

Introduction to the National Integrated Drought Information System (NIDIS)

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Chad McNutt^{1,4}, Roger Pulwarty^{1,4}, Jim Verdin^{1,5}
and Robert Webb^{1,2}*

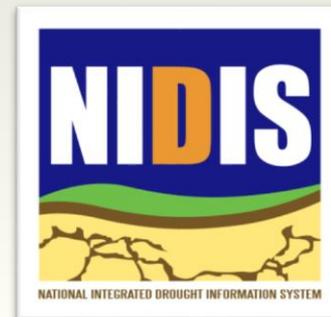
¹NOAA/NIDIS Program Office

²NOAA/ESRL/Physical Sciences Division

³Cooperative Institute for Research in Environmental Sciences

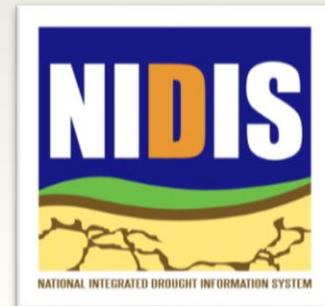
⁴NOAA/Climate Program Office

⁵USGS



National Integrated Drought Information System NIDIS

- What is NIDIS?
 - Drought Research
 - Drought Information
 - Drought Policy & Coordination
 - Drought Early Warning
 - NIDIS in 2013



NIDIS - Research

- NIDIS funds drought research through the NOAA/Climate Program Office
 - Coping with Drought
 - NOAA Modeling Analysis Predictions and Projections (MAPP)
 - NOAA Drought Task Force (DTF)

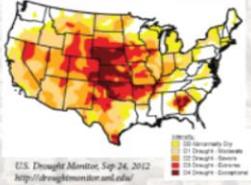
Attribution studies



An Interpretation of the Origins of the 2012 Central Great Plains Drought
An Assessment Report of the NOAA Drought Task Force Narrative Team

Historical Context - How do 2012 rainfall amounts and high temperatures compare to years past?

Precipitation deficits for the period May through August 2012 were the most severe since official records began in 1880.



U.S. Drought Monitor, Sep 24, 2012
<http://droughtmonitor.noaa.gov/>



Severity Index (PDSI) for August 2012 is compared to a 19 (left) and identifies the core region of the drought to be attributed to precipitation deficits occurring over the western Plains (consistent with the center for the drought is also affirmed by the May-August standardized departures from the 1981 to 2010 long-term average) of the dry region also experienced hot temperatures (right). This is typically seen during summertime droughts over the

Central Great Plains Drought?

It of 2012 resulted mostly from natural variations in weather. Increased in late spring as cyclone and frontal activity were

If when they did occur produced little rainfall. The change, factors that can provide long-lead predictability, the rainfall deficits over the major corn producing regions of



Helping communities plan for drought using climate outlook information

Reducing Drought Risks for Small- to Mid-Size Communities in the Southeast through Development of a Drought Index and Quantification of Its Value



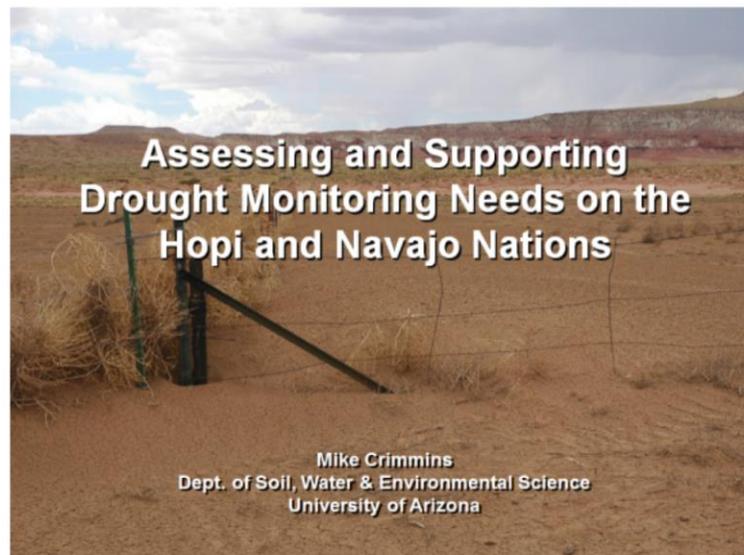
Puneet Srivastava

Professor of Ecological Engineering
Biosystems Engineering Department
Auburn University

