

Drought Information Services: Activities and Tools at the National Drought Mitigation Center

**Mark Svoboda, Climatologist
Monitoring Program Area Leader**

**National Drought Mitigation Center
University of Nebraska-Lincoln**

NOAA CPAS Annual Workshop, San Diego, CA, Mar. 2-4, 2010

Outline

- The NDMC Approach
- NDMC Program Areas
 - Tools
 - Drought Monitor
 - Drought Impact Reporter v2
 - Low-flow impact studies
 - VegDRI
- Drought Planning
 - Drought Ready Communities
- NIDIS
- Summary

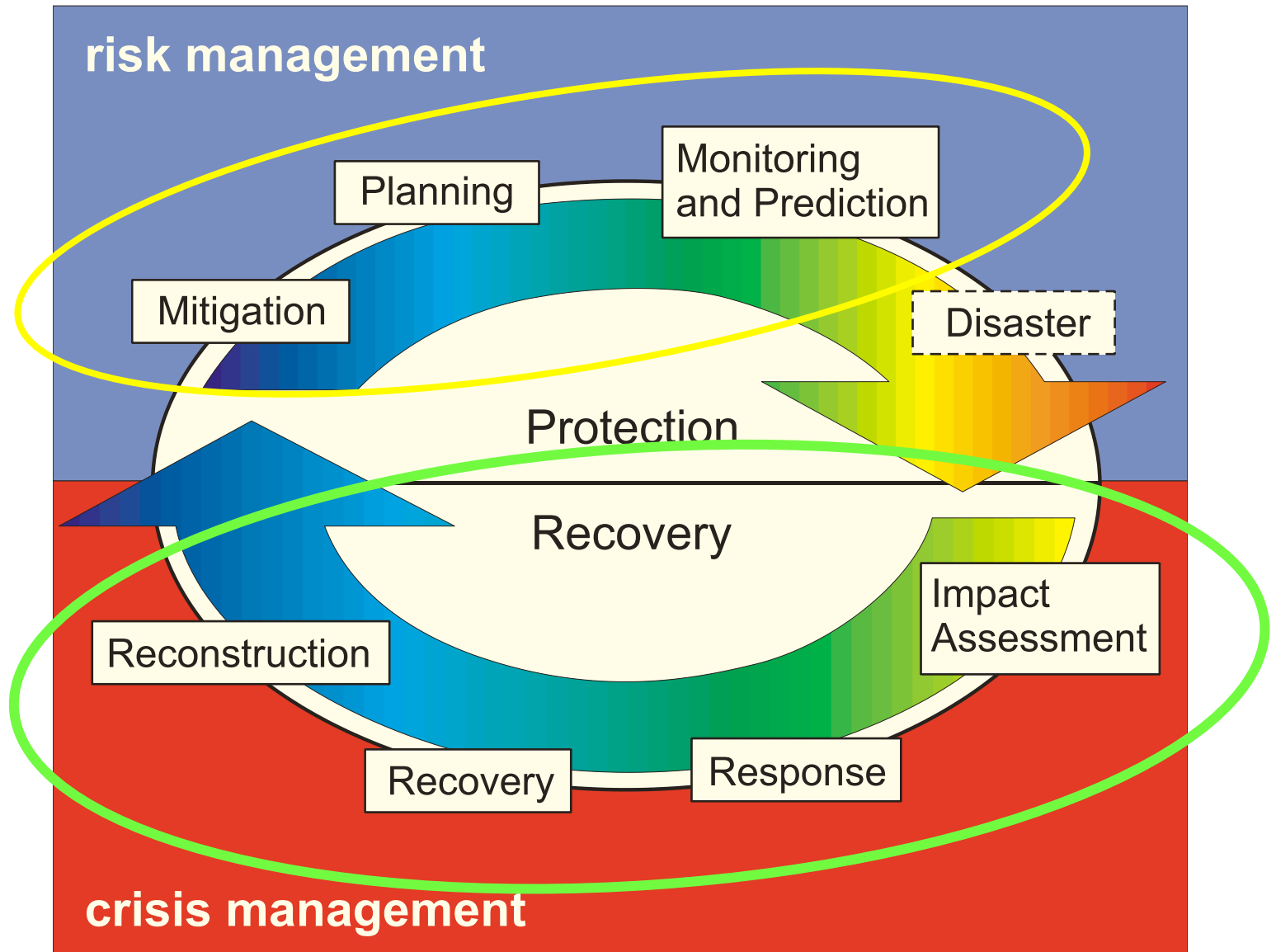
National Drought Mitigation Center



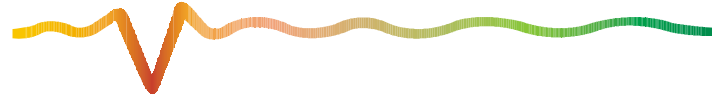
Founded: 1995 at the University of Nebraska-Lincoln

Mission: To lessen societal vulnerability to drought by promoting planning and the adoption of appropriate risk management techniques.

The Cycle of Disaster Management



NDMC Program Objectives



- **Improve the science** of drought monitoring, planning, and mitigation
- Build **awareness** of drought and its **impacts** on society and the environment, and how human actions affect our vulnerability to drought
- Focus the attention of policy makers on the importance of **drought policy and planning** in the wise stewardship of natural resources

RESEARCH, OUTREACH, AND TRAINING

1995



The National Drought Mitigation Center helps people and institutions develop and implement measures to reduce societal vulnerability to drought. The NDMC stresses prevention and risk management rather than crisis management. This approach promotes self-reliance to achieve greater resilience to drought.



Drought Watch



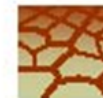
Drought Science



What's New



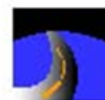
Climatology



Impacts



NDMC



Drought Links



Mitigation



Network



Search the Site



Methodologies



Why Plan?

<http://enso.unl.edu/ndmc>

Today

National Drought Mitigation Center

University of Nebraska–Lincoln



The National Drought Mitigation Center (NDMC) helps people and institutions develop and implement measures to reduce societal vulnerability to drought. The NDMC, based at the University of Nebraska–Lincoln, stresses preparation and risk management rather than crisis management.

