maintenance.

6.8. Every 2 years on October 1st, the subgrantee will report to the State, certifying that the property continues to be maintained consistent with the provisions of the agreement. The State will report the certification to FEMA.

Certified this _____ day of _____, 20_____

By _____

(*print name and title of responsible official*)

_____

(*Signature of responsible official*)

For questions, please call the State Hazard Mitigation Officer at 800.478.2337 or fax 907.428.7009

Attachment 1 **Work Schedule, Timelines, and Milestones**

HMGP Mitigation Project Title: _____

Grant Performance Period Dates: _____ ***through*** _____

1.1. Estimated Starting Date: _____, or within _____ days after final project approval. (Please explain if more than sixty (60) days):

1.2. Estimated Completion Date: _____, or within _____ months after project initiation. (Please explain if more than twelve (12) months):

1.3. Provide a General Outline of the Work Schedule Necessary to Complete This Project: Use Attachment 1 to list "Timelines and Milestones" for each item in the Scope of Work (expand as necessary). This application ***must*** include a comprehensive work schedule that clearly describes project milestones and shows the anticipated flow of the project from the time of initiation through completion.

Item 1: Title of Task

Task	Timelines	Milestones	Estimated Costs
List each line item specified in Scope of Work		1. List each item to be obtained or completed by the task 2.	

Item 2. Title of Task

Task	Timelines	Milestones	Estimated Costs
List each line item specified in Scope of Work			

Item 3: Title of Task

Task	Timelines	Milestones	Estimated Costs
List each line item specified in Scope of Work			

Item 4: Title of Task

Task	Timelines	Milestones	Estimated Costs
List each line item specified in Scope of Work			

APPENDIX 19 – CHECKLIST FOR LOCAL HAZARD MITIGATION PLANS

Local All Hazard Mitigation Planning Basics

What does a Mitigation Plan include?

1. Planning Process*
    a. A description of the planning process (to include public involvement);
    b. The plan must be implemented after receiving approval and being adopted by the community.
2. Risk Assessment*
    a. Describe the process for identifying hazards.
    b. Identify and assesses the risks;
    c. Determine vulnerability of facilities and public infrastructure.
3. Mitigation Strategy*
    a. Develop a mitigation strategy to reduce potential losses;
    b. Identify and prioritizes mitigation actions.
4. Target Resources*
    a. Identify potential resources to accomplish mitigation goals.
    b. Resources include: partner agencies, responsible parties, non-profit agencies, and local businesses.
5. Update Process*
    a. Describe how each community will periodically evaluate, monitor, maintain and update the plan.
6. Ensure every item above includes:*
    a. who, what, where, when, and how;
    b. Why, if appropriate.

Items that will be helpful to include are: List of plans for reference and development. These can include your EOP, Flood Plan, Community Development Plan, ect. Other items are maps and spreadsheets depicting potential “loss” data for a disaster.

*DMA 2000 Criteria

LOCAL HAZARD MITIGATION PLAN DETERMINATION FEMA Region 10

Jurisdiction(s):

Title of Plan: Date of Plan:

Determination: (Check one)

- [ ] Approved – Criteria Met & Plan Adopted
- [ ] Not Approved – **Criteria Met** / Plan Not Adopted
- [ ] Not Approved – **Criteria Not Met** / Plan Adopted or Not Adopted

The plan determination was based upon the review of each of the following plan criteria, excluding the shaded criteria, as required in 44 CFR Part 201. For a local plan to receive FEMA approval all plan criteria must receive a Satisfactory (S) rating and the plan must be adopted by the local governing body. The Needs Improvement (N) rating indicates the criteria was not addressed or additional information is needed to met the criteria.

		44 CFR Part 201	**N**	**S**
1.	Adoption by the Local Governing Body	*§201.6(c)(5)*		
2.	Multi-Jurisdictional Plan Adoption	*§201.6(c)(5)*		
3.	Multi-Jurisdictional Planning Participation	*§201.6(a)(3)*		
4.	Documentation of Planning Process	*§201.6(c)(1)*		
5.	Identifying Hazards	*§201.6(c)(2)(i)*		
6.	Profiling Hazard Events	*§201.6(c)(2)(i)*		
7.	Assessing Vulnerability: Identifying Assets	*§201.6(c)(2)(ii)(A)*		
8.	Assessing Vulnerability: Estimating Potential Losses	*§201.6(c)(2)(ii)(B)*		
9.	Assessing Vulnerability: Analyzing Development Trends	*§201.6(c)(2)(ii)(c)*		
10.	Multi-Jurisdictional Risk Assessment	*§201.6(c)(2)(iii)*		
11.	Local Hazard Mitigation Goals	*§201.6(c)(3)(i)*		
12.	Identification and Analysis of Mitigation Measures	*§201.6(c)(3)(ii)*		
13.	Implementation of Mitigation Measures	*§201.6(c)(3)(iii)*		
14.	Multi-Jurisdictional Mitigation Strategy	*§201.6(c)(3)(iv)*		
15.	Monitoring, Evaluating, and Updating the Plan	*§201.6(c)(4)(i)*		
16.	Implementation through Existing Programs	*§201.6(c)(4)(ii)*		
17.	Continued Public Involvement	*§201.6(c)(4)(iii)*		

Comments:

Please refer to the attached Local Hazard Mitigation Plan Review Worksheet for additional information and comments on each criteria.

FEMA Reviewer: **Date:**

FEMA Mitigation Plans Manager: **Date:**

01/2004

Jurisdiction: Title of Plan: Date of Plan:

1 Adoption by the Local Governing Body ***Requirement §201.6(c)(5)*** *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council)…*		NOT MET	MET
A. Is the local plan approved by the local governing body of the jurisdiction?			
B. Is supporting documentation, such as a resolution, included?			

2 Multi-jurisdictional Plan Adoption ***Requirement §201.6(c)(5)*** *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*		NOT MET	MET
A. Does the plan indicate the specific jurisdictions represented in the plan?	**NOT APPLICABLE**		
B. For each jurisdiction, has the local governing body approved the plan?	**NOT APPLICABLE**		
C. Are supporting documentations, such as resolutions, included?	**NOT APPLICABLE**		

3 Multi-jurisdictional Participation ***Requirement §201.6(a)(3)*** *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process… Statewide plans will not be accepted as multi-jurisdictional plans.*		NOT MET	MET
A. Does the plan identify how each jurisdiction participated in the plan's development?	**NOT APPLICABLE**		

4	Documentation of the Planning Process ***Requirement §201.6(c)(1):*** *[The plan **must** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*	N	S
A.	Does the plan provide a narrative description that explains the plan's development process, including who led the development at the staff level and any external contributors such as contractors?		
B.	Does the plan list who was involved and how they contributed to the planning process? (e.g., participated on plan committee, provided information, reviewed drafts)		
C.	Does the plan indicate how the public was involved?		

5	Identifying Hazards **Requirement §201.6(c)(2)(i):** *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction…*	N	S
A.	Does the plan include a description of the types of all natural hazards that affect the jurisdiction? DESCRIPTION – explain the characteristics of each hazard (e.g. for flooding hazard, is it coastal, riverine, stormwater) ALL NATURAL HAZARDS – all probable hazards. For northwest communities, hazards include flood, earthquake, wind, and fire, and, possibly, tsunami, volcano, winter storms. Human-caused hazards (HAZMAT, Terrorism) may also be identified in the plan, but are not required.		

Jurisdiction: Title of Plan: Date of Plan:

6 Profiling Hazard Events		N	S
Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*			
A. Does the risk assessment identify the location of each hazard being addressed in the plan?			
B. Does the risk assessment identify the extent of each hazard being addressed in the plan?			
C. Does the plan provide information on the previous occurrences of each natural hazard?			
D. Does the plan include the probability of future hazard events?			

7 Assessing Vulnerability: Identifying Assets		N	S
Requirement §201.6(c)(2) (ii)(A): *[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community. The plan **should** describe vulnerability in terms of: The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas…*			
A. Does the plan include an overall summary description of the jurisdiction's vulnerability to the hazards?			
B. Does the plan address the impacts of the hazards on the jurisdiction?			
C. Recommended: Does the plan identify the types and numbers of buildings, infrastructure, and critical facilities in hazard areas?			

8 Assessing Vulnerability: Estimating Potential Losses		N	S
Requirement §201.6(c)(2) (ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate…*			
A. Does the plan estimate potential dollar losses to vulnerable structures?	**NOT REQUIRED**		

9 Assessing Vulnerability: Analyzing Development Trends		N	S
Requirement §201.6(c)(2) (ii)(c): *[The plan **should** describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*			
A. Does the plan describe future land use and development trends?	**NOT REQUIRED**		

10 Multi-Jurisdictional Risk Assessment		N	S
Requirement §201.6(c)(2) (iii): *For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area..*			
A. Does the plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	**NOT APPLICABLE**		

11 Local Hazard Mitigation Goals		N	S
Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy shall include: a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*			
A. Does the plan include a description of mitigation goals? GOALS – usually long-term and represent what the community want to achieve, such as "eliminate flood damage."			

12 Identification and Analysis of Mitigation Measures		N	S
Requirement §201.6(c)(3) (ii): *[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure*			
A. Does the plan identify a comprehensive range of specific mitigation actions and projects for each hazard?			
B. Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?			

Jurisdiction: Title of Plan: Date of Plan:

C. Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?			

13 Implementation of Mitigation Measures

Requirement: §201.6(c)(3) (iii): *[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

		N	S
A. Does the mitigation strategy include how the actions will be prioritized?			
B. Does the mitigation strategy address how the actions will be implemented? (i.e. existing resources and potential future resources)			
C. Does the mitigation strategy address how the actions will be administered?			
D. Does the prioritization process include an emphasis on the use of cost-benefit review?			

14 Multi-jurisdictional Mitigation Strategy

Requirement §201.6(c)(3) (iv): *For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

		N	S
A. Does the plan include separate, identifiable action items for each jurisdiction requesting FEMA approval of the plan?	**NOT APPLICABLE**		

15 Monitoring, Evaluating, and Updating the Plan

Requirement §201.6(c)(4)(i): *[The plan maintenance process shall include a section describing the] method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

N	S

A. Does the plan describe the **method for monitoring** the plan? (i.e. both staff position responsible for monitoring and the department overseeing the monitoring)			
B. Does the plan describe a **schedule** for monitoring, evaluating, and updating the plan within the five-year cycle?			
16 Implementation Through Existing Programs		N	S
Requirement §201.6(c)(4) (ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate…			
A. Does the plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?			
B. Does the plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?			

17 Continued Public Involvement		N	S
Requirement §201.6(c)(4) (iii): *[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.*			
A. Does the plan explain how **continued public participation** will be obtained? (e.g., public notices, an on-going mitigation plan committee, annual review meeting with stakeholders).			

– END REVIEW CHECKLIST –

Notes:

APPENDIX 20 – COMMUNITIES WITH LOCAL HAZARD MITIGATION PLANS

Local Hazard Mitigation Plans must be developed to comply with provisions of §322 Robert T. Stafford Act as amended by DMA 2000.

Mitigation Plan Status
Current as of: 3-20-07

FEMA Approved Mitigation Plans: (20)	**MP.Com**	**Plan Type:**	**Status:**
Municipality of Anchorage (MOA		Multi	Approved 4/25/05
City and Borough of Juneau (CBJ)		Multi	Approved 12/15/05
City of Wasilla	x	Local	Approved 6/1/05
North Slope Borough (NSB)		Multi	Approved 5/5/06
City of Kaktovik		Local	Approved 5/11/05
Anaktuvuk Pass		Local	Approved 5/5/06
Atqusuk		Local	Approved 5/5/06
Barrow		Local	Approved 5/5/06
Nuiqsut		Local	Approved 5/5/06
Point Lay		Local	Approved 5/5/06
Wainwright		Local	Approved 5/5/06
City of Nome	x	Local	Approved 2/13/03
City of Aniak		Local	Approved 12/2/05
Kodiak Island Borough (KIB) (Single Jurisdiction only)	xx	Local	Approved 4/7/06 PDM (multi-jurisdiction due 10/15/07)
Kenai Peninsula Borough (KPB)		Multi	Approved 8/17/05 Annexed into KPB Plan
Homer		Local	Approved 8/17/05 Annexed into KPB Plan
Kachemak City		Local	Approved 8/17/05 Annexed into KPB Plan
Kenai		Local	Approved 8/17/05 Annexed into KPB Plan
Seward		Local	Approved 8/17/05 Annexed into KPB Plan
Soldotna		Local	Approved 8/17/05 Annexed into KPB Plan

FEMA Pre-Approved Mitigation Plans: (1)	MP.Com	Plan Type:	Status:
Point Hope		Local	Annexed into NSB Plan / Pre-Approved / Not Adopted

Plans in development & not yet submitted to FEMA: (19)	MP.com	Plan Type:	Status:
Fairbanks North Star Borough (FNSB)		Multi	State review comp. Rtn to Boro for more work.
Lake& Peninsula Borough (L&PB)	**xx**	Multi	PDM – Being developed by contractor
Matanuska-Susitna Borough (MSB)	**xx**	Multi	HMGP - Under revision. Being developed by staff.
Northwest Arctic Borough (NWAB)	**xx**	Multi	HMGP - Being developed by staff and contractor assistance
Petersburg	xx	Local	HMGP - Being developed by staff
Valdez	xx	Local	HMGP – Being developed by contractor
Whittier	xx	Local	HMGP – Being developed by contractor
Houston	xx	Local	Draft No recent activity. Being coordinated w/MSB.
Red Devil	xx	Local	PDM – Being developed by contractor
Sleetmute	xx	Local	PDM – Being developed by contractor
Cordova	xx	Local	PDM – Being developed by contractor
Unalaska	xx	Local	PDM – Being developed by contractor
Newtok	xx	Local	PDM – Being developed by contractor
Unalakleet	xx	Local	PDM – Being developed by contractor
Kotlik	xx	Local	PDM – Being developed by contractor
Dillingham	xx	Local	PDM - Being developed by staff
Golovin	xx	Local	HMGP - Being developed by Staff
Nunum Iqua	xx	Local	HMGP - Being developed by Staff
McGrath		Local	FMA Grant - FMA/DMA plan. Being developed by contractor.

Plan App's submitted to DHS&EM: (4)		**Plan Type:**	**Status:**
Kivalina	xx	Local	PDM – Under State Review. Being developed by contractor
Emmonak	xx	Local	PDM – Being developed by contractor
Bethel	xx	Local	PDM – Being developed by contractor
Kotzebue	xx	Local	PDM – Being developed by contractor

Plans Submitted to FEMA (2)	**MP.Com**	**Plan Type:**	**Status:**
Alakanuk	xx	Local	HMGP - Being developed by contractor
Hooper Bay	xx	Local	PDM - Being developed by contractor

MP.Com - MitigationPlan.Com
x - In MitigationPlan.com
xx - Will be entered in MitigationPlan.com

Anaktuvul Pass

Goals

1. *To maintain an uninterrupted power supply to City residences*

2. *Enhance the ability of the community of Anaktuvuk Pass to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance*

3. *To ensure that the local environment and subsistence lifestyle are not negatively impacted by petroleum product contamination.*

4. *To ensure that the effects of severe winter storms due not negatively impact services essential to life, health and safety in the community.*

5. *To protect the homes, businesses, industrial buildings and infrastructure of the community of Anaktuvuk Pass from damage due to subsidence in the permafrost underlying the community.*

6. *To protect the homes, business, public buildings and infrastructure in the community of Anaktuvuk Pass from the effects of flooding.*

Objectives and Actions

Objective: To ensure residential power supply is not lost for significant periods of time during winter months.

Actions 1: Assess and improve redundancy in electrical system to lessen number and severity of power outages in the community.

Action 2: Develop and implement a standardized power plant operator curriculum, to ensure that all staff are cross trained in system operation, maintenance and inspection. Training should cover power generation control systems as well as power grid line load protection and inspection.

Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.

Action 1: Provide Incident Command System (ICS) training to residents of the community of Anaktuvuk Pass.

Action 2: Develop and conduct annual emergency response exercises in the community of Anaktuvuk Pass.

Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Anaktuvuk Pass for use in Emergency Situations.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Anaktuvuk. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

- *Short-term projects are those which could be accomplished within a two year period.*

- *Long-term projects are those which will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.*

Objective: To ensure that the community can rapidly respond and mitigate any fuel spill occurring within or near Anaktuvuk Pass.
Action 1: Provide, or arrange provision of annual HAZWOPPER training to community members.
Action 2: Provide, or arrange provision oil spill response training to community members on an annual basis.
Action 3: Conduct an annual fuel spill response exercise in the community of Anaktuvuk Pass.
Objective: To ensure that both local ground transportation, as well as aircraft transportation are able to resume as soon as possible after a severe winter storm.
Action 1: Build a snow fence in the area parallel to Poker Hill Road, and perpendicular to Main Street. Local residents advise placement of such a fence will inhibit the development of the large snowdrifts that they currently experience on an annual basis.
Objective: To reduce the likelihood of structural damage in the community due to ground failure relating to subsidence in the permafrost underlying Anaktuvuk Pass.
Action 1: Acquire the services of a suitably qualified firm or individual to study the effects of a warmer weather pattern on the permafrost. Said firm or individual would then provide an action plan for alterations or protective actions for community buildings and infrastructure.
Objective: To reduce the potential for severe damage due to alluvial fan flooding or flash floods along Little Contact Creek.
Action 1: Utilize gabions and rock to deepen, widen and protect the current channel of Little Contact Creek. Such a project would extend an additional 5,000 feet above the end of where this work was completed on Contact Creek.
Action 2: Increase both the number and size of culverts under Main Street, north of Poker Hill Road, to allow for more rapid flow of waters produced from annual melt

Above information taken from: Anaktuvuk Pass Local All Hazard Mitigation Plan

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Anaktuvuk. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

- *Short-term projects are those which could be accomplished within a two year period.*

- *Long-term projects are those which will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.*

Municipality of Anchorage (MOA)

Goals

Education/Coordination:

1. *Develop coordinated and proactive public policies, emergency plans and procedures, and educational programs that minimize the risk to the community from natural hazards and disasters.*

Land Use / Planning:

2. *Develop an urban place that develops in harmony with its natural setting and is mindful of its natural hazards.*

Emergency Management:

3. *Create and maintain a community where people and property are safe.*

Protection of Public/Critical Facilities:

4. *Make Municipality of Anchorage (MOA) owned facilities as disaster resistant as feasible*

5. *Support Wildfire mitigation*

Information:

6. *Ensure information is easy to access and up-to-date*

Economy / Business:

7. *Maintain Anchorage's (and the State's) economic vitality*

Objectives and Actions	Priority	Timeline	Hazard
Objective 1.1 Increase coordination among Municipal departments			
Action 1: Have semi-annual meetings of the hazard mitigation committee	High	On going	All
Objective 1.2 Educate individuals and businesses about hazards, disaster preparedness and mitigation			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Action 2: Continue the A.W.A.R.E. Program	To Be Completed	On going	All
Objective 1.3 Increase coordination between hazard mitigation goals and existing and future plans including the incorporation of effective hazard mitigation strategies into the Capital Improvement Program			
Action 1: Review existing zoning to determine if additional wildfire mitigation measures could be incorporated	To Be Completed	2-3 years	Wildfire
Action 2: Implement the four essential strategies to implement policy #41 of Anchorage 2020. The four strategies are: design standards, land clearing standards, land use regulation amendment (Central Business zones), and landscape ordinance	To Be Completed	5-10 years	All
Objective 1.4 Coordinate with the Alaska Division of Insurance			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All

Objective 1.5 Educate public officials, developers, realtors, contractors, building owners and the general public about hazard risks and building requirements			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Action 2: Continue the A.W.A.R.E. Program	To Be Completed	On going	All
Objective 1.6 Partner with Municipal Departments and other agencies serving vulnerable populations to minimize harm in the event of an emergency			
Action 1: Conduct vulnerability analysis of shelters and traditional housing serving vulnerable populations.	To Be Completed	On going	All
Objective 2.1 Continue to provide for floodplain management to protect residents and property from the hazards of development in floodplains			
Action 1: The City shall continue to apply floodplain management regulations for development in the flood plain and floodway	To Be Completed	On going	Flood
Action 2: The City shall continue to utilize the Federal Emergency Management Agency's Flood Insurance Rate Map to define the special flood hazard area, the floodway and the floodplain	To Be Completed	On going	Flood
Action 3: Develop a list of possible sites to purchase for floodplain mitigation	To Be Completed	1 year	Flood
Action 4: Investigate the culvert near Arctic Boulevard and the Valley of the Moon Park as it is a source of localized flooding.	To Be Completed	2 years	All
Objective 2.2 Land use regulations shall include new design requirements that are responsive to Anchorage's climate and natural setting.			
Action 1: Review existing zoning to determine if additional wildfire mitigation measures could be incorporated	To Be Completed	2-3 years	Wildfire
Action 2: Implement the four essential strategies to implement policy #41 of Anchorage 2020. The four strategies are: design standards, land clearing standards, land use regulation amendment (Central Business zones), and landscape ordinance	To Be Completed	5-10 years	All
Objective 2.3 Use environmentally and conservation friendly materials in mitigation projects whenever possible and economically feasible			
Action 1: Develop a list of possible sites to purchase for floodplain mitigation	To Be Completed	1 year	Flood
Action 2: The City shall pursue funding to seismically retrofit City-owned facilities built before 1950.	To Be Completed	On going	Earthquake
Action 3: Identify all municipal facilities that need a pollution prevention plan	To Be Completed	1 year	Hazardous Materials
Objective 2.4 Adopt and enforce public policies to minimize impacts of development and enhance safe construction in high hazard areas			
Action 1: Review existing zoning to determine if additional wildfire mitigation measures could be incorporated	To Be Completed	2-3 years	Wildfire
Action 2: Implement the four essential strategies to implement policy #41 of Anchorage 2020. The four strategies are: design standards, land clearing standards, land use regulation amendment (Central Business zones), and landscape ordinance	To Be Completed	5-10 years	All
Objective 2.5 Integrate new hazard and risk information into building codes and land use planning mechanisms			
Action 1: Evaluate existing development guidelines to identify which ones, if any, should be revised to incorporate hazard mitigation activities.	To Be Completed	5-10 years	All
Action 2: Review existing zoning to determine if additional wildfire mitigation measures could be incorporated	To Be Completed	2-3 years	Wildfire
Action 3: Implement the four essential strategies to implement policy #41 of Anchorage 2020. The four strategies are: design standards, land clearing standards, land use regulation amendment (Central Business zones), and landscape ordinance	To Be Completed	5-10 years	All

Objective 3.1 Develop mechanisms in advance of a major emergency to cope with the subsequent rebuilding and recovery phases			
Action 1: Develop a recovery plan	To Be Completed	2 years	All
Objective 3.2 Consider the secondary effects of disasters, such as hazardous waste and hazardous materials spills, when planning and developing mitigation projects			
Action 1: Develop siting requirements for facilities built with Municipal funds	To Be Completed	6 months	All
Objective 3.3 Minimize increases in hazard vulnerability			
Action 1: Develop siting requirements for facilities built with Municipal funds	To Be Completed	6 months	All
Action 2: Increase the use of HAZUS	To Be Completed	5 year	All
Objective 3.4 Ensure compliance with the Emergency Planning and Community Right-to-Know Act of 1986			
Action 1: Continue to comply with Right to Know Act	To Be Completed	On going	Hazardous Materials
Objective 3.5 Improve road connectivity for evacuation purposes			
Action 1: Identify alternate connections between Eagle River and the Anchorage Bowl	To Be Completed	2-3 years	All
Objective 3.6 Promote disaster contingency planning and facility safety among institutions that provide essential services such as food, clothing, shelter and health care after hazard events			
Action 1: Conduct vulnerability analysis of shelters and traditional housing serving vulnerable populations.	To Be Completed	On going	All
Objective 3.7 Improve disaster warning systems.			
Action 1: Identify necessary warning system improvements	To Be Completed	On going	All
Objective 3.8 Promote appropriate hazard mitigation of all public and privately-owned property within the Municipality of Anchorage including, but not limited to, residential units, commercial structures, educational institutions, health care facilities, public gathering places, and infrastructure systems			
Action 1: Continue the A.W.A.R.E. Program	To Be Completed	On going	All
Action 2: Investigate the culvert near Arctic Boulevard and the Valley of the Moon Park as it is a source of localized flooding.	To Be Completed	2 years	All
Objective 3.9 Promote mitigation of historic buildings			
Action 1: The City shall pursue funding to seismically retrofit City-owned facilities built before 1950.	To Be Completed	On going	Earthquake
Objective 3.10 Promote post-disaster mitigation as part of repair and recovery			
Action 1: Develop a recovery plan	To Be Completed	2 years	All
Objective 4.1 Encourage a structural review of new facilities			
No Action Stated			
Objective 4.2 Consider known hazards when siting new facilities and systems			
Action 1: Develop a recovery plan	To Be Completed	2 years	All
Action 2: Develop siting requirements for facilities built with Municipal funds	To Be Completed	6 months	All
Objective 4.3 Perform structural retrofitting of existing structures			
Action 1: The City shall pursue funding to seismically retrofit City-owned facilities built before 1950.	To Be Completed	On going	Earthquake
Action 2: Install gas shut off valves in all MOA owned public facilities	To Be Completed	3-5 years	Earthquake
Action 3: Install gas shut off valves in all ASD public schools	To Be Completed	10-20 years	Earthquake
Action 4: Ensure school windows are shatter-resistant by installing a coating on the window or replacing the window.	To Be Completed	20 years	Earthquake
Action 5: Repair/replace the Lower Fire Lake Dam	High	1-5 years	Dam Failure
Action 6: Retrofit the Lake of the Hills Dam	To Be Completed	1-5 years	Dam Failure
Action 7: Identify municipal fire stations, police stations and emergency facilities that need to be seismically retrofit or rebuild to current seismic standards	To Be Completed	1 year	Earthquake

Objective 4.4 All public facilities should have a pollution prevention plan			
Action 1: Identify all municipal facilities that need a pollution prevention plan	To Be Completed	1 year	Hazardous Materials
Objective 4.5 Incorporate non-structural mitigation into existing buildings			
Action 1: Ensure school windows are shatter-resistant by installing a coating on the window or replacing the window.	To Be Completed	20 years	Earthquake
Objective 4.6 Implement mitigation programs that protect critical Municipal facilities and services and promote reliability of lifeline systems to minimize impacts from hazards, to maintain operations, and to expedite recovery in an emergency.			
Action 1: Install gas shut off valves in all MOA owned public facilities	To Be Completed	3-5 years	Earthquake
Action 2: Install gas shut off valves in all ASD public schools	To Be Completed	10-20 years	Earthquake
Action 3: Ensure school windows are shatter-resistant by installing a coating on the window or replacing the window.	To Be Completed	20 years	Earthquake
Action 4: Identify municipal fire stations, police stations and emergency facilities that need to be seismically retrofit or rebuild to current seismic standards	To Be Completed	1 year	Earthquake
Objective 4.7 Create redundancies for critical networks such as water, sewer, digital data, power and communications			
Action 1: Identify municipal fire stations, police stations and emergency facilities that need to be seismically retrofit or rebuild to current seismic standards	To Be Completed	1 year	Earthquake
Objective 4.8 Formalize best practices for protecting systems and networks			
No Action Stated			
Objective 5.1 Support the Anchorage Fire Department Wildfire Strategic Plan			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Action 2: Evaluate existing development guidelines to identify which ones, if any, should be revised to incorporate hazard mitigation activities.	To Be Completed	5-10 years	All
Objective 5.2 Promote FireWise Building design, siting and construction material			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Action 2: Evaluate existing development guidelines to identify which ones, if any, should be revised to incorporate hazard mitigation activities.	To Be Completed	5-10 years	All
Action 3: Review existing zoning to determine if additional wildfire mitigation measures could be incorporated	To Be Completed	2-3 years	Wildfire
Objective 5.3 Continue and Maintain vegetation management			
Action 1: Continue and maintain vegetation management	To Be Completed	1 year	Wildfire
Objective 5.4 Maintain the wildfire risk model			
Action 1: Maintain the wildfire risk model	To Be Completed	On going	Wildfire
Objective 5.5 Develop additional water resources to reduce the ISO rating			
Action 1: Develop additional water resources	To Be Completed	To Be Completed	Wildfire

Objective 6.1 Convert all hazard maps to a GIS format			
Action 1: Create of a dam inundation overlay zone in the MOA GIS System of known dam inundation areas.	To Be Completed	1 year	Dam Failure
Action 2: Digitize the ground failure maps from the Snow Avalanche & Mass-Wasting Hazard Analysis	To Be Completed	1 year	Ground Failure
Action 3: Continue to require new MOA buildings to go through the FM Global Engineering Review	To Be Completed	On going	All
Objective 6.2 Identify hazards not already mapped			
Action 1: Create of a dam inundation overlay zone in the MOA GIS System of known dam inundation areas.	To Be Completed	1 year	Dam Failure
Objective 6.3 Map all currently unmapped regulated flood-prone areas			
Action 1: Create a prioritized list of FIRMs that need to be updated	To Be Completed	1 year	Flood
Objective 6.4 Record information about MOA declared disaster events including location, extent, and damage caused on a standardized template			
Action 1: Establish a template that documents the information FEMA wants on each hazard event	High	1 year	All
Objective 6.5 Update drainage studies			
Action 1: Develop a list of drainage studies needing updating	To Be Completed	1 year	Flood
Objective 7.1 Partner with private sector, including small businesses, to promote structural and non-structural hazard mitigation as part of standard business practice			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Objective 7.2 Educate businesses about contingency planning citywide, targeting small businesses and those located in high risk areas			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Objective 7.3 Partner with private sector to promote employee education about disaster preparedness while on the job and at home			
Action 1: The City shall develop a program to educate the community on the various methods of making structures and their contents more disaster resistant, which would include: workshops, literature and public safety announcements	To Be Completed	2-3 years	All
Objective 7.4 Minimize economic loss			
Action 1: Port of Anchorage - Seismic Retrofit Terminal I Piles	To Be Completed	To Be Completed	Earthquake
Action 2: Port of Anchorage - Seismic Retrofit Terminal I Wells	To Be Completed	To Be Completed	Earthquake
Action 3: Port of Anchorage - Seismic Retrofit Terminal II – Crane Tie Downs	To Be Completed	To Be Completed	Earthquake

Above information taken from: Anchorage All-Hazard Mitigation Plan 2004

City of Aniak

Goals

Flood and Erosion:

1. *Reduce flood damage.*
2. *Prevent future flood damage.*
3. *Increase purchase of flood insurance and accurate insurance rating by public education and use of the elevation certification and city permits.*
4. *Increase public awareness*
5. *Adopt the digital FIRM before the 30-day notice letter.*

Severe Weather:

1. *Mitigate the effects of extreme weather by instituting programs that provide early warning and preparation.*
2. *Educate people about the dangers of extreme weather and how to prepare.*
3. *Develop practical measures to warn in the event of a severe weather event.*

Wildland Fire:

1. *Make buildings safer*
2. *Conduct outreach activities to encourage the use of Fire wise landscaping techniques.*
3. *Encourage the creation of firebreaks.*
4. *Encourage the evaluation of emergency plans with respect to wildland fire assessment.*
5. *Information acquisition*

Earthquake:

1. *Obtain funding to protect existing critical infrastructure from earthquake damage.*

Flood and Erosion Objectives and Actions

Objective 1.1: Support elevation, flood proofing, buyout or relocation of structures repetitively or substantially damaged that are covered by flood insurance policies.