Water Group Leader
Southeast Climate Consortium (SECC)

Source: The Texas Tribune

Assessing and Supporting Drought Monitoring Needs on the Hopi and Navajo Nations



Mike Crimmins
Dept. of Soil, Water & Environmental Science
University of Arizona

NIDIS - Information

- NIDIS, along with our partners, provides drought information tailored to stakeholder needs...
 - National drought outlooks (in-person meetings, 2-page outlooks)
 - Regional drought assessments and outlooks (in-person and webinars)
 - Sector-specific workshops
 - Engaging Preparedness Communities webinars

National Drought Outlook September 30, 2013

Current Drought Conditions and the Seasonal Drought Outlook

U.S. Drought Monitor (September 25, 2013)

U.S. Seasonal Drought Outlook (through February 28, 2014)

Temperature and Precipitation Outlooks and Vegetation Status

Western states are expected to experience above-normal temperatures, along with the few English cypresses, the North Slope of Alaska and the Alaskan Peninsula. "ET" indicates temperatures have equal chances of being below normal, normal or above normal.

Midwest, northern Idaho and western Washington State are anticipated to have above-normal precipitation. The rest of the country is anticipated to "ET" which means precipitation amounts have equal chances of being below normal, normal or above normal.

Agricultural drought impacts are typically few in the fall as the growing season comes to a close. Long-term climate continues to affect natural plants and vegetation in many areas of the U.S. For example, this map shows moderate to extreme drought conditions across large swaths of the western and southern U.S. The far northern Plains and many regions of the eastern U.S. are greater than average for this time of year.

USGS WaterWatch

Lake Lanier Inflows

Chattahoochee near Cornelia (02331600)

<http://waterwatch.usgs.gov>

Chestatee near Dahlonega (02333500)

Explanation - Percentile classes					
0-10	10-24	25-75	76-90	95	100
Very below normal	Below normal	Normal	Above normal	Very above normal	Extreme
Must be below normal	Below normal	Normal	Above normal	Must be above normal	Must be above normal

USGS WaterWatch

Managing Extreme and Extended Drought on the Farm and Ranch

January 9, 2014
8 a.m.-5 p.m.
4H Building
Garden City, Kansas

This one day workshop will feature information for ranchers and irrigated crop producers who are dealing with long-term choices associated with declining aquifer levels. Hear from experts in the field on planning for drought. The workshop is free and open to the public.

Morning

- Current Status of Drought in the High Plains
- Long-Lead Climate Outlook and the Role of La Niña in High Plains Drought
- Long Term Management of the Ogallala Aquifer
- Can You Plan for Drought?

Afternoon

Ranching Session

- Managing Risk on the Ranch
- Precipitation and Pasture Growth
- Long Term Effects of Drought and Planning for Recovery
- Producer Experiences Implementing the Drought Plan
- Adaptive Management for an Uncertain Climate

Irrigation Session

- Managing Limited Irrigation
- Irrigation Efficiencies
- Programs for Irrigators
- Financial Considerations
- Producer Experiences

Register by January 3 at:
<http://go.unl.edu/68tg> or 402-472-6776

Lunch will be provided for \$10. Please pay at the door.

For more information:
www.drought.unl.edu/ranchplan

Drought Impacts WEBINAR SERIES

Please join us for a free monthly webinar series exploring current research and applications on drought impacts. Understanding impacts helps planners, decision makers and resource managers reduce vulnerability to future drought.

The webinars, which continue Jan. 8, are on Wednesdays, at 1 p.m. Central time. Each includes:

- A focus on a specific effort to document drought impacts and the use of this information in decision-making
- Discussion of NIDIS' role in the emerging Impacts Community of Practice
- A chance to ask questions via chat
- Other interactive elements.