What is Drought?

An overview of drought • Climographs • Historical Palmer Drought Index maps and graphs • Drought and El Niño • The Dust Bowl

Planning for Drought

How (and why) to plan for drought • The 10-Step Planning Process • Directory of drought planning contacts

Monitoring Drought

How to select monitoring tools • The SPI, the U.S. Drought Monitor, and links to tools elsewhere on the web

Understanding Your Risk

Understanding drought's impacts • Current and historical drought impacts in the United States and around the world

Mitigating Drought

Putting a drought plan together • Existing drought plans and studies • Drought mitigation tools/initiatives • Water conservation

About the NDMC
Contact Information
What's New
Site Map
Search the Site
Drought Network News
Publications



For Media

*Other
Drought-related
Sites*

*U.S.
Drought
Monitor*

*Interim
National
Drought
Council*

Spring 2010

National Drought Mitigation Center - Windows Internet Explorer provided by School of Natural Resources

http://sucho.unl.edu/dotnetnuke/

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National Drought Mitigation Center

Home Contact

Search



National Drought Mitigation Center

About Us News Drought Basics Monitoring Tools Planning Drought for Kids

Welcome to the website of the National Drought Mitigation Center.

The NDMC helps decision-makers reduce vulnerability to drought through monitoring, understanding impacts, and planning.

NDMC News

- [Scientists Agree on International Standard for Drought Monitoring](#)
- [Researchers Document Effects of Drought on Bird Populations](#)
- [NDMC to Help Colorado Revise Drought Plan](#)
- [NDMC Helps Organize Building Sustainable Partnerships](#)

Drought Impacts

- [Burn ban in Medina County](#)
- [Drought waiver offered to those transporting hay and feed](#)
- [Southwest Florida Water Management authorizes emergency measures to supply Tampa area water needs](#)
- [Mandatory water restrictions in Central temporarily suspended](#)