Objective 2.1: Increase use of land use planning. Aniak should determine feasibility of utilizing land use planning tools, such as comprehensive land use plans, zoning, subdivision regulations, and storm water management regulations.

Objective 2.2: Elevation of structures in flood plains. Building a sustainable community requires long term planning; evaluation of new construction with respect to future disaster damages is fundamental to establishing a disaster-resistant community.

Objective 3.1: Encourage NFIP participation and compliance in Aniak. Support efforts to increase NFIP participation. Improve floodplain ordinance enforcement capability within the community by providing education and training. This is essential because Aniak has limited capability to enforce the floodplain ordinance for several reasons including lack of resources and training.

Objective 4.1 Increase public knowledgeable about mitigation opportunities, floodplain functions, emergency service procedures, and potential hazards.

Flood and Erosion Objectives and Actions

Objective 5.1: By obtaining City Council adoption of the new FIRM, Aniak will remain eligible for disaster assistance and flood insurance.	Timeline
Action 1: Dike Improvements	2006
Action 2: Critical Facilities	1-10 years
Action 3: Protection from Repetitive Flood Damage	On going
Action 4: Adopt the digital Flood Insurance Rating Maps	2005
Action 5: Restrict Vehicle Access on the Dike to Mitigate Erosion	2006
Action 6: Aniak Maps	On going
Action 7: Public Education	On going
Action 8: Airport Improvements	2006-2020
Action 9: Sewer and Water Projects	On going
Action 10: Helicopter Pad Improvement	2005-2006

Severe Weather Actions (no objectives stated)

Action 1: Research and consider instituting the National Weather Service program of "Storm Ready".	2006
Action 2: Conduct special statewide outreach/awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	2006-2007
Action 3: Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.	2006
Action 4: Encourage weather resistant building construction materials and practices.	2006
Action 5: Installation of automated weather sensors. Automated weather sensors are the chief method by which the National Weather Service detects the occurrence of incoming severe weather.	2007

Wildland Fire Actions (no objectives stated)

Action 1: Promote Fire Wise building design, siting, and materials for construction.	2006
Action 2: Ensure compliance with fire regulation and requirements.	On going
Action 3: Encourage revision or development of building codes and requirements.	2006
Action 4: Enhance public awareness of potential risk to life and personal property. Encourage mitigation measures in the immediate vicinity of their property.	2006
Action 5: Firebreaks greatly assist in controlling wildland fires. They can be developed in the form of roads and natural water channels. The firebreaks would also provide transportation corridors.	On going
Action 6: Develop or evaluate emergency plans to ensure consistency with the wildland fire assessments.	2006
Action 7: Encourage real-time availability and use of satellite data to evaluate fire potential.	2006

Earthquake Actions (no objectives stated)	Timeline
Action 1: If funding is available, perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City of Aniak.	2006-2010
Action 2: Identify buildings and facilities that must be able to remain operable during and following an earthquake event.	2006-2010
Action 3: Contract a structural engineering firm to assess the identified buildings and facilities to determine their structural integrity and strategy to improve their earthquake resistance.	2006-2010
Action 4: Identify priorities and budget to retrofit existing infrastructure to existing earthquake resistive construction standards.	2006-2010
Action 5: Educate the public in construction techniques to mitigate potential earthquake damage.	2006-2010

Above information taken from: Aniak All-Hazard Mitigation Plan 2005

Atqasuk

Goals

1. *To maintain an uninterrupted power supply both publicly and privately owned buildings during a long-term power outage.*
2. *Enhance the ability of the community of Atqasuk to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance.*

3. *To ensure that the local environment and subsistence lifestyle are not negatively impacted by petroleum product contamination.*

Objectives and Actions

Objective: To ensure power supply is not lost for significant periods of time during winter

Action 1: Assess and improve redundancy in electrical system to lessen number and severity of power outages in the community.
Action 2: Develop and implement a standardized power plant operator curriculum, to ensure that all staff are cross trained in system operation, maintenance and inspection. Training should cover power generation control systems as well as power grid line load

Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.
Action 1: Provide Incident Command System (ICS) training to residents of the community of Atqasuk. Provision of such training will greatly enhance the ability of community members to respond to disasters in a coordinated fashion.
Action 2: Develop and conduct annual emergency response exercises in the community of Atqasuk. Provision of, and participation in such locally based exercises will further develop the ability of the community to adequately respond to times of crisis or disaster.

Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Atqasuk for use in Emergency Situations. Provision and storage of said supplies will allow the community immediate access to resources for utilization in times of crisis.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Atqasuk. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

- *Short-term projects are those that could be accomplished within a two year period.*

- *Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.*

Action 1: Provide, or arrange provision of annual HAZWOPPER training to community members. The presence of several trained fuel spill responders in the community will provide for a more rapid response and recovery effort for any spill occurring in the community.

Action 2: Provide, or arrange for of provision oil spill response training to community members on an annual basis. Again, the presence of several trained fuel spill responders in the community will provide for a more rapid response and recovery effort for any spill

Action 3: Conduct an annual fuel spill response exercise in the community of Atqasuk. Provision of, and participation in such locally based exercises will further develop the ability of the community to adequately respond to times of crisis or disaster.

Above Information taken from: Community of Atqasuk Local All Hazard Mitigation Plan

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Atqasuk. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

- *Short-term projects are those that could be accomplished within a two year period.*

- *Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.*

Barrow

Goals

1. *Hardening of the natural gas production and transmission facilities and infrastructure prior to a natural or man made incident in order to reduce or eliminate potential damages.*
2. *Address and control coastal erosion encroaching upon community infrastructure and homes.*
3. *Address and lessen the potential impact upon community infrastructure and homes of flooding related to coastal storm surges*
4. *Enhance the ability of the community of Barrow to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance*
5. *To protect the homes, businesses, industrial buildings and infrastructure of the community of Barrow from damage due to subsidence in the permafrost underlying the community.*

Objectives and Actions

Objective: Ensure power generation, electrical transmission and home heating capabilities are not interrupted for the community during a disaster.

Action 1: Conduct a Risk, Target and Hazard Assessment on the Barrow Gas Fields, as well as the gas line that transports the product to the community. The Alaska Department of Homeland Security and Emergency Management can complete said assessment.

Action 2: Assess the feasibility of the development of a second natural gas transmission line from the Barrow Gas Fields to the Community of Barrow.

Action 3: Replace the spillway between the lower lagoon and the middle lagoon.

Action 4: The North Slope Borough, BUECI, the City of Barrow and UIC should work cooperatively to assess ownership and status of all power lines in the community. An action plan should be developed and implemented regarding the upgrade and maintenance of the system, especially as it relates to lines that are aged, and in a potentially weakened state.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Barrow. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

- *Short-term projects are those that could be accomplished within a two-year period.*

- *Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.*

Objective: To ensure that community infrastructure, homes and businesses are protected from damages due to coastal erosion.

Action 1: An alternate roadway should be built to access NARL in an area away from the coastline. Infrastructure, such as power lines and natural gas lines that run parallel to the roadway should also be relocated.

Action 2: The North Slope Borough Planning Commission should enact and enforce a moratorium on all building within areas deemed to be threatened by erosion. This area should be factored based upon an erosion rate of .86 meters annually, for a 50-year period.

Action 3: The North Slope Borough should acquire the services of a suitably qualified individual or firm to conduct a Project Analysis Report on a rollback/relocation of the community, to include all utilities. Particular attention should be paid to the buildings in blocks 28, 37, 38 and 39.

Action 4: The North Slope Borough should work cooperatively with BUECI to identify an alternate fresh water supply and develop infrastructure necessary to access said water in times of need.

Action 5: The North Slope Borough should continue to monitor the new beach armament efforts initiated during the summer of 2004. Although it is improbable that such efforts will halt continued erosion, the technology in use may be valuable in protecting critical areas such as the landfill, South Salt Lagoon, Middle Salt Lagoon, Old Ukpeagvik and the Utilidor Pump Station 4. Use of the technology, if it is found to be effective, may also postpone the need to relocate portions of the community.

Objective: To ensure that community infrastructure, homes and businesses are protected from damages due to flooding attributed to coastal storm surges.

Action 1: The community of Barrow should develop and enact a formalized storm watch program. Such a program would allow for advance notification of approaching storms, thereby allowing for adequate time to prepare and protect the community and its residents.

Action 2: The community of Barrow does not currently participate in the National Floodplain Insurance Program. Although participation in the NFIP has previously been discussed and rejected by the North Slope Borough Assembly, a careful assessment of the benefits of said participation is worth a second look.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Barrow. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Action 3: The North Slope Borough should codify and enforce a prohibition on any future development within the identified flood plain in the community. Efforts should also be made to implement a buyout and relocation assistance program for those property owners whose buildings are seriously damaged in future flood events.

Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.

Action 1: Provide Incident Command System (ICS) training to residents of the community of Barrow.

Action 2: Develop and conduct annual emergency response exercises in the community of Barrow.

Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Barrow for use in Emergency Situations.

Objective: To reduce the likelihood of structural damage in the community due to ground failure relating to subsidence in the permafrost underlying Barrow.

Action 1: Acquire the services of a suitably qualified firm or individual to study the effects of a warmer weather pattern on the permafrost. Said firm or individual would then provide an action plan for alterations or protective actions for community buildings and infrastructure.

Above Information taken from: City of Barrow Local All Hazard Mitigation Plan

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Barrow. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Homer

Goals

Tsunami	Priority
1. *Public Education*	High
2. *TsunamiReady Community Designation (Priority-High) *Status Completed 2002*	High
3. *Tsunami Evacuation Route Signage (Priority-High) *Status Completed 2002*	High
4. *Mapping (Priority-Medium) *Status Completed-2004*	Medium
5. *Encourage City of Homer, Planning & Zoning Department to incorporate tsunami risk areas in land use*	Medium
6. *Encourage federal flood insurance programs to cover tsunami damage. (Priority-Low) *Status Ongoing*	Low
Wildfire	
1. *Public Education of Wildfire Potential and Mitigation Strategies.*	High
2. *Control and direct open burning within the City limits of Homer.*	High
3. *Establish alternative methods of disposal for slash, brush, and organic debris so that residents do not have to*	High
4. *Prohibit open burning during high-risk periods.*	High
5. *Limit the types of roofing authorized materials approved for use in "interface" zones to prohibit use of highly*	Medium
6. *Develop wildfire fuel load reduction projects, especially around critical infrastructure and identified "safe zone"*	High
Earthquake	
1. *Protect existing critical infrastructure from earthquake damage.*	Medium
2. *Building Code Adoption-Seismic Requirement-New Construction*	Low
3. *Existing Buildings – Non-Structural Mitigation Program*	Medium
Flood	
1. *Participation in National Flood Insurance Program*	High
2. *Update Flood Plain Maps*	Medium
3. *Review flood scenario of 2002 to determine potential mitigation strategies*	Low
4. *Manage development in flood prone areas*	High

Objectives and Actions

Tsunami

Objective 1.1: Encourage all coastal local residents with a tsunami threat to participate in the Tsunami Awareness Program.
Action 1.1.1: Advertise Disaster Preparedness Workshop/Homer Community Schools
Objective 2.1: Participate in the NWS/WC&ATWC TsunamiReady Program.
Objective 3.1: Install evacuation route signs.
Objective 4.1: Obtain tsunami inundation maps for the City of Homer and adjacent communities.
Action 4.1.1: Develop tsunami inundation map for the Homer/Seldovia area.
Objective 5.1: Provide Tsunami Inundation Mapping and mitigation information to the City of Homer Planning Director for possible incorporation into
Action 5.1.1: Compile Tsunami Hazard Information
Objective 6.1: Educate residents and property owners about the Federal Flood Insurance Program. Currently, the City of Homer is enrolled in the Flo
Action 6.1.1: Obtain Federal Flood Insurance Program information from FEMA office for distribution
Action 6.1.2: Distribute Flood Insurance Program information during the Disaster Preparedness Workshops

Wildfire

Objective 1.1: Educate Homer area residents of the high potential for catastrophic wildfire in the Homer area. While the threat of wildfire can not be fully eliminated, educating the public regarding their personal risk and vulnerability to wildfire entrapment.
Action 1.1.1: Conduct annual public information campaigns in cooperation with the Division of Forestry.
Objective 1.2: Cooperate with the Division of Forestry in the “Fire Wise” campaign.
A**ction 1.2.1:** Encourage home owners and property owners to remove dead or diseased trees to promote regeneration of healthy forests and to replace vegetation know to easily ignite in wildfire conditions with fire resistive plants, shrubs and trees.
Action 1.2.2: Educate home owners in wildfire resistive construction techniques and strategies to limit their exposure to wildfire.
Action 1.2.3: Provide interested residents with Fire Wise informational packets and brochures.
Objective 2.1: Limit the number, size and location of burn piles within City Limits. Homer City Code requires that residents obtain an Open Burning Permit anytime during the year for all fires other than “warming fires”
Action 2.1.1: Issue burn permits year-round to Homer residents and seasonally to residents outside of Homer that wish to dispose of organic materials.
Objective 3.1: Encourage use of alternative methods of debris disposal other then open burning.
Action 3.1.1: Encourage use of composting, chipping, or grinding as an alternative to burning of woody debris.

Objective 4.1: In cooperation with the Division of Forestry, suspend burn permits and open burning during high fire danger conditions or when other factors will contribute to high fire danger.
Action 4.1.1: Maintain open lines of communication between the Division of Forestry, National Weather Service, and the Homer Volunteer Fire Department to determine when fire conditions warrant suspension of burn permits or open burning in general.
Action 4.1.2: When conditions warrant suspension of burn permits or open burning in Homer, disseminate that information in the form of press-releases to the local radio and print media.
Action 4.1.3: When open burning is prohibited, or burn permits are suspended ensure that the Homer Police Department Dispatch center is notified so that they can advise persons that call in to activate their individual permit that a temporary suspension has been placed on open burning.
Action 4.1.4: Complete a daily assessment of fire danger during closures or suspensions by 10:00 AM each day to determine the need to continue the closure or resend the closure.
Objective 5.1: Establish zoning and planning ordinances to prohibit the use of highly combustible wood shingles in at-risk "interface zones".
Action 5.1.1: Establish the definition of Interface Zone in City Zoning Code.
Action 5.1.2: Determine which areas of Homer should be considered as being in an Interface Zone
Action 5.1.3: Adopt codes to prohibit the use of wood shingles on roofs of structures/buildings located within an Interface Zone.
Objective 6.1: Review current fuel loads surrounding infrastructure and safety zone/shelter locations within the City of Homer.
Action 6.1.1: Develop list of know shelters (from Emergency Plan), safe zones, and critical infrastructure.
Action 6.1.2: Review wildfire fuel load and develop mapping of area in need of fuels management activities.
Action 6.1.3: Develop and implement fuel reduction plan

Earthquake

Objective 1.1: Perform an engineering assessment of the earthquake vulnerability of each identified critical infrastructure owned by the City of Homer.
Action 1.1.1: Identify buildings and facilities that must be able to remain operable during and following an earthquake event.
Action 1.1.2: Contract a structural engineering firm to assess the identified buildings and facilities to determine their structural integrity and strategy
Objective 1.2: Perform those steps identified above to protect critical infrastructure from earthquake damage and to preserve functionality.
Action 1.2.1: Identify priorities and budget to retrofit existing infrastructure to existing earthquake resistive construction standards.
Action 1.2.2: Develop a Request for Proposals to submit for design and construction of the retrofitting requirements.
Objective 2.1: Adopt into the Homer City Code regulations pertaining to the construction of new buildings, including all residential occupancies including seismic engineering and construction.
Action 2.1.1: Adopt the International Residential Code (2003 Edition) for the construction of all new residential occupancies within the City of Homer.
Objective 3.1: Provide technical advice, information, and non-structural building inspection services to those individuals, businesses and institutions requesting non-structural mitigation program guidance.
Action 3.1.1: Compile list of available non-structural mitigation materials available to the public.
Action 3.1.2: Compile list of individuals trained in non-structural mitigation strategies for dissemination to the public

Flood

Objective 1.1: Maintain the City of Homer's participation in the flood insurance program so that low cost flood insurance is available to residents.

Action 1.1.1: Annually review the requirements of the National Flood Insurance Program to conform to enrollment objectives and criteria.
Objective 2.1: Obtain funding to update existing flood plain maps to include all current city limits and the Bridge Creek Watershed.
Action 2.1.1: Coordinate with Alaska Department of Community and Economic Development and the Federal Emergency Management Agency to acquire funds to update area mapping.
Action 2.1.2: Work with the Federal Insurance and Mitigation Administration's Hazard Mapping Division to obtain updated maps
Objective 2.1: Coordinate updated mapping with GIS capabilities to aid in the determination of flood susceptible infrastructure and facilities.
Objective 3.1: Coordinate fact finding between Zoning and Planning and Public Works, Kenai Peninsula Borough and the State of Alaska DOT to map areas that experienced flooding in 2002.
Objective 3.2: Evaluate existing infrastructure to determine if changes need to be made to mitigate future flood under similar conditions.
Action 3.2.1: Develop overlay map of existing infrastructure (drainages, culvert size, storm drains.
Objective 3.3: Coordinate with responsible parties (Private, State, Borough, City) to determine design minimums to prevent future flooding under the heavy rainfall scenario similar to 2002.
Objective 4.1: Provide for the regular review of Chapter 12.12 to ensure up-to-date requirements are being addressed.
Objective 4.2: Require developers/land owners to provide documentation of compliance with existing Flood Damage Prevention requirements if the project is located within a flood hazard area as defined by City Code.

Above information taken from: City of Homer Local All Hazard Mitigation Plan

City and Borough of Juneau (CBJ)

Mitigation Ideas and Goals

Avalanche:

1. *Reduce the CBJ's vulnerability to avalanche hazards in terms of threat to life and property.*
2. *Promote public education and awareness regarding avalanche hazards.*

Landslide:

1. *Reduce risk of landslides in developed areas.*
2. *Reduce the CBJ's vulnerability to landslide damage in terms of loss of life and property.*
3. *Have comprehensive information regarding landslide hazards and unstable soils throughout the CBJ's developed area, including areas that will be developed in the future.*
4. *Increase public awareness of landslide dangers and hazard zones.*

Downtown Fire:

1. *Reduce the vulnerability of downtown structures to fire in terms of loss of life and property.*
2. *Reduce risk of fire in downtown Juneau.*

Earthquake:

1. *Reduce vulnerability of structures to earthquake damage.*
2. *Promote public education regarding avalanche hazards.*

Severe Weather:

1. *Increase warning time and public awareness of imminent severe weather events.*
2. *Reduce vulnerability to severe weather events.*

Flooding:

1. *Relocate and / or protect structures located in flood zones that are not eligible for NFIP.*
2. *Increase awareness of flood plains in Juneau.*
3. *Reduce risk of flood damages.*

Wildland Fire:

1. *Intercept potential wildland / urban interface fire danger before it becomes critical.*
2. *Increase public awareness and compliance with open burning safety guidelines.*
3. *Promote recognition of an prepare for the potential for wildland fire as a Juneau-area hazard.*

Tsunamis and Seiches:

1. *Promote recognition of tsunamis as a potential Juneau-area hazard.*
2. *Identify potential sources of landslide-included tsunamis in the Juneau area.*
3. *Reduce vulnerability to tsunamis.*

Volcanoes:

None stated

Avalanche Actions:	Timeline
Action 1: Public education	On going
Action 2: Utilize appropriate methods of structural avalanche control.	1-2 years
Action 3: Establish regular avalanche hazard evaluation and forecasting during the winter months.	1 year
Action 4: Progressively buy out homes in high hazard zones.	10-50+ years
Action 5: Prohibit all new construction in hazard zones.	1 year
Action 6: Attach "high hazard zone" designation to titles of properties.	1 year
Landslide Actions:	
Action 1: Update CBJ mapping to reflect high hazard and moderate hazard areas as determined in CBJ-funded studies.	3-5 years
Action 2: Utilize existing drainage system above Gastineau Avenue.	Immed-1 year
Action 3: Prohibit removal of vegetation in landside areas.	1 year
Action 4: Restrict construction in landside zones.	2 year
Action 5: Buy out of affected properties.	10-50+ years
Action 6: Structural reinforcement of unstable slopes.	1-10 years
Action 7: Thorough geological mapping of soils and slopes.	3-10 years
Action 8: Link "high hazard" designation to titles of properties.	1 year
Action 9: Require owners to notify renters of hazard prior to occupancy.	2 year
Downtown Fire Actions:	
Action 1: Code changes: Mandatory sprinklers for structures in hazard zone.	1 year
Action 2: Restrict open burning/campfires in hazard area.	2 year
Action 3: Increase code enforcement.	On going
Action 4: Update downtown fir3e hazard zone mapping more accurately reflect highest hazard areas.	1 year
Action 5: Provide incentives for business owners to incorporate fire protection measures.	1-3 years
Action 6: Restrict smoking in the downtown area.	1 year
Action 7: Place cigarette receptacles in strategic location to discourage careless disposal.	2 year

Above information taken from: The City and Borough of Juneau All-Hazards Mitigation Plan 2004

Kachemak City

Goals

Earthquake

1. *Reduce earthquake damage*
2. *Increase public awareness*

Fire

1. *Reduce and eliminate fire damage*
2. *Increase public awareness*

Flood

1. *Reduce and eliminate flood damage*
2. *Increase public awareness*

Landslide

1. *Reduce and eliminate landslide damage*
2. *Increase public awareness*

Volcanic Eruption

1. *Mitigate the effects of extreme weather by instituting programs that provide early warning and preparation.*
2. *Educate people about the dangers of extreme weather and how to prepare.*

Weather Extremes

1. *Mitigate the effects of extreme weather by instituting programs that provide early warning and preparation.*
2. *Educate people about the dangers of extreme weather and how to prepare.*

Potential Projects	Timeline
Earthquake	
1. Establishing minimum seismic standards for new construction will reduce structural damage and make recovery efforts easier and less costly.	Not Defined
2. Evaluate and revise if necessary building codes for single family, duplex, and tri-plex residential construction, and seek state resources and incentives to ensure compliance.	Not Defined
3. Encourage non-structural mitigation and preparedness activities.	Not Defined
4. Encourage the development of earthquake structural performance standards and incorporate earthquake overlay zones in the community land use ordinances.	Not Defined
5. Encourage the development of siting requirements based on soil type, slope, and other considerations. Before this can happen, information about where the various risks are located must be developed.	Not Defined
6. Promote incorporation of new methods to improve building performance. New materials and construction techniques might be more effective or feasible than what is currently available.	Not Defined
7. Evaluate the need for development of large-scale earthquake-hazard maps of The City of Kachemak areas. Seismic hazard area maps need to be created for the area. The maps should depict site amplification, liquefaction susceptibility, and ground failure at a minimum scale of 1 inch = 1 mile.	Not Defined
8. Continued enforcement of the International Building Code which requires that new construction be built with adequate standards that reduces the structural damage in the community should an earthquake occur.	Not Defined

Fire	
1. Evaluate FireWise building design, siting, and materials for construction. FireWise building design, siting, and materials for construction are a way to reduce a structure's vulnerability to fires.	Not Defined
2. Building codes should be evaluated to promote using nonflammable building material where appropriate, and adopting a residential fire code, an urban interface code, and support or promote Firewise communities.	Not Defined
3. Identify buildings or locations vital to the emergency response effort and buildings or locations that, if damaged, would create secondary disasters.	Not Defined
Flood	
1. Brochure containing information on the City of Kachemak flood dangers could be developed that is distributed to the community	Not Defined
2. Historic and potential flooding information	Not Defined
3. Finding available resources for mitigation projects	Not Defined
4. Erosion and sediment control project assistance	Not Defined
5. Real estate disclosure	Not Defined
6. Current homeowners and potential homebuyers are notified about flood hazard risk. Requirements for disclosing hazard risk in real estate transactions are made with the idea that the more knowledgeable homeowners and homebuyers are about flood risk, the more risk reduction efforts will occur.	Not Defined
7. Provide local realtors and lending institutions with flood potential information.	Not Defined
8. Evaluate the need for development of large-scale flood-hazard maps of City areas.	Not Defined
Landslide	
1. Brochure containing information on the City of Kachemak landslide dangers could be developed that is distributed to the community	Not Defined
2. Historic and potential landslide information	Not Defined
3. Finding available resources for mitigation projects	Not Defined
4. Erosion and sediment control project assistance	Not Defined
5. Real estate disclosure	Not Defined
6. Current homeowners and potential homebuyers are notified about landslide hazard risk. Requirements for disclosing hazard risk in real estate transactions are made with the idea that the more knowledgeable homeowners and homebuyers are about landslide risk, the more risk reduction efforts will occur.	Not Defined
7. Provide local realtors and lending institutions with landslide potential information.	Not Defined
8. Encourage the development of siting requirements based on soil type, slope, and other considerations. Before this can happen, information about where the various risks are located must be developed.	Not Defined
9. Evaluate the need for development of large-scale landslide-hazard maps of City areas.	Not Defined
Volcanic Eruption	
1. Conduct special outreach/awareness activities concerning the hazards associated with volcanic eruptions.	Not Defined
2. Expand public awareness about NOAA Weather Radio for continuous broadcasts and warning tone alert capability.	Not Defined
3. Encourage ashfall resistant building construction materials and practices.	Not Defined
Weather Extremes	
1. Conduct special outreach/awareness activities, such as Winter Weather Awareness Week, etc.	Not Defined
2. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.	Not Defined
3. Encourage weather resistant building construction materials and practices.	Not Defined

Above information taken from City of Kachemak Hazard Mitigation Plan

City of Kaktovik

Goals

1. *Address and control coastal erosion encroaching upon community infrastructure and homes:*
2. *To maintain an uninterrupted power supply to City residences*
3. *Enhance the ability of the community of Kaktovik to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance:*
4*. To protect the homes, businesses, industrial buildings and infrastructure of the community of Kaktovik from damage due to subsidence in the permafrost underlying the community.*
5. *To reduce the likelihood of damages to homes on the east edge of the community due to annual accumulation of water due to snowmelt.*
6. *To ensure that the local environment and subsistence lifestyle are not negatively impacted by petroleum product contamination.*

Objectives and Actions

Objective: To ensure that the City of Kaktovik will have its assets and infrastructure adequately protected from coastal storm surges and erosion.
Action 2: The North Slope Borough should investigate erosion rates at the current site of the Kaktovik Airport, and assess the need for relocation of the airport.
Action 2: Due to the fact that previous efforts to protect the old landfill from erosion have failed, the North Slope Borough should continue to work closely with the United States Air Force and the U. S. Army Corps of Engineers to ensure the mining and removal of the old Dew Line landfill site.

Objective: To ensure residential power supply is not lost for significant periods of time during winter months.
Action 1: Assess and improve redundancy in electrical system to lessen number and severity of power outages in the community.
Action 2: Develop and implement a standardized power plant operator curriculum, to ensure that all staff are cross trained in system operation, maintenance and inspection. Training should cover power generation control systems as well as power grid line load protection and inspection.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Kaktovik. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.
Action 1: Provide Incident Command System (ICS) training to residents of the community of Kaktovik.
Action 2: Develop and conduct annual emergency response exercises in the community of Kaktovik.

Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Kaktovik for use in Emergency Situations.
Objective: To reduce the likelihood of structural damage in the community due to ground failure relating to subsidence in the permafrost underlying Kaktovik.
Action 1: Acquire the services of a suitably qualified firm or individual to study the effects of a warmer weather pattern on the permafrost. Said firm or individual would then provide an action plan for alterations or protective actions for community buildings and infrastructure.
Objective: To improve the ability of the current infrastructure to allow drainage of excess groundwater due to snow melt.
Action 1: Install additional culverts under Pipsuk Road, Barter, Kaktovik, Hula Hula and First Streets and adjacent driveways to allow for proper drainage during melt off.
Objective: To ensure that the community can rapidly respond and mitigate any fuel spill occurring within or near Kaktovik.
Action 1: Provide, or arrange provision of annual HAZWOPPER training to community members.
Action 2: Provide, or arrange provision oil spill response training to community members on an annual basis.
Action 3: Conduct an annual fuel spill response exercise in the community of Kaktovik.

Above Information taken from: City of Kaktovik Local All hazard Mitigation Plan

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Kaktovik. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Kenai

Goals

1. Goal: Reduce or eliminate loss of bluff and potential damages due to such erosion by shoring the bluff, and zoning changes.
2. Reduce or eliminate loss of homes and property due to wildland fires by removing fuels, creating defensible spaces and public education.
3. Reduce or eliminate property damage and influx of debris into waterways due to floods by raising public awareness, and through zoning changes.

Objectives and Actions

Objective: Construct coastal trail walk with bluff protection, ensure zoning prohibits construction within reasonable distance from bluff, and protect city infrastructure in area.

Action Item: Continue seeking funding for completion of coastal trail for bluff protection, establish zoning restrictions for that area, and develop a plan to move infrastructure back from bluff to protect from catastrophic failure and potential pollution of inlet.

Objective: Develop "Fire Wise" neighborhoods to remove fuels; increase awareness of wildland/urban fire hazards in the community.

Action Item: Continue promoting "Fire Wise" programs to include public education programs in schools and neighborhoods. Develop and demonstrate defensible space and landscaping techniques to encourage community and home construction contractor participation. Reduce fuels in hazard areas and emergency egress routes in cooperation with the Kenai Peninsula Spruce Bark Beetle Mitigation Office, State Forestry and land owners

Objective: Raise public awareness of probable magnitude of flood damage and debris based on historical events using on site visits and meetings during permit issuance. Encourage securing of docks, vehicles, trash and utilities (LPG tanks, fuel tanks, etc) to reduce loss of same to owners, and reduce influx of debris into waterways during floods.

Action Item: Continue cooperative efforts of the Kenai Peninsula Borough, City of Kenai Planning & Zoning Commission, City Council and land owners/developers to enact and enforce a 50-foot setback of items on property adjacent to waterways.

