

United States Drought Monitor Forum

South Florida Water Management District (SFWMD)

Grenada Drought Monitoring Activities



Presented By: Trevor Thompson

Ministry of Agriculture, Lands, Forestry, Fisheries & the Environment

April 16-18, 2013

Miami, Florida.

GRENADA

Location : 12⁰ N.L & 61⁰ W.L.

Area: 344 sq.km

Population : 100,000

Annual Rainfall: 1,500 - 4000 mm

Capital City: Saint George's

Climate : Tropical

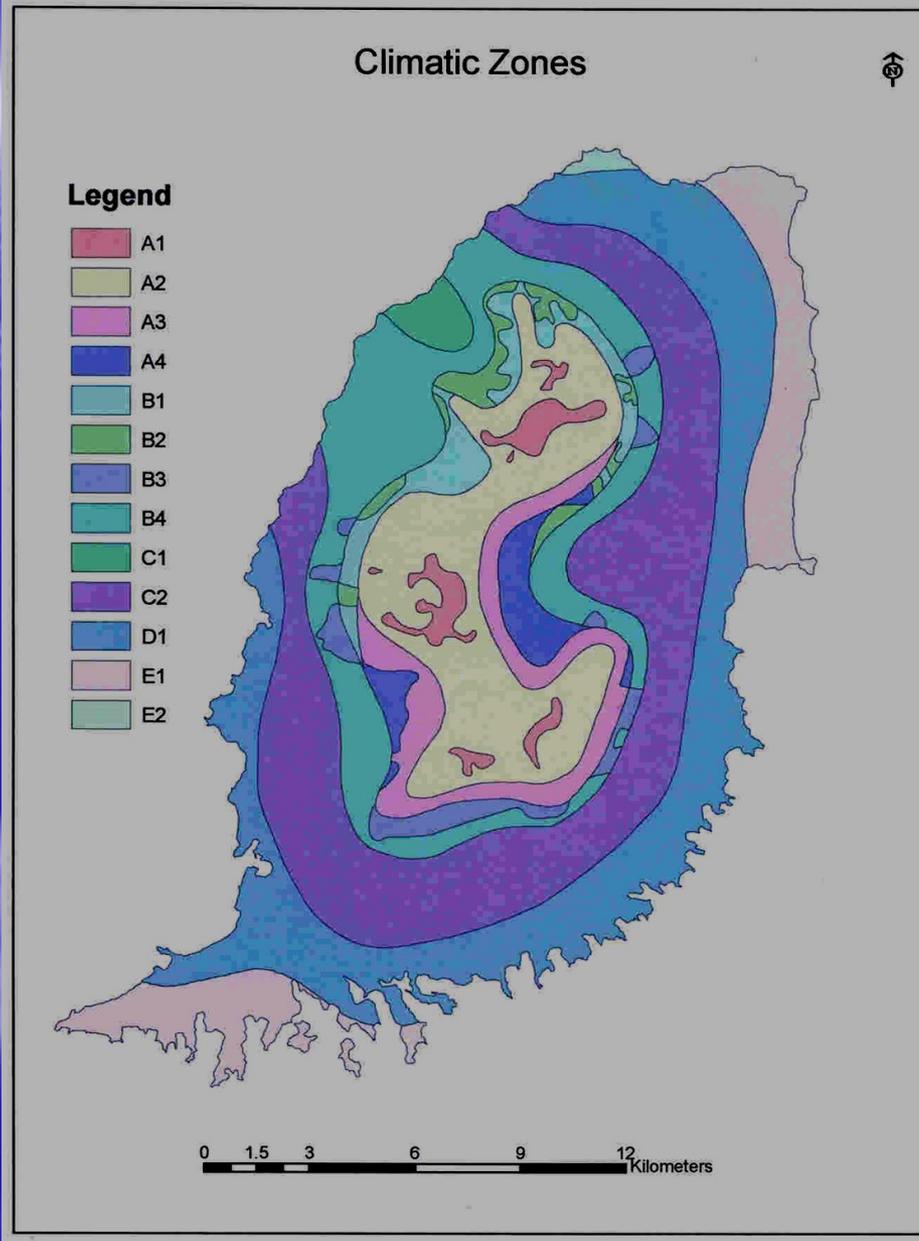
Language : English (Official)

