



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

MISSOURI RIVER BASIN

DROUGHT EARLY WARNING SYSTEM

THE KICKOFF MEETING, FEB. 26-27 2014; NEBRASKA CITY, NEBRASKA

Teaming up for drought planning, preparedness, early warning systems

People from more than 70 federal, state, tribal, academic, regional and national institutions met in Nebraska City, Nebraska, in February 2014 to discuss the current state of drought awareness, planning and capacity across the Missouri River Basin.

The meeting was the first of a multi-year engagement process in the basin to better understand existing resources, vulnerabilities, impacts and priorities. The goal is to create a Drought Early Warning System (DEWS).

Regional DEWS (RDEWS), developed by the National Integrated Drought Information System (NIDIS), explore and demonstrate a variety of early warning and drought risk reduction strategies. They

incorporate drought monitoring and prediction information in partnership with federal, state, tribal and local agencies, organizations and other users. Located throughout the contiguous U.S., RDEWS help regions plan for and establish best practices in drought-stressed times, and transfer this information to under-served regions of the country.

Key sponsors of the Nebraska meeting were NIDIS, the National Drought Mitigation Center (NDMC), Western Governors Association (WGA), U.S. Department of Agriculture (USDA), North Central Climate Science Center (NCCSC), South Dakota State University (SDSU) and the National Oceanic and Atmospheric Administration (NOAA).

ABOVE

The Missouri River near Yankton, South Dakota. Lewis and Clark Lake can be seen in the distance. NATIONAL PARK SERVICE PHOTO

FOR MORE INFORMATION

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Vast, productive basin is vulnerable to drought and flood

The Missouri River Basin is known for intense weather and extreme climate variability, such as the stark differences between record high flows and flooding in 2011, followed by record low flows and drought in 2012. Drought is a normal part of climate throughout the Basin, causing devastating impacts during the 1930s Dust Bowl, the 1950s, 1988-89, 2000-2006, and 2012-13.

While the effects of flooding tend to be concentrated along waterways, the effects of drought spread across the landscape. Drought has direct impacts on agriculture, water supply, water quality, wildlife habitat, wildfire, landscapes, and air quality.

It has physical, economic and social effects on the well-being of people, families and communities. Widespread drought disrupts farming and livestock production, which can, in combination with market processes, increase food prices.

Many aspects of human activity affect vulnerability to flood and drought, including land and water use patterns, population shifts and agricultural practices. Warming climate adds urgency to the need to address drought in the basin, because heat contributes to drought. More frequent extreme weather such as the heavy precipitation that led to flooding in 2011 also threatens the region's productivity.

ABOVE LEFT

Brown areas on the map show below average plant growth during the drought in June and July of 2012. NASA GRAPHIC

ABOVE RIGHT

North Dakota Air National Guards place sandbags alongside a home by the Missouri River in Bismarck, N.D., during the flood of 2011. DEPT. OF DEFENSE



Stakeholders at the meeting requested:

- Networks for regional drought monitoring and planning.
- Better understanding of drought as a hazard, societal vulnerability, and coping strategies.
- Education and outreach to citizens, agencies and organizations in the basin.

Gaps that came up included the need to:

- Create or revisit state drought plans.
- Develop early warning information and delivery systems based on the historical pattern of floods followed by droughts, such as the 2011 flood and 2012 drought.
- Communicate information about drought severity and impacts to states, tribes, and various sectors to increase awareness of the hazard.
- Communicate about related water use issues.
- Consolidate tools and information about drought.
- Capitalize on the strong, pre-existing foundation of connectedness in the basin while developing NIDIS as a key coordinator of drought information.
- Improve vulnerability analysis.

- Identify trigger or tipping points.
- Improve monitoring of soil moisture, stream flow and snow pack.
- Research and communicate ground water vulnerability.
- Offer education and outreach through trusted entities.

Next steps

NIDIS and its partners are in the process of identifying activities for building and enhancing a drought early warning information system in the Missouri River Basin. Next steps will include:

- Improving understanding of impacts and vulnerability to drought.
- Partnering with states and tribes to create new or improved drought plans.
- Continuing to support and assess ways to enhance the Midwest and Great Plains Drought and Flood Update Webinar series.
- Assessing approaches for improved forecasts and long-term monitoring.
- Initiating a series of regional or sub-basin meetings to understand impacts and ways to inform drought risk management.

ABOVE

Cow Creek flows into the Missouri River in Montana. The steamboats dropped freight at Cow Island Landing, in the area where trees stand now, during the steamboat era of 1860 to mid 1880s. On September 23, 1877 the Nez Perce crossed the Missouri here in their flight to Canada.

MONTANA GEOGRAPHIC SOCIETY VIA WIKIMEDIA COMMONS



Participants at the workshop

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| American Planning Association | Administration (NOAA) |
| Army Corps - Missouri River Water Management | National Park Service |
| Bureau of Indian Affairs | Natural Resources Conservation Service - National Soil Survey Center |
| Bureau of Land Management | National Weather Service |
| Bureau of Reclamation | Nebraska Department of Agriculture |
| Center for Research on the Changing Earth System | Nebraska Department of Health & Human Services |
| Colorado Climate Center, Colorado State University | North Central Climate Science Center, Colorado State University |
| Colorado Water Conservation Board | North Dakota State Water Commission |
| East Dakota Water Development District | Northern Arapaho Tribe |
| Eastern Tallgrass Prairie & Big Rivers LCC | Omaha World-Herald |
| Environmental Protection Agency, Region 7 | Santee Sioux Nation of Nebraska |
| Federal Emergency Management Agency | South Dakota School of Mines and Technology |
| High Plains Regional Climate Center | South Dakota State University Extension |
| InterTribal Buffalo Council | South Dakota State University/South Dakota State Climate Office |
| Intertribal Council On Utility Policy (COUP) | U.S. Department of Agriculture - Agricultural Research Service |
| Iowa Dept. of Agriculture & Land Stewardship | U.S. Geological Survey - Earth Resources Observation and Science Center |
| Kansas State University | U.S. Geological Survey - Nebraska Water Science Center |
| Kansas Water Office | U.S. Geological Survey - North Central Climate Science Center |
| Local public | U.S. Geological Survey - South Dakota Water Science Center |
| Mid-America Regional Council | University of Colorado, Boulder |
| Missouri Department of Natural Resources | University of Nebraska Medical Center |
| Missouri River Association of States and Tribes | University of Nebraska Public Policy Center |
| Montana Department of Natural Resources and Conservation | University of Nebraska Public Policy Center |
| National Drought Mitigation Center | Western Governors' Association |
| National Integrated Drought Information System (NIDIS) | Wyoming State Engineer's Office |
| National Oceanic and Atmospheric | |