Above information taken from: City of Kenai All Hazard Mitigation Plan

Kenai Peninsula Borough (KPB)

Strategy-Goals

Flood

1. *Complete a Borough-wide flood hazard risk assessment.*
2. *Develop mechanisms to enhance floodplain permit compliance.*
3. *Improve KPB floodplain mapping and identify other effective tools or methods to assist with flood hazard assessment.*
4. *Cooperate with the City of Seward and the Seward/Bear Creek Flood Service Area Board to identify, prioritize and implement cost effective strategies for controlling flood damage.*
5. *Review and appropriately revise KPB floodplain development standards and requirements.*
6. *Research and implement alternative floodplain management strategies.*
7. *Evaluate Borough-maintained roads for floodplain hazards and potential flood reduction projects.*
8. *Protect and maintain beneficial floodplain natural values.*
9. *Promote positive economic development.*
10. *Enhance existing emergency preparedness practices.*
11. *Provide flood hazard and floodplain development education and information.*
12. *Identify and develop partnership opportunities.*

Earthquake

1. *Identify and prioritize studies and retrofit measures for KPB critical facilities and infrastructure that are seismically vulnerable .*
2. *Encourage the reduction of non-structural and structural earthquake hazards in homes, businesses and government offices.*
3. *Encourage KPB residents to purchase earthquake hazard insurance.*
4. *Identify oil and gas producing facilities that pose a risk to the Kenai Peninsula Borough due to their proximity to active faults.*
5. *Perform earthquake hazard mapping for the Kenai Peninsula Borough and improve technical analysis of earthquake hazards.*
6. *Augment KPB communications and facility support.*
7. *Conduct mock emergency exercises to identify response vulnerabilities.*
8. *Minimize damage to residential structures in the unincorporated area of the Kenai Peninsula Borough.*

Weather

1. *Increase public awareness of severe winter storm mitigation activities and emergency response*
2. *Enhance weather monitoring and warning systems.*
3. *Expand local weather monitoring programs.*
4. *Minimize damage to residential structures and private property in the Kenai Peninsula Borough.*

Tsunamis & Seiches

1. *Increase public awareness of tsunami and seiche mitigation activities and emergency response.*
2. *Conduct mock tsunami hazard response exercises to identify response vulnerabilities.*
3. *Enhance tsunami-warning systems in KPB coastal communities.*
4. *Minimize tsunami damage to structures in the Kenai Peninsula Borough.*

Volcano

1. *Public Education*
2. *Increase planning for volcanic hazards*
3. *Research and publish information on volcanic hazards in Alaska*
4. *Improve monitoring*

Implementation Ideas and Action Items

Flood	Timeline
1.1 Provide a detailed inventory of problem areas and flood susceptible structures, and infrastructure (e.g., buildings, critical facilities, roads, bridges, culverts, etc.).	Ongoing
1.2. Identify potential retrofit or rehabilitation measures or activities.	Ongoing
1.3. Analyze cost/benefits and prioritize projects.	Ongoing
1.4. Coordinate with other agencies and organizations to identify permit requirements, partnership interests, funding sources.	Ongoing
1.5. Review and update information on a periodic basis.	Ongoing
2.1. Develop a project notification process to connect property owners with the appropriate floodplain, utility, and right-of-way construction permit information.	3-6 Months
2.2. Complete an audit of existing floodplain development within regulated floodplains for permit compliance.	1-2 years ongoing
2.3. Complete and verify the Floodplain Permit Database.	1-2 years ongoing
3.1. Perform detailed flood studies for FIRM Un-Numbered A and V Zones to provide base flood and wave run-up elevations and floodway delineations.	1-5 years
3.2. In addition to 100-year BFE predictions, generate detailed flood boundaries and predicted base flood elevations for 10, 25, and 50 events in areas with significant floodplain growth and development (e.g., the Kenai River).	1-5 years
3.3. Seek funding to complete Digital Elevation Mapping (DEM) for all KPB floodplains, with the Seward area as a priority. Acquiring digital elevation data would be a valuable first step to assist with understanding surface water hydrology, hazard assessment and emergency response planning and actions.	1-5 years
3.4. Correct geo-referencing problems with the Nikiski, Port Graham and Nanwalek FIRM maps so they can be entered into the KPB GIS System.	1-5 years
3.5. Digitize, geo-rectify and enter floodway boundary lines into the KPB GIS System for all numbered A zones.	1-5 years
3.6. Verify existing and install additional vertical elevation benchmarks in developing floodplains to facilitate accurate base flood elevation surveys for homeowners.	1-5 years
3.7. Map actual flood boundaries after major flood events.	1-5 years
3.8. Identify and map areas of active and severe riverine erosion along streams and rivers.	1-5 years
3.9. Identify and map areas of active and severe coastal erosion.	1-5 years
3.10. Install visible shoreline markers to collect erosion rate information in areas vulnerable to coastal storm run-up.	1-5 years

4.1. Seek grants and technical partnerships to complete comprehensive hydrologic studies of the Seward area alluvial streams from their headwaters to Resurrection Bay.	1-5 years
4.2. Apply for grants and technical partnerships to obtain 2-foot interval digital surface elevation data to assist with alluvial fan flood hazard evaluation as well as future FIRM map revisions.	1-5 years
4.3. Investigate the feasibility of implementing an array of alluvial fan floodplain management alternatives including: land use planning and zoning, stream channel migration zones, floodplain conservation areas, moving and elevating structures, acquiring properties subject to repetitive flooding, identifying areas, methods and markets for annual gravel and debris removal.	1-5 years
5.1. Review the definition section and add and clarify definitions as needed.	Ongoing
5.2. In areas where base flood elevation (BFE) information is available, require the lowest floor of residential and commercial buildings to be elevated a minimum of one foot above the BFE.	Ongoing
5.3. Add emergency response permit provisions, including guidelines for issuing verbal and written permits during emergencies.	Ongoing
5.4. Add regulations governing permanent and temporary storage of home heating oil, gasoline, diesel, and other hazardous materials.	Ongoing
5.5. Evaluate changing Chapter 21.06 Floodplain Management and Chapter 20.12.060 Subdivisions to limit or prohibit (with the exception of properly engineered and permitted stream crossings) the platting of new roads in floodways.	Ongoing
5.6. Require all new subdivisions lots to be of adequate size, orientation and elevation to insure there is developable space that is not unduly constrained by floodway, tideland, steep terrain, poor soils, wetlands, or un-mapped surface water drainages.	Ongoing
5.7. Require new subdivision plats to show FIRM floodplain and floodway boundaries and carry appropriate plat notes.	Ongoing
5.8. At the time of preliminary plat submittal, require an engineer stamped drainage plan that evaluates the surface water flow across the landscape and describes the methods that will be used to reduce flood damage exposure for all subdivisions that contain mapped floodway or are greater than 5 acres or 5 lots in the mapped floodplain.	Ongoing
5.9. Develop a long-term (2-5 year) permit exclusively for alluvial floodplain gravel extraction projects that will improve flood-water conveyance and reduce flood hazard.	Ongoing
5.10. Review and revise Chapters 14.06.150 Road Construction Standards and 14.08 Utility Right-of-Way Permits as appropriate to insure drainage plans and proper floodplain standards are incorporated into new floodplain road development as well as any significant upgrades to existing road and utility services.	Ongoing
5.11. Review all proposed code changes for consistency with KPB Coastal Management Program enforceable policies and specifically include language in KPB 21.06, Floodplain Management, KPB 21.18, Anadromous Streams Habitat Protection, KPB 20.20, Subdivisions, KPB 14.06 Road Standards, KPB 14.08 Permits for Utility Right-Of-Ways, and Chapter 21.26 Material Site Permits, which specifies floodplain related development decisions must comply with the enforceable policies of the KPB Coastal Management Program.	Ongoing

6.1. Create or encourage establishment of a revolving low-interest loan fund to help private property owners elevate or appropriately retrofit their structures to meet floodplain standards.	Ongoing
6.2. Investigate use of waterway setbacks and special zoning overlay areas, including riparian buffers and channel migration zones.	Ongoing
6.3. Provide tax credits to people willing to institute non-development easements in mapped floodplains and floodways.	Ongoing
6.4. Encourage the use of "flood service areas" for places and projects that require annual maintenance to control flooding hazards.	Ongoing
6.5. Periodically meet with the Cities of Homer and Seward to share information and brainstorm ways to improve National Flood Insurance Program implementation.	Ongoing
6.6. Encourage the Cities of Soldotna, Kenai, Kachemak, and Seldovia to adopt their own floodplain regulations and join the NFIP.	Ongoing
6.7. Acquire property or relocate structures in areas subject to severe flooding or erosion.	Ongoing
7.1. Institute a revolving flood mitigation budget fund to assist with Borough maintained road and capital projects.	Ongoing
7.2. Conduct joint site visits with key permitting agencies to evaluate repetitively damaged roads and formulate plans for flood mitigation upgrades.	Ongoing
7.3. Identify and investigate the possibility of vacating existing platted but not yet constructed floodway roads.	Ongoing
7.4. Evaluate the feasibility of constructing additional alternate road access to areas currently served by a single flood prone road.	Ongoing
7.5. Identify and upgrade existing stream crossings to maximize flood-water conveyance, maintain fish passage, and reduce negative impacts to wetlands, rivers, and streams.	Ongoing
7.6. Identify and stabilize erosion prone cut-banks to decrease damage to KPB roads.	Ongoing
7.7. Clean, resize or relocate overflow ditches to facilitate water movement and minimize debris jam flooding.	Ongoing
7.8. Install, upgrade or maintain protective dikes, dams, levees and as appropriate, conduct ongoing maintenance activities such as emergency gravel/debris removal or stream re-canalization.	Ongoing
8.1. Work with other interested agencies to identify degraded floodplains and investigate the potential for restoring or improving water passage, removing repetitively damaged structures and/or acquiring land to restore or preserve floodplain function.	Ongoing
8.2. Work with other interested agencies and non-profit organizations to develop watershed management plans that identify important natural water storage and flow features and recommend land management and development techniques to preserve critical floodplain function.	Ongoing
8.3. Provide best management practices (BMP) education and information to landowners and contractors to help minimize floodplain project impacts.	Ongoing
8.4. Provide incentives to encourage proper stewardship and limit impacts from residential and recreational use of lakes, rivers, and streams	Ongoing

9.1. Incorporate floodplain and watershed planning in appropriate KPB planning documents such as the Comprehensive Plan, Transportation Plan, and Coastal Management Program Plan.	Ongoing
9.2. Require written disclosure of hazard prone areas (such as floodplain, tsunami run-up zones, and areas with high erosion potential) when property ownership is transferred.	Ongoing
9.3. Enforce development standards to reduce or avoid flood vulnerability.	Ongoing
9.4. Encourage planning concepts such as cluster development, floodplain open space, and riparian zone conservation easements.	Ongoing
9.5. Develop incentive programs to encourage growth and development in less hazard prone areas outside of floodplains.	Ongoing
10.1. In cooperation with the USGS, upgrade the Anchor River gage to a continuous real time system (approximate additional cost: $15, 400), and find funding to return the Ninilchik River gage system to service (approximate cost $23,100) .	Immediately
10.2. Seek funding for digital elevation mapping (DEM).	Ongoing
10.3. Add a permit liaison position to the KPB Incident Command Structure to coordinate emergency permitting with the appropriate regulatory agencies.	Immediately
10.4. Institute a revolving flood mitigation fund for the purpose of delivering clean water, sand and sand bags and other critical services to communities during flood emergencies.	Immediately
11.1. Continue to send annual letters to all floodplain property owners notifying them of floodplain regulatory requirements.	Ongoing
11.2. Expand the annual property owner mail-out to include homeowners in areas that are flood prone but are not currently within a KPB flood-mapped (FIRM) area.	Ongoing
11.3. Continue to sponsor regular educational seminars with lending institutions, title companies, realtors, building contractors, surveyors, architects and engineers;	Ongoing
11.4. Continue to provide “self-help” flood protection and structural retrofit information from FEMA as well as participate in area trade shows, and public meetings.	Ongoing
11.5. Continue to provide information and individual permit assistance to property owners.	Ongoing
12.1. By seeking and participating in partnerships, the KPB can capitalize on resources available in the public and private sectors, providing more benefit for less overall cost. Ideally, long-range hazard mitigation planning will involve everyone with interest, resources and ideas to share.	Ongoing

Earthquake	Timeline
1.1. Assemble prioritized lists of Borough structures needing seismic studies to identify necessary changes or retrofits to meet current earthquake building standards.	18 wks per bldg.
1.2. Identify potential retrofit and rehabilitation measures and activities.	Ongoing
1.3. Analyze benefits/costs and prioritize seismic studies and retrofit projects.	Ongoing
1.4. Coordinate with other agencies and organizations to identify permit requirements, partnership interests and possible funding sources.	Ongoing
1.5. Review and update project priorities on an annual basis.	Ongoing
2.1. Augment existing homeowner earthquake safety programs. This should include distribution of information on safe building design and retrofitting techniques.	Ongoing
2.2. Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals and contractors.	Ongoing
2.3. Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.	Ongoing
3.1. Coordinate with insurance companies and organizations such as the Alaska Division of Insurance to produce and distribute earthquake insurance information.	Ongoing
4.1. Coordinate with insurance companies and organizations such as the Alaska Division of Insurance to produce and distribute earthquake insurance information.	Ongoing
5.1. Conduct HAZUS-MH modeling for the Borough.	1-2 years
5.2. Develop liquefaction-susceptibility maps for the urban and industrial areas at the scale of 1:25,000. It is possible to derive liquefaction susceptibility from existing geologic maps (available for much of the Borough), however this effort requires particular expertise.	2-4 years
6.1. Perform a Peninsula-wide assessment of communication system vulnerability. This information could be obtained through HAZUS-MH modeling.	2-3 years
6.2. Promote interagency planning to implement strategies that reduce loss of life and property resulting from an earthquake (e.g. If an event occurs during winter, transportation may be problem and useful construction equipment may not be readily available in off seasons).	2-3 years
7.1. Conduct simulated exercises to determine vulnerabilities in emergency response and facilities. This will help identify areas that need further attention, resources, and training.	2-4 years
8.1. Implement building codes for residential structures (smaller than 4-plexes) outside of city limits.	3-5 + years

Weather	Timeline
1.1. Participate in statewide outreach and awareness activities such as Winter Weather Awareness Week and Flood Awareness Week.	Ongoing
1.2. Continue weather preparedness outreach and education activities for Borough residents.	Ongoing
1.3. Coordinate with local utility organizations to increase homeowner education about potential storm effects and possible mitigation activities.	Ongoing
1.4. Expand public awareness about the NOAA Weather Radio service continuous weather broadcasts and warning tone alert services.	Ongoing
2.1. Evaluate the need for additional weather stations and/or weather instrumentation across the Kenai Peninsula Borough.	Ongoing
2.2. Evaluate current weather warning systems and explore the need to employ redundant methods of receiving and distributing weather warnings to Borough residents.	Ongoing
2.3. Support ongoing coordination between the incorporated cities, KPB, local utilities, and state and federal agencies to promote disaster warning and preparedness planning.	Ongoing
2.4. Seek funding for digital elevation mapping (DEM), which is a multi-faceted tool for hazard assessments, such as flooding, tsunami run-up, and avalanche and wildfire behavior.	Ongoing
2.5. Add a permit liaison position to the KPB Incident Command Structure to coordinate emergency permitting with regulatory agencies during disaster events.	Ongoing
2.6. Institute a revolving flood mitigation fund for the purpose of delivering clean water, sand bags and other critical services or supplies to communities during flood emergencies.	Ongoing
3.1. Investigate participation in the National Weather Service all-season storm spotter network.	Ongoing
3.2. Partner with the National Weather Service to use their all-hazard warning system (weather radio) to initiate alerts and provide Borough specific hazard warnings.	Ongoing
4.1. Encourage use of weather resistant materials and construction practices by implementing Uniform International Building Code Standards for residential structures smaller than 4-plexes outside of city limits (see Section 4.5, Strategy 8).	Ongoing
4.2. Require written disclosure of hazard prone areas (such as floodplain, tsunami run-up zones, and areas with high erosion potential) when property ownership is transferred.	Ongoing
4.3. Augment existing homeowner winter storm safety programs. This should include distribution of information on safe building design and retrofitting techniques.	Ongoing
4.4. Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals and contractors.	Ongoing
4.5. Encourage non-participating local communities to join the StormReady program to help prepare for weather events.	Ongoing

Tsunamis & Seiches	Timeline
1.1. Continue tsunami education activities for coastal residents (such as development of personal disaster preparedness kits for resident's homes and vehicles).	Ongoing
1.2. Increase public awareness of the Siren Alert and Warning System (SAWS) and the Community Alert Network (CAN).	Ongoing
1.3. Increase the number and visibility of warning signs to alert visitors and residents when entering tsunami hazard areas.	Ongoing
1.4. Ensure that evacuation routes and assembly areas are clearly marked in the event of emergency.	Ongoing
1.5. Coordinate with coastal communities to develop additional evacuation routes (see City of Seward All-Hazard Plan, Annex E).	Ongoing
1.6. Work with local health services, emergency services and American Red Cross officials to identify people with mobility impairments who live or work in tsunami vulnerable areas and develop plans for providing evacuation assistance.	Ongoing
2.1. Conduct simulated exercises to determine vulnerabilities in emergency response and facilities. This will help identify areas that need further attention, resources and training.	Ongoing 2-4 years
3.1. Evaluate the need for additional tsunami warning systems in coastal communities across the Kenai Peninsula Borough.	Ongoing 2-4 years
3.2. Partner with the NWS to use their all-hazard warning system (weather radio) to initiate alerts and provide KPB area-specific hazard warnings.	Ongoing 2-4 years
3.3. Seek funding to complete tsunami run-up maps for Port Graham and Nanwalek.	Ongoing 2-4 years
3.4. Support ongoing coordination between the incorporated cities, KPB, local utilities, and state and federal agencies to promote disaster warning and preparedness planning and training.	Ongoing 2-4 years
3.5. Seek funding for digital elevation mapping (DEM), which is a multi-faceted tool for hazard assessments, such as flooding, tsunami run up, avalanche and wildfire behavior.	Ongoing 2-4 years
3.6. Add a permit liaison position to the KPB Incident Command Structure to coordinate emergency permitting with regulatory agencies during and immediately following disaster events.	Ongoing 2-4 years
3.7. Institute a revolving flood mitigation fund for the purpose of delivering clean water, sand bags or other critical services or supplies to communities during disaster emergencies.	Ongoing 2-4 years
4.1. Use tsunami inundation maps (when available) to assist with land use planning, zoning and permitting decisions and processes.	Ongoing
4.2. Support the development of tsunami inundation maps for all vulnerable KPB coastal communities that haven't yet been mapped.	Ongoing
4.3. Encourage residents to explore building options to make property and structures more resistant to tsunami damage. Options may include such activities as elevating coastal homes, identifying ways to possibly divert water away from coastal structures and implementing sound site planning, building design and construction.	Ongoing
4.4. Require written disclosure of hazard prone areas (such as coastal storm surge -FIRM V Zones, tsunami run-up zones, and areas with high erosion potential) when property ownership is transferred.	Ongoing
4.5. Encourage non-participating local communities to join the TsunamiReady program to help them prepare for tsunami events.	Ongoing
4.6. Explore partnerships to provide retrofitting information or classes to homeowners, renters, building professionals and contractors who work or live in tsunami vulnerable locations.	Ongoing

Volcano Objectives and Actions	Timeline
Objective 1.1. Conduct specific outreach to the Alaskan aviation community regarding the hazards posed by Alaskan and Russian volcanoes.	Ongoing
Action 1.1.1: Revise the fact sheet on Volcano Hazards and Aviation Safety.	1 year
Action 1.1.2: Develop a fact sheet about mitigating the risk to aviation from Kamchatkan volcanoes.	1 year
Objective 1.2: Ensure all Alaskan communities at risk from volcanic eruptions are aware of the hazard and what can be done to mitigate risk.	Ongoing
Action 1.2.1: Distribute free USGS literature on volcano hazards.	Ongoing
Objective 2.1: Revise the Alaska Interagency Plan for Volcanic Ash Episodes to include the U.S. Coast Guard and make this plan available publicly online.	Ongoing
Objective 2.2: Revise the Alaska Interagency Plan for Volcanic Ash Episodes to include the U.S. Coast Guard and make this plan available publicly online.	Ongoing
Action 1.2.1: Revise State EOP	1 year
Objective 3.1: Compile an integrated volcano hazard and risk assessment for Cook Inlet and surrounding areas.	Ongoing
Objective 3.2: Continue to support publication of volcano hazard assessments for Alaska's active volcanoes.	Ongoing
Objective 4.1: Expand real time seismic monitoring to high-priority western Aleutian volcanoes.	Ongoing

Above information taken from: All Hazard Mitigation Plan Kenai Peninsula Borough

Kodiak Island Borough (KIB)

Goals

1. *Reduce Threats to Life Safety*
2. *Protect Critical Facilities*
3. *Reduce the Threat to Property*
4. *Create a Disaster Resistant-Resilient Economy*
5. *Increase Public Awareness of Mitigation*

Objectives	Duration
Objective 1.1: Enhance life safety by minimizing the potential for deaths and injuries in future disaster events.	Long-Term
Objective 2.1: Implement activities or project to protect critical facilities and infrastructure.	
Objective 2.2: Seek opportunities to enhance, protect, and integrate emergency and essential services.	Long-Term
Objectives 2.3: Strengthen emergency operations plans and procedures by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry and the citizens of Kodiak Island Borough.	
Objective 3.1: Reduce the potential for damages to public, residential, commercial and industrial buildings from each hazard that poses risk to specific buildings.	Long-Term
Objective 3.2: Reduce the potential for damages to other facilities and infrastructure from each hazard that poses risks to specific facilities and infrastructure.	
Objective 4.1: Develop and implement activities to protect economic well-being and vitality while reducing economic hardship in post disaster situations.	
Objective 4.2: Reduce insurance losses an repetitive claims for chronic hazard events.	
Objective 4.3: Work with state and Federal Partners to reduce short-term and long-term recovery and reconstruction costs.	Long-Term
Objective 4.4: Work with local organization, such as Local Emergency Planning Association (LEPA).	
Objective 4.5: Expedite pre-disaster grants and program funding.	
Objective 5.1: Coordinate and collaborate, where possible, risk reduction outreach efforts with other public and private organizations.	Long-Term
Objective 5.2: Develop and implement risk reduction education programs to increase awareness among citizens, local, borough, and regional agencies, non-profit organizations, business, and industry.	
Objective 5.3: Promote insurance coverage for catastrophic hazards.	Long-Term
Objective 5.4: Strengthen communication and coordinate participation in and between public, agencies, citizens, nonprofit organizations, business, and industry.	

Earthquake Action Items	Timeline
Short-Term Action 1: Complete seismic retrofits for school buildings identifies as posing a high life safety risk	1-3 years
Short-Term Action 2: Conduct seismic risk evaluation for critical facilities to determine which assets require retrofit	1-3 years
Short-Term Action 3: Disseminate FEMA pamphlets to educate homeowners and businesses about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	Ongoing
Long-Term Action 1: Obtain funding and retrofit critical facilities to ensure adequate seismic performance in future earthquakes.	Long Term
Long-Term Action 2: Encourage retrofit of vulnerable residential, commercial and industrial buildings.	Long Term
Tsunami Action Items	
Short-Term Action 1: Complete inventory of critical facilities located within mapped tsunami inundation zones (and probable inundation zones where mapping is not completed)	1-2 years
Short-Term Action 2: Complete mapping of tsunami inundation zones for all communities within the Borough	5 years
Long-Term Action 1: Harden or relocate critical facilities determined to be in tsunami inundation zones.	Long Term
Long-Term Action 2: Continue public education, evacuation awareness, and emergency planning for tsunami events.	Ongoing
Erosion Action Items	
Short-Term Action 1: Complete the inventory of locations, buildings and infrastructure subject to significant erosion.	1-2 years
Long-Term Action 1: Remediate erosion or relocate buildings or infrastructure subject to erosion when coast effective.	Long-Term
Long-Term Action 2: Limit future development in high erosion risk areas.	Ongoing

Flood Action Items	Timeline
Short-Term Action 1: Complete the inventory of locations, buildings and infrastructure subject to significant flooding.	1-2 years
Long-Term Action 1: Undertake flood mitigation actions when cost effective for identified high risk locations.	Long Term
Long-Term Action 2: Limit future development in high flood risk areas.	Ongoing
Landslide Action Items	
Short-Term Action 1: Complete the inventory of locations where critical facilities, other buildings and infrastructure are subject to landslides.	1-2 years
Long-Term Action 1: Consider landslide mitigation actions for slides seriously threatening critical facilities, other buildings or infrastructure.	Long Term
Long-Term Action 2: Limit future development in high landslide potential areas.	Ongoing
Severe Winter Storm Action Items	
Short-Term Action 1: Ensure that all critical facilities in Kodiak Island Borough have backup power and emergency operations plans to deal with power outages.	1-2 years
Long-Term Action 1: Enhance tree trimming efforts especially for transmission lines and trunk distribution lines.	Ongoing
Long-Term Action 2: Encourage prudent tree planting (avoid service lines) and safe, professional tree trimming where necessary.	Ongoing
Long-Term Action 3: Encourage citizens and businesses to plan for emergencies and to stockpile emergency supplies.	Ongoing
Snow Avalanche Action Items	
Short-Term Action 1: Complete the inventory of locations where critical facilities, other buildings and infrastructure are subject to avalanche.	1-2 years
Long-Term Action 1: Consider mitigation actions for avalanche areas seriously threatening critical facilities, other buildings or infrastructure.	Long Term
Long-Term Action 2: Limit future development in high avalanche potential areas.	Ongoing
Volcanic Hazards Action Items	
Short-Term Action 1: Update public emergency notification procedures and emergency planning for ash fall events.	Ongoing
Short-Term Action 2: Evaluate vulnerability of water and electric power systems to ask falls and mitigate risks when cost effective.	Long Term

Wildland/Urban Interface Fire Action Items	Timeline
Short-Term Action 1: Identify specific parts of Kodiak Island Borough at high risk for urban/wildland urban interface fires because of fuel loading, topography and prevailing construction practices.	1-2 years
Short-Term Action 2: Identify evacuation routes and procedures for high risk areas and educate the public.	1-2 years
Short-Term Action 3: Develop Community Wildland Fire Protection Plans.	1-2 years
Long-Term Action 1: Encourage fire-safe construction practices for existing and new construction in high risk areas.	Ongoing

Above information taken from: Hazard Mitigation Plan for Kodiak Island Borough Alaska

City of Nome

Goals

Flood:

Goal 1: *Protect individual properties from storm surges and erosion.*
Goal 2: *Guide development and use of the floodplain for flood protection*
Goal 3: *Enhance emergency services (emergency service activities)*
Goal 4 *: Increase public awareness*

Erosion:

Goal 1: *Protect individual properties from shoreline erosion.*

Severe Weather:

Goal 1: *Mitigate the effects of extreme weather by instituting programs that provide early warning and preparation.*
Goal 2: *Educate people about the dangers of extreme weather and how to prepare.*
Goal 3: *Develop practical measures to warn in the event of a severe weather event.*

Earthquake:

Goal 1: *Obtain funding to protect existing critical infrastructure from earthquake damage.*

Mitigation Projects	Timeline
Project 1: Update the current Flood Insurance Rate Maps.	2-3 years
Project 2: Provide adequate insurance for all city structures located within the flood plain.	Annual expense
Project 3: Pursue a lower CRS ranking.	Annual expense
Project 4: Fund an engineering evaluation to flood proof vulnerable structures.	1-2 years
Project 5: Bring a flood-proofing workshop to Nome to assist the City and private property owners.	1 year
Project 6: Continue to require buildings to be built with the lowest floor one foot above base flood elevation, as per NCC	On going
Project 7: As per NCC 11.50.020, continue enforcement of floodplain regulations, including requiring elevation certifications for all structures within the flood plain.	On going
Project 8: Establish zoning code and subdivision regulations that are specific to development within the flood prone areas.	On going
Project 9: Identify properties that would be appropriate for protection because of flood risks, and after public input, acquire, conserve, or protect by regulations.	5 years
Project 10: Distribute to local realtors and lending institutions GIS copies of FIRM.	Annually
Project 11: Pursue advanced risk analysis projects, which include GIS and other methodology.	5 years
Project 12: Consider revising the flood plain ordinance to include a provision for cumulative substantial improvement/damage.	2 years
Project 13 : Seek funding for additional maintenance and repair to the Nome Seawall	> 2 years
Project 14: Obtain funding to increase the height and impermeability of the Nome Seawall.	> 2 years
Project 15: Extend the Nome Seawall to Beam Road.	> 2 years

Project 16: Require that the USCOE re-map the flood and erosion hazard from the relocation of the mouth of the Snake River during the recent harbor improvement project.	> 2 years
Project 17: Request the Corps assess the use of dredge material for nourishing the beach in front of the Nome Seawall to lessen the storm and erosion damage.	> 2 years
Project 18: Assess and identify structures that have been damaged by ice.	On going
Project 19: Ask the LEPC to research and consider instituting the Alaska Department of Emergency Services program of "Storm Ready".	< 1 year
Project 21: Ask the LEPC to conduct special citywide outreach/awareness activities, such as Winter Weather Awareness Week, Flood Awareness Week, etc.	Annually
Project 22: Expand public awareness about National Weather Service radio for continuous weather broadcasts and warning tone alert capability.	Annually
Project 23: Require weather resistant building construction materials and practices.	On going
Project 24. Installation of automated weather sensors. Automated weather sensors are the chief method by which the National Weather Service detects the occurrence of incoming severe weather.	> 5 years
Project 25: Provide information on earthquake mitigation and preparedness activities.	Annually
Project 26: Evaluate the need for development of earthquake-hazard maps of the Nome areas.	> 1 year
Project 27: Continue enforcement of the International Building Code which requires that new construction be built with adequate standards that reduces the structural damage in the community should an earthquake occur.	On going
Project 28: Relocate NJUS power lines that are located in the flood plain.	> 2 years
Project 29: Replace the Nome Museum door with a flood proof door.	< 1 year
Project 30: Limit building city-owned buildings in the 100 and 500 year flood zones.	On going
Project 31: Erosion protection project for Belmont Point.	< 1 year
Project 32: Improve areas subject to chronic erosion (houses on Belmont Point that have flooded in past 2 years.)	< 1 year
Project 33: Raise elevation of Seppala Drive to 100 year flood elevation plus 1' for entire length of road.	< 1 year

Above information taken from: The City of Nome, Alaska 2006 All-Hazard Plan Update

Nuiqsut

Goals

1. *To maintain an uninterrupted power supply to City residences*
2. *Enhance the ability of the community of Nuiqsut to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance:*

3. *To ensure that the local environment and subsistence lifestyle are not negatively impacted by petroleum product contamination.*
4. *To protect the vulnerable assets of the Community of Nuiqsut from the effects of flooding on Nechelik Channel of the Colville River.*
5. *To ensure that the effects of severe winter storms due not negatively impact services essential to life, health and safety in the community.*

Objectives and Actions

Objective: To ensure residential power supply is not lost for significant periods of time during winter months.
Action 1: Assess and improve redundancy in electrical system to lessen number and severity of power outages in the community.
Action item: Develop and implement a standardized power plant operator curriculum, to ensure that all staff are cross trained in system operation, maintenance and inspection. Training should cover power generation control systems as well as power grid line load protection and inspection.

Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.
Action 1: Provide Incident Command System (ICS) training to residents of the community of Nuiqsut.
Action 2: Develop and conduct annual emergency response exercises in the community of Nuiqsut.
Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Nuiqsut for use in Emergency Situations.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Nuiqsut. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Objective: To ensure that the community can rapidly respond and mitigate any fuel spill occurring within or near Nuiqsut.
Action 1: Provide, or arrange provision of annual HAZWOPPER training to community members.
Action 2: Provide, or arrange provision oil spill response training to community members on an annual basis.
Action 3: Conduct an annual fuel spill response exercise in the community of Nuiqsut.

Objective: To ensure access to the community gravel source during times of crisis or need.
Action 1: Elevate the level of the gravel source road in order to prevent annual damage, or impassibility due to flooding on the Nechelik Channel of the Colville River.
Action 2: Armor or protect the gravel source road in order to prevent annual damage, or impassibility due to flooding on the Nechelik Channel of the Colville River.
Objective: To ensure that aircraft transportation is able to resume as soon as possible after a severe winter storm.
Action 1: Placement of a snow fence in a suitable location near the airport to reduce drifts which inhibit aircraft operation.

Above Information taken from: City of Nuiqsut Local All Hazard Mitigation Plan

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Nuiqsut. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Point Lay

Goals

1. *To maintain an uninterrupted power supply to City residences.*
2. *Enhance the ability of the community of Point Lay to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance*

3. *To ensure that the local environment and subsistence lifestyle are not negatively impacted by petroleum product contamination.*
4. *To ensure that the effects of severe winter storms due not negatively impact services essential to life, health and safety in the community.*
5. *To protect the homes, businesses, industrial buildings and infrastructure of the community of Point Lay from damage due to subsidence in the permafrost underlying the community.*

Objectives and Actions

Objective: To ensure residential power supply is not lost for significant periods of time during winter months.
Action 1: Assess and improve redundancy in electrical system to lessen number and severity of power outages in the community.
Action 2: Develop and implement a standardized power plant operator curriculum, to ensure that all staff are cross trained in system operation, maintenance and inspection. Training should cover power generation control systems as well as power grid line load protection and inspection.
Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.
Action 1: Provide Incident Command System (ICS) training to residents of the community of Point Lay.
Action 2: Develop and conduct annual emergency response exercises in the community of Point Lay.
Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Point Lay for use in Emergency Situations.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Kaktovik. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Objective: To ensure that the community can rapidly respond and mitigate any fuel spill occurring within or near Point Lay.
Action 1: Provide, or arrange provision of annual HAZWOPPER training to community members.
Action 2: Provide, or arrange provision oil spill response training to community members on an annual basis.
Action 3: Conduct an annual fuel spill response exercise in the community of Point Lay.

Objective: To ensure that both local ground transportation, as well as aircraft transportation are able to resume as soon as possible after a severe winter storm.
Action 1: Reposition the snow fence north of the community in order to reduce drifting snow on the roads and streets of the community.
Action 2: Develop and implement a heavy equipment maintenance schedule to ensure that equipment is available for snow removal on both roadways and the airport.

Objective: To reduce the likelihood of structural damage in the community due to ground failure relating to subsidence in the permafrost underlying Point Lay.
Action 1: Acquire the services of a suitably qualified firm or individual to study the effects of a warmer weather pattern on the permafrost. Said firm or individual would then provide an action plan for alterations or protective actions for community buildings and infrastructure.

Above Information taken from: Point Lay Local All Hazard Mitigation Plan

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Kaktovik. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

- *Short-term projects are those that could be accomplished within a two-year period.*

- *Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.*

Seward

Goals

Flood

1. *Identify hazard areas and select mitigation measures for those areas.*
2. *Increase public awareness of hazards.*
3. *Enact mitigation measures.*

Earthquake

1. Identify hazard areas and select mitigation measures for those areas.
2. Increase public awareness of hazards.
3. Enact mitigation measures.

Tsunami

1. Identify earthquake and tsunami hazards within the City of Seward and evaluate and prioritize potential mitigation measures.
2. Protect lives and properties in the event of a tsunami through public education and emergency response exercises.

Coastal Erosion

1. Reduce the amount of shoreline erosion within allowable practices and monetary constraints.

Weather

1. Increase public awareness of hazards related to severe weather

Snow Avalanche/Landslides

1. Increase public awareness of hazards of avalanche/landslides in the community.

Volcano

1. Increase public awareness of hazards

Technical

1. Increase public awareness of hazards of potential spills/accidents

Economic

1. Increase public awareness of potential hazards
2. Support and encourage planned economic development that will be beneficial to the City of Seward.

Mitigation Measures/Projects

Flood

1.1. Floodplain development permits to include elevation certificates and data.
1.2. Request base sea level and flood elevations from builders on proposed projects.
1.3. Provide maps of flood hazard areas, in digital and hard copy.
1.4. Update as required city code floodplain management ordinance.
1.5. Update the Seward Flood Hazard Mitigation Plan, 1996.
1.6. Integrating Flood Hazard Mitigation strategies into the Seward 2010 Comprehensive Plan, 1990.
1.7. Include flood issues in the Seward Strategic Plan, 1999.
1.8. Provide FEMA Public Outreach Floodplain information booklets.
1.9. Staff coordination with KPB, State of Alaska, and Federal Floodplain managers on flood issues within the City of Seward.
1.10. Building Permits; insuring the adopted building codes address flood issues.
1.11. Working with the Seward Bear Creek Flood Service Area Advisory Board to establish a working mitigation plan.
1.12. Advising the US Army Corps of Engineers of conditions concerning the Lowell Creek Tunnel Project including renovating the tunnel and developing a new outfall.
1.13. Maintaining the Japanese Creek Levee.
2.1 Risk Analysis: With advances made in Geographic Information System (GIS) technology, it is becoming increasingly easy to analyze the risk of various flood events.
3.1. Once the potential problems and solutions have been addressed along with input from the public process and approval of the City Council, the mitigation can go forward. The process of funding each project can be addressed during the normal budget process and/or with grant funding. Completion of any project will depend on the availability of funds and any changes of priority.

Earthquake

1.1. Update building codes to stay current with state requirements and industry concerning earthquake protection.
1.2. Identify non-build able sites through the city's land use plan and city zoning maps.
1.3. Earthquake proof priority structures (schools, city buildings, public safety offices, etc.) This project requires the involvement of many government entities and assessments of various structures.
1.4. Acquire land within the city to develop a secondary evacuation route that bypasses the Seward lagoon and boat harbor areas. Provide barriers to this route and designate it as a recreational trail for use outside of emergency access. (Planning and Zoning Commission, May 6, 2004)

2.1. Conduct community mock emergency exercises and evaluate response.
2.2. Develop public education to concentrate on the SAWS (Siren Alert and Warning System), what it means and what to do in the event of an emergency. Educate the public on CAN (Community Alert Network). (Planning and Zoning Commission May 6, 2004) Possibly make public announcements using the utility billing memo and the scanner announcement page with GCI cable TV and radio.
2.3. Develop a brochure to educate homeowners on fuel tank stand codes to be more flood/earthquake prepared (Planning and Zoning Commission May 6, 2004)
3.1. Once the potential problems and solutions have been addressed along with input from the public process and approval of the City Council, the mitigation can go forward. The process of funding each project can be addressed during the normal budget process and/or with grant funding. Completion of any project will depend on the availability of funds and any changes of priority.

Tsunami

1.1. Complete tsunami inundation hazard prediction maps and revise as needed after an event or disaster.

1.2. Acquire land within the city to develop a secondary evacuation route that bypasses the Seward lagoon and boat harbor areas. Provide barriers to this route and designate it as a recreational trail for use outside of emergency access. (Planning and Zoning Commission, May 6, 2004)

2.1. Install AWS (Alaska Weather System) radios in public buildings. These radios will also broadcast tsunami watches and warnings.

2.2. Install EMWIN (Emergency Managers Weather Information Network), from the National Weather Service into the police dispatch area.

2.3. Conduct community mock tsunami exercises and review responses to correct deficiencies.

2.4. Develop public education to concentrate on the SAWS (Siren Alert and Warning System), what it means and what to do in the event of an emergency. Educate the public on CAN (Community Alert Network). (Planning and Zoning Commission May 6, 2004)

Coastal Erosion

1.1. Build a protective barrier south of the Seward Marine Industrial Center (SMIC) for erosion control.

1.2. Complete wave barrier at the ship lift located in SMIC.

1.3. Maintain the rock barrier located in the Waterfront Park area.

1.4. Create a baseline assessment on Lowell Point Road, existing infrastructures and the feasibility of culvert/ditch line installation.

1.5. Maintain or redesign rip-rap barriers along Lowell Point Road.

1.6. Dredging operations to remove debris and fill at the head of Resurrection Bay near the airport.

Weather

1.1. Coordinate responses of private contractors during a severe event as indicated in the City's Emergency Plan.

1.2. Public education on the effects of severe weather.

1.3. Inform public of availability of AWS radios, in preparation of potential weather advisories.

Snow Avalanches/Landslides

1.1. Identify avalanche areas within the city and generate GIS Hazard Maps. Coordinate with Community Development on locations of areas for any zoning issues.

1.2. Create safe parking areas along Lowell Point Road for vehicles.

1.3. Develop and install signs designating avalanche danger zone.

1.4. Renovate Lowell Canyon Tunnel access.

1.5. Establish a retaining structure in Lowell Canyon to prevent avalanches from disrupting city water storage system.

Volcano

1.1. Refer to KPB Hazard Mitigation Plan for guidance on mitigation plans

1.2. Identify critical facility risk and need from ash fallout.

Technical

1.1. Work with industry operators to educate the public on potential hazards and develop strategies for response, evacuation, and containment.

1.2. Develop spill/clean up plans with industry.

1.3. Encourage sites to meet standards/regulations for all reportable quantity hazard materials.

1.4. During large renovation, repairs or after a disaster, encourage the use of utility doors for future pipelines.

Economic

1.1. Make concise information available to the public about local industry concerning any government control.

1.2. Make sure that accurate information is given to agencies that are responsible for dissemination of information concerning the City of Seward or other government agencies.

1.3. Public groups (Chamber of Commerce, Lions, and Rotary Clubs, etc.) with business interests have accurate and timely information available to dispel rumors.

2.1. Insure that the City of Seward is a safe and clean place for visitors to come.

Above information taken from: Seward Hazard Mitigation Plan

Soldotna

Goals, Objectives, and Actions

Wildfire Steps

Fire breaks in and around City of Soldotna (including Wildlife Refuge)
Fuel reduction of beetle killed spruce and underbrush
Build an emergency route via Mackey Lake to the Kenai Spur Hwy
Enhance Forestry response by relocating their facilities to the Soldotna Airport for helicopter and truck operations
Alternate water supplies
Insure defensible areas surrounding vital public facilities
Wildlife awareness
Provide public education and awareness
Public and private equipment sources

Earthquake Steps

Increase roof load requirements (done)
Establish water supply facilities at artesian flow well houses
Purchase generators to run water well pumps at well B (near hospital) and E on Funny River Road
Water reservoir tank on south side of the Kenai River in case of disruption of main lines under Sterling Highway Bridge
Provide standby generators to operate vital facilities
Provide road maintenance equipment on both sides of the Kenai River in case of bridge damage
Provide alternate water/sewer utility lines crossing the Kenai River other than the those under on the Sterling Highway Bridge
Provide public education and awareness
Provide information and location of shelter
Public and Private equipment sources

Hazardous Material Release Steps

Establish reporting of hazardous loads traveling the Kenai Spur Highway, Seward Highway, Sterling Highway, and Sterling Highway Bridge
Build an emergency route via Mackey Lake Road to the Kenai Spur Highway
Provided public education on Shelter-in-Place
Provide public education and awareness

Above information taken from: City of Soldotna Annex to the Kenai Peninsula Borough Local All Hazard Mitigation Plan

Wainwright

Goals

1. *Address and control coastal erosion encroaching upon community infrastructure as homes:*
2. *To maintain an uninterrupted power supply both publicly and privately owned buildings during a long-term power outage.*
3. *Enhance the ability of the community of Wainwright to respond to emergency situations, recognizing that substantial periods of time may pass prior to obtaining outside assistance:*
4. *To ensure that the local environment and subsistence lifestyle are not negatively impacted by petroleum product contamination.*

Objectives and Actions

Objective: To ensure that the City of Wainwright will not have to be relocated in the future.

Action 1: Identify and utilize alternative technologies to protect/reinforce those areas of the community currently threatened by coastal erosion.
Action 2: Develop a long-range plan for the potential relocation of community infrastructure (water lines, sewer lines, roads) currently threatened by coastal erosion.

Objective: To ensure power supply is not lost for significant periods of time during winter months.
Action 1: Commission and complete a study regarding how best to develop redundancy in electrical system to lessen the impact of a catastrophic power outage in the community.

Action 2: Develop and implement a standardized power plant operator curriculum, to ensure that all staff are cross trained in system operation, maintenance and inspection. Training should cover power generation control systems as well as power grid line load protection and inspection.

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Kaktovik. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

Objective: To ensure that infrastructure, lives and property are protected during periods of crisis or emergency.
Action 1: Provide Incident Command System (ICS) training to residents of the community of Wainwright. Provision of such training will greatly enhance the ability of community members to respond to disasters in a coordinated fashion.
Action 2: Develop and conduct annual emergency response exercises in the community of Wainwright. Provision of, and participation in such locally based exercises will further develop the ability of the community to adequately respond to times of crisis or disaster.

Action 3: Obtain emergency supplies (MRE's, temporary shelters, candles, cots, etc) and store in Wainwright for use in Emergency Situations. Provision and storage of said supplies will allow the community immediate access to resources for utilization in times of crisis.
Objective: To ensure that the community can rapidly respond to, and clean up any fuel spill occurring within or near Wainwright.
Action 1: Provide, or arrange provision of annual HAZWOPPER training to community members. The presence of several trained fuel spill responders in the community will provide for a more rapid response and recovery effort for any spill occurring in the community.
Action 2: Provide, or arrange for of provision oil spill response training to community members on an annual basis. Again, the presence of several trained fuel spill responders in the community will provide for a more rapid response and recovery effort for any spill occurring in the community.
Action 3: Conduct an annual fuel spill response exercise in the community of Wainwright. Provision of, and participation in such locally based exercises will further develop the ability of the community to adequately respond to times of crisis or disaster.

Above Information taken from the: Wainwright Local All Hazard Mitigation Plan

Timeline

The following list is based upon the analysis of vulnerabilities and mitigation measures for known hazards in the City of Kaktovik. Prioritizing the list will depend on future disasters and the needs of the community. The use of short and long term projects is consistent with the state hazard plan.

• Short-term projects are those that could be accomplished within a two-year period.

• Long-term projects are those that will take longer than two years, and/or will depend on other projects being accomplished first, or substantial funding resources.

City of Wasilla

Goals

Earthquake

1. *Inform public of existing fault lines that may affect Wasilla*
2. *Publicize and promote general awareness of earthquake emergency action plans (individuals, families, community).*
3. *Inform public of the measures they can take to protect structures from earthquake damage.*
4. *Develop emergency plans to provide food and shelter as the result of earthquake damage. This is a goal for all hazard scenarios.*

High Winds

1. *Institute measures that will improve resistance of new buildings to high winds.*
2. *Identify schools, medical facilities, senior centers and day care centers, and other public buildings vulnerable to loss from high winds and suggest ways their owners can prepare for wind storms.*
3. *Encourage installation/utilization of backup power supplies at critical facilities.*
4. *Encourage installation of damage-resistant glass replacement or liners in public buildings.*

Severe Weather

1. *Develop emergency plans to provide shelter when power fails during extreme weather.*
2. *Mitigate the effects of extreme weather by instituting programs that provide early warning and pre-event preparation.*
3. *Identify transportation improvements and other methods to reduce injuries to traveling public during severe weather.*

Wildfire and Urban Fires

1. *Reduce fire injuries and damage to structures from fires.*
2. *Educate Wasilla area residents about wildfires and urban fires.*

Ash Fall

1. *Reduce health problems caused by volcanic ash.*
2. *Reduce property damage caused by ash fall.*
3. *Reduce property damage caused wind or water erosion.*

Floods

1. *Reduce property loss and injuries caused by flooding.*

Objectives and Actions	Timeline
Earthquake	
Objective 1: Develop easy to understand visual information on earthquake faults in the Wasilla area to increase general awareness of areas with known earthquake potential.	1-5 years
Action 1: Work with Alaska Geophysical Institute and USGS to obtain large scale map of regional fault lines and develop informational brochure for distribution to schools and general public.	1-5 years
Action 2: Distribute maps to schools and general public.	1-5 years
Objective 2: Inform/remind community of need to discuss ways to communicate with family members, locate shelter, stockpile food and medication for use in earthquake or other emergency situation.	1-5 years
Action 1: Develop education information similar to Are you prepared for the next big Earthquake in Alaska! With details specific to Wasilla area for distribution to schools, churches, civic organizations, and general public.	1-5 years
Action 2: Distribute to schools, churches, civic organizations and general public.	1-5 years
Objective 3: Inform homeowners and businesses of action they can take to reduce structural damage and injuries caused by seismic activity.	1-5 years
Action 1: Distribute information on simple measures homeowners can take to strengthen structure before next earthquake with each development permit issues.	1-5 years
Action 2: Analyze and strengthen public water towers and wastewater facilities as necessary to ensure public health through continuance of the ability to provide clean water and dispose of wastewater.	1-5 years
Action 3: Encourage owners of critical facilities to brace equipment whose failure may disrupt the operations of a critical facility.	1-5 years
Action 4: conduct community meetings to discuss adoption of Building Codes to ensure future construction of structures that are designed to withstand tremors.	1-5 years
Objective 4: Review with local emergency agencies the projected need for emergency shelter locations to handle community needs following an earthquake, and develop plan for providing number of locations identified.	1-5 years
Action 1: Designate emergency shelter site, provide for emergency needs to be met at the location and publicize location of shelters.	1-5 years
Action 2: Develop shelter method of publicizing when a shelter is open, and they types of services each shelter can provide.	1-5 years

High Winds	
Objective 1: Reduce structural damage to homes and businesses caused by wind damage or from flying debris.	1-5 years
Action 1: Develop a system to inform builders, homeowners and businesses that building with additional bracing for roof tresses, reinforced columns and bond beams, protected building openings, and securely mounted roof equipment including cowlings and flashing suffer fewer and less costly damages than other buildings as part of the land use permit process.	1-5 years
Action 2: Install reinforcement clips to City owned street name signs, directional and instructional signs to prevent damage and injury caused by flying debris.	1-5 years
Action 3: Conduct a community meeting to discuss adoption of Building Codes to ensure future construction of structures that are designed to withstand high winds.	1-5 years
Objective 2: Provide information and encourage building owners to invest time, energy and resources wind proofing their structures.	1-5 years
Action 1: Conduct a windshield survey of critical facilities and mail a copy of any recommendation on wind proofing projects that might reduce damage caused by high winds.	1-5 years
Action 2: Develop community campaign to encourage residents to cut back trees that might fall on buildings, check and refasten roof sheathing when patching or repairing roof, to select wind resistant exterior wall finish.	1-5 years
Objective 3: Reduce injuries due to loss of power at facilities that are important to communities in an emergency.	1-5 years
Action 1: Seek grants to provide emergency back-up such as emergency generators, secondary power feeds, portable generators with standard connections at all critical facilities.	1-5 years
Objective 4: Reduce injuries caused by falling glass.	1-5 years
Action 1: Seek grants to lower cost of installing damage-resistant glass or liners in building on critical facilities list.	1-5 years

Severe Weather	
Objective 1: Review with local emergency agencies the projected need for emergency shelter locations to handle community needs during severe weather and develop plan for providing number of locations identified.	1-5 years
Action 1: Designate emergency shelter sites, provide for emergency needs to be met at he locations, publicize location of shelters.	1-5 years
Action 2: Develop shelter method of publicizing when a shelter is open, and the types of services each shelter can provide.	1-5 years
Objective 2: Reduce personal injury and property damage caused by extreme weather events.	1-5 years
Action 1: Evaluate the clarity of reception of NONA Weather Radio broadcasts locally and determine if additional broadcast repeater is necessary to ensure this information is available and clear.	1-5 years
Action 2: Provide NONA Weather Radio to all government buildings, schools, medical facilities and work with staff to develop information/process that ensures early warning of potential weather event.	1-5 years
Action 3: Identify elderly and indigent citizens who may be at risk during winter storms and develop method of informing them of expected weather event.	1-5 years
Action 4: Place exposed power and telephone lines underground to prevent damage from ice loading.	1-5 years
Action 5: Encourage routine trimming of trees to reduce power outages during storms.	1-5 years
Action 6: Develop a credit-card sized, laminated card that lists warning signs of frostbite and hypothermia that can be distributed to the public through schools, day-care facilities and businesses.	1-5 years
Objective 3: Reduce personal injury and property damage caused by extreme cold, ice, and blowing snow.	1-5 years
Action 1: Review accident report information for roads and intersections with high number of weather related accidents to determine if change or enhancement of road design will reduce accidents or severity of accidents. Assign City Public Works Department to work with Alaska Department of Transportation & Public Facilities to fund identified changes.	1-5 years
Action 2: Reduce or eliminate glaciation on Parks Highway caused by wind blowing across frozen surface of Wasilla Lake by constructing seasonal snow fence/wind screen.	1-5 years
Action 3: Provide tourist related businesses with information on where to find NOAA Weather Radio broadcast and on warning signs of frostbite or hypothermia to educate winter travelers.	1-5 years

Wildfire and Urban Fires	
Objective 1: Encourage use "Defensible space" design in location and construction of homes and businesses and other ways to reduce personal and property damage due to wild fires.	1-5 years
Action 1: Distribute information on how to find the FIREWISE web site and on some of the information there that will help home owners to create a defensible space.	1-5 years
Action 2: Work to ensure that sub dividers in Wasilla provide more than one means of access into and out of developing areas through the City subdivision review process.	1-5 years
Action 3: Educate the public on City ordinance requiring property owners to post addresses on all structures to reduce response time during an emergency, and enforce the ordinance.	1-5 years
Action 4: Encourage homeowners and businesses to use fire-resistant materials in construction of buildings and structures.	1-5 years
Action 5: Develop fire incident command protocols.	1-5 years
Action 5: Notify absent landowners whose property is at high risk for fire and encourage then to remedy the problem.	1-5 years
Objective 2: Reduce number of fires caused by human carelessness.	1-5 years
Action 1: Work with schools and Fire Department to distribute educational material on fire prevention.	1-5 years
Action 2: alert the public when fire risk is greatest by posting "Fire Danger" gauges similar to those used in National Forests at City limits.	1-5 years
Action 3: Identify neighborhoods especially vulnerable to fire and work with volunteer firefighters to conduct neighborhood meeting on fire safety and "defensible space" concepts.	1-5 years
Action 4: Promote the use of fire-resistant materials in building construction by supplying informational material to local Home Builders Association.	1-5 years
Ash Fall	
Objective 1: Inform those at risk of preventive measures in advance of ash fall danger by developing public education campaign.	1-5 years
Action 1: Identify medical facilities, child care centers, and senior centers and invite caregivers to meetings to explain respiratory problems resulting from exposure of ash fall. Provide information on how to reduce exposure.	1-5 years
Action 2: Work with Borough on publicity campaign to inform/remind public to call MSB Air Quality Alert phone number-352-DUST for daily air quality information.	1-5 years
Action 3: Work with Alaska Department of Environmental Concerns to install air quality monitoring equipment in Wasilla, and add Wasilla information to MSB Air Quality Alert reports.	1-5 years
Objective 2: Provide Wasilla residents with information on how to prevent property damage caused by volcanic ash by developing flyers on ash fall.	1-5 years
Action 1: Develop educational material on hazard to electrical & mechanical equipment and to roofs due to weight of ash and distribute to the public.	1-5 years
Action 2: Develop/Distribute information on increased danger of falls and auto accidents due to decreased visibility and slippery walking and driving conditions caused by ash.	1-5 years

Erosion	
Objective 1: Inform property owner at risk for wind or water erosion of the risk and of preventive measures that they can initiate to avoid some or all of the damage.	1-5 years
Action 1: Using information from the Wasilla Soil and Water Conservation District and other state and federal agencies develop a map of areas in Wasilla most likely to experience wind or water erosion.	1-5 years
Action 2: Identify property in the path of flood waters that could cause erosion and provide information to property owners of potential problems and prevention measures.	1-5 years
Action 3: Identify property in the path of flood waters that could cause erosion and provide information to property owners of potential problems, prevention measure, and use of flood insurance to mitigate public cost of rebuilding.	1-5 years
Action 4: Develop a grading ordinance that would control timing of land clearing to reduce wind/water erosion before and during construction.	1-5 years
Action 5: Work with the Wasilla Soil Conservation District to educate the public on actions they can take to reduce erosion.	1-5 years
Floods	
Objective 1: Improve existing flood hazard map information which was last revised in May 1985 (FIRM community Panel 0200210 9675 C &0200210 9700 C).	1-5 years
Action 1: Work with FEMA to overlay new flood plain information on aerial photographs. Flood plain information should include all of land in the city limits, the future utility service area, and show flood elevations.	1-5 years
Action 2: Identify City culverts that flood often and determine if increasing culvert size would reduce/eliminate future flooding events.	1-5 years
Action 3: Protect any public water supply in flood prone areas from infiltration and flood damage by raising controls and well pipe.	1-5 years
Action 4: Identify buildings at risk from 100 and 500 year storms and inform owners/residents of flood proofing alternatives.	1-5 years
Action 5: Identify any hazardous material storage.	

Above information taken from City of Wasilla Hazard Mitigation Plan (Phase I - Natural Hazards)

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APPENDIX 21 – ALASKA ECONOMIC DEVELOPMENT RESOURCE GUIDE

Guide is on file in DHS&EM office.

Also available at:

http://www.commerce.state.ak.us/dca/edrg/EDRG.htm

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APPENDIX 22 – FEDERAL PROGRAMS OFFERING NON-STRUCTURAL FLOOD RECOVERY AND FLOODPLAIN MANAGEMENT ALTERNATIVES

Guide in on file in DHS&EM office.

Also available at:

http://www.fema.gov/hazard/flood/pubs/non_fema1.shtm

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APPENDIX 23 – A GUIDE TO FEDERAL AID IN DISASTERS

Guide is on file in DHS&EM office.

Also available at:

http://www.itsdocs.fhwa.dot.gov?JPODOCS/REPTS_TE?9043.pdf

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APPENDIX 24 – STATE OF ALASKA EMERGENCY RESPONSE PLAN

This plan is on file in DHS&EM office.