Main Income Earner : Tourism

Soil content : Clay loams (84.5%), Clays (11.6%), Sandy loams (2.9%)

Seasons : Rainy (June - December), Dry (January-May)

CLIMATIC ZONES

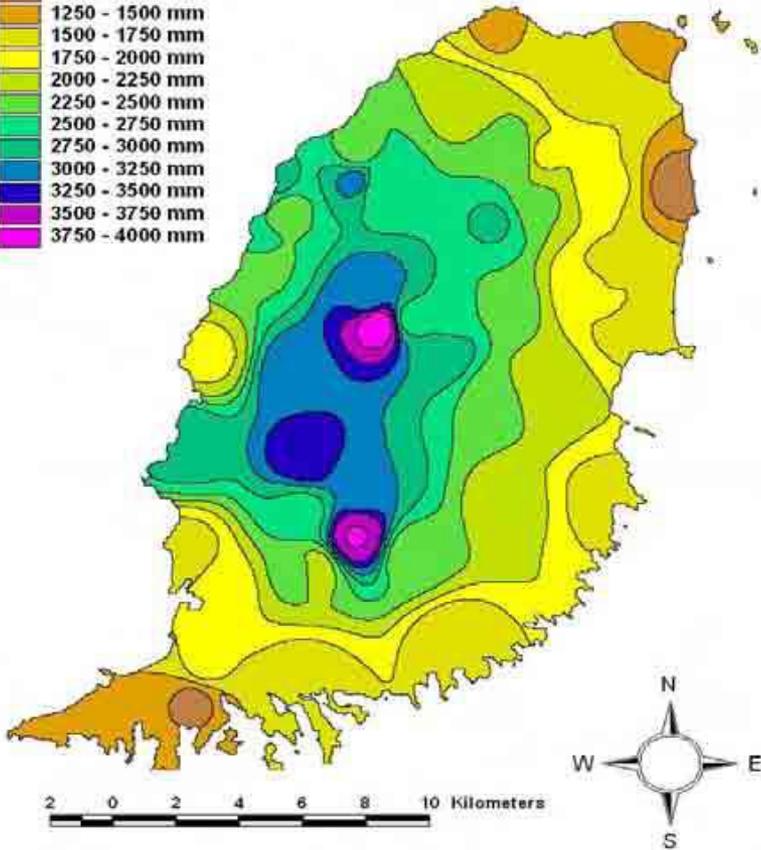


**Mean Annual Temperature.
20 - 27.5 Degrees.**

**Mean Number of Relative Dry
Months Ranges From 0 - 5/6**

ANNUAL RAINFALL

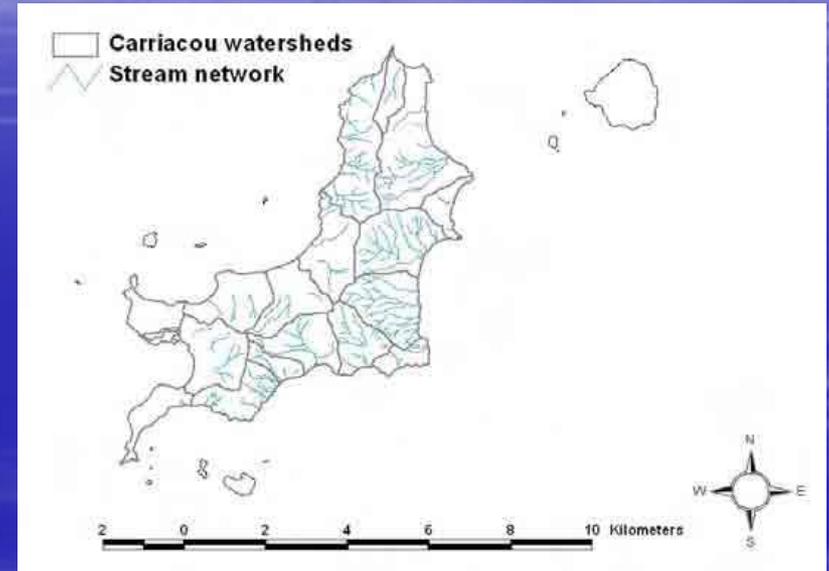
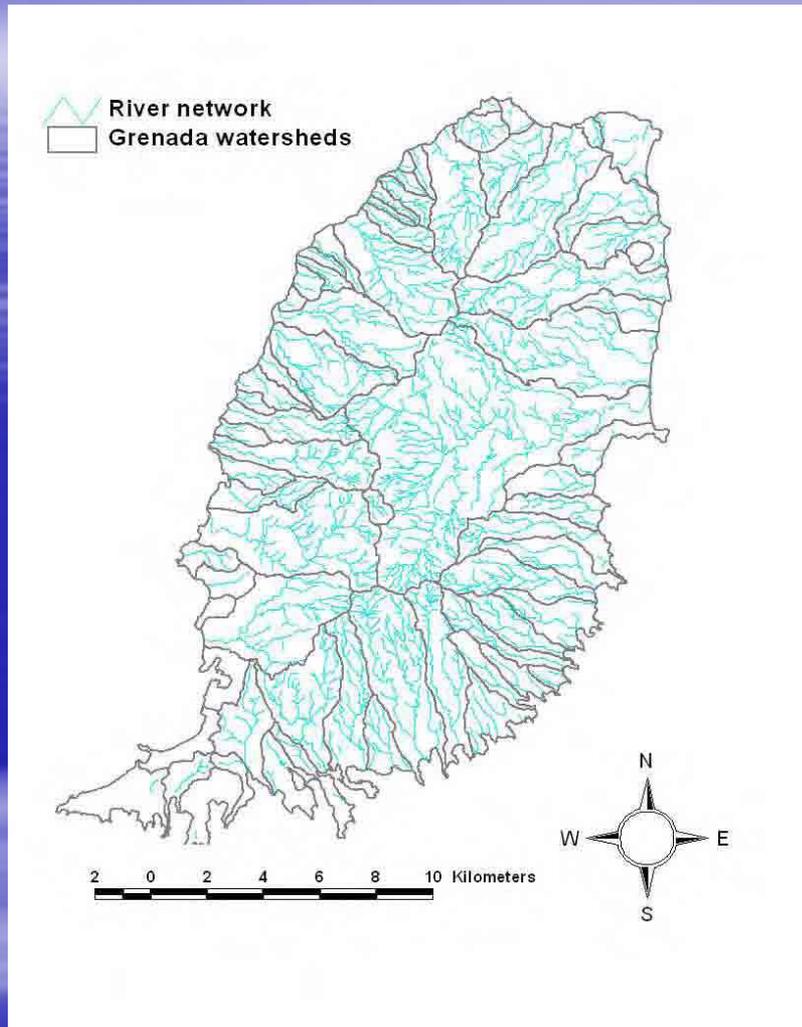
Total mean annual rainfall



The average annual rainfall for Grenada ranges between:

- 1,000 mm and 1,500 mm along the coastal zone,
- To **>4,000 mm** in the interior, and supports surface stream flow and recharge of sub-surface aquifers.
- The interior mountain ranges results in a marked spatial distribution in rainfall across the island which gives rise to the arid conditions experienced in the northern and southern extremes of the island

Watershed Management Units on Mainland Grenada and Carriacou: (Source: Land Use Division, Ministry of Agriculture)



Grenada has 71 Watersheds, Carriacou has 20 Watersheds, Petit Martinique has 1. On Grenada the watersheds are characterized by a relatively dense network of permanent rivers, while the sister islands are dominated by intermittent streams.