Presented by the Engaging Preparedness Communities working group of the National Integrated Drought Information System.

Please register for the webinar on Jan. 8:
<http://www.nidus.edu/68tg>

Jan 8: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/01/08/>

Jan 15: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/01/15/>

Jan 22: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/01/22/>

Jan 29: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/01/29/>

Feb 5: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/02/05/>

Feb 12: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/02/12/>

Feb 19: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/02/19/>

Feb 26: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/02/26/>

Mar 5: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/03/05/>

Mar 12: The Missing Piece and Field of Dreams
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Mar 26: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/03/26/>

Apr 2: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/04/02/>

Apr 9: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/04/09/>

Apr 16: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/04/16/>

Apr 23: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/04/23/>

Apr 30: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/04/30/>

May 7: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/05/07/>

May 14: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/05/14/>

May 21: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/05/21/>

May 28: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/05/28/>

Jun 4: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/06/04/>

Jun 11: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/06/11/>

Jun 18: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/06/18/>

Jun 25: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/06/25/>

Jul 2: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/07/02/>

Jul 9: The Missing Piece and Field of Dreams
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<http://www.nidus.edu/68tg/2013/07/23/>

Jul 30: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/07/30/>

Aug 6: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/08/06/>

Aug 13: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/08/13/>

Aug 20: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/08/20/>

Aug 27: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/08/27/>

Sep 3: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/09/03/>

Sep 10: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/09/10/>

Sep 17: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/09/17/>

Sep 24: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/09/24/>

Oct 1: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/10/01/>

Oct 8: The Missing Piece and Field of Dreams
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Dec 3: The Missing Piece and Field of Dreams
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Dec 17: The Missing Piece and Field of Dreams
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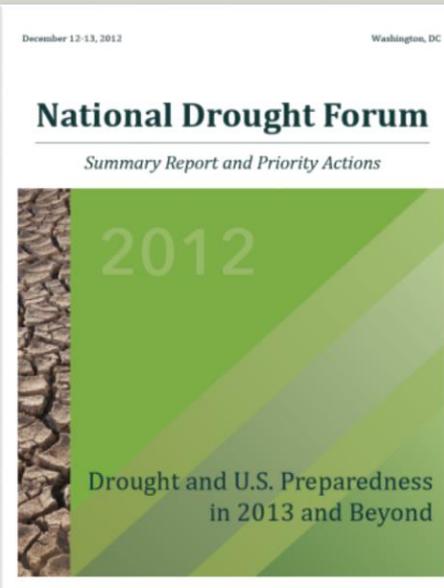
Dec 24: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/12/24/>

Dec 31: The Missing Piece and Field of Dreams
<http://www.nidus.edu/68tg/2013/12/31/>

Save the dates for more EPC webinars:
Feb 12 and March 12
1pm Central

NIDIS – Policy and Coordination

- National Drought Forum – Dec. 12 – 13, 2012
- National Drought Resilience Partnership – Announced Nov. 15, 2013
- National Soil Moisture Monitoring Workshop – Nov. 13 – 14, 2013



NEW DROUGHT RESILIENCE PARTNERSHIP

Nov 15, 2013 - As part of the President's Climate Action Plan, the Administration is launching a National Drought Resilience Partnership (the Partnership). The Partnership will make it easier for communities to access the drought assistance they need by promoting strong partnership and information sharing at all levels of government. It will also build on existing efforts to provide States, Tribes and local communities risk-informed decision making tools for drought preparedness planning. The Partnership aims to align Federal drought polices across the government and help communities manage the impact of drought by linking information (monitoring, forecasts, outlooks, and early warnings) with drought preparedness and long-term resilience strategies in critical sectors such as agriculture, municipal water systems, energy, recreation, tourism and transportation.