Also Available at:

http://www.ak-prepared.com/plans/acrobat_docs?Alaska_Emergency_Response_Plan.pdf

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APPENDIX 25 – MITIGATION TASKS WORKBOOK 2007

Current as of April 12, 2007

Color Key	Blue Text = total award	Red Text = problem	Gray Text = Project Closed	Periwinkle Text = terminated		Due date not pressing	Due in the next 1-2 months	Past due	Discrepancy between us and FEMA
Due Date	**Grant Expiration Date**	**Obligated Project Award Amount**	**Status**		**Grant Funds Spent to Date**	**Task**	**Assigned To:**	**Outstanding Reimburse Requests**	**Qtr Reports Received from Applicant**
Reports									
04/30/07						**State HMGP Qtrly Reports**	Lize		
						- Review, coordinate, submit to FEMA			
						- Communicate with applicant, answer/return telephone calls and inquiries			
04/30/07						**PDM Qtrly Reports**	Lize		
03/08/07						Complete Monthly Progress and Budget Reports for Tsunami Program	Scott/Erv		
HMGP Projects									
Declaration Date	**06/26/02**	**Expiration Date Extended to:**	**12/26/07**			**1423 HMGP Project Coordination**			
Total Award:	**$723,190**	5% discretionary available:	$36,160	7% Planning available:	$50,623	88% Other available:	$636,407		
Total Obligated to Sub-Grantees:	$305,063	5% discretionary obligated:	$0	7% Planning obligated:	$0	88% Other obligated:	$418,127		
Total Difference:	$418,127	5% remainder:	$36,160	7% remainder:	$50,623	88% remainder:	$218,280		
						- Review, coordinate, submit to FEMA (principally Red Devil and Alakanuk)			
						- Communicate with applicant, answer / return telephone calls and inquiries			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
IAWQR		$73,127	Obligated 01/30/04	88%	$56,343	1423.M001, DHS&EM, Management Costs	Lize		

	05/30/07	$15,000	Obligated 8/5/04	88%	$10,206	1423.0002, City of Aniak helicopter landing pad for emergency evacuation	Brent		7/1-9/30-04,10/31-12/31-04, 1/1-3/31-05, 4/1-6/30-05, 7/1-9/30/05, 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30/06, 10/1-12/31-06, 1/1-3/31/07
	Complete	$280,000	**Complete**	88%	$278,530	1423.0003, City of Alakanuk relocation of homes and foundation elevation	Lize		4/1-6/30-04, 7/1-9/30-04, 10/1-12/31-04, 1/1-3/31-05, 4/1-6/30-05, 7/1-9/30-05, 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06
	Complete	$50,000	Complete (Feasibility Study)	88%	$47,358	1423.0005a, Kuskokwim River (Red Devil and Sleetmute) Structure elevation feasibility study			4/1-6/30-05
	10/29/06	$385,063	**Terminated**	88%		1423.0005b, Kuskokwim River (Red Devil and Sleetmute) Structure elevation construction			
				Total Spent:	$392,436				
Declaration Date	**Declared 11/8/2002**	**Extended Expiration to:**	**11/8/08**			**1440 2003 Denali Earthquake Disaster and Supplmental Applications HMGP Projects**			
Total Award:	**$3,194,667**	5% discretionary available:	$159,733	7% Planning available:	$223,627	88% Other available:	$2,811,307		
Total Obligated to Sub-Grantees:	$3,180,867	5% discretionary obligated:	$0	7% Planning obligated:	$70,000	88% Other obligated:	$3,110,867		
Total Difference:	$13,800	5% remainder:	$159,733	7% remainder:	$153,627	88% remainder:	($299,560)		
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			

						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
IAWQR		$219,854	Obligated	88%	$92,600	1440.0001, DHS&EM, Management Costs	Lize		
		$2,500	**Complete**	88%	$2,500	1440.0002, Mat-Su BoroughDept. Emer Serv, Non-structural Seismic Mitigation			12/03-12/31-04, 1/1-3/31-05, 4/1-6/30-05, 7/1-9/30-05
	08/26/06	$0	**Terminated for lack of progress**	88%	$0	1440.0003, Copper River School District, Non-structural Seismic Mitigation			
	06/30/07	$10,000	Obligated	7%	$0	1440.0004, City of Valdez, Hazard mitigation plan	Erv		4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	05/27/07	$7,500	Obligated 7/27/05	7%	$0	1440.0005 , City of Alakanuk, Hazard mitigation plan	Erv		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	06/01/07	$7,500	Obligated 9/1/05	7%	$0	1440.0006, City of Kotlik, Hazard mitigation plan	Erv		4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	06/28/07	$10,000	Obligated	7%	$0	1440.0007, City of Whittier, Hazard mitigation plan	Erv		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06, 1/1-3/31/07
	Complete	$20,000	**Complete**	88%	$18,065	1440.0008, Fairbanks NS Borough, Sewell Subdv. Acquisition, Phase I			1/1-3/31-06 Ammended 6/30/06

	06/13/08	$776,601	Obligated 6/12/06	88%	$58,984	1440.0008b, Fairbanks NS Borough, Sewell Subdv. Acquisition, Phase II	Brent		4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	11/07/07	$741,269	Obligated 10/21/05	88%	$0	1440.0009, NSB - Kaktovik, Electrical system upgrade	Brent		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06, 1/1-3/31-07
	Complete	$10,000	**Project Complete**	7%	$7,500	1440.0010, City of Nome, Mitigation Plan update			7/1-9/30-05 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06
	11/15/06	$10,000	**Terminated for lack of progress**	7%	$0	1440.0011, City of Shishmaref, Hazard Mitigation Plan			1/1-3/31-06
	10/21/07	$454,161	Obligated 10/13/05	88%	$0	1440.0012 , Kenai Peninsula Borough, Tsunami Warning System upgrade	Brent		7/1-9/30-05, 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	06/30/07	$96,482	Obligated 11/3/05	88%	$0	1440.0013 , Homer Electric, Tree Clearing-Swanson River	Brent		1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	11/18/07	$15,000	Obligated	7%	$0	1440.0014 , City of Petersburg, Hazard mitigation plan	Erv		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	04/17/08	$800,000	Obligated	88%	$0	1440.0015 , AK-DOT&PF (Nome), Improved drainage on Front Street, Nome	Brent		4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
				Total Spent:	$179,649				

Declaration Date	**Declared 12/4/2002**	**Extended Expiration to:**	**12/4/08**			**1445 2003 KPB Fall Flooding Disaster HMGP Projects**			
Total Award:	**$2,371,362**	5% discretionary available:	$118,568	7% Planning available:	$165,995	88% Other available:	$2,086,799		
Total Obligated to Sub-Grantees:	$2,343,261	5% discretionary obligated:	$0	7% Planning obligated:	$24,000	88% Other obligated:	$2,319,261		
Total Difference:	$28,101	5% remainder:	$118,568	7% remainder:	$141,995	88% remainder:	($232,462)		
						- Review, coordinate, submit to FEMA			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$86,617	Obligated 04/30/04	88%	$65,032	1445.0002, Division of Homeland Security, Management Costs	Lize		
	Complete	$10,000	**Project Complete**	88%	$9,475	1445.0001, Alaska DCED, Bishop residence relocation			7/1-9/30-04, 10/1-12/31-04
	08/10/07	$15,000	Obligated 6/17/04	7%	$5,519	1445.0003, City of Seward, Hazard Mitigation Plan	Erv		10/1-12/31-04 1/1-3/31/05, 4/1-6/30, 7/1-9/30, 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	Complete	$9,000	**Project Complete**	7%	$2,573	1445.0004, City of Homer, Hazard Mitigation plan			7/1-9/30-04, 10/1-12/31-04, 1/1-3/31/05, 4/1-6/30, 7/1-9/30 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06
	10/22/07	$640,000	Obligated 01/20/05	88%	$177,210	1445.0005, Municipality of Anchorage, Lower Fire Lake Dam Upgrade	Brent	.	10/1-12/31-04, 1/1-3/31-05, 4/1-6/30-05, 7/1-9/30-05, 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06, 1/1-3/31-07

	Complete	$34,000	**Project Complete**	88%	$24,806	1445.0014, Alaska Railroad, Embankment Protection for Indian siding switch MP 88.2 Seward Line			4/1-6/30-05, 7/1-9/30-05, 10/01-12/31-05, 1/1-3/31-06
	Complete	$64,500	**Project Complete**	88%	$45,967	1445.0015 , Alaska Railroad, Raise RR embankment Beluga Point MP 96.4			4/1-6/30-05, 7/1-9/30-05, 10/01-12/31-05, 1/1-3/31-06
	Complete	$64,500	**Project Complete**	88%	$47,012	1445.0016 , Alaska Railroad, Flood Protection-Potter March MP 100.8			4/1-6/30-05, 7/1-9/30-05, 10/01-12/31-05, 1/1-3/31-06
	12/20/07	$187,406	Obligated 9/16/05	88%	$0	1445.0017 , Kenai Peninsula Borough, Relocation of Kasilof River Rd.	Brent		10/1/12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	Withdrawn	$0	Withdrawn		N/A	1445.0018, Alaska Railroad, Flood Protection-Old Girdwood MP 255.1			
				Total Spent:	$832,907				
Declaration Date	**04/26/03**	**Expiration Date:**	**4/26/07**			**1461 2003 KPB Southcentral Windstorm Disaster HMGP Projects**			
Total Award:	**$322,753**	5% discretionary available:	$16,138	7% Planning available:	$22,593	88% Other available:	$284,023		
Total Obligated to Sub-Grantees:	$325,700	5% discretionary obligated:	$0	7% Planning obligated:	$10,000	88% Other obligated:	$315,700		
Total Difference:	($2,947)	5% remainder:	$16,138	7% remainder:	$12,593	88% remainder:	($31,677)		
						- Review, coordinate, submit to FEMA			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			

				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$36,450	Obligated	88%	$19,336	1461.0006, Division of Homeland Security, Management Costs	Lize		
	04/01/07	$263,650	**Project Complete**	88%	$87,021	1461.0002, Mat-Su Borough, School Roof Upgrade - Strapping	Brent		7/1-9/30-05, 10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	Complete	$15,600	**Project Complete**	88%	$15,600	1461.0003, Anchorage School District, Ursa Minor School Soffit upgrade			4/1-6/30-05, 7/1-9/30-05, 10/1-12/31-05
	Complete	$10,000	**Project Complete**	7%	$7,500	1461.0004 City of Wasilla, Hazard Mitigation Plan			3/3-3/31-05, 4/1-6/30-05, 7/1-9/30-05, 10/1-12/30-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06
						1461.0005 Clear 3 Phase Line outside of right of way near Swanson River			
				Total Spent:	$129,457				
Declaration Date	**11/15/04**	**Expiration Date:**	**11/15/08**			**1571 Bering Strait Sea Storm Disaster HMGP Projects**			
Total Award:	**$710,179**	5% discretionary available:	$35,509	7% Planning available:	$49,713	88% Other available:	$624,958		
Total Obligated to Sub-Grantees:	$678,319	5% discretionary obligated:	$34,960	7% Planning obligated:	$49,516	88% Other obligated:	$292,525		
Total Difference:	$31,860	5% remainder:	$549	7% remainder:	$197	88% remainder:	$332,433		
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			

		$64,765	Obligated	88%	$41,347	1571.0001, Division of Homeland Security, Management Costs	Lize		
	03/13/08	$6,044	Obligated 3/2/06	88%	$0	1571.0002, City of Nome, Museum Sump Pump	Brent		4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06, 1/1-3/31/07
	05/30/08	$45,942	Obligated 5/22/06	88%	$29,432	1571.0003, Shishmaref IRA, Relocate Computer Center Cottage	Brent		
	05/23/07	$15,000	Obligated 5/8/06	7%	$0	1571.0004, Mat-Su Borough, Mitigation Plan	Erv		7/1-9/30-06, 10/1-12/31-06
	02/22/08	$34,516	Obligated 5/8/06	7%	$0	1571.0005, Northwest Arctic Borough, Mitigation Plan	Erv		10/1-12/31-06, 1/1-3/31/07
	06/07/08	$46,100	Obligated 5/26/06	88%	$0	1571.0006, AK Railroad MP 255	Brent		7/1-9/30-06, 10/1-12/31-06
	07/24/08	$34,960	Obligated 7/18/06	5%	$0	1571.0007, UAF/GI, EQ Notification System and Real Time Display System, Phase I	Brent		
	07/17/08	$129,674	Obligated 7/7/06	88%	$15,159	1571.0008, Sewell Acquisition Phase III	Brent		7/1-9/30-06, 10/1-12/31-06
	08/02/08	$301,318	Obligated 7/24/06	88%	$0	1571.0009, KIB Ouzinke School Seismic Retrofit	Brent		7/1-9/30-06, 10/1-12/31-06
		$159,070	Denied	5%		1584.000x, Kenai Peninsula Borough, Tsunami Warning System upgrade			
				Total Spent:	$85,938				
Declaraton Date	**03/14/05**	**Expiration Date:**	**3/14/09**			**1584 2004 North Slope Borough Severe Winter Storm Disaster HMGP Applications**			
Total Award:	**$625,312**	5% discretionary available:	$31,266	7% Planning available:	$43,772	88% Other available:	$550,275		
Total Obligated to Sub-Grantees:	$625,200	5% discretionary obligated:	$19,490	7% Planning obligated:	$19,965	88% Other obligated:	$585,745		

Total Difference:	$112	5% remainder:	$11,776	7% remainder:	$23,807	88% remainder:	($35,470)		
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$75,037	Performance Period 6/16/05 - 6/16/09	88%	$2,797	1584.0006, Division of Homeland Security, Management Costs	Lize		
	06/26/07	$10,000	Obligated 5/12/06	7%	$0	1584.0001 City of Golovin Mitigation plan	Erv		7/1-9/30-06, 10/1-12/31-06
	06/27/07	$9,965	Obligated 5/12/06	7%	$0	1584.0002 , Nunam Iqua Local All-Hazard Mitigation Plan	Erv		7/1-9/30-06, 10/1-12/31-06
	8/17/08	$455,508	Obligated 8/7/06	88%	0	1584.0003, Kodiak Island Borough High School Library	Brent		7/1-9/30-06, 10/1-12/31-06
	8/17/08	$55,200	Obligated 7/31/06	88%	$0	1584.0004, AK Railroad Bank Stabilization @ MP 407.4	Brent		7/1-9/30-06, 10/1-12/31-06
	08/02/08	$19,490	Obligated 7/24/06	5%	$0	1584.0005, UAF/GI, EQ Notification System and Real Time Display System, Phase II	Brent		
		$2,500	Denied	5%		1584.000x KPB/Seward, Resurrection River Debris Removal Plan development			
				Total Spent:	$2,797				
Declaration Date	**12/09/05**	**Expiration Date:**	**12/9/09**			**1618 2005 West Coast Storm Disaster HMGP Applications**			
Total Award (6 mo. Lock-in):	**$266,295**	5% discretionary available:	$13,315	7% Planning available:	$18,641	88% Other available:	$234,339		
Total Obligated to Sub-Grantees:	$245,831	5% discretionary obligated:	$0	7% Planning obligated:	$0	88% Other obligated:	$245,831		
Total Difference:	$20,464	5% remainder:	$13,315	7% remainder:	$18,641	88% remainder:	($11,492)		

						NEED TO BEAT THE BUSHES FOR MORE APPLICATIONS			
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$31,954	Performance Period 12/9/05 - 12/9/09	88%	$4,578	1618.M001, Division of Homeland Security, Management Costs	Lize		
	02/15/08	$134,917	Obligated 2/15/07	88%		1618.0002, Kodiak Island Borough (KIB) Schools - East Elementary School Windows	Brent		
	02/28/08	$78,960	Obligated 2/28/07	88%		1618.0003, AKRR Embankment Stabilization MP 260.3 to 260.35	Brent		
				Total Spent:	$4,578				
Declaration Date	**08/04/06**	**Expiration Date:**	**8/4/10**			**1657 Snow Melt and Ice Jam Flooding Disaster HMGP Applications**			
Total Award (6 mo. Lock-in):	**$113,100**	5% discretionary available:	$5,655	7% Planning available:	$7,917	88% Other available:	$99,528		
Total Obligated to Sub-Grantees:	$23,572	5% discretionary obligated:	$0	7% Planning obligated:	$10,000	88% Other obligated:	$13,572		
Total Difference:	$89,528	5% remainder:	$5,655	7% remainder:	($2,083)	88% remainder:	$85,956		
Apps Due to FEMA	***08/04/07***								
						NEED TO BEAT THE BUSHES FOR MORE APPLICATIONS			
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			

						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$13,572		88%		1657.M001, Division of Homeland Security, Management Costs	Lize		
		$10,000		7%		1657.00xx State Hazard Mitigation Plan Update - Vulnerability Analysis			
						1657.00xx			
				Total Spent:	$0				
Declaration Date	**10/14/06**	**Expiration Date:**	**10/14/10**			**1663 Southcentral Flooding Disaster HMGP Applications**			
Total Award 3-Month ESTIMATE (Expected to go down):	**$2,549,331**	5% discretionary available:	$127,467	7% Planning available:	$178,453	88% Other available:	$2,243,411		
Total Obligated to Sub-Grantees:	$0	5% discretionary obligated:	$0	7% Planning obligated:	$0	88% Other obligated:	$0		
Total Difference:	$2,549,331	5% remainder:	$127,467	7% remainder:	$178,453	88% remainder:	$2,243,411		
Apps Due to FEMA	***10/14/07***								
						NEED TO BEAT THE BUSHES FOR MORE APPLICATIONS			
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
				88%		1663.M001, Division of Homeland Security, Management Costs	Lize		
						1663.00xx			

						1663.00xx			
				Total Spent:	$0				
Declaration Date	**10/27/06**	**Expiration Date:**	**10/27/10**			**1666 Hooper Bay Disaster HMGP Applications**			
Total Award 3 Month ESTIMATE (Expected to go down):	**$649,200**	5% discretionary available:	$32,460	7% Planning available:	$45,444	88% Other available:	$571,296		
Total Obligated to Sub-Grantees:	$0	5% discretionary obligated:	$0	7% Planning obligated:	$0	88% Other obligated:	$0		
Total Difference:	$649,200	5% remainder:	$32,460	7% remainder:	$45,444	88% remainder:	$571,296		
Apps Due to FEMA	***10/27/07***								
						NEED TO BEAT THE BUSHES FOR MORE APPLICATIONS			
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$0		88%		1666.M001, Division of Homeland Security, Management Costs	Lize		
						1666.00xx			
						1666.00xx			
				Total Spent:	$0				

Declaration Date	**12/08/06**	**Expiration Date:**	**12/8/10**			**1669 '06 Southern Alaska Storm Disaster HMGP Applications**			
Total Award ESTIMATE:	**$1,590,118**	5% discretionary available:	$79,506	7% Planning available:	$111,308	88% Other available:	$1,399,304		
Total Obligated to Sub-Grantees:	$0	5% discretionary obligated:	$0	7% Planning obligated:	$0	88% Other obligated:	$0		
Total Difference:	$1,590,118	5% remainder:	$79,506	7% remainder:	$111,308	88% remainder:	$1,399,304		
Apps Due to FEMA	***12/08/07***								
						NEED TO BEAT THE BUSHES FOR MORE APPLICATIONS			
						- Review, coordinate, submit to FEMA, and answer/return telephone calls			
						- Communicate with applicant, answer/return telephone calls and inquiries			
						- Prepare grant agreements after award			
				Funding Type		Complete NEMIS data input for disaster expenditures, reimbursements, etc.			
		$0		88%		1669.M001, Division of Homeland Security, Management Costs	Lize		
						1669.00xx			
						1669.00xx			
				Total Spent:	$0				
	PDM 2005	**PDM**							
Total Award		$423,267				**2005 PDM Grants Awarded by FEMA (Communities will use VRisk MitigationPlan.com**			
2005-x	5/18/09	$39,127				DHS&EM Sub Grant for Management Cost			

2005-04						DHS&EM Sub Grant for Planning Initiative (Contractor to place in VRISK MitigationPlan.com)			
		$277,000				Red Devil	Erv		4/1-6/30-06
						Sleetmute	Erv		4/1-6/30-06
						Emmonak	Erv		4/1-6/30-06
						Bethel	Erv		4/1-6/30-06
						Kivalina	Erv		4/1-6/30-06
						Kotzebue	Erv		4/1-6/30-06
						Cordova	Erv		4/1-6/30-06
						Unalaska	Erv		4/1-6/30-06
						Newtok	Erv		4/1-6/30-06
						Unalakleet	Erv		4/1-6/30-06

	Community Sub-Grantees								
	04/15/07	$15,600	Obligated	PDM	$0	City of Hooper Bay and Paimiut All Hazards Mitigation Plan - VRISK	Lize	11/9/2006	4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	08/15/07	$10,020	Obligated	PDM	$0	City of Dillingham Hazard Mitigation Plan - VRISK	Lize		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 9/1-12/31-06
	10/15/07	$55,631	Obligated	PDM	$13,653	Kodiak Island Borough Hazard Mitigation Plan - VRISK	Lize		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 10/1-12/31-06
	10/15/07	$25,889	Obligated	PDM	$1,632	Lake & Peninsula Borough Hazard Mitigation Plan - VRISK	Lize		10/1-12/31-05, 1/1-3/31-06, 4/1-6/30-06, 7/1-9/30-06, 9/1-12/31-06
	2006	**PDM**							
		$46,855	Unobligated	PDM		DHS&EM Sub Grant for Management Cost			
		$878,531.25	Unobligated	PDM		Kodiak Island Borough: Seismic Rehab			
		$69,346.50	Unobligated	PDM		Anchorage School District: Gas Shut-Off Valves			
11/18/05	n/a		Goal			Develop Tsu 5-Year Plan for AK			
	n/a		Completed			Manage Tsunami RSA with UAF/GI for Perryville and Chignik Sirens			
	n/a					Manage Tsunami RSA with DNR/DGGS for Map production	Dale		
	n/a					Contact Prior Tsu Sign communities to have them coordinate their sign placement plan with AK DOT - Scott Thomas	Erv		

	n/a		Hold (Goal)			Coordinate w Kachemack Bay Research Reserve Director for product production			
	n/a					Manage funding received from NOAA Project proposal for sirens, brochures, video & misc.	Erv		
	n/a		Hold (Goal)			Coordinate w AK Ocean Observing System - Tsu mapping needs			
	n/a					Develop Scope of Work and requirements for PDDA program funding - Determine best office to locate these activities due to Vince's unavailability			
	n/a					No other EQ program activities at this time			
05/30/05	n/a		Complete			**FEMA HMTAP Task Order 382, DR-1461 funded Project to Convert State Haz Mit Plan to MitigationPlan.com and develop User's Guide**			
	n/a		Complete			- Coordinate URS development of User's Guide and inputing data into VRisk MitigationPlan.com			
	n/a					**HMGP Planning Projects:**			
	n/a					- Assist new successful HMGP applicants with developing their plans using this web-based software			
on-going	n/a					Misc Disaster Filing	mit team		
	n/a					Determine value of HMGP project score (evaluation) sheet	mit team		
Goal	n/a					Learn Vrisk Map Reporting for State / Local Planning efforts			
	n/a					Complete Tsu Brochures for Homer, Kodiak, and Sitka	Erv		

Current as April 12, 2007

DR-1423-AK	2002 Interior Flood	June 26, 2002	December 26, 2007	15.0%	12 mo.	$723,191	$542,393	$180,798
DR-1440-AK	2002 Denali Fault Earthquake	November 8, 2002	November 8, 2008	15.0%	12 mo.	$3,194,667	$2,396,000	$798,667
DR-1445-AK	2003 Kenai Peninsula Borough Flood	December 4, 2002	December 4, 2008	15.0%	12 mo.	$2,371,363	$1,778,522	$592,841
DR-1461-AK	2003 South Central Windstorm	April 26, 2003	April 26, 2007	7.5%	12 mo.	$322,753	$242,065	$80,688
DR-1571-AK	2004 Bering Strait Sea Storm	November 15, 2004	November 15, 2008	7.5%	12 mo.	$710,179	$532,634	$177,545
DR-1584-AK	2004 Kaktovik/North Slope Winter Storm	March 14, 2005	March 14, 2009	7.5%	12 mo.	$625,312	$468,984	$156,328
DR-1618-AK	2005 West Coast Storm	December 9, 2005	December 9, 2009	7.5%	12 mo.	$266,295	$199,721	$66,574
DR-1657-AK	2006 Spring Flood	August 4, 2006	August 4, 2010	7.5%	6 mo.	$113,100	$84,825	$28,275
DR-1663-AK	2006 August Flood	October 14, 2006	October 14, 2010	15.0%	3 mo.	$2,549,331	$1,911,998	$637,333
DR-1666-AK	2006 Hooper Bay Fire	October 27, 2006	October 27, 2010	15.0%	3 mo.	$649,200	$486,900	$162,300
DR-1669-AK	2006 October Flood	December 8, 2006	December 8, 2010	15.0%	est.	$1,590,188	$1,192,641	$397,547
	Total Funds Locked-in and projects funded					**$8,213,759**	**$6,160,319**	**$2,053,440**
	Total Funds NOT Locked-in and open for applications					**$4,901,819**	**$3,676,364**	**$1,225,455**
				Grand Total		**$13,115,577**	**$9,836,683**	**$3,278,894**

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APPENDIX 26 – STATE OF ALASKA ADMINISTRATIVE ORDER NO. 175

STATE OF ALASKA

OFFICE OF THE GOVERNOR
JUNEAU

ADMINISTRATIVE ORDER NO.175

FINDINGS

I, Tony Knowles, Governor of the State of Alaska, make the following findings concerning the siting and construction of state-owned and state-financed construction projects:

1. It is in the state's best interest to protect the state's capital investments by ensuring that future state-owned, and state-financed, construction projects are sited and constructed in a manner that reduces the potential for flood and erosion damage. The Department of Community and Regional Affairs (DCRA) is the appropriate agency to be tasked with coordinating this effort.
2. The Federal Emergency Management Agency (FEMA) is responsible for the National Flood Insurance Program and through regulations has developed flood plain management criteria for flood-prone, mudflow-prone, and flood-related erosion-prone areas. It is in the state's best interest to site and construct state-owned and state-financed projects using the portions of those regulations pertaining to construction standards as a guide.

ORDER

Under the authority of Article II, Section 1 of the Alaska Constitution and AS 26.23. 150,

I, Tony Knowles, Governor of the State of Alaska, hereby order:

1. To the maximum extent possible, consistent with existing law, all state agencies with construction authority, or that administer grants, loans, or disaster assistance for construction, shall use pertinent portions of the FEMA National Flood Insurance Program regulations, 44 CFR Part 60, as a guide for such construction activities, and shall encourage a broad and united effort to lessen the risk of flood and erosion losses in connection with state lands and installations and state-financed or supported improvements. Specifically, state agencies directly responsible for building and structure construction, and other development including grading, paving, and excavation, shall to the maximum extent possible, preclude the uneconomic, hazardous, or unnecessary use of documented flood plains and erosion areas in connection with such development.
2. DCRA is the state coordinating agency for the National Flood Insurance Program and shall assist state agencies in complying with this order.
3. State agencies responsible for the construction of, or the administration of grant or loan programs involving the construction of, buildings, structures, roads, or other facilities shall consider the potential of flood and erosion hazards.

Consideration shall be given to setbacks, flood proofing, building elevation, and erosion control measures in flood and erosion-prone areas.
4. State agencies responsible for the leasing or disposal of lands or properties shall, to the extent the action is economically feasible, evaluate flood and erosion hazards in connection with lands or properties proposed for disposal and, in order to minimize future state expenditures for protection and disaster relief, shall consider including within all new subdivision proposals and other proposed developments greater than 50 lots or 5 acres, whichever is the lesser, base (100) year flood elevation data, or information on approximate flood risks.
5. State agencies responsible for programs that affect land use planning, including state permit programs, shall, consistent with existing statutory and regulatory requirements, take flood and erosion hazards into account when evaluating plans and permits and shall encourage land use appropriate to the degree of hazard involved.
7. Administrative Order No. 46 dated January 24, 1978, is hereby revoked.
This order takes effect immediately.
Dated at Juneau, Alaska this ~ day of ~ 1998.
Tony Knowles
Governor

APPENDIX 27 - ACTIVE VOLCANOES OF ALASKA 2007

MAP#	NAME	*IAVCEI* CATALOG#	LOCATION	LAST HISTORICAL ERUPTION	*ELEVATION*
1	*Bona-Churchill*	*1105-03*	***61□23'N, 141□45'W***	**	*16, 420'; 5005 m*
2	**Wrangell**	**1105-02**	**62 00'N, 144 01'W**	**1902**	**14,163'; 4,317 m**
3	*Hayes*	*1103-05*	*61 'N, 152 'W*	**	*9,147'; 2,788 m*
4	**Spurr**	**1103-04**	**61 18'N, 152 15'W**	**1992**	**11,070'; 3,374 m**
5	**Redoubt**	**1103-03**	**61 'N, 152 'W**	**1989-90**	**10,197'; 3,108 m**
6	**Iliamna**	***1103-02***	***60□□'N, 153□04'W***	**	***10,016'; 3,053 m***
7	**Augustine**	**1103-01**	**59 23'N, 153 26'W**	**2005-2006**	**4,134'; 1,260 m**
8	***Fourpeaked***	**1102-26**	**58 46'N, 153 40'W**	**2006**	***6,903'; 2,104 m***
9	**Snowy**	***1102-20***	***58□20'N, 154□41'W***	**	***7,090'; 2,161 m***
10	***Griggs***	***1102-19***	***58□21'N, 155□□'W***	**	***7,602'; 2,317 m***
11	**Katmai**	**1102-17**	**58 16'N, 154 59'W**	**1912**	**6,716'; 2,047**
12	**Novarupta**	**1102-18**	**58 16'N, 155 09'W**	**1912**	**2,759'; 841**
13	**Trident**	**1102-16**	**58 14'N, 155 07'W**	**1953-74**	**3,599'; 1,097 m**
14	***Mageik***	***1102-15***	***58□11'N, 155□14'W***	**	***7,103'; 2,165 m***
15	***Martin***	***1102-14***	***58□10'N, 155□21'W***	**	***6,102'; 1,860 m***
16	**Peulik**	**1102-13A**	**57 45'N, 156 21'W**	**1852**	**4,836'; 1,474 m**
17	**Ukinrek**	**1102-13B**	**57 50'N, 156 30'W**	**1977**	**299'; 91 m**
18	Chiginagak	1102-11	57 08'N, 157 00'W	1971?	7,005'; 2,135 m
19	**Aniakchak**	**1102-09**	**56 53'N, 158 10'W**	**1931**	**4,400'; 1,341 m**
20	**Veniaminof**	**1102-07**	**56 10'N, 159 23'W**	**2002-2006**	**8,225'; 2,507 m**

21	**Pavlof**	**1102-03**	**55 25'N, 161 54'W**	**1996-97**	**8,261'; 2,518 m**
22	***Dutton***	***1102-011***	***55□11'N, 162□16'W***	**	***4,833'; 1,473 m***
23	***Isanotski***	***1101-37***	***54□45'N, 163□44'W***	**	***8,025'; 2,446 m***
24	**Shishaldin**	**1101-36**	**54 45'N, 163 58'W**	**1999**	**9,373'; 2,857 m**
25	**Fisher**	**1101-35**	**54 39'N, 164 26'W**	**1830?**	**3,648'; 1,112 m**
26	**Westdahl**	**1101-34**	**54 31'N, 164 39'W**	**1991-92**	**5,118'; 1,560 m**
27	**Akutan**	**1101-32**	**54 08'N, 165 58'W**	**1992**	**4,275'; 1,303 m**
28	**Makushin**	**1101-31**	**53 53'N, 166 56'W**	**1995**	**6,680'; 2,036 m**
29	Bogoslof	1101-30	53 56'N, 168 02'W	1992	492'; 150 m
30	**Okmok**	**1101-29**	**53 24'N, 168 10'W**	**1997**	**3,520'; 1,073 m**
31	Vsevidof	1101-27	53 08'N, 168 41'W	1957?	7,050'; 2,149 m
32	Kagamil	1101-26	52 58'N, 169 43'W	1953-54?	2,930'; 893 m
33	Carlisle	1101-23	52 54'N, 170 03'W	1987	5,315'; 1,620 m
34	Cleveland	1101-24	52 49'N, 169 57'W	2005-07	5,676'; 1,730 m
35	Yunaska	1101-21	52 38'N, 170 38'W	1937	1,804'; 550 m
36	Amukta	1101-19	52 30'N, 171 15'W	1996	3,497'; 1,066 m
37	Seguam (Pyre Peak)	1101-18	52 19'N, 172 31'W	1993	3,458'; 1,054 m
38	**Korovin (Atka Is.)**	**1101-16**	**52 23'N, 174 09'W**	**1998**	**5,029'; 1,533 m**
39	Kasatochi	1101-13	52 11'N, 175 30'W	1828?	1,030'; 314 m
40	**Great Sitkin**	**1101-12**	**52 05'N, 176 08'W**	**1974**	**5,709'; 1,740 m**
41	**Kanaga**	**1101-11**	**51 55'N, 177 10'W**	**1993-95**	**4,288'; 1,307 m**
42	**Tanaga**	**1101-08**	**51 53'N, 178 08'W**	**1914**	**5,925'; 1,806 m**

43	**Gareloi**	**1101-07**	**51 47'N, 178 48'W**	**1989**	**3,458'; 1,573 m**
44	**Semisopochnoi (Cerberus)**	**1101-06**	**51 56'N, 179 35'E**	**1987**	**2,625'; 800 m**
45	**Little Sitkin**	**1101-05**	**51 57'N, 178 32'E**	**1900?**	**3,898'; 1,188 m**
46	Kiska	1101-02	52 06'N, 177 36'E	1990	4,003'; 1,220 m

Bold: Volcanoes with seismic monitoring networks as of August 2007. Little Sitkin and Semisopochnoi have networks but telemetry is unreliable and AVO does not consider these volcanoes seismically monitored.

***Italics: Volcanoes with no historical (AD 1760–present) eruptions but considered significantly hazardous because of vigorous fumarolic activity, intense earthquake swarms, or their pre-historic eruption record.*

Data sources: (1) Miller, T.P., McGimsey, R.G., Richter, D.H., Riehle, J.R., Nye, C.J., Yount, M.E., and Dumoulin, J.A., 1998, Catalog of the historically active volcanoes of Alaska: U.S. Geological Survey Open-File Report 98-582, 104 p; (2) Simkin, T., and Siebert, L., 1994, Volcanoes of the world, Tucson, Arizona, Geoscience Press, Inc., 349 p; (3) the on-line database of the Global Volcanism Program of the Smithsonian Institution (http://www.volcano.si.edu/gvp/world/index.cfm); (4) published and unpublished AVO reports and internal files; (5) AVO's web site and online database of volcanoes called GEODIVA. Some inconsistencies among data sources remain unresolved and this list may change slightly through time as new information becomes available.