- **GRENADA**
GENERALLY DOES NOT HAVE A LARGE WATER STORAGE CAPACITY BECAUSE OF ITS STEEP SLOPES & SHORT DISTANCE FROM MOUNTAIN TO COAST. LESS THAN 6 MILES IN MOST CASES

Grenada's experiences with Drought

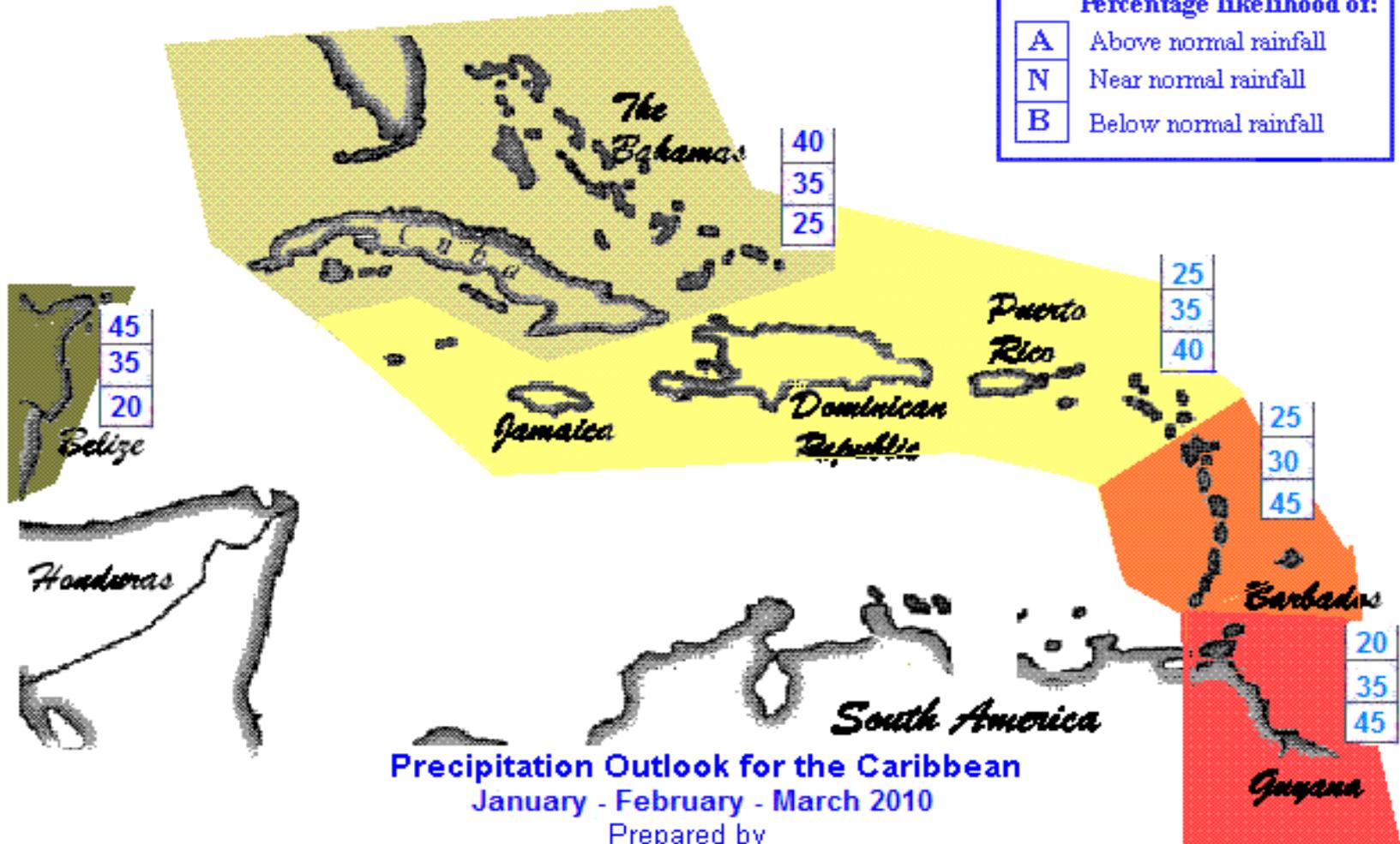
- El Niño-related 2009/2010 Drought, which impacted -Water resources , Agriculture, Economy.
- The National Emergency Action Committee (NEAC) coordinated a meeting (chaired by the Prime Minister) on February 19th 2010.
- Task force comprising National Stakeholders was set up and chaired by NaDMA to coordinate a National response to the drought.
- The need for a Drought Mitigation and Response Plan was identified.