PRESS RELEASE **MORE INFORMATION**

CONTACT: Email Us 202-564-8086

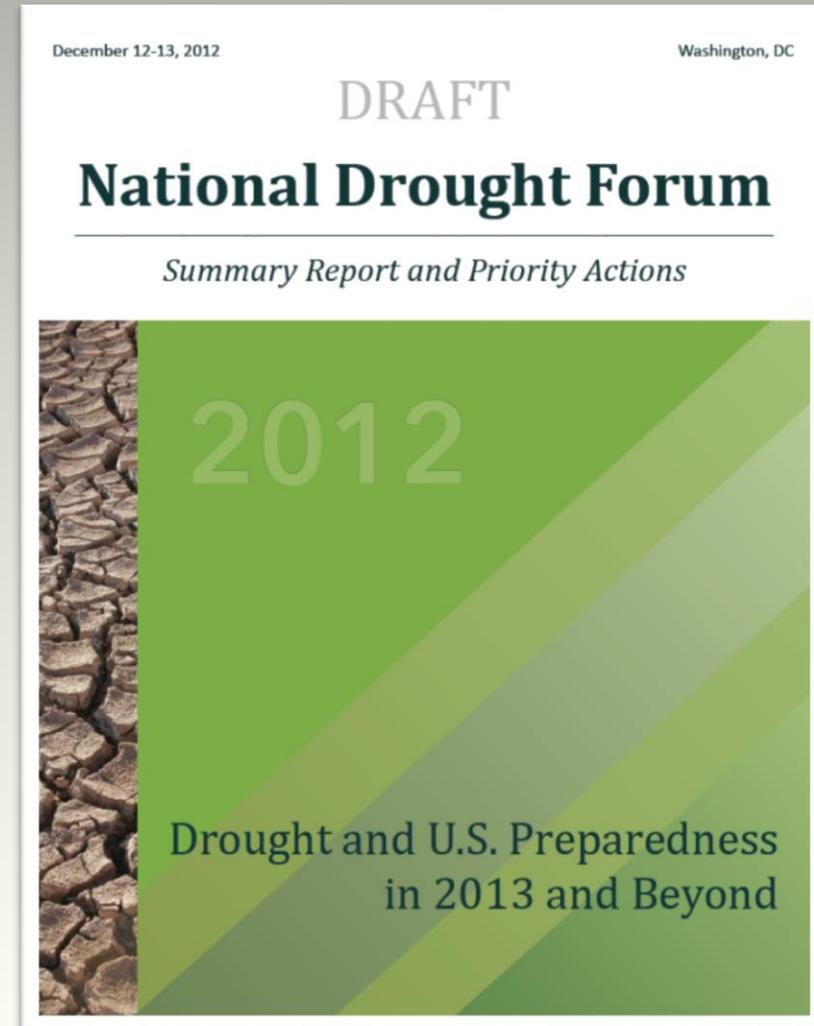


National Drought Forum

Goals

“To understand the extent of 2012 drought impacts and response in 2012, and help provide new information and coordination for improving the nations’ drought readiness for 2013 and in the future”

- Increase public awareness of this year’s drought and potential impacts for next year
- Technical assistance
- Ensure sustained support for monitoring, streamgages and other data
- Outreach with impacted communities
- Conservation plans



National Drought Resilience Partnership

- Spearheaded by the USDA and NOAA
- Part of President Obama's Climate Action Plan
- Goals include...
 - Help communities better prepare for drought
 - Reduce drought impacts
 - Provide easier access to Federal drought resources
 - New web-based portal
 - More frequent drought outlook forums
 - Build on NOAA's climate programs and products
- Partners include...
 - USDA, NOAA, DOI, EPA, Army for Civil Works, FEMA, DOE, White House Rural Council
- More information can be found at drought.gov



**NEW
DROUGHT
RESILIENCE
PARTNERSHIP**

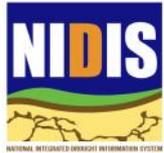
NOAA EPA DOI FEMA USDA
US Army Corps of Engineers