NDMC Gallery

Drought Plan Status



State	Drought Plan Status
AK	None
AZ	Plan emphasizes response
CA	Plan emphasizes mitigation
CO	Plan emphasizes response
CT	None
DC	None
DE	None
FL	Plan emphasizes response
GA	Plan emphasizes response
IA	Plan emphasizes mitigation
ID	Plan emphasizes mitigation
IL	Plan emphasizes mitigation
IN	Plan emphasizes mitigation
KS	Plan emphasizes response
KY	Plan emphasizes response
LA	None
MA	None
MD	Plan emphasizes mitigation
ME	None
MI	Plan emphasizes mitigation
MN	Plan emphasizes mitigation
MO	Plan emphasizes mitigation
MS	None
MT	Plan emphasizes response
NC	Plan emphasizes mitigation
ND	Plan emphasizes mitigation
NH	None
NJ	None
NM	Plan emphasizes response
NV	Plan emphasizes mitigation
NY	None
OH	Plan emphasizes mitigation
OK	Plan emphasizes response
OR	Plan emphasizes mitigation
PA	None
RI	None
SC	None
TN	Plan emphasizes response
TX	Plan emphasizes response
UT	Plan emphasizes mitigation
VA	None
VT	None
WA	Plan emphasizes mitigation
WI	Plan emphasizes mitigation
WV	Plan emphasizes mitigation
WY	Plan emphasizes mitigation

Current Drought Plan Status

The NDMC maintains a collection of state drought plans, contacts, agencies and other resources.

Contact Information

National Drought Mitigation Center
University of Nebraska-Lincoln
819 Hardin Hall
3310 Holdrege Street
P.O. Box 830988



My Computer 100%

Home Contact



National Drought Mitigation Center

About Us News Drought Basics Monitoring Tools Planning Drought for Kids

- Planning**
- Why Plan for Drought?
 - Monitoring
 - Impacts
 - Management Options
 - Planning Processes
 - U.S. Policy
 - State Drought Planning Tool
 - Tribal Drought Planning
 - Resources by Sector

TEXAS State Drought Planning

Contacts

Cantrell, Johnna
 State Coordinator for Preparedness and Operations
 Texas Department of Public Safety
 (512) 424-2453
 johnna.cantrell@txdps.state.tx.us

State Climatologist

Nielsen-Gammon, John
 Texas State Climatologist
 Texas Office of the State Climatologist
 (979) 845-5044
 n-g@tamu.edu

[See more contacts](#)

State Drought Plan

Texas State Drought Preparedness Response Plan
 Texas Drought Preparedness Council
[See Plan](#)

[See more state and local plans](#)

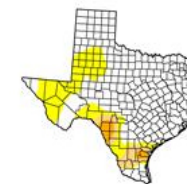
State Drought Website

Agricultural Drought Task Force: Resources on Drought
[Visit site](#)

Lead Agency

Texas Water Development Board
 info@twdb.state.tx.us
[Visit site](#)

Current U.S. Drought Monitor



Number of people currently affected by drought: 613,293

Drought Impacts

[New pumps and generators to draw water from the depths of Lake Meredith](#)
 31 Dec 2009

[Geese drawn to Lubbock lakes as area lakes dwindle](#)
 18 Dec 2009

[Rebates offered for improving water efficiency in San Antonio yards](#)
 17 Oct 2009

[Roughly \\$9 million in field crops lost to drought in Guadalupe County](#)
 01 Jan 2009

State-wide Agencies and Organizations	Monitoring and Data	Local Organizations	Tribal	Farmers and Ranchers	Water Conservation
Association of Texas Soil and Water Conservation Districts					More Info Visit site
NRCS Texas					More Info Visit site
NWS Arkansas-Red Basin River Forecast Center					More Info Visit site
NWS Lower Mississippi River Forecast Center					More Info Visit site
NWS West Gulf River Forecast Center					More Info Visit site
Office of the Texas State Climatologist					More Info Visit site

Home Contact

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U.S. Drought Monitoring

Climatological Drought Indicators

At the country scale, climatologists recommend that policymakers work with large-scale or nation-wide drought indicators. These include the:

- ▶ [U.S. Drought Monitor](#)
- ▶ [Seasonal Drought Outlook](#)
- ▶ Standardized Precipitation Index
 - [Monthly suite of SPI maps produced by the NDMC](#)
 - [Daily gridded SPI](#)
 - Monthly SPI maps and related products from the [Western Regional Climate Center](#)
 - SPI maps from the [National Oceanic and Atmospheric Administration](#)
- ▶ [Palmer Drought Severity Index](#)
- ▶ [Crop Moisture Index](#)
- ▶ Various Soil Moisture Indices

To compare the pros and cons of these climatological indices, please refer to [A Comparison of Drought Indices](#).