2009/10 DROUGHT CONDITIONS

- Significantly below average monthly rainfall totals in the first quarter of 2009
- Increasing rainfall deficits.
- For the periods (i) March – September 2009 recorded rainfall was 50 percent of normal;
- (ii) October, 2009 – January 2010 recorded rainfall ranged between 37 – 19 percent of normal;
- (iii) February 2010 rainfall was 0.03 percent of normal.
- Several rainfall stations recorded their lowest monthly total ever recorded
- February 2010, monthly rainfall recorded was 0.22 mm which is significantly below the annual mean and 3 percent of the value recorded in February 2009.
- March, April, May generally represents the driest months

PRECIPITATION OUTLOOK - CARIBBEAN

Key	
Percentage likelihood of:	
A	Above normal rainfall
N	Near normal rainfall
B	Below normal rainfall



Precipitation Outlook for the Caribbean
 January - February - March 2010

Prepared by

The Caribbean Institute for Meteorology and Hydrology

DECREASED RIVER FLOWS

BEAUSEJOUR RIVER



LA MODE RIVER



BALTHAZAR RIVER

BUSH FIRES



NAWASA Response

- **Enforcement of Water Services Regulations**
- **Valve Regulation**
- **Truck Delivery**
- **Installation of Public Water Tanks in badly affected dense communities**
- **Increased Personnel to respond to reported leaks**
- **Treatment Plant Regulation**
- **Increased Public Relations**

MINISTRY OF AGRICULTURE RESPONSE

- Participate in the National Emergency Action Committee (NEAC) meetings
- Developed a Disaster Policy and setup the Agricultural Disaster Management Committee
- Develop TOR for Drought Monitoring Network Committee and Sub Committees
- Increase assistance to farmers without Irrigation.
- Adopting a No Burn Policy.
- Public Awareness
- Encouraging irrigation scheduling where more than one farmer is using the same stream, pond etc;
- Promoting Irrigation Efficiency through, scaling back on the use of overhead sprinklers, less efficient pumps, and encouraging system checks for leaks, etc.