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APPENDIX 28 –ALASKA INTERAGENCY OPERATING PLAN FOR VOLCANIC ASH EPISODES

This plan is on file in DHS&EM office.

Also available at:

http://aawu.arh.noaa.gov/interagency/interagency_plan.pdf

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APPENDIX 29 – PRINCIPAL REFERENCES

General/All-Hazard

Alaska Department of Natural Resources (1985). Geological Hazard Mitigation in Alaska: A Review of Federal, State and Local Policies. Alaska: Author.

Federal Emergency Management Agency (1997). Multi Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy. USA

Federal Emergency Management Agency (2000). Rebuilding for a More Sustainable Future: An Operational Framework. USA.

Mileti, Dennis.(1999) Disasters by Design: A Reassessment of Natural Hazards in the United States. Washington, DC: Joseph Henry Press.

Smith, Keith. (1996). Environmental Hazards: Assessing risk and reducing disaster (2nd ed.). New York: Routledge.

Schwab, Jim, Topping, Kenneth C., Eadie, Charles C., Deyle, Robert E., & Smith, Robert A. (1998). Planning for Post-Disaster Recovery and Reconstruction. Washington DC: American Planning Association.

Flood

Glacier Dammed Lakes and Outburst Floods in Alaska. Department of the Interior, U.S. Geological Survey. Hydrologic Investigations Atlas HA-455. 1971. P. 1.

Wildfire

Alaska Division of Forestry. Resource Programs. http://www.dnr.state.ak.us/forestry/resource.htm

Rozell, Ned. “Bark Beetles Take a Bite Out of Southcentral.” Article #1338 http://www.gi.alaska.edu/ScienceForum/ASF13/1338.html

Avalanche

Fredston, Jill, & Fesler, Doug. (1999) Snow Sense: A Guide to Evaluating Snow Avalanche Hazard (4th ed.). Alaska: Alaska Mountain Safety Center.

McClung, David & Schaerer, Peter. (1993) The Avalanche Handbook. Seattle: The Mountaineers.

Mears. A.I. (1992). Snow-Avalanche Hazard Analysis for Land-Use Planning and Engineering. Denver: Colorado Geological Survey.

Volcano

United States Geological Survey. (1997). Volcanic Ash – Danger to Aircraft in the North Pacific. Fact Sheet 030-97.

(1998). Can Another Great Eruption Happen in Alaska? Fact Sheet 075-98. Available at http://wrgis.wr.usgs.gov/fact-sheet/fs075-98/FS075-98.pdf

(1998). What are Volcano Hazards? Fact Sheet 002-97.

(2002). Photo Glossary of Volcanic Terms. Available at http://volcanoes.usgs.gov/Products/Pglossary/pglossary.html

Earthquake

Please see General/All Hazard

Tsunami & Seiche

Anthony J. Lewis, "Seiche," Discovery Channel School, original content provided by World Book Online, http://www.discoveryschool.com/homeworkhelp/ worldbook/atozgeography/s/500060.html, Accessed June 26, 2001.

Lander, James F. (1996). Tsunamis Affecting Alaska 1737-1996. Boulder: US Department of Commerce.

National Tsunami Hazard Mitigation Program (2001). Designing for Tsunamis: Seven Principles for Planning and Designing for Tsunami Hazards.

Weather

Ground Failure

Erosion

Coastal erosion http://www.csc.noaa.gov/crs/ALACE/techcd/htm/erosion.htm

Wind erosion http://www.weru.ksu.edu/problem.html

Economic

Technological, Human-caused

2004 Nevada Hazard Mitigation Plan

2002 Kansas Hazard Mitigation Plan

2004 Missouri Hazard Mitigation Plan

Oil Spills and Hazardous Materials

Terrorism

APPENDIX 30 – OTHER RESOURCES

This list is provided to enable anyone to gain more information concerning mitigation. There are many sources of information about hazards and hazard mitigation. If you know of additional sources of information that should be added to this list, please contact the State Hazard Mitigation Officer.

General/All-Hazard

Federal Emergency Management Agency (2000). Rebuilding for a More Sustainable Future: An Operational Framework.

(2001). Understanding Your Risks: Identifying hazards and estimating losses. FEMA 386-2.

Mason, Owen, Neal, William J., Pilkey, Orrin H., Bullock, Jane, Fathauer, Ted, Pilkey, Deborah & Swanston, Douglas. (1997). Living with the Coast of Alaska. Durham, NC: Duke University Press.

International Building Code, 2000 Edition

International Fire Code, 2000 Edition

International Mechanical Code, 2000 Edition

Floods

Floodplain Hazard Data for Alaska Communities. Civil Works Branch of the US Army Corps of Engineers, Alaska Division. http://www.poa.usace.army.mil/en/cw/fld_haz/floodplain_index.htm

State of Alaska Flood Hazard Mitigation Plan. March 1990.

Wildfire

Snow Avalanche

Volcano

Neal, Christina A., McGimsey, Robert G., Miller, Thomas P., Riehle, James R., & Waythomas, Christopher F. (2001). Preliminary Volcano-Hazard Assessment for Aniakchak Volcano, Alaska. United States Geological Survey. Open-File Report 00-519.

Begˆt, J.E., Nye, C.J., & Bean, K.W. (2000). Preliminary Volcano-Hazard Assessment for Makushin Volcano, Alaska. United States Geological Survey. Report of Investigations 2000-4.

Waythomas, Christopher F., & Miller, Thomas P. (1999). Preliminary Volcano-Hazard Assessment for Iliamna Volcano, Alaska. United States Geological Survey. Open-File Report 99-373.

Miller, T.P., McGimsey, R.G., Richter, D.H., Reihle, J.R., Nye, C.J., Yount, M.E., & Dumoulin, J.A. (1998). Catalog of the Historically Active Volcanoes of Alaska. United States Geological Survey. Open-File Report 98-582.

Waythomas, Christopher F., & Waitt, Richard B. (1998). Preliminary Volcano-Hazard Assessment for Augustine Volcano, Alaska. United States Geological Survey. Open-File Report 98-106.

Waythomas, Christopher F., Power, John A., Richter, Donald H., & McGimsey, Robert G. (1998). Preliminary Volcano-Hazard Assessment for Akutan Volcano East-Central Aleutian Islands, Alaska. United States Geological Survey. Open-File Report 98-360.

Waythomas, Christopher F., Dorava, Joseph M. Miller, Thomas P., Neal, Christina A. & McGimsey, Robert G. (1998). Preliminary Volcano-Hazard Assessment for Redoubt Volcano, Alaska. United States Geological Survey. Open-File Report 97-857.

Earthquake

Tsunami & Seiche

Weather
Ivu
http://www.co.north-slope.ak.us/gis/SeaIce/text/BSSI.htm#4

Ground Failure

Erosion

Economic

Technological

103rd WMD-CST Pamphlet

Travel Alaska Website http://www.travelalaska.com/

Anchorage Daily News Website http://www.adn.com/

Ted Stevens International Airport Website http://www.dot.state.ak.us/anc/index.shtml

Dams

Oil Spills and Hazardous Materials

Terrorism

Financial Resources

FUNDING SOURCE	APPLICATION DEADLINE	INTERESTS	ELIGIBLE REGIONS	PHONE #	ADDRESS	CONTACT PERSON	WEB ADDRESS
JANUARY							
The Acron Foundation Inc.	January 15th & June	**Community based projects dedicated**	national	(510) 834-2995 or	c/o Common Counsel Foundation		www.commoncounsel.org
	15th	to building a sustainable future		(510) 834-2998	1221 Preservation Park Way Oakland, CA 94612-1206		
Eastman Kodak Charitable Trust	January - April 30	Env. Conservation, education, senior and youth	national	(716) 724-1980	343 State Street		www.kodak.com
		organization, health care programs, **community centers, and volunteer services**		(716) 724-1376 fax	Rochester, NY 14650-0517		
Gannet foundation	15th of Jan/May/	Education, neighborhood improvement,	national	(703) 284-6000	1100 Wilson Boulevard		www.gannettfoundation.org
	Sep/Feb/June/Oct	economic development, youth development, **community problem solving, disadvantaged** people, environmental conservation and cultural enrichment			Arlington, VA 22234		
The Home Depot, Inc.	January 1st-March	Arts and humanities, the environment,	national	(770) 433-8211	Director of Community Affairs		
	1st	social services, education and civic and **public affairs**			2455 Paces ferry Road Atlanta, GA 30339-4024		
The Levinson (Max and Anna) Foundation	January 4th &	the environment, social causes and	national	(505) 982-3662 or	Charlotte Talbeth, Executive Director	Charlotte Talberth	
	August 1st	Israel/Jewish concerns		982-3665	PO Box 6309 Santa Fe, NM		
MARCH							
Borden Foundation, Inc.	March 1st, July 1st,	art, education, humanities, environment,	national	(614) 225-4580 or	180 East Broad Street		
	Oct 1st	health, and social services		225-4340	Columbus, Ohio, 43215-3799		
Goyce Mertz-Gilmore Foundation	March 30th	Arts, civil rights, community dev.,	national	(212) 475-1137	218 E. 18th St.	Robert Crane pres.	
		neighborhood dev., environment, energy, peace			New York, NY 10003-3697		www.jmgf.org jmgf@jmgf.org
The Home Depot, Inc.	January 1st-March	Arts and humanities, the environment,	national	(770) 433-8211	Director of Community Affairs		
	1st	social services, education and civic and **public affairs**			2455 Paces ferry Road Atlanta, GA 30339-4024		

National environmental Education and Training The Foundation INC.	March 1, Jan 1, Jul 15, Sept 1	Dollar for each NEETF dollar awarded,	national	(202) 833-2933 or	Vice President of Programs	Neetf@neet.org
		environmental education/interpretation, Sustainable community development		(202) 261-6464	1707 H. Street, NW, Suite 99 Washington, DC 20009	
MAY						
Kieckhefer (J.W.) Foundation	May-November	Family planning, social services,	national	(520) 445-4010	116 East Gurley Street	
		education, ecology, and conservation			PO Box 750 Prescott, AZ 86302	
JUNE						
The Acron Foundation Inc.	January 15th & June	**Community based projects dedicated**	national	(510) 834-2995 or	c/o Common Counsel Foundation	www.commoncounsel.org
	15th	to building a sustainable future		(510) 834-2998	1221 Preservation Park Way Oakland, CA 94612-1206	
Motorola Foundation	June 1st	Higher education, employee matching gifts, **social services and youth agencies. Engineering**				
		and technology education, Environmental education.				
Phillips Petroleum Company	June 1st - Aug 31st	Education, the environment, civic, youth	national		Phillips Building	www.phillips66.com
		health, welfare, culture and the arts			16th floor Bartlesville, OK 74004	
Urban park and Recreation Recovery (UPARR)	June 18th, see web	Rehabilitation grants that focus on	national	AZ, CO, NM, TX, OK	Midwest Regional Office	http://www.nps.gov/pub_aff/uparr/grants/index.html
	site for annual	**neighborhood recreation sites that have**		(402) 221-3358 OR	National Park Service	
	details	deteriorated to the point where the communities' health and safety are endangered, or the communities range of quality recreation opportunities are impaired		3292 OR 3205	1709 Jackson St. Omaha, NE 68102-2571	
JULY						
Ben & Jerry's foundation	March 1st, July 1st,	General environment,	national	(802) 846-1500	30 Community Drive	www.benjerry.com/foundation/index.html
	and November 1st	wildlife/fisheries/habitat **Sustainable community development** racism, and sexism. Primarily funds grassroots organizations			South Burlington, VT 05403-6828	

Borden Foundation, Inc.	March 1st, July 1st,	art, education, humanities, environment,	national	(614) 225-4580 or	180 East Broad Street		
	Oct 1st	health, and social services		225-4340	Columbus, Ohio, 43215-3799		
AUGUST							
Sustainable Development Challenge Grants	fall	**Community based projects that promote**	national	(202) 260-6812	U.S. Environmental Protection		http://aspe.os.dhhs.gov/cfda/p66651.htm
		environmentally and economically sustainable development			Agency, SDGC, Office of the Adminstrator (MC 1306) Ariel Rios		http://www.epa.gov/ecocommunity/sdcg/
					Building, 1200 Pennsylvania Ave, NW		
					Washington, DC 20460		
The Levinson (Max and Anna) Foundation	January 4th &	the environment, social causes and	national	(505) 982-3662 or	Charlotte Talbeth, Executive Director	Charlotte Talberth	
	August 1st	Israel/Jewish concerns		982-3665	PO Box 6309 Santa Fe, NM		
Phillips Petroleum Company	June 1st - Aug 31st	Education, the environment, civic, youth	national		Phillips Building		www.phillips66.com
		health, welfare, culture and the arts			16th floor Bartlesville, OK 74004		
SEPTEMBER							
Sustainable Development Challenge Grants	Fall	**Community based projects that promote**	national	(202) 260-6812	U.S. Environmental Protection		http://aspe.os.dhhs.gov/cfda/p66651.htm
		environmentally and economically sustainable development			Agency, SDGC, Office of the Adminstrator (MC 1306) Ariel Rios		http://www.epa.gov/ecocommunity/sdcg/
					Building, 1200 Pennsylvania Ave, NW		
The David and Lucile Packard Foundation	December 15th,	Africa, Arts, community dev., education,	national,	(605) 948-7658	300 2nd St. Ste. 200		
	September 15th,	environment, natural resources, etc.	international		Los Altos, CA 94022		
	March 15th, June 15th						
OCTOBER							
Sustainable Development Challenge Grants	Fall	**Community based projects that promote**	national	(202) 260-6812	U.S. Environmental Protection		http://aspe.os.dhhs.gov/cfda/p66651.htm
		environmentally and economically			Agency, SDGC, Office of the		

		sustainable development			Adminstrator (MC 1306) Ariel Rios Building, 1200 Pennsylvania Ave, NW Washington, DC 20460	http://www.epa.gov/ecocommunity/sdcg/
Enron Foundation	October 1st	Arts, humanities, civic and public affairs, education, the environment, health, and **social services**	national	(713) 853-6161	1400 Smith Street Houston, TX 77002-7369	www.enron.com
Georgia-Pacific Corporation	October 31st	Arts & humanities, education, environment health issues, and social services. Partnerships with G-P/NPCA which supports National Parks	national	(404) 652-4000	133 Peachtree Street NE Atlanta, GA 30303	www.gpcom/enviro/oldnpca.html
National Fish and Wildlife Foundation: Bring Back the Natives (BBN) (NFWF)	October 6th	To restore watersheds where federal land agencies have land management responsibilities	national	(415) 778-0999 (415) 778-0998	Wetern Region Partnership Office: 116 New Montgomery Street Suite 203 San Francisco, CA 94015	www.nfwf.org/grants.html
NOVEMBER **Sustainable Development Challenge Grants**	Fall	**Community based projects that promote** environmentally and economically sustainable development	national	(202) 260-6812	U.S. Environmental Protection Agency, SDGC, Office of the Adminstrator (MC 1306) Ariel Rios Building, 1200 Pennsylvania Ave, NW	http://aspe.os.dhhs.gov/cfda/p66651.htm http://www.epa.gov/ecocommunity/sdcg/
Crosswicks Foundation	November 1st	Humanities, civic and public affairs, education, the environment, health and **social services**	national	(860) 626-0523	924 West End Avenue New York, NY 10025	
National Gardening	November 1st	The National Gardening Association awards 400 Youth Garden Grants to schools, **neighborhood groups, community centers,** camps, clubs, treatment facilities, and intergenerational programs throughout the United States.	national		Youth Garden Grants Program National Gardening Association 1100 Dorset Street South Burlington, VT 05403	www.kidsgardening/grants.asp

Ben & Jerry's Foundation	March 1st, July 1st, and November 1st	General environment, wildlife/fisheries/habitat **Sustainable community development** racism, and sexism. Primarily funds grassroots organizations	national	(802) 846-1500	30 Community Drive South Burlington, VT 05403-6828		www.benjerry.com/foundation/index.html
DECEMBER							
The David and Lucile Packard Foundation	December 15th, September 15th, March 15th, June 15th	Africa, Arts, community dev., education, environment, natural resources, etc.	national, international	(605) 948-7658	300 2nd St. Ste. 200 Los Altos, CA 94022		
YEAR-ROUND							
AMR/American Airlines Foundation AMR Corps	Year-round requests	**Community development, education**	national	(817) 967-9784	PO Box 619616		www.amrcorps
Armstrong Foundation	Year-round	programs, recycling, environment, economic development Resources conservation with grants for conferences/seminars, general support, and research	national	(601) 442-0122	Mail Drop 5575 DWF Airport, TX 75261-9616 PO Drawer 2299 Natchex, MS 39121	Mr. Thomas K. Armstrong	
BHP Copper North America	Year-round	**Civic and public affairs, eduation, the** environment, and social services. Emphasis is given to communities where the company	national	(520) 575-5674	Public Relations Coordinator North America 7400 North Oracle Road, Suite 200 Tucson, AZ 85704	Wright.jenna.jt@bhp.com.au	www.cat.com/
Binghmam (William) Foundation	Year-round	Humanities, civic and public affairs, education, the environment, and social services	national	(216) 331-6350	Director 20325 Center Ridge Road, Suite 629 Rocky River, OH 44116-3554		
Burlington Northern Santa Fe Foundation	Year-round	Education, cultural organizations, civic services involving youth, environmental organizations, parks and recreation facilities and human services	national	(708) 924-5615	5601 W 26th Street Licero, IL 60804		
Carthage Foundation	Year-round	Grants for capital, conference/simians, fellowship, general support, operating	national	(412) 392-2900	Three Mellon Bank Center 525 William Penn Place, Ste. 3900		

		expenses, project, research and seed money			Pittsburgh, PA 15219-1708		
Civil Works Projects, U.S. Department of Defense, Army Corps of Engineers	Year-round	Provides help to communities with a variety	national	Texas (214)	Military & Environmental Restoration		www.nwd.usace.army.mil/
		of resource problems and opportunities		767-2400	Division Southwestern District		
		including flood controls, outdoor recreation, environmental restoration, and water quality control			1110 Commerce Street Dallas, TX 75242-0216		
Circuit City Foundation, Circuit City Stores, Inc.	Year-round	Arts and the humanities, civic and public	national	(804) 527-4000	Executive Director		
		affairs, education, the environment, health and social services			9950 Maryland Drive Richmond, VA 23233		
Claiborne Foundation	Year-round	Devoted to the conservation of of nature	national	(212) 333-2536	650 Fifth Avenue, 10th floor	Lcaof@compuserve.com	
		and the amelioration of human distress, by linking		fax 956-3531	New York, NY 10019		
Dana Corporation	Year-round	Air quality, environment, general, water	national	(419) 535-4601	Dana Corporation Administrator		www.dana.com
		resources			PO Box 1000 Toledo, OH 43697		
Dingman (Michael D.) Foundation	Year-round	Arts and humanities, civic and public affairs,	national	(603) 929-2203	Assistant Secretary		
		education, the environment, and social **services**			1 Liberty Lane Hampton, NH 03842		
Dreyfus (Max and Victoria) Foundation	Year-round	Arts and culture, civic affairs, education,	national	(914) 682-2008	Office Adminstrator		
		the environment, health, and social services			50 Main Street, Suite 1000 White Plains, NY 10606		
Economic Development	Year-round	Provides grants to states, counties and cities	national	(202) 482-5265	Herbert Hoover Bldg Dept. of	David L. McIlwain,	www.cfda.gov/public/viewprog.asp?prodig+167
Grants for Public Works and Development of Facilities	Depends	designated as redevelopment areas by			Commerce, Rm. H7326	Dir., Public Works	
		EDA for public works projects that can include developing trail and greenway facilities			Washington, DC 20230	Division	
Emerson Charitable Trust	Year-round	Arts, civic affairs, education, health, science,	national	(314) 553-3722	Senior vice President		

		and social services. With a strong emphasis on cultural aspects and youth education			8000 W. Florissant Ave Mail Station 3621 St. Louis, MO 63136		
El Paso Energy Foundation	Year-round	Supports environmental and conservation	national	(915) 496-3455	President	Webmaster@epenergy.com	www.epenergy.com
		programs, higher education, community and **civic projects, human services, and cultural** programs			PO Box 1492 El Paso, TX 79978-1492		
Eureka Company	Year-round	No specific interest, but generally focuses on social services, health, and the environment (wildlife, fisheries, habitat, and sustainable community development).	national	(309) 823-5742	Director, Public Relations 1201 E. Bell Street Bloomington, IL 61701		www.electrolux.se
Ferguson (Michael D.) Charitable Foundation	Year-round	General environment, wildlife, fisheries, habitat,	national		124 E. Main St.		
		Sustainable community development			Rexburg, ID 83440-1912		
Gund (Geoffrey) Foundation	Year-round	Arts and humanities, civic and public affairs,	national	(212) 689-3075	40 E. 94th Street, #28-E		
		education, the environment, health, and social **services.**			New York, NY 10128		
Halliburton Foundation Inc.	Year-round	Arts and humanities, civic and public affairs,	national	(214) 978-2600	Vice President & Secretary		www.halliburton.com
		education, the environment, health, social **services**			3600 Lincoln Plaza 500 North Akard Street Dallas, TX 75201		
Heinz (Vira I.) Endowment	Year-round	Sustainable urban design, environment	national	(412) 338-2615	30 CNG Tower		www.heinz.org
		enterprise and innovation, energy and the environment, watershed protection and ecosystem management			625 Liberty Avenue Pittsburgh, PA 15222		
Hoechst Cleanese Foundation, Inc.	Year-round	Education, health and human services,	national	(908) 231-2880	Route 202-206 North		
		environmental protection, equal opportunity, art		(908) 231-2431	PO Box 2500		
		and culture, and civic and public affairs			Somerville, NJ 08876-1258		
Jain Foundation	Year-round	Arts, humanities, the environment and **social services**	national		President 23650 Morrill Cutoff Road Los Gatos, CA 95033-9222		
Kerr Foundation	Year-round	Arts, humanities, civic and public affairs, education, the environment, health and social **services**	national	(405) 749-7991	12501 North May Ave. Oklahoma City, OK 73120		
Mellon (Andrew W.) Foundation, The	Year-round	Higher education, cultural affairs, art, population	national	(212) 838-8400	140 East	Dnt@mellon.org	www.mellon.org
		conservation and environment and public affairs			New York, NY 10021		

Mootty (John W.) Foundation Trust	Year-round	Civic affairs, education, health, the environment, and social services	national	(612) 343-2839	3400 City Center Minneapolis, MN 55402		
Penn (William) Foundation	Year-round	Children, communities and the natural environment	national	(215) 988-1830 (215) 988-1823 fax	Two Logan Square, 11th fl 100 North 18th Street Philadelphia, PA 19103-2757		
Poinsettia (Paul and Magdalena Ecke) Foundation	Year-round	Art and humanities, civic and public affairs, education, the environment, and social **services**	national	(619) 431-5600	Financial Officer 5600 Avenida Encinas, # 100 Carlsbad, CA 92008		
Sulzberger Foundation	Year-round	Arts and humanities, civic affairs, and public **affairs, environment, health, and social services**	national	(212) 556-1750	President 229 West 43rd Street, rm. 1031 New York, NY 10036		
True North Foundation	Year-round	**Communities and the environment**	national	(907) 223-5285	PO Box 271308 Fort Collins, CO 80527-1308		
Teast (Charlotte and Donald) Foundation	Year-round	Sustainable communities, Arts, humanities, **civic and public affairs, education, the** environment, health and social services	national	(214) 373-6039	Trust Officer 7502 Greenville Ave, Suite 250 Dallas, TX 75231		
Ungar Foundation	Year-round	Arts, humanities, civic and public affairs, education, the environment, and social **services**	national	(518) 325-7159	Director C/O Skytop Ranch 325 Sky Farm Rd Copake, NY 12516		
Wallace Global Fund, Inc.	Year-round		national	(202) 452-1530	1990 M. Street NW Suite 250 Washington, DC 20036	Tkroll@wgf.org Mdann@wgf.org	www.wgf.org
Wardlaw (Edna) Charitable Trust	Year-round	**Civic and public affairs, the environment, and social services**	national	(404) 827-6921	Trust Officer C/O Sun Trust Bank Atlanta PO Box 4655 Atlanta, GA 30302-4655		
Wishnick (Robert I.) Foundation	Year-round	Arts and humanites, civic and public affairs, education, the environment, science, and **social services**	national	(212) 371-1844	President & Director 1 American Lane Geenwich, CT 06831		

Land O'Lakes Foundation	Call	Arts and humanities, civic and public affairs,	national	(612) 481-2212	Executive Director		
	One month prior to board meeting	education, the environment, health and social **services**			PO Box 62150 St. Paul, MN 55164-0150		
Money-Arnez Foundation	Look up info	Animals, children, youth services, education, environment, natural resources, human services	national	(706) 571-6594	PO Box 40 Columbus, GA 31902	Ronnie L. Bridges	
Urban Park and Recreation Recovery Program	Look up	Rehabilitation grants that focus on **neighborhood park and recreation sites and** facilities that have deteriorated to the point where health and safety are endangered or the community's range of quality recreation services is impaired	national	See web	See web		
Watershed Protection and Flood Prevention Program	Eligible project sponsors may submit formal requests for assistance to the NRCS state Conservationist in each state	Provides technical and financial assistance to **address resource and related economic problems on a watershed basis**	national	(202) 720-3534	Department of Agriculture Natural Resources Conservaton Service PO Box 2890 Washington, DC 20013-9770		Rcollett@usda.gov www.ftw.nrcs.usda.gov/programs.html
GRANT DIRECTORIES http://www.lgean.org/html/whatsnew.cfm#wn2							
www.sonoran.org							

FEDERAL PROGRAMS			
PROJECT SUPPORT	DESCRIPTION	LOCATION/PHONE	LOCATION/PHONE
Clean Water Act Section 319 Grants	**Grants to States to implement non-point source** programs, including support for non-structural watershed resource restoration activities	EPA Office of Water Chief, Non-Point Source Control Branch:	(202) 260-7088, 7100
Community Development Block Grant Entitlement Communities Program Block Grant (CDBG) State Administered Program	**Grants to States to develop viable communities** (e.g., housing, a suitable living environment, expanded economic opportunities) in non-entitled for low and moderate-income persons.	HUD State CDBG Program Manager Or State and Small Cities Division, Office of Block Grant Assistance, HUD Headquarters:	(202) 708-3587
Community Development Block Grant Entitlement Communities Program	**Grants to entitled cities and urban counties to** develop viable communities (e.g. decsent housing, a suitable living environment, expanded economic opportunities), principally for low- and moderate-income persons.	HUD City and county applicants should call the Community Planning and Development staff of their appropriate HUD field office. As an alternative, call the Entitlement Communities Division, Office of Block Grant Assistance, HUD Headquarters:	(202) 708-1577, 3587
Emergency Watershed Protection Program	**Provides technical and financial assistance for** relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events.	USDA-NRCS National Office (202) 690-0848	Watersheds and Wetlands Division (202) 720-3042
Rural Development Assistance - Utilities	**Direct and guaranteed rural economic loans and business enterprise grants to address utility** issues and development needs.	USDA-RUS Program Support: Northern Regional Division: Electric Staff Division: Power Supply Division:	(202) 720-1382 (202) 720-1402 (202) 720-1900 (202) 720-6436

Disaster Recovery Initiative	**Grants to fund gaps in available recovery assistance** after disasters (including mitigation).	HUD Community Planning and Development Divisions in HUD field offices or HUD Community Planning and Development:	(202) 708-2605
Non-Structural Alternativesto Structural Rehabilitation of Damaged Flood Control Works	**Direct planning and construction grants for non-structural alternatives to the structural rehabilitation of flood control works damaged in floods or coastal storms. $9 million FY99**	DOD-USACE Emergency Management @ USACE Regional Office	N. Atlantic: S. Atlantic: Great Lakes & Ohio River: Miss. Valley: Northwestern: Southwestern: South Pacific: Pacific Ocean:
Partners for Fish and Wildlife	**Financial and technical assistance to private** landowners interested in pursuing restoration projects affecting wetlands and riparian habitats.	DOI-FWS National Coordinator, Ecological Services:	(703) 358-2201 A list of State and Regional contacts is available upon requests.
Project Modifications for Improvement of the Environment	Provides for ecosystem restoration by modifying structures and/or operations or water resources projects constructed by the USACE, or restoring areas where a USACE project contributed to the degradation of an area.	DOD-USACE Chief of Planning @ USACE Regional Office	N. Atlantic: S. Atlantic: Great Lakes & Ohio River - Chicago: - Cincinnati: Miss. Valley: Northwestern - Portland - Omaha Southwestern: South Pacific: Pacific Ocean:
Post-Disaster Economic Recovery Grants and Assistance	**Grant funding to assist with the long-term** economic recovery of communities, industries, and firms adversely impacted by disasters	DOC-EDA EDA Headquarters Disaster Recovery Coordinator	(202) 482-6225
Public Housing Modernization Reserve for Disasters and Emergencies	**Funding to public housing agencies for modernization needs resulting from natural disasters (including elevation, floodproofing, and retrofit).**	HUD Director, Office of Capital Improvements	(202) 708-1640
Land Protection	**Technical assistance for run-off retardation and** soil erosion prevention to reduce hazards to life and property.	USDA-NRCS Applicant's should contact the National NRCS office by phone	(202) 720-4527
HAZARD ID & MAPPING			
National Digital Orthophoto Program	Develops topographic quadrangles for use in mapping of flood and other hazards	DOI-USGS USGS - National Mapping Division	(573) 308-3802

