Building Drought Early Warning Capacity
Bozeman, MT: Training for Resilience
March 17-18, 2015

Chad McNutt, Roger Pulwarty, Veva Deheza, Kathleen Bogan, Alicia Marrs, Claudia Nierenberg, and Robert Webb
NOAA, National Integrated Drought Information System (NIDIS)
Agenda

• What is the National Integrated Drought Information System (NIDIS)

• Early Warning Framework
  – Drought assessments
  – Climate outlook forums
  – Education and outreach webinars
  – Engaging the preparedness community

• Missouri River Basin Pilot
NIDIS: Creating a drought early warning information system

• Public Law 109-430 (The NIDIS Act 2006)
  – “Enable the Nation to move from a reactive to a more proactive approach to managing drought risks and impacts”
  – “better informed and more timely drought-related decisions leading to reduced impacts and costs”
Drought Early Warning?

- Early warning: provision of timely and effective information, through identified institutions, that allows individuals exposed to a hazard to take action to avoid or reduce their risk and prepare for effective response-

  *International Strategy for Disaster Reduction*

  - Allows timely and appropriate responses to droughts and famine in the form of food aid and other mitigation strategies

  - Involves forecasts and the area’s drought history, possible outcomes of developing drought events, and answering questions about how long a drought might last and how severe it might be.

  - Effective early warning systems should involve both technology and all interested parties in drought planning and response.
NIDIS/Early Warning Framework

- Drought assessments
- Climate outlook forums
- Education and outreach webinars
- Engaging the preparedness community
Where is the drought? Will it change? What are its impacts?

U.S. Drought Monitor

March 10, 2015
(Released Thursday, Mar. 12, 2015)

Click a topic for more information:

- U.S. Drought Monitor
- U.S. Seasonal Drought Outlook
- Drought Impacts Report
- Wildfire Risks
- Summary of Drought this week
- NIDIS in Your Region

Drought in your backyard
How is drought affecting you? Enter your zip code for current conditions:

Zip Code (5 digit): [ ]

February national drought outlook features snowpack conditions in the West

The 2-page update shows how drought conditions have changed over the past year, the outlooks for drought, temperature, precipitation and wildfire through May, and how snowpack in the Northwest was far below the median despite near-normal precipitation since Oct. 1.

Download the pdf

Webinar series features Western experts on water and drought management

Inspired by its Drought Forum initiative, the Western Governors’ Association is presenting a five-webinar series examining the challenges of drought management. Topics include re-used, produced and brackish water; reducing municipal water consumption; the role of data in understanding and predicting dry conditions; managing forests for water resource needs; and how local approaches to
Approach

• Working with communities and existing networks through:
  
  – **Drought assessment/monitoring groups**
  – Climate outlook forums
  – Education and outreach webinars
  – Engaging the preparedness community
Drought Assessment Groups

States
- Arizona
- Hawaii
- Texas
- New Mexico
- Alabama
- Colorado
- North Carolina
- Florida

River Basins
- South Dakota
- Oklahoma
- Upper Colorado
- Apalachicola
- Chattahoochee-Flint

Tribes
- Navajo Nation
Colorado Drought Status Briefing

Above is the most recent release of the U.S. Drought Monitor map for the UCRB region. Below shows the proposed changes for this week, with supporting text.

Summary: February 25, 2014
Approach

• Working with communities and existing networks of people through:
  – Drought assessments
  – **Climate outlook forums**
  – Education and outreach webinars
  – Engaging the preparedness community
Seasonal Climate Outlook Forum

**ENSO Status**

[Graph showing the multivariate ENSO index with standardized departure values from 1950 to 2010.]

**Effects of ENSO**

[Maps showing composite standardized temperature and precipitation anomalies for the period 1971-2000 and 2007-2008 compared to the long-term average.]