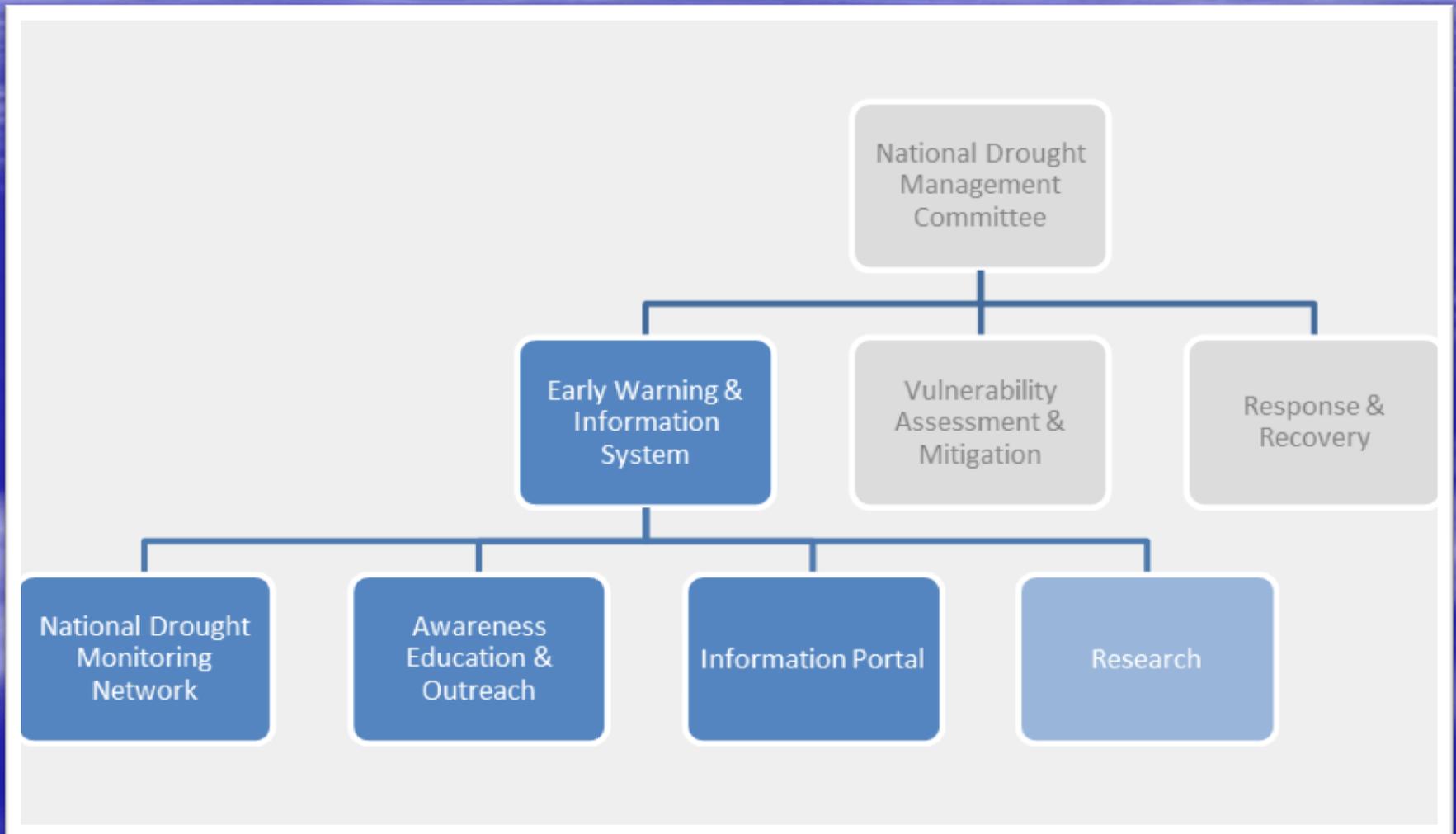
GRENADA'S RESPONSE

- Participated in The Caribbean Drought & Precipitation Monitoring Network (CDPMN)
- Participated in The Caribbean Water Initiative (CARIWIN) project
- Grenada was selected as a Pilot country under the CARICOM/Brazil Cooperation Project.
- Participated in CIMH, National Drought Mitigation Centre of the USA, Training Workshop in “Drought Monitoring and Planning” Kingston, Jamaica 2012
- Training provided for staff from the Ministry of Agriculture, NaDMA, Meteorological Service, and NAWASA .

DROUGHT TOR DEVELOPMENT

- 1 day Writeshop to develop a framework for risk-based management of drought in Grenada Feb 2013
- Decision on the structure illustrated in the figure below.
- Action the recommendation for the establishment of a National Drought Management Committee (NDMC) that would have an overall management role of the system.
- This is expected to be a High Level Committee of Ministers and/or Permanent Secretaries or their selected representatives, along with the Director of the National Disaster Management Authority (NaDMA), Met Services, Fire Dept.

Proposed Organizational Structure



Drought Early Warning and Information Systems (DEWIS) Committee – Coordinating and Policy role)

The Committee comprise of the following institutions:

- **Ministry of Agriculture (Lead Agency); Meteorological Services; National Water and Sewerage Authority; NaDMA; Farmers' representatives, Fire Department of the Royal Grenada Police Force), Media Representative, Government Information Systems, Grenada Chamber of Commerce**

The overall goal of this Committee is to contribute to efforts to mitigate the effects of droughts in Grenada through provision of early warning, and public education and awareness information

The Committee has a:

1. The scope of works :collection, analysis and dissemination of hydrological and meteorological and other forms of public information related to drought, and the coordination of necessary action.

2. Terms of Reference for committee:

- Monitoring, forecasting , development and dissemination of information on drought
- Development and implementation of a Grenada Drought Plan.
- Review and update existing drought legislation
- Ensure harmonization to develop a Drought Act.
- Capacity Building in relevant institutions
- Public Education and Awareness information

3. Reporting Requirements –This Committee should report to the NDMC.

SUB-COMMITTEES

Drought Monitoring Network: This Working Group would consist of: NAWASA, Ministry of Agriculture, (IICA), Farmers Groups, Meteorological Service, NaDMA, Inter Agency Group of Development Organisations (IAGDO), Min.Of Environment.