Remote Sensing of Drought

Remote sensing – i.e., satellites – also provide useful data, at a variety of spatial scales. The NDMC is developing the Vegetation Drought Response Index, which shows how much of the dryness in farm and ranch land is due to drought. A collection of links to more [drought monitoring information derived from remote sensing](#) is on the U.S. Drought Portal.

Hydrologic Indicators of Drought

Monitoring Tools

U.S. Drought Monitor

January 12, 2010
Valid 7 AM EST

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- H - Hydrological (water)
- A - Agriculture (crops, pastures, grasslands)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for recent statements.

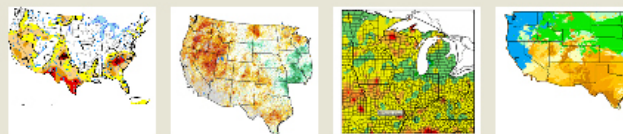
Released Thursday, January 14, 2010

Author: Mark Svoboda, National Drought Mitigation Center

<http://drought.unl.edu/dm>

Drought Monitor

The U.S. Drought Monitor is a composite index, combining a variety of drought indicators into a single map.



Drought Monitor VapDRI Gridded SPI Rain/Dry Days

Winter 2010

USDM Forum Highlights

The biennial U.S. Drought Monitor Forum is a chance for stakeholders and scientists to refine the weekly drought map. Read highlights from the October forum on pages 10 and 11.

Research Shows Birds Vulnerable to Drought



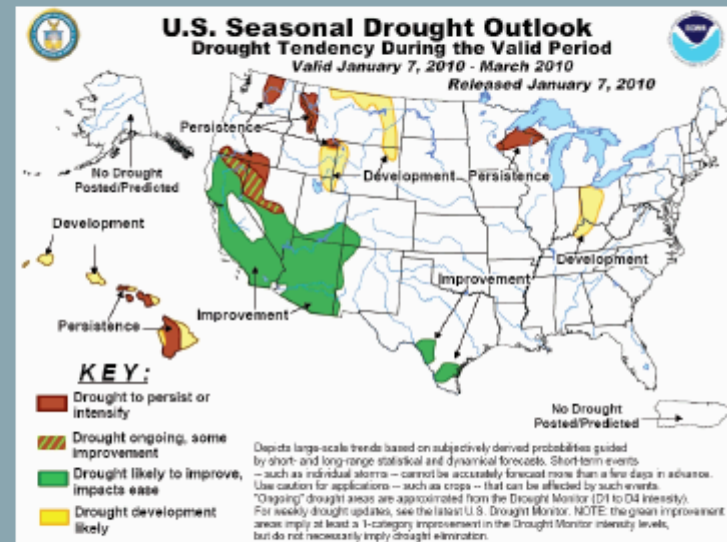
© Bruce Rosenstiel

Brian Wardlow, GIScience program area leader at the NDMC, was part of a research team that detailed the effects of drought on various bird

Drought Likely to Ease

Drought conditions in the Southwest, along the Gulf Coast, and in south Texas are likely to improve this winter and spring, due to the El Niño pattern that will gradually return to normal by late spring.

For the full outlook and summary of October-December 2009 drought conditions, please see pages 2-3.