**Impacts & Vulnerability**

[Images and data related to impacts and vulnerability.]
Southern Plains Drought

January 2011

April 2011

July 2011

October 2011

January 2012

April 2012

July 2012

October 2012

January 2013

April 2013

July 2013

October 2013

Austin, TX
July 2011

Fort Worth, TX
November 2011

Lubbock, TX
April 2012

Santa Fe, NM
June, 2012

Abilene, TX
November, 2012

Guymon, OK
March 2013

Colby, KS
July 2013
Abilene, TX

- What are current conditions?
- What can we say about the drought continuing into 2013?
- What can we say about long-term trends?
- What are information needs going forward?
Approach

• Working with communities and existing networks of people through:
  – Drought assessments
  – Climate outlook forums
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  – Engaging the preparedness community
Webinar Topics

- La Niña
- Flash Drought
- Water Resources
- Cattle Industry Response
- Seasonal Forecasts
- Wildfire
- U.S. Drought Monitor
- Wildlife

Webinars are posted on YouTube

Some webinars were geared to the press, others to stakeholders in general.
West sees record low temps, persistent drought, according to 'Outlook' from WGA and NOAA

FOR IMMEDIATE RELEASE
June 27, 2013

Last year's drought covered two-thirds of the U.S. at its height, but has since receded from the East and remained severe across much of the West, according to the most recent Quarterly Climate Impacts and Outlook.

The publication also shows that the spring of 2013 set records for low temperatures in many states represented by the Western Governors' Association, including Alaska, Hawaii and the Dakotas.

The Outlook features a synopsis of drought conditions over the past three months as well as a glimpse of potential conditions through September. Though drought is receding in much of the Central Plains, it is likely to persist across much of the Central West and the coastal states. Additional information, such as reservoir levels, areas of above-average wildfire potential, is also included in the Outlook.
Tri-County Risk Management

Workshop: Tuesday, February 4, 2014

Create a risk management plan for your own operation.

This workshop will focus on opportunities and challenges of weather and climate-related risk management.

- Cody Knutson, UNL National Drought Mitigation Center: Why you need a written drought plan, and how to do it
- Laura Edwards, SDSU Extension Climate Field Specialist: Weather and climate monitoring
- Pete Bauman, SDSU Extension Range Field Specialist: Measuring grassland productivity
- Dr. Matt Diens, SDSU Risk/Business Management Specialist: Using Pasture, Rangeland, Forage - Rainfall Index Insurance & Market outlook
- NRCS: SD Drought Tool and efficiency of soil infiltration, and NUTBAL program
- Roger Gates & Dave Oillia, SDSU Extension Range Specialist and Sheep Field Specialist: Best management practices for range

Location: SDSU Extension Center, Winner

Time: 9 am – 3 pm

No pre-registration required, but encouraged. Contact Bob below. Lunch will be provided.

For more information:
Bob Fanning, SDSU Extension in Winner, 842-1287
or Steve Higgins, NRCS in Winner, 842-0603
or Shane Reis, NRCS in Kennebec, 869-2216
or Brandon Walter, NRCS in Burke, 487-7501 x.3

Sponsored by:

- North Central Risk Management Education Center
- NIDIS
- USDA
- Farm Credit Services of America

Local Sponsors:
Hamill Conservation District, Clearfield-Keyapaha Conservation District, Gregory County Conservation District, American Creek Conservation District, SDSU Extension Service, Natural Resources Conservation Service, First Fidelity Bank, Bankwest of Gregory, Winner & Kennebec, and Statewide Ag Insurance

This program is based upon work supported by USDA-NSF under Award Number 2013-46001-23032, with support from National Integrated Drought Information System and Farm Credit Services of America. South Dakota State University, South Dakota counties, and USDA cooperating. South Dakota State University adheres to AA/EEO guidelines in offering educational programs and services.
Approach

• Working with communities and existing networks of people through:
  
  – Drought assessments
  – Climate outlook forums
  – Education and outreach webinars
  – **Engaging the preparedness community**
Engaging the Preparedness Community

- Drought planning: American Planning Association-Public Advisory Service
- Webinars
- Developing drought coordinator network
NIDIS Pilots Areas

National Integrated Drought Information System (NIDIS)
Regions in the US where NIDIS is currently developing drought early warning information systems

- California Pilot DEWS
- Upper Colorado River Basin DEWS and Four Corners Pilot DEWS
- Missouri Basin Pilot DEWS in development
- Southern Plains Pilot DEWS
- Chesapeake Bay Watershed Pilot DEWS in development
- Carolinas Coastal Ecosystems Pilot DEWS
- Apalachicola-Chattahoochee-Flint River Basin Pilot DEWS

NIDIS is working toward a fully national drought information system through national, tribal and state partnerships. NIDIS-supported research and monitoring is conducted across the nation. For monitoring, forecasting, data products, research activities and information on NIDIS webinars and meetings, visit the drought portal - www.drought.gov
Midwest and Great Plains Webinars

The High Plains Regional Climate Center is archiving drought update webinars to keep you up to speed with the latest information. We hope that you find this information to be useful.