Awareness, Education and Outreach Working Group (AEO)

The AEOC Committee should consist of: NaDMA MBIA Meteorological Service, NAWASA, Ministry of Agriculture, Farmers' Rep. Media (MWAG), Government Information System (GIS), Ministry of Education; Chief Education Officer, Friends of the Earth Grenada (FOEG)

Web Information Portal Working Group

The Working Group should consist of: Meteorological Service, Ministry of Agriculture, NaDMA, NAWASA, Ministry of Agriculture – NWIS, NAWASA- GIS, NaDMA - GPRS

Research: Need to establish a Research Working Group or Committee after DEWIS established. Mainly working groups and research institutions such as UWI and St. George's University are sought and established.

Each Committee has an:

Objective, Scope of Works , Terms of Reference

SUBCOMMITTEES

- Subcommittees directly responsible for Key Elements will report to the NDMC.
- Each of these elements must be supported by Funding, Research, and Capacity Building, and Collaboration of Multiple Stakeholders in a coordinated approach mechanism.
- The focus: To establish the first two key elements – **Early Warning and Information.**
- The recommendation is to establish a Subcommittee and its Working groups/Networks on Drought Early Warning and Information Systems.

Links to Regional Initiatives

Caribbean Drought and Precipitation Monitoring Network (CDPMN)

Centralized information base makes it easier for the CDPMN to monitor holistically the occurrences of Drought in particular across the Region

Caribbean Agrometeorological Initiative (CAMI)

Provision of meaningful information to the farming and wider agricultural communities on water loss, irrigation, Pest and disease, predictability, crop weather modeling



IP ADDRESS www.cariwin.gd

Grenada - Water Information System - Windows Internet Explorer

http://www.cariwin.gd/webmap/app/db/index.php

File Edit View Favorites Tools Help

Google www.cari Search Sidewiki Check Translate AutoFill www cariwin gd Sign In

WEB SEARCH

Grenada - Water Information System Home Feeds (J) Read Mail Print Page Safety Tools Help

Grenada Water Information System



The Ministry Of Agriculture, Fisheries and Forestry



CARIWIN is a project on Integrated Water Resources Management (IWRM) in the Caribbean, led by the Brace Centre for Water Resources Management at McGill University and the Caribbean Institute for Meteorology and Hydrology (CIMH), Barbados.

Grenada Water Information System (WIS) uses up-to-date Web technologies to provide reliable and easy access to water related data. The core component of the Grenada WIS is the WebMap Application, facilitating data retrieval through an user-friendly interface.

Database: Grenada
Predefined View: My Last View
Raster Images: Soils
Point Objects: Show All

Username:
Password:

Sign In

Contact [Kenton Fletcher:Kenflet@hotmail.com](mailto:Kenflet@hotmail.com) or [Trevor Thompson:trevort_lud@yahoo.com](mailto:TrevorThompson:trevort_lud@yahoo.com) to obtain Username and Password.

start Microsoft PowerPoint ... Inbox (50) - Yahoo! ... Grenada - Water Info... Internet 100% 9:02 AM