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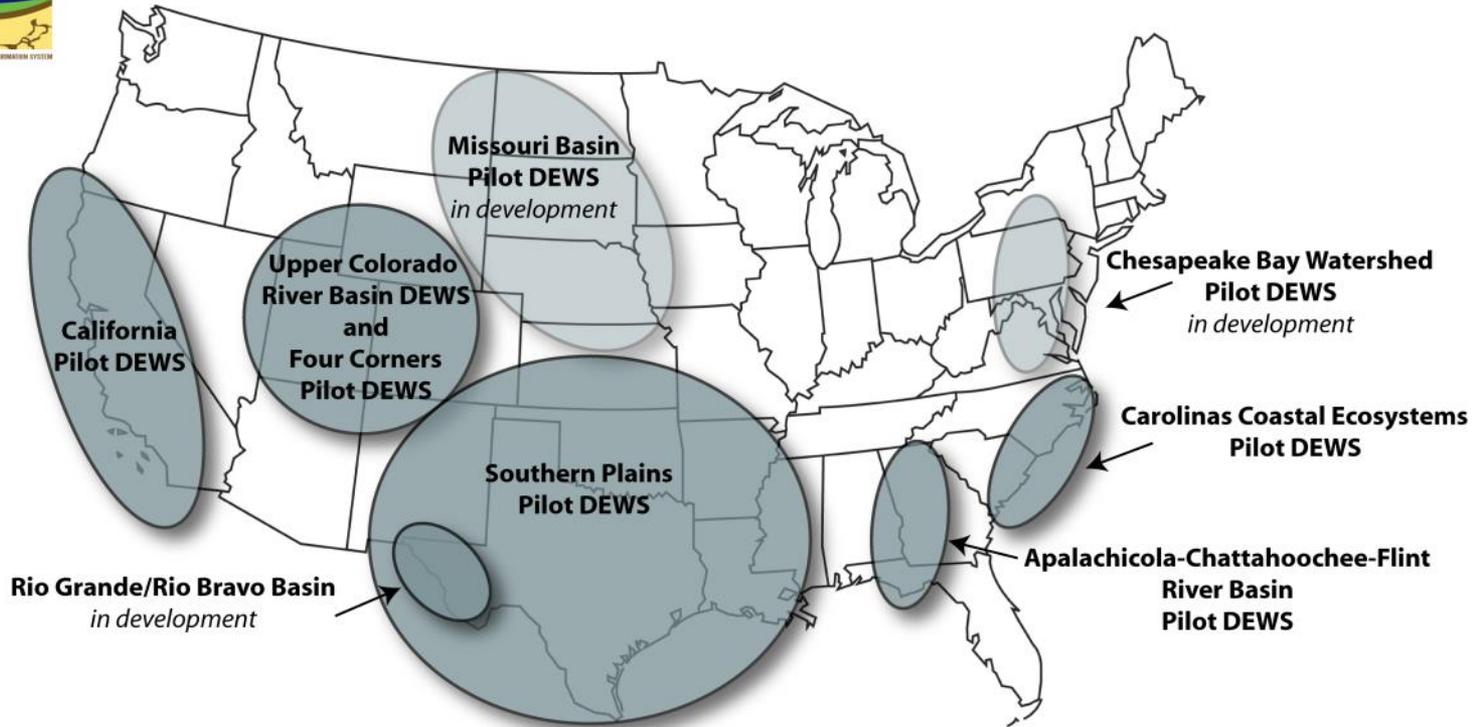
PRESS RELEASE **MORE INFORMATION**

CONTACT: Email Us 202-564-8086

NIDIS – Drought Early Warning



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



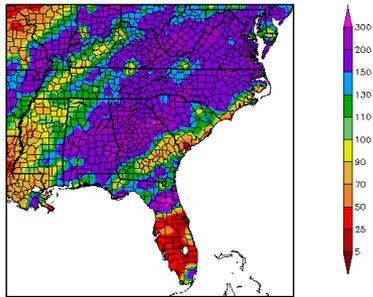
NIDIS is working toward a fully national drought information system through national, tribal and state partnerships

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

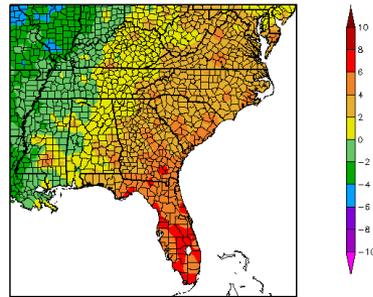
We've got the tools to assess current conditions and to provide short-term and seasonal forecasts...but how do we communicate potential problems associated with drought? How do agencies and citizens work together to mitigate the negative impacts of drought?