February 19, 2015 Update
2015-02-19 Central US Climate Outlook
Climate Outlook
February 19, 2015

January 15, 2015 Update
2015-01-15 Monthly Central US Climate Outlook

December 18, 2014 Update
2014-12-18 Climate Webinar
Climate Network Updates

November 20, 2014 Update
2014-11-20 Monthly Climate and Drought Webinar
Forecast

Download presentation in PDF format
Assessments

Seasonal precipitation forecasts over the Missouri River Basin

An assessment of operational and experimental forecast system skill and reliability

In 2011, the Missouri River Basin experienced devastating flooding, which caused significant property loss and disrupted thousands of lives. In 2011, the basin experienced extreme drought that impacted water supplies and downstream navigation. Historically, the climate of this region shows a general tendency for both very wet and very dry months in a given year. The ability to accurately predict seasonal flood and drought conditions between one and six months in advance was recognized to be extremely beneficial to water managers, emergency personnel, as well as the general public for planning purposes.

At the request of the Missouri River Basin Water Management office and the U.S. Army Corps of Engineers, NOAA’s Earth System Research Laboratory and the University of Colorado Cooperative Institute for Research in Environmental Sciences (CIRES) performed an assessment study to determine the skill and reliability of current state of the art operational and experimental seasonal forecast systems in predicting the atmospheric conditions that led to the 2011 flood or the 2012 drought.

For the study, NOAA’s operational and experimental modeling systems were analyzed for December 2010 precipitation forecasts for the winter (January - February - March) and spring (April - May) of 2011. Likewise, December 2011 precipitation forecasts for 2012 winter and spring were analyzed. These retrospective forecasts were compared to actual observations for just the Upper Missouri River Basin, for just the Lower Missouri River Basin, and for the entire Missouri River Basin.

The effects of El Nino and La Nina, together known as ENSO, on seasonal precipitation in the Missouri River Basin have been complex and have varied widely from event to event. More recently, however, ENSO has been shown to influence seasonal precipitation in the basin through the sea breeze response, which has been a dominant feature in the seasonal forecast models.

Major Findings

Monthly and seasonal precipitation in the Upper Basin, in the Lower Basin, and entire Missouri River Basin is highly variable with standard deviations averaging close to 30 percent of the long-term average.
Assessments

From Too Much to Too Little:
How the central U.S. drought of 2012 evolved out of one of the most devastating floods on record in 2011
MRB Priorities
Drought impacts and vulnerability to drought

Partner with states and tribes for drought planning

Support/enhance Midwest and Great Plains Drought and Flood Webinar Series

Assess approaches for improved forecasts and long-term monitoring

Conduct regional or sub-basin meetings: understand impacts and ways to inform drought risk management
Tribal Workshop

Explore opportunities to expand and strengthen monitoring capabilities throughout tribal lands

Investigate partnerships with tribal colleges to build capacity for climate and drought planning

Continue outreach to tribes through several mechanisms

Assess ways to expand funding potential with other federal agencies and programs
Outcomes

Assess tribally specific early warning systems for drought
- e.g. drought summaries

Drought and climate monitoring education

Leverage agencies for resources on planning and building resilience

Approaches to conduct vulnerability assessments of cultural and water resources
Drought early warning and risk management at the state level

- States
  - Kansas
  - South Dakota
  - Nebraska
  - Funding sources (e.g. FEMA/Bureau of Reclamation)
Monitoring/Forecast Improvements

- Upper Basin Soil Moisture & Snow Water Equivalent-WRRDA Bill

- National Soil Moisture Network

- NWS Low-flow forecasts
Summary

- NIDIS serving as coordination/collaboration mechanism for drought risk reduction discussion: planning, data and information needs, sharing information/best practices

- Leadership and early adopters important

- Monitoring and Early Warning Information starting point for the engagement of stakeholders for risk management.
Thanks

Experts say rainfall may lessen drought

By Julia Glick
The Associated Press