Streamgaging and Flood Monitoring Network	Operation of a network of over 7,000 **streamgaging stations that provide data on the** flood characteristics of rivers.	DOI-USGS USGS - Chief, Office of Surface Water	(703) 648-5303
Mapping Standards Support	Expertise in mapping and digital data standards to support the National Flood Insurance Program	DOI-USGS USGS - National Mapping Division	(573) 308-3802
Soil Survey	**Maintains soil surveys of counties or other areas** to assist with farming, conservation, mitigation, or related purposes.	DOI-USGS NRCS - Deputy Chief for Soil Science and Resource Assessment:	(202) 720-4630
TECHNICAL AND PLANNING ASSISTANCE			
Planning Assistance to States	**Technical and planning assistance for the** preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources.	DOD-USACE Floodplain Management Staff @ USACE Regional Office	N. Atlantic: S. Atlantic: Great Lakes & Ohio River: Miss. Valley: Northwestern: Southwestern: South Pacific: Pacific Ocean:
Disaster Mitigation Planning and Technical Assistance	**Technical and planning assistance grants for** capacity building and mitigation project activities focusing on creating disaster resistant jobs and workplaces.	EDA's Disaster Recovery Coordinator (202) 482-6225	DOC-EDA: (800) 345-1222
Watershed Surveys and Planning	**Surveys and planning studies for appraising** water and related resources, and formulating alternative plans for conservation use and development. Grants and advisory/counseling services to assist w/ planning and implementation improvement.	Watersheds and Wetlands Division (202) 720-4527	USDA-NRCS Deputy Chief for Programs: (202) 690-0848
Floodplain Management Services	**Technical and planning assistance at the local,** regional, or national level needed to support effective floodplain management.	DOD-USACE	N. Atlantic: S. Atlantic: Great Lakes & Ohio River: Miss. Valley: Northwestern: Southwestern: South Pacific: Pacific Ocean:
Watershed Protection and Flood Prevention Program	**Technical and financial assistance for installing** works of improvement to protect, develop, and utilize land or water resources in small watersheds under 250,000 acres.	USDA-NRCS Director, Watersheds and Wetlands Division	(202) 720-3042 (202) 690-4614

Environmental Quality Incentives Program (EQIP)	**Technical, educational, and limited financial assistance to encourage environmental** enhancement.	USDA-NRCS NRCS County Offices OR NRCS EQUIP Program Manager	(202) 720-1834
FINANCING AND LOAN GUARANTEES			
Physical Disaster Loans and Economic Injury Disaster Loans	**Disaster loans to non-farm, private sector owners** of disaster damaged property for uninsured losses. Loans can be increased by up to 20 percent for mitigation purposes.	SBA National Headquarters Associate Administrator for Disaster Assistance:	(202) 205-6734
Clean Water State Revolving Funds	**Loans at actual or below-market interest rates to** help build, repair, relocate, or replace wastewater treatment plants.	EPA EPA Office of Water State Revolving Fund Branch Branch Chief: A list of Regional Offices is available upon request.	(202) 260-7359
Section 108 Loan Guarantee Program	**Loan guarantees to public entities for community** and economic development (including mitigation measures).	HUD Community Planning and Development staff at approprate HUD field office, or the Section 108 Office in HUD Headquarters:	(202) 708-1871
Section 504 Loans for Housing	**Repair loans, grants and technical assistance to** very low-income senior homeowners living in rural areas to repair their homes and remove health and safety hazards.	USDA-RHS Contact local RHS Field Office, or RHS Headquarters, Director, Single Family Housing Direct Loan Division, RHS	(202) 720-1474
Section 502 Loan and Guaranteed Loan Program	Provides loans, loan guarantees, and technial **assistance to very low and low-income applicants** to purchase, build, or rehabilitate a home in a rural area.	USDA-RHS Contact the Local RHS Field Office, or the Director, Single Family Housing Guaranteed Loan Division, RHS:	(202) 720-1452
Rural Development Assistance - Utilities	**Direct and guaranteed rural economic loans and business enterprise grants to address utility** issues and development needs.	USDA-RUS Contact Rural Development Field Offices, or RHS, Deputy Administrator, Community Programs Division:	(202) 720-1490
Farm Ownership Loans	**Direct loans, guaranteed/ insured loans, and technical assistance to farmers so that they may** develop, construct, improve, or repair farm homes, farms, and service buildings, and to make other necessary improvements.	USDA-FSA Director, Farm Programs Loan Making Division, FSA:	(202) 720-1632

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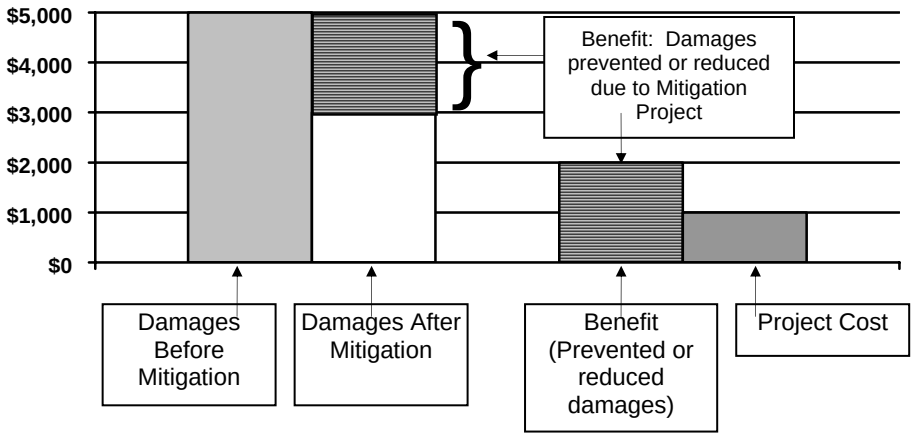
APPENDIX 31 – BENEFIT COST ANALYSYS

How to Determine Cost-Effectiveness Of Mitigation Projects

As the well-publicized devastation of floods, earthquakes, and hurricanes attests, disasters are random and inevitable events that we can't control. But how we reduce — or mitigate — damage from disasters is something that we *can* control. That is why FEMA funds hazard mitigation projects: to reduce future damages, losses, casualties, and other devastating impacts from disasters. Some examples of flood mitigation projects include elevating buildings or upgrading culverts. Projects in earthquake-prone areas might focus on retrofitting buildings to lower future damages and casualties. So instead of continuously picking up the pieces after disasters, states and communities can identify and carry out hazard mitigation measures that will reduce damage and hardship —the "loss"— due to future disasters. A key criterion for mitigation projects to be eligible for funding is that they must be cost-effective. If the project benefits are higher than the project costs, then the project is cost-effective.

Benefit-cost analysis is used for all cost-effectiveness determinations — for flood and earthquake mitigation projects alike. Although the following graph is an oversimplification, the concepts it illustrates are important. At its most basic level, benefit-cost analysis determines whether the cost of investing in a mitigation project today (the "cost") will result in sufficiently reduced damages in the future (the "benefits") to justify spending money on the project. If the benefit is greater than the cost, then the project *is* cost-effective; if the benefit is less than the cost, then the project *is not* cost-effective. This graph provides an example of the kind of comparative benefit and cost data you might see after conducting a benefit-cost analysis.

Basic Benefit-Cost Model



For more information about FEMA's Benefit-Cost Modules, please contact the FEMA Region X Mitigation Division at 425-487-4600

It is important to understand that benefit-cost analysis is basically the same for each type of hazard mitigation project. The only differences are the types of data that are used in the calculations, depending on whether the project is for floods, earthquakes, or other natural hazards. For example, whereas the depth of flooding is used to estimate damage for flood mitigation projects, the severity of ground shaking is used to estimate damage for earthquake mitigation projects.

Calculating the Benefit-Cost Ratio

In the previous graph, cost-effectiveness is determined by comparing the project cost of $1,000, to the value of damages prevented after the mitigation measure, which is $2,000. Because the dollar-value of benefits exceeds the costs of funding the project, the project is cost-effective. This relationship is depicted numerically by dividing the benefits by the costs, resulting in a benefit-cost ratio (BCR). The BCR is simply a way of stating whether benefits exceed project costs, and by how much. To derive the BCR, divide the benefits by the cost ($2,000 ÷ $1,000). If the result is 1.0 or greater, then the project is cost-effective. In this instance, the BCR is 2.0, which far exceeds the 1.0 level. On the other hand, if the cost of the project is $2,000 and the benefits are only $1,000, the project would have a BCR of 0.50 ($1,000 ÷ $2,000) and would not be cost-effective.

By conducting a benefit-cost analysis, you determine one of two things: either the project is cost-effective (BCR > 1.0) or it is not (BCR < 1.0). If the project is cost-effective, then no further work or analysis needs to be done; there is no third step other than to move the project to the next phase in the approval process. If, however, the project is not cost-effective, then it is not eligible for funding.

FEMA utilizes a computer software program to calculate a project's cost-effectiveness. The following is a technical illustration of how benefit-cost analysis works. There are four key elements to all benefit-cost analyses of hazard mitigation projects:

1. an estimate of damages and losses *before* mitigation
2. an estimate of damages and losses *after* mitigation
3. an estimate of the frequency and severity of the hazard causing damages (e.g. floods), and
4. the economic factors of the analysis (i.e. discount rate and mitigation project useful lifetime)

These four key elements and their relationships to one another are detailed in the following example.

EXAMPLE: Consider a 1500 square foot, one-story, single family residence located in the Acorn Park subdivision along Squirrel Creek. A proposed mitigation project will elevate the structure four feet at a cost of $20,000. Whether this project is cost-effective depends on the damages and losses from flooding without the mitigation project; the effectiveness of the mitigation project in reducing those damages and losses; the frequency that the house is flooded and the depth of the flood water; and, the mitigation project's useful lifetime.

If the pre-mitigation damages are frequent and/or severe, then the project is more likely to be cost-effective. Even minor damage that occurs frequently can exceed, over the life of a project, the up-front costs of implementing a mitigation measure. On the other hand, if the building in the example above only flooded once, then it may not be cost-effective to elevate, unless the damages were significant in relation to the value of the structure and its contents.

FEMA is trying to maximize its investment in damage reduction by focusing mitigation resources on those projects that have the best chance of making an impact on losses in property and life. Determining cost-effectiveness of mitigation projects is of critical importance, therefore, to ensure that FEMA is fulfilling its mission of not just responding to disasters, but also in reducing the economic loss and suffering that they bring.

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APPENDIX 32 – ALASKA FEDERATION OF NATIVES 2006 ANNUAL CONVENTION RESOLUTION 06-20

ALASKA FEDERATION OF NATIVES

2006 ANNUAL CONVENTION

RESOLUTION 06-20

TITLE: CLIMATE CHANGE IN ALASKA

WHEREAS : Alaska Natives have developed unique cultures that evolved over thousands of years, molded, in part, by environment and climate, and climate change is likely to have significant impacts on the availability of subsistence foods such as salmon, whales, seals, caribou, berries, plants, and waterfowl that present serious challenges to subsistence ways of life in Alaska and other regions; and

WHEREAS: As stated in the 2004 Arctic Climate Impact Assessment, there is international scientific consensus that carbon dioxide (CO2) and other greenhouse gasses released into the atmosphere have a profound warming effect on the Earth's climate. The 2001 Third Assessment Report from the International Panel on Climate Change (IPCC), the 2000 U. S. Global Change Research Program's (USGCRP) First National Assessment, and Snowchange 2005 (an international indigenous meeting on climate change) indicate that climate change has begun;

and

WHEREAS : Over the past 40 years, annual temperatures in Alaska have increased 4 degrees F and over the next 100 years, under a moderate emissions scenario, the annual average temperatures are projected to rise 5-9 degrees F over land and up to 13 degrees F over the oceans; and

WIE1EREAS: Warming permafrost throughout most of Alaska is undermining Alaska's roads and utility infrastructure, pipelines and buildings, affecting the availability of groundwater and surface water, and contributing to increased erosion along coasts and rivers; and

WHEREAS: Unpredictable weather, snow, and ice conditions make travel and traditional hunting and fishing practices more hazardous, thus endangering our lives; and

WHEREAS: Climate change is impacting entire ecosystems and is threatening many species of Alaska wildlife by changing habitat, insect populations, snow and ice cover, unpredictable weather, changes in precipitation and water levels in rivers and lakes, and increased air and water temperatures that are creating diseases in plants, wildlife and fish; and

WHEREAS : The increase in air and sea temperatures will result in a significant rise in sea level caused by melting ice that will adversely effect Alaskan communities and

ecosystems by exposure to more intensified storm driven waves; and

WHEREAS: Climate-related changes to the weather, food sources, and local landscapes undermine the social identity and cultural survival of Alaska Natives and create new challenges for community health and rural infrastructure; rural economies that will be affected, including commercial fisheries, oil and gas development, tourism, and timber harvesting, as well the challenges of covering the enormous cost of relocating flooded villages; and

WHEREAS: Actions taken to reduce greenhouse gas emissions and increase energy efficiency provide local benefits by decreasing air pollution, creating jobs, reducing energy

use, saving money, and preventing melting permafrost from eroding away homes,

shorelines and entire villages; and

WHEREAS: The International Polar Year (IPY) will commence in 2007 and end in 2008, during which scientists and institutions across the Arctic will focus on global climate change research in the Arctic, with an emphasis on local monitoring.

NOW THEREFORE BE IT RESOLVED by the Delegates to the 2006 Annual Convention of the Alaska Federation of Natives that the Alaska Federation of Natives, Inc., and all of our Alaska Native leadership consider the following courses of action:

1. Urge the Alaska Congressional delegation, the United States Congress and the President of the United States to move forward on a national, mandatory program to reduce climate change pollution and promote the development and adoption of renewable energy and energy efficient technologies within a timeframe that prevents irreversible harm to public health, the economy and the environment.

2. Urge the Alaska State Legislature and the Governor of Alaska to promote, through legislation and regulations, the development and adoption of renewable energy and energy efficient technologies within a timeframe that prevents irreversible harm to public health, the economy and the environment.

3. Support active involvement and participation of Alaska Native communities and organizations in scientific research, monitoring, planning, and policy-making related to climate change projects and initiatives in Alaska, and notifying all appropriate domestic and international agencies and institutions of this position.

4. Support the creation of forums for Alaska Native communities and organizations to deliberate on and plan for climate change impacts in their areas.

5. Urge the Alaska Federation of Natives, Inc. to consider establishing a Climate Change Committee within AFN's Board structure to deal with questions of climate change policy and other appropriate issues.

6. Develop a comprehensive strategic plan to assist Alaska Native communities and organizations assess and plan for climate change impacts to cultures, economies, community well-being, human health, fish, wildlife, habitat, and environment.

SUBMITTED BY: ALASKA NATIVE SCIENCE COMMISSION & INUIT

CIRCUMPOLAR COUNCIL, AKIAK NATIVE COMMUNITY,

CBIITINA NATIVE CORPORATION, KAWERAK, INC.,
SHAKTOOLIK NATIVE CORPORATION, BRISTOL BAY
NATIVE ASSOCIATION, ASSOCIATION OF VILLAGE
COUNCIL PRESIDENTS
COMMITTEE ACTION: DO PASS
CONVENTION ACTION: AMENDED AND PASSED

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APPENDIX 33 – HMGP ADMIN PLAN

STATE OF ALASKA

ADMINISTRATIVE PLAN

For

HAZARD MITIGATION GRANT PROGRAM FUNDING

(PUBLIC LAW 93-288, SECTION 404)

STATE OF ALASKA DEPARTMENT OF MILITARY AND VETERANS AFFAIRS

DIVISION OF HOMELAND SECURITY AND EMERGENCY MANAGEMENT

Revised – February 2007

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1. PURPOSE

1.1. The purpose of this plan is to outline the management, fiscal, and administrative procedures the Division of Homeland Security and Emergency Management will follow to implement the provisions of the Robert T. Stafford Act, as amended 42 U.S.C 5121 et seq, September 1998 (Stafford Act) PL 93-288, §404, Hazard Mitigation activities.

1.2. This Administrative Plan for Hazard Mitigation Grant Funding will be incorporated into the State's new Emergency Response Plan as a separate annex in accordance with (IAW) 44 CFR § 206.437(c).

2. INTRODUCTION

2.1. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended 42 U.S.C 5121 et seq, September 1998 (Stafford Act) established the Hazard Mitigation Grant Program (HMPG). This plan further fulfills the Stafford Act §404, the Disaster Mitigation Act of 2000 (DMA 2000), §201 and §322 (a-d) plan requirements. HMGP identifies pre- and post-disaster hazard mitigation strategies for activities that can be funded under both Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Program guidelines. For a project to be eligible, the applicant must demonstrate that the project is cost effective and substantially reduces the risk of future damage, hardship, loss, or suffering resulting from a major disaster.

2.2. The Post-Katrina Emergency Management Reform Act of 2006-10-03 Title VI—National Emergency Management Attached to the Department of Homeland Security FY 2007 Appropriations Bill H.R. 5441 reestablished the maximum amount of HMGP funds typically available after a disaster as being 15% of federal disaster recovery costs, for disasters with costs under $2 billion. Up to 75 percent of the cost of the approved HMGP project shall be covered by federal contributions. The remaining 25 percent of the project's costs shall be covered by state or local matching funds, or contributions from other funding sources IAW the Federal Emergency Management Agency (FEMA) - State Agreement. HMGP funds cannot be used to match other federally funded grants; however specific federal grants, such as Community Development Block Grants (CDBG), may be used as matching funds for HMGP, assuming that the proposed project meets CDBG program eligibility requirements.

2.3. FEMA HMGP guidance allows the State to use up to 5% of HMGP to complete discretionary State mitigation activities that may be difficult to evaluate against traditional FEMA program cost-effectiveness criteria. Some examples are warning systems, hazard mapping, Geographic Information System hardware and software, public awareness campaigns, unproved mitigation technologies or products, etc. FEMA Policy Guidance Letter EL-7, 9/19/96

2.4. FEMA HMGP guidance also allows 7% of HMGP funds for developing hazard mitigation plans at the State, local, and tribal levels. 44 CFR § 206.434(d)(1)

2.5. Section 404 mitigation funding cannot be used to fund any type of mitigation measure that is eligible under FEMA's Public Assistance (PA) program, Stafford Act §406 mitigation projects, or other Federal programs, though it may be used to complement or enhance other hazard mitigation projects including §406 projects. Section 404 mitigation funds may be combined with other Federal, State, or local private funding sources when appropriate to develop a comprehensive mitigation solution.

3. AUTHORITY

3.1. State

3.1.1. Alaska Disaster Act A.S. 26.23.010 – A.S. 26.23.220, A.S. 26.23.300

3.1.2. Any Executive Order of the Governor

3.1.3. Administrative Order 175

3.1.4. State of Alaska Hazard Mitigation Plan

3.1.5. FEMA/State Agreement

3.1.6. State Emergency Operations Plan

3.2. Federal

3.2.1. Robert T. Stafford Disaster Relief and Emergency Assistance Act §404 (Public Law 93-288, as amended) and the Disaster Mitigation Act of 2000; §322

3.2.2. Disaster Assistance; Hazard Mitigation & Relocation Assistance Act (Public Law 103-181).

3.2.3. Public Law 93-234, Flood Disaster Protection Act.

3.2.4. Executive Order 12612, Federalism.

3.2.5. Executive Order 11988, Floodplain Management.

3.2.6. Executive Order 11990, Protection of Wetlands.

3.2.7. FEMA Regulations, 44 CFR § 206, Subparts M and N.

3.2.8. Executive Order 12699, Seismic Safety

3.2.9. Executive Order 12898, Environmental Justice

3.2.10. National Environmental Policy Act (NEPA)

3.2.11. National Historic Preservation Act (NHPA)

3.2.12. OMB Circulars, A-21, A-87, A-94, A-102, A-110, A-122 and A-133.

3.2.13. FEMA/State Agreement

3.2.14. FEMA document "Hazard Mitigation Grant Program Guidelines for Acquisition and Relocation Projects"

3.2.15. Interagency Hazard Mitigation Team Agreements

3.2.16. FEMA Regulation, 44 CFR § 13, Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.

4. DEFINITIONS

4.1. AKSAS: Alaska State Accounting System

4.2. Alternate GAR: Alternate Governor's Authorized Representatives (AGARs): Performs as the Alternate Governor's Authorized Representative (GAR) to represent the Governor in all activities related to implementing Public Law 93-288 as amended and serves as the alternate grant administrator for all funds provided under the Hazard Mitigation Grant Program When the GAR is not available. The AGARs performs all duties and assumes all responsibilities of the GAR when the GAR is not available. These duties include providing technical advice and assistance to eligible subgrantees, ensuring that all potential applicants are aware of assistance available, and submitting those documents necessary for grant award.

4.3. Applicant: Any State agency, local government, eligible tribal or native government/organization, or eligible non-profit organization submitting an application for assistance under the Hazard Mitigation Grant Program. An applicant is also referred to as a subgrantee.

4.4. Application: The initial request for HMGP funding, as outlined in §206.436 of 44 CFR.

4.5. Disaster Policy Cabinet (DPC): The DPC is chaired by the DMVA Commissioner or his designated representative and comprises commissioners of select agencies to provide recommendations to the Governor concerning disaster related matters. The role of the DPC includes approving requests for mitigation project funding and State-funded long-term recovery projects as well as supporting the State's commitment to disaster relief fund efforts.

4.6. Division of Homeland Security and Emergency Management (DHS&EM): The agency responsible for implementing the Hazard Mitigation Grant Program for the Governor.

4.7. Federal Hazard Mitigation Officer (FHMO): The FEMA employee responsible for coordinating post disaster hazard mitigation activities with other government agencies at all levels.

4.8. FEMA/State Agreement: A formal legal document stating the understandings, commitments, and binding conditions for assistance applicable as a result of a disaster declared by the President.

4.9. Grant: An award of financial assistance. The Federal share of HMGP equals 15% of the total cost of disaster assistance outlays for disasters with costs under $2 billion.

4.10. Grantee: The entity to whom a grant is awarded and which is accountable for expending the funds provided. The Grantee is the entire legal entity, even if only a particular component of the entity is designated in the grant award

document. For the purposes of this plan, except as noted in §206.435 of 44 CFR, the State is the grantee.

4.11. Governor's Authorized Representative (GAR): Represents the Governor in all activities related to implementing Public Law 93-288 as amended and serves as the grant administrator for all funds provided under the Hazard Mitigation Grant Program. The GAR's responsibilities include providing technical advice and assistance to eligible subgrantees, ensuring that all potential applicants are aware of assistance available, and submitting those documents necessary for grant award.

4.12. Hazard Mitigation: Any cost-effective measure that will reduce the potential for damage from a natural disaster event, or any action taken to reduce or eliminate the risk to life and property from a disaster.

4.13. Hazard Mitigation Plan: Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act as amended by §104 of the Disaster Mitigation Act of 2000 requires a State Hazard Mitigation Plan as a condition of receiving disaster assistance funds, excluding assistance provided pursuant to emergency provisions. To obtain Federal assistance each State, local, and tribal government must prepare a hazard mitigation plan with sections that include: a description of the planning process; an assessment of natural hazard risks; a description and analysis of hazard management policies, programs, and capabilities; a list of mitigation goals, objectives, and strategies to reduce or eliminate vulnerability; and a method to implement, monitor, evaluate, maintain, and update the mitigation plan.

4.14. Hazard Mitigation Grant Program (HMGP): The program authorized under §404 of the Stafford Act, which provides funding for certain mitigation measures identified through the evaluation of hazards conducted under §409 (Section 322 of the Disaster Mitigation Act of 2000 when guidelines are adopted).

4.15. In Accordance With (IAW): An acronym used throughout the document to show compliance to a referenced authority.

4.16. Local/Tribal Mitigation Plan: The plan required from local and tribal governments as a condition of receiving a project grant under the Hazard Mitigation Grant Program.

4.17. Preliminary Damage Assessment (PDA): A survey to determine the magnitude and impact of damage caused by a disaster. The PDA is the basis for estimating total disaster related damage and evaluating the need to request a Presidential disaster declaration. The PDA is generally conducted jointly with FEMA, DHS&EM, and technical representatives from appropriate State agencies. The team also identifies immediate mitigation opportunities and issues to be addressed.

4.18. Project: Any mitigation measure, project, or action proposed to reduce risk of future damage, hardship, loss, or suffering from disasters. The term “project” is used interchangeably with the term “measure.”

4.19. Private Non Profit Organizations (PnP): Any non government agency or entity that currently has: 1) an effective ruling from the Internal Revenue Service granting tax exemptions under section 501 (c), (d), or (e) or the Internal Revenue Code of 1954; and 2) Articles of Incorporation and by-laws filed with the State of Alaska.

4.20. National Flood Insurance Reform Act and Disaster Assistance (NFIRDA): Requires recipients for Federal Disaster Assistance for flood damage to real and or personal property to purchase and maintain flood insurance coverage if they want to remain eligible for federal flood disaster assistance.

4.21. Regional Director (RD): The representative from FEMA Region X who is responsible for approving the State Hazard Mitigation Plan and the State’s Administrative Plan for implementing the HMGP.

4.22. Standard State Hazard Mitigation Plan (SHMP): Must be approved by FEMA in order for States to be eligible to receive Stafford Act assistance, excluding emergency assistance. HMGP funding is based on fifteen percent (15%) of the total estimated eligible Federal disaster assistance, for disasters with recovery costs under $2 billion. This plan demonstrates the State’s goals, priorities, and commitment to reduce risks from natural hazards and serves as a guide for State and local decision makers as they commit resources to reducing the devastating effects of natural hazards.

4.23. State Hazard Mitigation Officer (SHMO): The representative of State government who is the primary point of contact in planning and implementing pre- and post-disaster mitigation programs and activities required under the Stafford Act.

4.24. State Hazard Mitigation Plan Advisory Committee (SHMPAC): A team of personnel comprised of appropriate DHS&EM staff and technical experts from other State, local, tribal, and federal agencies, all with decision making authority or contact with their agency decision makers. The SHMPAC is chaired by the SHMO. The purpose of the SHMPAC is to review, prioritize, and recommend selection of HMGP projects submitted by eligible applicants. Agency members will also assist with developing and reviewing the State Hazard Mitigation Plan.

4.25. Subgrant: An award of financial assistance under a grant by the grantee to an eligible subgrantee.

4.26. Subgrantee: The government or other legal entity to which a subgrant is awarded and which is accountable to the grantee for the use of the funds provided. Subgrantees can be a State agency, local government, private non-

profit organization, Alaska Native village, or organization (not Alaska Native corporations with ownership vested in private individuals) as outlined in § 206.434 of 44 CFR.

4.27. Supplement: Means an amendment to the hazard mitigation application to add or modify one or more mitigation measures

5. ORGANIZATION AND STAFFING

5.1. The organizational structure for administrating the HMGP will be flexible and capable of expansion and contraction as the need dictates depending upon the severity of the disaster.

5.2. The SHMO shall submit a staffing plan for the JFO within five (5) days of the opening of the office (IAW 44 CFR, § 206.437). If no initial staffing plan is submitted within the first 5 days, it is assumed that the initial staffing plan consists of the GAR and the SHMO. The staffing plan for this disaster is included as Appendix A.

6. RESPONSIBILITIES

6.1. State

6.1.1. The Division of Homeland Security and Emergency Management is the State agency responsible for administering §404 HMGP and §406 mitigation as defined in this plan. All applications for §404 funding will be processed through DHS&EM.

6.1.2. The State Hazard Mitigation Officer, a member of the DHS&EM Staff, is defined in this plan as the person responsible for all emergency management mitigation activities for the State and pursues compliance with Stafford Act §322 as amended by §104 DMA 2000 planning requirements.

6.1.3. For each Presidential Disaster Declaration where Alaska has an existing applicable Hazard Mitigation Plan, the plan will be reviewed and revised as a means of validating earlier concerns and priorities, or to update the existing plans to reflect changes that have resulted from the current disaster or in mitigation technologies, strategies, or policies.

6.1.4. DHS&EM Hazard Mitigation Section personnel will work with PDA teams on tasks requiring special expertise or knowledge concerning §322, §404 and/or §406 activities as well as other State hazard mitigation programs. The SHMO may request personnel from other State agencies, per Alaska Statute 26.23.010, to augment the PDA teams.

6.1.5. DHS&EM will submit the State's HMGP application IAW 44CFR § 206.436 as well as all local HMGP applications and funding requests for the purpose of identifying new projects to the FEMA Region X Director within 12 months of the date of disaster declaration.

6.2. Local

6.2.1. The Chief Executive Officer or Senior Elected Official of an organization or governmental entity who qualifies for public assistance and possible mitigation grants will approve an individual to represent that entity in all §404 and §322 matters.

7. DIRECTION AND CONTROL

7.1. Notifying Potential Applicants:

7.1.1. The SHMO, in cooperation with the State Public Assistance Officer (SPAO), Federal Public Assistance Officers (FPAO), and the FHMO will issue a statement on the availability of HMGP and will establish a State mitigation program point of contact during the Individual and Public Assistance Applicant's Briefing.

7.1.2. Potential applicants will be identified through a joint PDA and applicant briefings conducted with the PA and/or IA programs, through media and public information channels, or other methods determined appropriate by the State. Applicant eligibility, as described below, may be determined during these briefings.

7.1.3. At the discretion of the SHMO and FHMO, the Federal Public Information Officer (FPIO) will distribute a joint State/FEMA media release describing the program. The media release will include federal and State points of contact and information regarding any scheduled HMGP briefings.

7.1.4. The SHMO, FHMO, SPAO, and FPAO, or their representatives, will announce, advertise, and conduct HMGP applicant briefings as needed in areas convenient to potential applicants. The briefings will include: a description of the program, the mitigation priorities for the current disaster, application information and forms, an explanation of the submittal-review-award process and schedule, and a point-of-contact for additional information and assistance.

7.1.5. Potential applicants not previously notified during Preliminary Damage Assessment Briefings or Applicant Briefings will be advised of application prospects and procedures using the internet, email messages, or by letter.

7.1.6. Applicants will be notified of any eligibility or non-eligibility determinations made by FEMA or DHS&EM in writing.

7.2. Applicant's Agent:

7.2.1. An applicant's Chief Elected Official is required to designate an agent who will be the applicant's point of contact for all matters pertaining to its application for Federal assistance (DHS&EM Form 30-5). If no agent is

appointed, the Chief Elected Official of the eligible organization will be designated as the applicant's agent.

7.3. Applicant Eligibility:

7.3.1. The following are eligible to apply for §404 Hazard Mitigation Grant Program funds:

7.3.1.1. State and local governments.

7.3.1.2. Private non-profit (PNP) organizations or institutions that own or operate a non-profit facility as defined in 44 CFR § 206.221 (e).

7.3.1.3. Alaska Native Villages or organizations, but not Alaska Native Corporations with ownership vested in private individuals.

7.3.2. DHS&EM does not differentiate on the ground of race, color, or national origin.

7.4. Project Eligibility:

7.4.1. Project eligibility criteria are addressed in the Division of Homeland Security and Emergency Management's Hazard Mitigation Grant Program applications (Appendix B and C). Eligible activities include:

7.4.1.1. Local All-Hazard Mitigation Plan Development

7.4.1.2. State Management Costs are eligible under 44 CFR, § 206.439(b)(2). Costs of State personnel (regular time salaries only) assigned to administer HMGP in the Joint Field Office (JFO) may be eligible when approved by the FEMA Regional Director (RD). The request for funding State Management Costs will be included in the FEMA / State Agreement. The State shall submit a staffing plan for the JFO within five (5) days of the opening of the office IAW 44 CFR, § 206.437 and 206.439(b)(2) Management Costs are subtracted from the HMGP aggregate total.