Percent of Normal Precipitation (%)
12/4/2013 - 1/2/2014



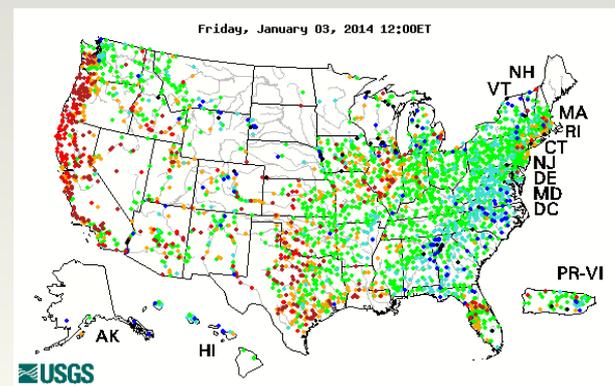
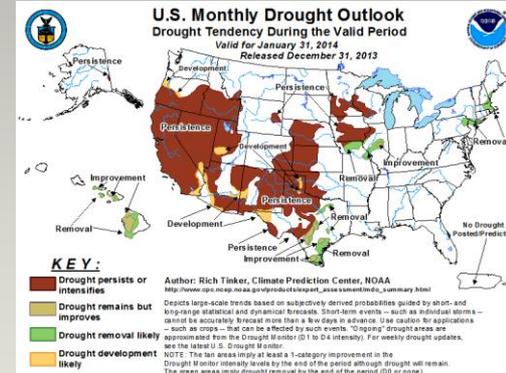
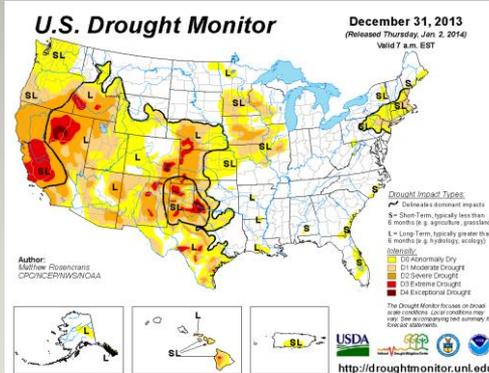
Regional Climate Centers

Departure from Normal Temperature (F)
12/4/2013 - 1/2/2014



/2014 at HPRDC using provisional data.

Regional Climate Center



You'll hear more about the Carolinas DEWS from Kirstin Dow

United States Senate Committee on
**AGRICULTURE
NUTRITION
& FORESTRY**

Time 09:30 AM
Location 328A Russell
Senate Office Building

Opening Statement of Chairwoman Debbie Stabenow (D-Mich)

**Drought, Fire and Freeze: The Economics of Disasters for America's Agricultural
Producers**

February 14, 2013



Witnesses:

Dr. Joe Glauber, chief economist,
USDA;

Dr. Roger Pulwarty, NIDIS, NOAA

Leon LaSalle, rancher, Havre, MT;

Anngie Steinbarger, farmer, Edinburgh,
IN;

Jeff Send, cherry farmer, Leelanau, MI.



National Governors Association Meeting 24-27 February, 2013

National Drought Early Warning Outlook February 21, 2013

Current Drought Conditions and the Seasonal Drought Outlook

U.S. Drought Monitor February 19, 2013

U.S. Seasonal Drought Outlook February 21, 2013

Much of the central U.S. is still in the grip of long-standing moderate (D2) to exceptional (D4) drought, while recent rain has brought relief to the southeast U.S. Abnormally dry (D0) to exceptional drought (D4) conditions exist over 67% of the contiguous U.S., which, although still serious, is a slight improvement since Feb 2012. The 2012/2013 drought has serious implications for agriculture, recreation and municipal water supplies, costing the nation at least \$35 billion in economic losses.