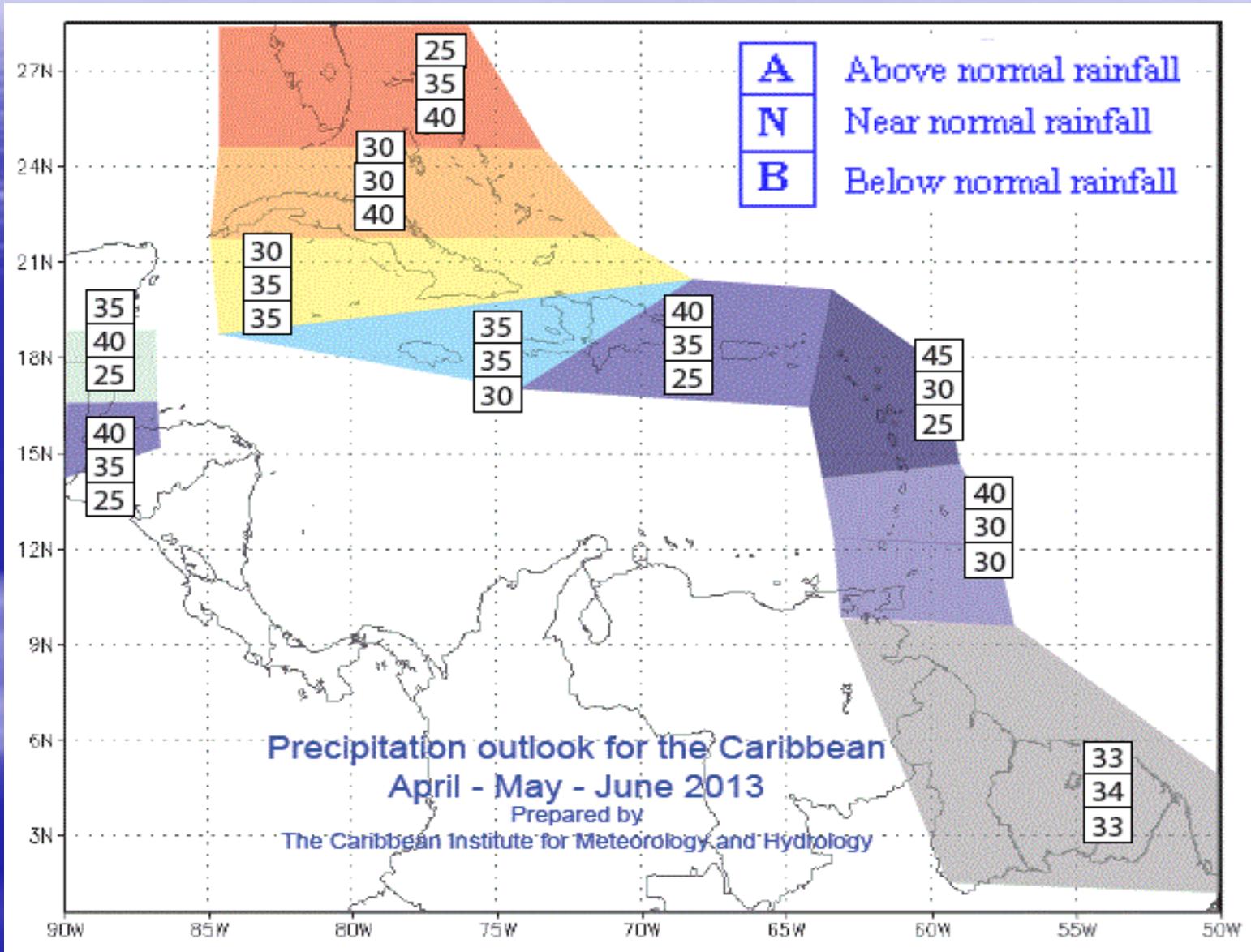
2013 DROUGHT IMPACTS



ANNANDALE DAM



CARIBBEAN PRECIPITATION OUTLOOK

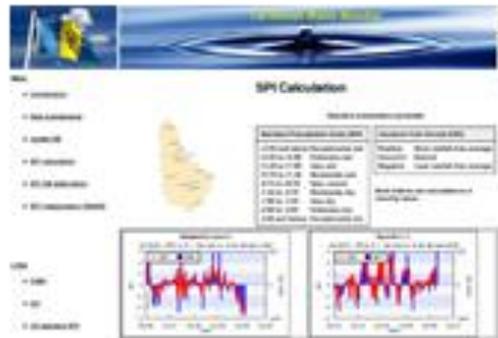


DATA COLLECTION EXPANSION



SPI FOR GRENADA

Caribbean Water Monitor



Tool created calculates SPI and Deviation from Normal for any station and time period in its data base. These are automatically graphed.

SPI is also mapped using the open access GIS software Grass. Some tweaking of the software still to be done.



FUTURE PLANS

- Cabinet approval for **The National Drought Early Warning and Information Systems Implementation Plan**
- Activation of the Committee and Sub-Committees
- Setup of a National Water Resources Management Unit.
- Enforce Rainwater Harvesting
- Develop Land Use Policy to enshrine IWRM in Development Plans
- Legal and Regulatory Framework completion
- Increase Data collection, Analysis and Dissemination

THANK
YOU