7.4.1.3. After the close of the JFO, costs of State personnel (regular time salaries only) for continuing management of the HM grants may be eligible when approved in advance by the RD.

7.4.1.4. Those projects that conform to the State Hazard Mitigation Plan and the applicant's Local All-Hazard Mitigation Plan if applicable.

7.4.1.5. Those that have a direct beneficial impact upon the designated disaster area, whether or not the project is located in the designated area, IAW 44 CFR § 206.434 (b)(2).

7.4.1.6. Projects that conform to 44 CFR § 9, Flood Plain Management and Protection of Wetlands; and 44 CFR § 10, Environmental Considerations.

FEMA and State floodplain and environmental program managers will review these projects as applicable.

7.4.1.7. Projects that solve a problem independently or constitute a functional portion of a solution if there is assurance that the project as a whole will be completed.

7.4.1.8. Projects that are cost effective and substantially reduce the risk of future damage, i.e.:

7.4.1.8.1. they address a problem that has been repetitive or that pose a significant risk if left unsolved;

7.4.1.8.2. the value of future damage reduction exceeds the cost of the project;

7.4.1.8.3. there is assurance that the entire project will be completed.

7.4.1.9. Projects that provide the most practical, effective, and environmentally sound solution after considering a range of options for mitigation.

7.4.1.10. Projects that contribute to a long-term solution that integrates hazard mitigation principles with existing programs and overall community planning.

7.4.1.11. Projects that consider the long-term effects of the areas and entities they protect and also feature manageable future maintenance and modification requirements.

7.4.2. Projects involving any facility for which assistance was provided as a result of a previous major disaster will only be eligible is all insurance required by FEMA as a condition of previous assistance has been obtained and maintained. The deductible amount, or damages in excess of the NFIP limits, or for flood damaged items not covered by standard NFIP policy will be eligible.

7.5. Environmental Review:

7.5.1. Applicants must indicate any potential environmental issues needing consideration on their Project applications.

7.5.2. DHS&EM does not have the capability to perform National Environmental Policy Agency (NEPA) level reviews. FEMA Region X will conduct the required Federal environmental reviews. Therefore, no project shall commence prior to this review and appropriate approval(s). All projects considered for funding under the HMGP must meet minimum NEPA requirements, which are included in the HMGP project application. The applicant is encouraged to work with the SHMO and the FEMA Regional Environmental Officer to obtain and provide a reasonable level of environmental detail that is dependent on the type and location of the proposed mitigation project.

7.5.3. FEMA is responsible for making the final NEPA determination and approval recommendation for all projects, IAW federal guidelines. Projects may receive conditional approval. DHS&EM is responsible for ensuring that these conditions, if applicable, are met. Documentation to prove these conditions were met may be required before the project will be closed.

7.5.4. FEMA will determine reasonable timeframes for conducting NEPA reviews. Turn-around time for a NEPA review is based on project complexity, project scope, existing workloads, local capacity, or other priorities. FEMA will ensure that reviews are conducted in the shortest time possible. This will likely be done on a project-by-project basis.

7.6. Project Identification:

7.6.1. Preliminary Damage Assessment (PDA) Teams will include the SHMO when possible, or be briefed by the SHMO to identify potential mitigation projects prior to an official Presidential Disaster Declaration. The SHMO will review PDA Team reports to closely scrutinize them for possible §404 and §406 mitigation opportunities.

7.6.2. The SHMO will review the State Hazard Mitigation Plan (SHMP) to identify potential projects that may qualify for mitigation grant funds.

7.6.3. The Public Assistance Damage Assessment Teams (PADAT) will be briefed to consider potential mitigation projects and include them in their Project Worksheets as §406 mitigation projects. The worksheets will be reviewed by the SHMO for additional §404 and §406 potential.

7.6.4. The SHMO will review the PADAT reports and recommendations d to identify potential mitigation grant projects to include FMA, PDM, or Forestry mitigation grants.

7.7. Application Procedures:

7.7.1. A “Statement of Intent” to participate in HMGP will be forwarded to FEMA by the GAR within 60 days of the disaster declaration date. If an extension is needed, it will be coordinated with FEMA Region X prior to the 60-day deadline. The request for an extension will include a new timeline.

7.7.2. The SHMO is responsible for ensuring that all Hazard Mitigation Grant Program applications are submitted prior to DPC review and that the Hazard Mitigation Grant Program applications are finalized prior to submission to FEMA. The SHMO will assist applicants with developing projects and completing comprehensive applications during community visits and hazard area inspections as needed. The SHMO, SCO, or GAR may request FEMA provide a Mitigation Technical Assistance Team to assist with soliciting and preparing HMGP applications and completing Benefit / Cost Analyses of the projects.

7.7.3. Comprehensive "PROJECT" and "PLANNING" applications are included as Appendix B and C of this Administrative Plan. The appropriate application must be completed for each proposed activity prior to the SHMO submitting them to the DPC. The DPC will validate and finalize the priority of activities for the Governor's approval. The completed applications will be submitted to FEMA for funding upon approval by the Governor. The applications include, but are not limited to:

7.7.3.1. Eligibility Criteria: Does the project meet the criteria for funding by the HMGP?

7.7.3.2. State Mitigation Goals: Does the project meet the goals outlined in the State Hazard Mitigation Plan?

7.7.3.3. Signature of Authorized Agent: Subgrantee (1) agrees to commit its jurisdiction to completing the project and (2) verifies they have their cost - share of funds required (if applicable).

7.7.3.4. Applicant Data

7.7.3.5. Historical Damage Information

7.7.3.6. Cost Estimates

7.7.3.7. Primary Project Scope of Work

7.7.3.8. Alternative Project Descriptions

7.7.3.9. Project Eligibility Issues

7.7.3.10. Environmental Information: This section includes information consistent with 44 CFR § 9, Floodplain Management and Protection of Wetlands, and 44 CFR § 10, Environmental Considerations.

7.7.3.11. Required Information for the Project: i.e. Maps, sketches, detailed drawings, descriptions etc.

7.7.3.12. Checklist of Attachments: The attachments are used to further explain complex issues and concerns. The SHMO or FEMA Regional Technical Assistance Team will evaluate each application and determine additional attachments that are required.

7.7.3.13. Maintenance Agreement

7.7.3.14. Work Schedules and Timelines

7.7.4. The SHMO will convene and chair the SHMAC when DHS&EM receives the 180-day lock-in for the disaster. The committee is comprised of appropriate DHS&EM staff and technical experts from other State or Federal agencies.

They will review all HMGP activity submittals for eligibility and completeness. Based on the committee's prioritized recommendations, the SHMO will make any final adjustments before presenting them to the Governor's DPC for approval, refining priority, or further guidance.

7.7.5. The SHMO will identify potential Fast Track projects and present them to the DPC for consideration. The DPC determines each project's priority and has final approval authority. The DPC may circumvent the normal project selection process by choosing to "fast track" projects when determined to be in the State's best interest.

7.7.6. Applicants are required to have a FEMA approved, locally adopted Local All-Hazard Mitigation Plan to comply with Disaster Mitigation Act of 2000 § 322 and 44 CFR §201.6(a) criteria as a condition of applying for mitigation grant assistance. Local communities without a FEMA approved and locally adopted plan may only apply for planning project assistance. Each local plan must complement the State Hazard Mitigation Plan, include hazard Vulnerability Analyses and Risk Assessments, document community involvement, be adopted by the community or tribal government, and be approved by FEMA. Eligible private non-profits (PNPs) must participate with the State to identify potential hazards, to analyze the vulnerability, to assess the risk threatening their population and infrastructure, and to develop mitigation measures and strategies to reduce the threat from these hazards. This can be accomplished within the local government's mitigation plan where the PNP is located, or if more appropriate, through creating an annex to the State Mitigation Plan. PNPs must coordination with the local jurisdictions in which PNP infrastructure is located, regardless of the jurisdiction having a FEMA approved all-hazard local mitigation plan. DHS&EM mitigation staff will provide technical assistance as needed.

7.8. Project Selection:

7.8.1. The SHMO will convene a board of SHMAC members to evaluate and prioritize all eligible HMGP project submittals because funding is typically insufficient to select all valid HMGP projects. Regardless of funding availability, projects will be ranked according to the criteria set forth in 44 CFR § 206.425 (b) as follows:

7.8.2. Measures that, if not taken, will have a detrimental impact on the applicant, such as potential loss of life, loss of essential services, damage to critical facilities, or economic hardships on the community;

7.8.3. Projects for developing local all-hazard mitigation plans to comply with DMA 2000 initiatives. If a community does not have a community adopted FEMA approve plan, they will not be eligible for HMGP funding;

7.8.4. Measures that best fit the State Hazard Mitigation Plan and an overall plan for development and / or hazard mitigation in the community, disaster area, or State;

7.8.5. Measures that have the greatest potential impact on reducing future disaster losses;

7.8.6. Measures that are designed to accomplish multiple objectives, including damage reduction, environmental enhancement, and economic recovery.

7.9. The SHMAC will also consider the level of interest and demonstrated degree of commitment on the part of each applicant. Applicants with a poor history of compliance or success may be closely monitored during the construction phase of the project.

7.10. Project Management:

7.10.1. DHS&EM has primary responsibility for project management and accountability of funds as prescribed in 44 CFR § 13 and in the funding section below. The GAR is responsible for ensuring that the subgrantees meet all program and administrative requirements.

7.10.2. DHS&EM may place special conditions or restrictions on grants to "high risk" subgrantees, as defined in 44 CFR § 13.12. DHS&EM will notify the subgrantee subject to these conditions in writing of the nature of the conditions, the reason(s) for imposing them, what action must be taken before the conditions will be removed, and the time period in which this must be accomplished, and the method of requesting reconsideration of the conditions.

7.10.3. The SHMO reviews and approves all requests for reimbursement and advances from applicants before forwarding them to the Division of Administrative Services (DAS) financial management staff for audit to prevent duplication of payment and to ensure payment eligibility. Any questions regarding eligibility or duplication of payment are returned to the SHMO for clarification. Final approval for payment is made by the GAR. DAS financial management staff then processes payment, disburses funding, and returns the request for payment and financial transaction reports (showing payment processed) to the SHMO. The DAS financial management staff conducts a periodic reconciliation of AKSAS with FEMA's disaster management system, NEMIS.

7.10.4. The subgrantee shall submit a Project Quarterly Report (DHS&EM Form 30-60) (Subgrantee's Handbook, Attachment 2) to the GAR indicating the status and projected completion date for the project. Any problems affecting the completion date, scope of work, or project cost which could result in noncompliance with the approved grant conditions will also be included in the report.

7.10.5. The SHMO shall submit a quarterly progress report to FEMA indicating the status and projected completion date for each measure funded. Any problems affecting the completion date, scope of work, or project costs which could result in noncompliance with the approved grant conditions will also be included in the report.

7.10.6. Subgrantees normally have up to twenty-four (24) months from the activity approval and funding date to complete the project, or twelve (12) months for a plan. DHS&EM and FEMA Region X must approve any deviation from this schedule.

7.10.7. The subgrantee will submit project cost overruns, with complete justification, to the GAR for approval. Cost overruns which can be met without additional federal funds, or which can be met by offsetting cost underruns on other projects, need not be submitted to the FEMA Regional Director for approval, so long as the full scope of work on all affected projects can still be met. For cost overruns which exceed federal obligated funds and which require additional federal funds, the GAR shall evaluate each cost overrun and shall submit a request with a recommendation to the Regional Director for a determination. The applicant's justification for additional funding and other pertinent material shall accompany the request. The Regional Director shall notify the GAR in writing of the determination and process a supplement, if necessary. In no case will the federal cost for HMGP exceed either the 75% federal share or fifteen percent (15%) of the estimated aggregate amount of grants identified in the Stafford Act and section II.B. of this document.

7.10.8. Payment to the State for claims under § 404 will be as provided in 44 CFR § 206.438(d).

7.10.9. If any provision under this Grant Agreement or its application to any person or circumstances is held invalid by any court of rightful jurisdiction, this invalidity does not affect other provisions of the Grant Agreement which can be given effect without the invalid provision.

7.10.10. While DHS&EM undertakes to assist the applicant with the project by providing grant funds pursuant to this Grant Agreement, the project itself remains the sole responsibility of the applicant. DHS&EM undertakes no responsibility to the applicant, or to any third party, other than as is expressly set out in this Grant Agreement. The responsibility for the design, development, construction, implementation, operation and maintenance of the project, as those phases are applicable to this project, is solely that of the applicant, as is responsibility for any claim or suit of any nature by any third party related in any way to the project.

7.10.11. The applicant shall defend at its own cost any and all claims or suits at law or in equity which may be brought against the applicant in connection with the project. The applicant shall not look to DHS&EM, or state or federal agency, or to any of their employees or agents, for any performance,

assistance, or any payment or indemnity, including but not limited to cost of defense and/or attorney's fees, in connection with any claim or lawsuit brought by any third party related in any design, development, construction, implementation, operation and/or maintenance.

7.11. Technical Assistance:

7.11.1. Technical assistance may be given by FEMA and/or DHS&EM to assist either the grantee and/or subgrantee. Technical assistance may include assistance with data collection, project development and management, engineering and/or floodplain management assistance, and benefit/cost determinations. Requests for technical assistance should be forwarded to the respective agency (FEMA or DHS&EM, as appropriate). Requests should be in writing, but alternative methods may be acceptable, as appropriate.

7.12. Financial Management (Funding):

7.12.1. Total approved project costs are split with a 75% Federal share and a 25% State share. Any additional program costs are not eligible, and are the responsibility of the subgrantee. However, in some instances cost overruns may be funded on a case-by-case basis, using the procedures described above in Section J 6.

7.12.2. Hazard Mitigation Grant Program funds obligated by FEMA will be identified and dispersed to DHS&EM in a manner similar to Public Assistance funds. A copy of the Public Assistance Administrative Plan can be found at DHS&EM.

7.12.3. Applicants must set-up separate accounts to facilitate tracking HMGP funds generated by different disasters.

7.12.4. All payments to a subgrantee go through a review and approval process within DHS&EM. The SHMO will review the request and the applicant file to determine payment amounts. The request will be reviewed and approved for payment by the SHMO, then routed through the DAS financial management staff for audit, the Plans and Preparedness Program Manager for review, and to the GAR for final payment approval.

7.12.5. Applicants will use local standard operating procedures when procuring services or goods. Qualified State agencies will follow State Procurement Guidelines.

7.12.6. Obligating Federal funds for specific mitigation projects will be accomplished as those projects are approved by FEMA.

7.12.7. An Applicant (subgrantee) may request an Advance or Reimbursement of Funds by completing DHS&EM Form 30-03, "Request for Funds" (Subgrantee's Handbook, Attachment 1). The completed form must

be typewritten and submitted to the State for approval and processing. DHS&EM will not accept handwritten requests. Faxed documents must be followed-up with a mailed original. Advance funds must be expended towards the approved scope of the project within 30 days of receipt, or they must be refunded to the state. The applicant must provide supporting documentation for all project expenditures for which advance funds are used prior to receiving subsequent funding. Accruing interest on advance funds is not authorized, and any accrued interest must be returned to the State and subsequently to FEMA.

7.12.8. Advances are limited to increments of 30% of the estimated total "Approved" project cost. Additional funding may be advanced as the Applicant provides documentation to substantiate expenditures. Each subsequent request may not exceed 30% of the estimated total project cost. Total advances may not exceed 75% of the estimated project cost. Final payments and subgrantee Administrative Allowances will not be paid until the project is complete and all receipts and documentation are received by DHS&EM.

7.12.9. Reimbursement of funds: An applicant (subgrantee) may request a reimbursement of funds by completing the DHS&EM Form 30-03. The applicant must provide documentation that shows actual expenditures made supporting grant project activities and/or supporting functions described in the approved scope of work for the project. The request will be processed for payment once it is validated for authorized expenditures.

7.12.10. If the request is denied, the GAR will inform the subgrantee in writing within thirty (30) days of the date of the request with an explanation for the denial. If approved, the request will be transmitted to the DAS financial management staff for processing per established accounting procedures.

7.12.11. Disbursement of funds will be as expeditious as possible to minimize the time between the grant award and actual disbursement. The State prefers to use electronic funds transfers (EFT) whenever feasible to the applicant. Payments will be made by "Warrant" (check) only upon request by the applicant.

7.12.12. DAS financial management staff will draw the funds through Smartlink. The funds will only be drawn from Smartlink as DHS&EM incurs expenditures on the approved project. DHS&EM will request that FEMA de-obligate unexpended funds at the closeout of each project, once all project expenditures are paid.

7.12.13. State "Warrants" are good for six months from date of issue. Under normal circumstances, the State would keep warrants that have reached the Statute of Limitations (SOL) on the books for 18 months and then send them to "Unclaimed Properties" at:

Department of Revenue Division of Treasury Unclaimed Property Section P.O. Box 110405 Juneau, AK 99811-0405	or	Department of Revenue Division of Treasury Unclaimed Property Section Willoughby Ave., 11th Floor Juneau AK 99811-0405

If the warrant expires before the expiration of the performance period of the disaster and the applicant submits an affidavit that the:

- Warrant was lost;
- Warrant was stolen;
- Warrant was fraudulently cashed; or
- Applicant was unable to cash the warrant because they were:
  - o Medically incapable of cashing the check and there is no one with a power of attorney that can act in the applicants behalf.
  - o Outside the U.S.A. during the entire time the warrant was valid and could not find an institution willing to cash it.

  - o The applicant can then request that the warrant be reissued. State warrants can be reissued indefinitely by contacting the Unclaimed Properties Section at the addresses above.

7.12.14. In the event the applicant fails to expend funds in accordance with state law and or the provisions of the agreement, DHS&EM reserves the right to recapture funds in an amount equivalent to the extent of noncompliance. Such right of recapture shall exist for a period not to exceed three years following agreement termination. Repayment by the applicant of funds under this recapture provision shall occur within 30 days of demand. In the event DHS&EM is required to institute legal proceeding to enforce the recapture provision, DHS&EM shall be entitled to its costs thereof, including reasonable attorney's fees.

7.12.15. Subgrantees are permitted to rebudget within the approved direct cost budget to meet unanticipated requirements and may make limited program changes to the approved project, per 44 CFR § 13.03. However, all changes of the budget, Scope of Work, and program activities must be coordinated with DHS&EM.

7.12.16. Final payments and subgrantee Administrative Allowances will not be paid until the project is complete and all receipts and documentation are received by DHS&EM. The applicant's claim and reimbursement documents for reimbursement must be submitted within 60 working days of the completion of the work. Upon justification from the applicant, the SHMO can grant an extension of 30 days. All payments to a subgrantee go through a review and approval process within DHS&EM. Prior to project closeout, applicants must reconcile their programmatic expenditures with actual financial activity. If funds remain after project completion, the remaining funds, and any interest accrued in excess of $100 annually must be returned to the State and ultimately to FEMA before the project can be closed.

7.12.17. Applicants for Acquisition/Relocation projects must provide copies of all documentation obtained from financing the home including contracts between applicants and home owners, vendors, and suppliers. Applicants must provide a written report explaining what happened with each home, funds expended, and any information concerning project progress.

7.12.18. No expenditure made, or obligation incurred, following this completion date shall be eligible, in whole or in part, for grant funds. In addition to any remedy DHS&EM may have under this Grant Agreement, the amounts set out in Section 3.01 may be reduced to exclude any such expenditure from participation.

7.13. Payment of Administrative Allowance:

7.13.1. Grantee Administrative Allowance: The State will be reimbursed an Administrative Allowance at project close-out IAW 44 CFR § 206.439 (b)(1)(i)(A)-(D).

7.13.1.1. This allowance is reimbursement from the State to the Subgrantee to cover the cost of administering the grant program based on the sliding scale in accordance with 44 CFR § 206.439 (b)(1)(ii) (A)-(D).

7.13.1.2. Subgrantee must retain records detailing how Administrative Allowance is used, and must report on total expenditures quarterly. Documentations on Administrative Allowance need not be submitted; however they must be retained for three (3) years beyond date of closeout for the disaster. These records are subject to audit.

7.13.2. State Management Costs: Costs of State personnel (regular time salaries only) assigned to administer the Hazard Mitigation Grant Program in the Joint Field Office (JFO) may be eligible when approved by FEMA's Regional Director (RD) within 5 days of the opening of the office. Post JFO costs are also eligible if approved in advance. (44 CFR § 206.439(b)(2)(i)).

7.14. Appeals:

7.14.1. Appeal of State Decision:

7.14.1.1. An eligible applicant, subgrantee, or grantee may appeal any previously made determination related to an application for federal assistance through the grantee (DHS&EM) to the FEMA Region X Director (IAW 44 CFR § 206.440). Applicants whose projects are not selected by the Disaster Policy Cabinet will be notified by the State Hazard Mitigation Officer, and advised of the following appeal process:

- DHS&EM will provide guidance or technical assistance with writing an appeal if needed.

- Appeals must be submitted to the Governor's Authorized Representative (GAR) at DHS&EM, within 60 days of receipt of notice of non-selection.
- The written appeal must contain sufficient additional information and supporting documentation to warrant reconsideration. DHS&EM will review and evaluate the appeal then submit the documentation for the appellant's position, sighting specific monetary discrepancies or disputed provisions in Federal law, regulation, or policy. Upon completion of the review and evaluation, DHS&EM will forward with a written recommendation to the Regional Director for action.
- The grantee will review and forward appeals from an applicant or subgrantee, within 60 days of receipt.
- All appeals must be resolved by the GAR or his representative prior to the grant closeout period.

7.14.2. Appeal of a Federal Decision:

7.14.2.1. The applicant may also appeal if its project is turned down by FEMA. This appeal must be made in writing to the GAR within 60 days of receipt of notice on non-selection by FEMA.

- Within 60 days of receipt of the appeal, the GAR will make an evaluation, and forward the appeal to the FEMA, Region X Director with a written recommendation.
- After the Regional Director receives the appeal, a response must be made within 90 days. That response may take the form of a determination or a request for additional information from the applicant. After receipt of any additional information, which is requested, the Regional Director has an additional 90 days to make a determination.
- If the appeal is denied by the FEMA Regional Director, the GAR may appeal to the FEMA Associate Director, Mitigation. The same time limits for submission and response apply to the second appeal.
- The Associate Director shall decide on the appeal within 90 days from receipt of all related information. In most cases, the Associate Director's decision will be considered final.

7.15. Records and Reports:

7.15.1. Progress Reports:

7.15.1.1. The subgrantee will submit a Project Quarterly Report, (DHS&EM Form 30-60) (Subgrantee's Handbook, Attachment 2), to the State which

will serve as the basis for the State reporting on the status of all open projects to FEMA. The report will contain the status of open projects as prescribed by 44 CFR § 13.40 (b)-(c) and 206.438(C). The progress report will be submitted to DHS&EM within twenty (20) days after the end of the first federal quarter following the initial grant award and shall be submitted each quarter thereafter for State administered disaster assistance programs authorized by the Stafford Act. Reports are due to DHS&EM January 20, April 20, July 20, and October 20.

7.15.1.2. The State will submit quarterly progress reports to FEMA detailing the status of open projects as required by 44 CFR § 13.40 (b)-(c) and 206.438(C). Quarterly progress reports are due on January 30, April 30, July 30, and October 30.

7.15.1.3. Quarterly reports are due the 20th of the month following the end of the quarter. If a jurisdiction has not submitted its reports in a timely manner, DHS&EM will contact this jurisdiction as a reminder of its reporting duties. DHS&EM will attempt to contact the jurisdiction by phone, email and/or letter several times during the quarter following the due date of the missing report. If no report for the prior quarter is received before the end of the next quarter, the grant may be terminated, and recoupment of all reimbursed expenditures may be sought.

7.15.2. Financial Status Reports:

7.15.2.1. The grantee will submit a quarterly Financial Status Report (SF FEMA 20-10) to the FEMA Region X office 30 days after the end of the first federal quarter following the initial grant award. Financial reports will be submitted quarterly thereafter for State administered disaster assistance programs authorized by the Stafford Act. Reports are due January 30, April 30, July 30, and October 30.

7.15.2.2. The subgrantee will submit a quarterly financial report (Federal Cash Transaction Report) to DHS&EM twenty (20) days after the end of the first federal quarter following the initial grant award. Financial reports will be submitted quarterly thereafter for State administered disaster assistance programs authorized by the Stafford Act. Reports are due January 20, April 20, July 20, and October 20.

7.15.2.3. This report will consist of the following at a minimum:

- Total authorized for the project
- Total expenditures to date
- Total payments received to date
- Total advances received
- Total project funds remaining

- The grantee will submit the Federal Cash Transaction Report (FCTR) to FEMA 30 days after the end of the quarter, but no later than the 15th of the following month.

7.15.3. Receipt of Hazard Mitigation Grant Program funding is a contractual agreement between the grantee and subgrantee. As the grantee, DHS&EM requires that quarterly and annual fiscal status reports be completed as a condition of receiving these funds. Project funding can be suspended or reimbursement sought if the required reports are not received as indicated above.

7.15.4. Project Documentation Record Retention (44 CFR § 13.42): The applicant will be required to keep complete records of all work including administrative allowance expenses covered by Administrative Allowances (i.e. receipts, checks, job orders, contracts, equipment, equipment usage documentation and payroll information in paper, electronic or microfiche formats) funded under the Hazard Mitigation Grant Program as follows:

7.15.4.1. Except as noted below, FEMA requires that records must be retained for three years from the date of the last expenditure report or if waived, the date the report would have been due. However, the State of Alaska requires that records be retained for 3 years after final closeout of the disaster. This includes support documentation of all soft match dollars, such as force account labor and use of existing inventory,

7.15.4.2. If litigation, claim, negotiation, audit, or other action involving the records has been started before the expiration of the 3-year period, the records must be retained until completion of the action and resolution of all issues arising from the action or three years whichever is later.

7.15.4.3. Grantee and subgrantees are required to retain real estate transaction and property tracking records indefinitely.

7.15.4.4. To avoid duplicate recordkeeping, awarding agencies may make special arrangements with grantees and subgrantees to retain any records which are continuously needed for joint use.

7.15.4.5. Records for income transactions after grant or subgrant support will be retained for three years starting from the end of the grantee's fiscal year in which the income is earned.

7.15.4.6. Alternate forms of documentation such as microfilming, photocopying, or similar methods may be substituted for the original records.

7.15.5. Access to Records (44 CFR § 13.42 (e)): All projects are subject to State and Federal audit or, examinations during the retention period.

However, grantees and subgrantees are not required to permit public access to their records unless required by Federal, State, or local law.

7.15.5.1. The State may make random audits, checks, or inspections to determine that records are retained and available as required.

7.16. Equipment Management:

7.16.1. 44 CFR § 13.32(a)-(d) is very explicit concerning equipment management responsibilities. The grantee will use, manage, and dispose of equipment acquired under this grant IAW State laws and procedures. Additionally, the grantee and subgrantees will use the equipment for the project for which it is acquired for as long as needed. Once the original need is terminated, the equipment can be used for other activities supported by the federal government.

7.16.2. All equipment acquired with grant funding will be maintained on inventory following State of Alaska Procurement guidelines to include serial number, property identification tag, location, cost, and other tracking data. Physical inventory will be conducted annually and reconciled with property records every two years. Maintenance will be performed to ensure the equipment remains in functional order until disposition and appropriate records will be kept current in the Division's logistics office.

7.16.3. Equipment will be disposed of following State disposition regulations and as delineated in 44 CFR § 13.32(e).

7.17. Facilities and Real Property:

7.17.1. DHS&EM makes no claim to any capital facilities or real property improved or constructed with funds under this Grant Agreement, and by this grant of funds does not and will not acquire any ownership interest or title to such property of the applicant. The applicant shall assume all liabilities arising from the ownership and operation of the project and agrees to hold DHS&EM and the State of Alaska harmless from any and all causes of action arising from the ownership and operation of the project.

7.17.2. Every two years the State will contact the communities that have purchased land with HMGP monies and have tem verify in writing that the land requirements (open space, public ownership, etc.) are being adhered to.

7.18. Close-out Procedures:

7.18.1. The SHMO reserves the right to inspect all projects for compliance at any time and FEMA may also conduct an inspection of any project at any time.

7.18.2. Upon completion of all work approved in a project application the SHMO, or designee, will make a final inspection and submit certification of the

project to the GAR. At the request of the GAR or the Regional Director (RD), a joint DHS&EM/FEMA team will perform the inspection for large projects. Projects less than $100,000 may be certified by a desk audit of all project documentation.

7.18.3. If inspection and review of Subgrantee support documentation reveals problems in work performance and/or documentation of such work, the SHMO shall work with the subgrantee to correct the deficiencies before program closure. The State will forward final inspection documents to the RD to close the project.

7.18.4. The GAR will submit a final report to FEMA when all subgrants have been closed. The report will include a certification that all funds have been expended in accordance with the FEMA-State Agreement, a listing of all projects and total expenditures, and a final request for reimbursement based upon an eligible Administrative Allowance determination.

7.19. Audits:

7.19.1. The State and subgrantees are responsible for obtaining audits IAW 44 CFR § 13.26, the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507), and revised OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations. This requirement applies to all §404 Hazard Mitigation Grant Projects

7.19.2. Audit requirements will be IAW 44 CFR § 14 or OMB Circular A-128, as appropriate for all projects $25, 000 - $100,000.

7.19.3. Applicants expending $500,000 or more in total Federal financial assistance in a fiscal year will be required to have an audit made in accordance with the Single Audit Act Amendments of 1996 - OMB Circular A-133.

7.19.4. Applicants will be required to provide Alaska Division of Homeland Security and Emergency Management a copy of the Single Audit.

7.19.5. Even though a Single Audit is performed, grant recipients also are subject to additional audits by FEMA Office of Inspector General and State auditors for items not covered by the Single Audit.

7.19.6. Applicants will be advised to retain records and supporting documentation for 3 years after closeout of the disaster.

7.19.7. The GAR may request an audit for funds disbursed to a subgrantee at any time. The audit results will be submitted to the Regional Director for resolution based on the FEMA-State Agreement. The audit will determine whether the subgrantees have met the requirements outlined in this plan and expended HMGP funds IAW 44 CFR §§13.26 and 14.2, the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507), and revised OMB Circular A-

133, Audits of States, Local Governments, and Non-Profit Organizations. If non-compliance is determined, the SHMO will ensure that appropriate corrective action is taken within six (6) months of audit completion.

8. DEVELOPMENT AND MAINTENANCE

7.20. This plan will be reviewed annually. Amendments will be made to meet current policy guidelines, as required. Revisions will be forwarded to the Regional Director of the Federal Emergency Management Agency.

8. APPENDICES

8.1. Staffing Plan

8.2. HMGP Application-PROJECT

8.3. HMGP Application-PLANNING

8.4. Subgrantee's handbook

Prepared By

Division of Homeland Security & Emergency Management

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