Drought will persist or intensify in much of the current drought-stricken area (brown shading). Improvement is anticipated in Minnesota and surrounding areas (green and hatched shading), and much of the southeast. This designation of improvement, however, does not imply elimination of drought, just a possible easing of conditions. Drought is anticipated to persist or develop in Florida.

Temperature, Precipitation and Wildfire Outlooks

Warmer-than-normal temperatures are anticipated over much of the U.S. over the next three months. In the northwest, extending northward into Alaska, cooler temperatures are expected. "EC" indicates temperatures have equal chances of being below normal, normal or above normal.

Much of the western U.S. and parts of the southeast are anticipated to receive below-normal precipitation. Above-normal precipitation is expected in the Great Lakes region and surrounding states. "EC" indicates precipitation amounts have equal chances of being below normal, normal or above normal.

Periodic precipitation across the Mississippi and Ohio Valley, central Gulf States and the mid-Atlantic will bring below-normal significant wildfire fire potential in much of the east. The seasonal increase in fire across Florida will be amplified to above-normal significant wildfire fire potential by ongoing very dry conditions.

Agriculture

The projected long-term weather-adjusted U.S. corn yield trend for 2013 starts at 143.5 bushels/acre.

- U.S. corn yield has declined each year since a record high of 147.7 bushels/acre was set in 2009 (corn yield was 132.8 bushels/acre in 2002, 147.2 bushels/acre in 2011, and 123.4 bushels/acre in 2012).
- The most important factors for a favorable U.S. corn yield in 2013 will be early planting and July weather.
- Corn, sorghum and the livestock sector, including hay production, were hit hard by the drought of 2012.
- If the drought persists, the hard red winter wheat crop, grown on the Great Plains, is at risk for abandonment and yield reductions in the spring of 2013.

Upcoming Events

NOAA/NWS Spring Outlook March 21, 2013
Keep up-to-date on drought conditions at the NIDIS Drought Portal: www.drought.gov

Outlook Partners

National Integrated Drought Information System
www.nidis.gov
National Drought Mitigation Center
drought.mcgill.ca/
DWR WaterSMART
www.water.gov/water-smart/
DRI/Institute of Sustainable
www.isdri.org/

NOAA/Office of the Chief Economist
www.oce.noaa.gov/
NOAA/NWS National Water and Climate Center
www.nws.noaa.gov/
National Irrigation Fire Center
www.nifc.gov/

US Army Corps of Engineers
www.usace.army.mil/
NOAA/NWS Climate Prediction Center
www.cpc.ncep.noaa.gov/
NOAA/NWS National Water Research Institute
www.nwr.noaa.gov/

Contact: Lisa Derby (lisa.derby@noaa.gov)
Head Reporter: Stephanie Smith (steph.smith@noaa.gov)
View Details: (www.drought.gov)

National Drought Early Warning Outlook, February 2013
www.drought.gov
Congressional Liaison: Michaela "Marti" Prosser (mprosser@noaa.gov)

MOU Between DOC and USDA




**MEMORANDUM OF UNDERSTANDING
BETWEEN THE
U.S. Department of Commerce
AND THE
U.S. Department of Agriculture**

NIDIS and its partners are working to reauthorize the NIDIS Act of 2006!

National Integrated Drought Information System

“Drought is the most obstinate and pernicious of the dramatic events that Nature conjures up. It can last longer and extend across larger areas than hurricanes, tornadoes, floods and earthquakes...causing hundreds of millions of dollars in losses, and dashing hopes and dreams.”