Drought Recedes in 2009

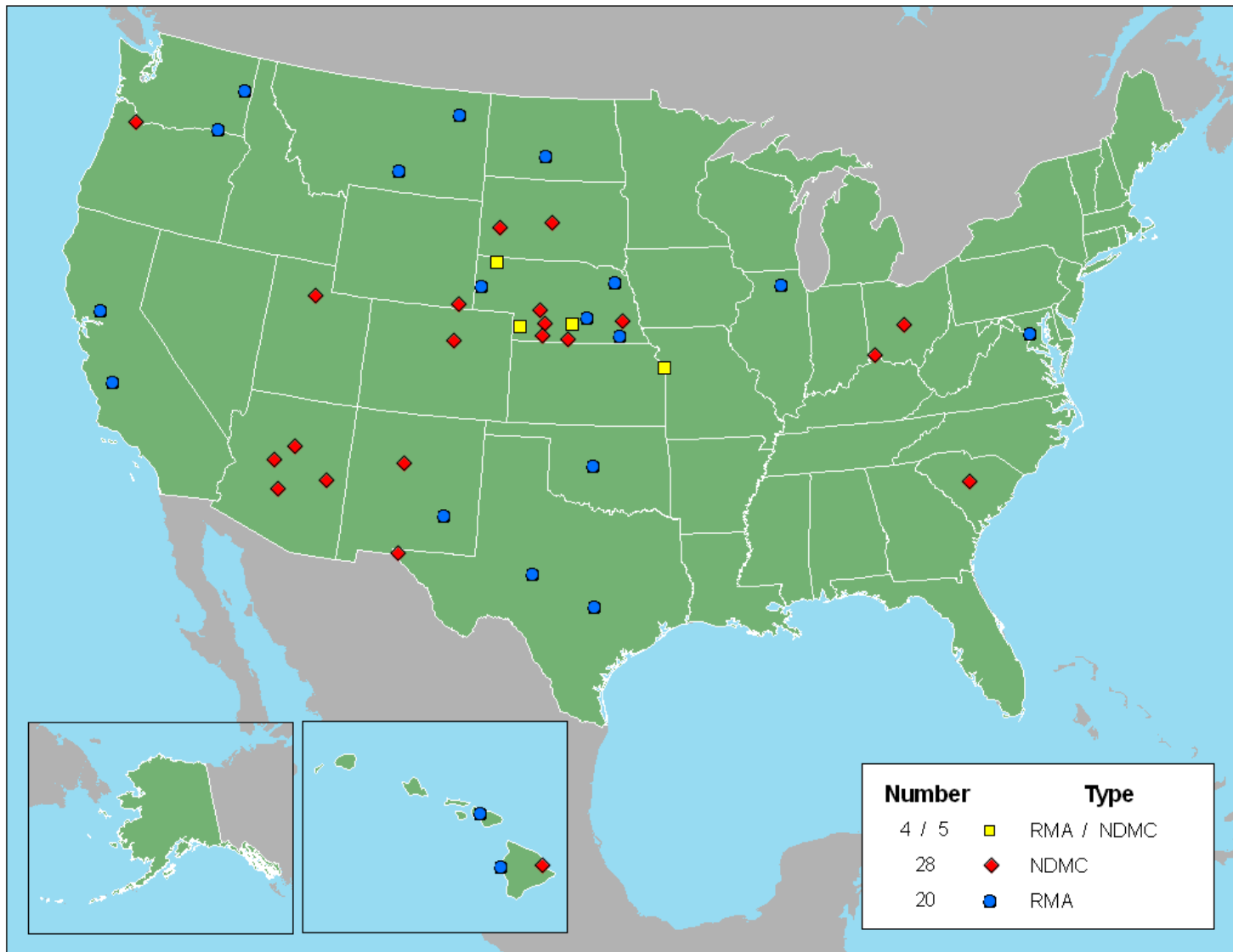
The area of the United States that was abnormally dry or in drought was at its lowest point in 10 years in October 2009. For a complete climatological overview of drought in 2009, please see pages 4-5.

Workshops on Drought Management Tools



- Building partnerships and trust
- Provide producers and advisors with easy-to-use tools and data to better understand the linkages between local climate/drought and decision making
- Obtain feedback on what information or tools are needed to better understand these linkages
 - Multiple feedback approaches
- Effectively plan and prepare for drought