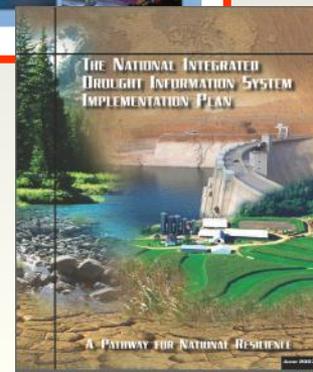
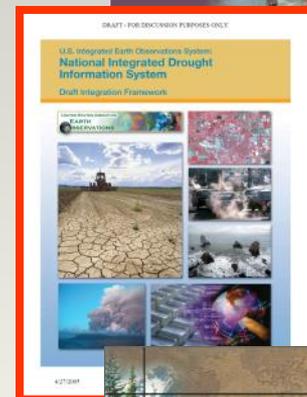
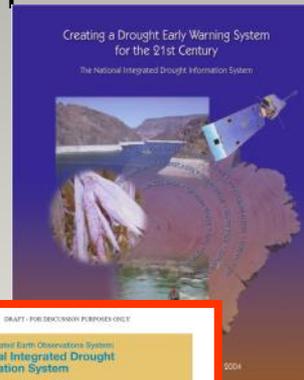
US National Drought Policy Commission Report, May 2000

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...”

www.drought.gov



Workshop Goals

- Introduce the new USGS real-time salinity drought index to potential users
- Identify challenges and opportunities for using the new index in the Carolinas DEWS pilot
- Provide guidance to NIDIS on advancing the use of salinity indices in managing coastal drought beyond the Carolinas DEWS pilot
- Understand the relevance of drought and salinity issues for other agencies by identifying related activities, needs, and opportunities for future work

The collage consists of four news snippets:

- U.S. A Fight Over Water, and to Save a Way of Life**: A snippet from The New York Times showing a boat on a body of water with wind turbines in the background.
- Chesapeake Bay Drought Impacts on Maryland and Chesapeake Bay**: A snippet from the Chesapeake Bay Foundation showing a grassy field with a small stream.
- Drought contributes to oyster shortage (w/video)**: A snippet from WTTW News 5 showing a person in a blue shirt and yellow gloves holding an oyster over a pot.
- Texas' Matagorda Bay suffering from drought, water use**: A snippet from Dallas News showing a map of Matagorda Bay and the Gulf of Mexico.

- Who is interested in joining a working group, either as a potential user of or contributor to the development of the salinity drought index?
- What preliminary steps could (or should) be taken by this working group to help move this project forward?
- Can we come up with a name for this coastal drought index that results in a cool acronym?

Workshop Agenda

Overview of the NIDIS-Carolinas Coastal Ecosystems Drought Early Warning Pilot,

Kirstin Dow (CISA)

Challenges in Monitoring Coastal Drought and the Potential for Salinity Indices,

Kirsten Lackstrom (CISA)

Coffee Break – check out the 13-foot time series of river flow, salinity, and drought monitor categories

Overview of the Development of the USGS Real-time Salinity Drought Index,

Paul Conrads (USGS, South Carolina Water Science Center)

Example Applications

Connecting Ecological Linkages to the USGS Real-time Salinity Drought Index,

Dan Tufford (CISA)

Health, Water and Environmental Quality: The Importance of Real-time Salinity Data for Vibrio Modeling and Other Issues,

Geoff Scott (NOAA/CCEHBR)

Forecasting Blue Crab Distributions Using an Individual-based Population Model,

Michael Childress (Clemson University)

Lunch – Box lunches will be provided

Feds, sorry, but no free lunch for you

You will receive an email later this week telling you how to pay for lunch online

Workshop Agenda

We want to hear from you...

Facilitated Discussion, *Robert Webb (NOAA) - facilitator*

- (1) How might the incorporation of an enhanced coastal drought index such a USGS salinity drought index fit into your agency's mission?
- (2) What similar efforts are already underway in your agency?
- (3) What is your agency's related needs regarding real-time information on drought and salinity conditions?
- (4) What management decisions could be informed by access to a real-time coastal drought index such as the USGS Salinity drought index?
- (5) What research questions could be informed by access to a real-time salinity drought index?
- (6) How could your agency contribute to and support USGS' work on the index?
- (7) What are your thoughts on the transferability of the index to other geographical regions?

Next Steps

2:30 to 3:00 pm *Lisa Darby (NOAA) and Paul Conrads (USGS)*

- (1) Who is interested in joining a working group, either as a potential user of or contributor to the development of the salinity drought index?
- (2) What preliminary steps could (or should) be taken by this working group to help move this project forward?
- (3) Can we come up with a name for this coastal drought index that results in a cool acronym?