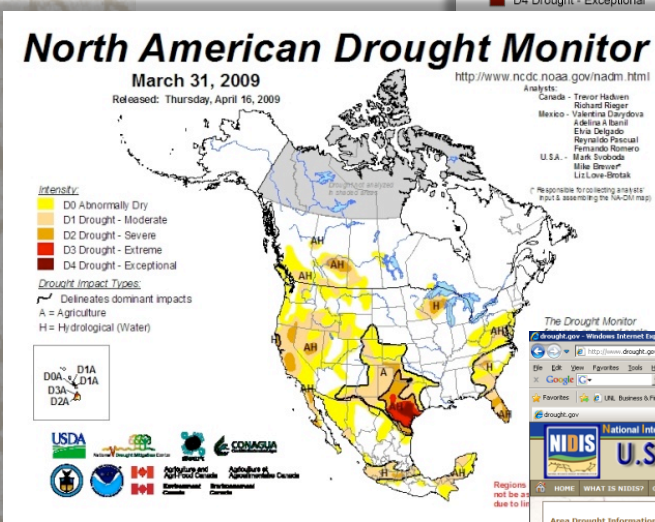
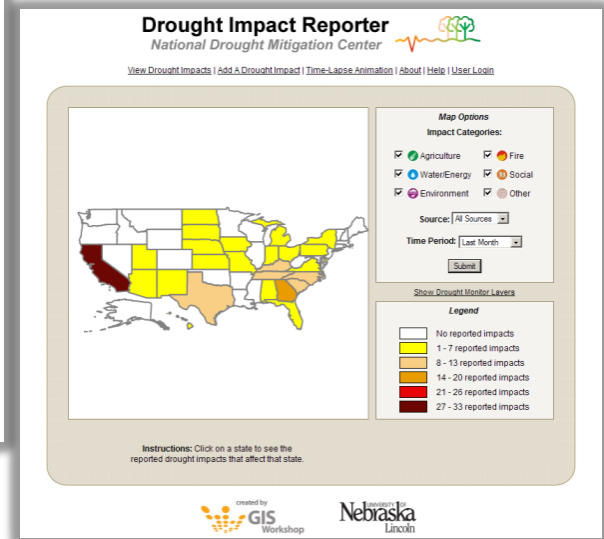
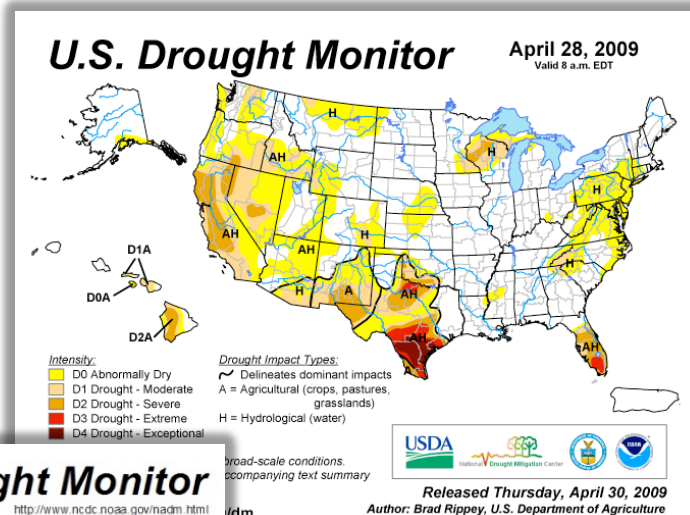
NDMC Stakeholder Workshops 1996-2009



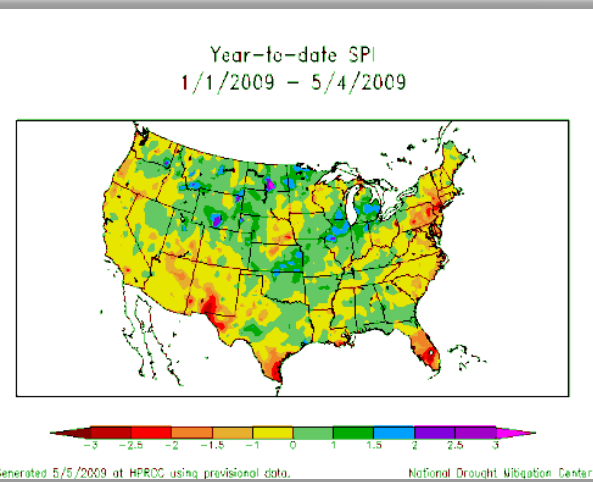
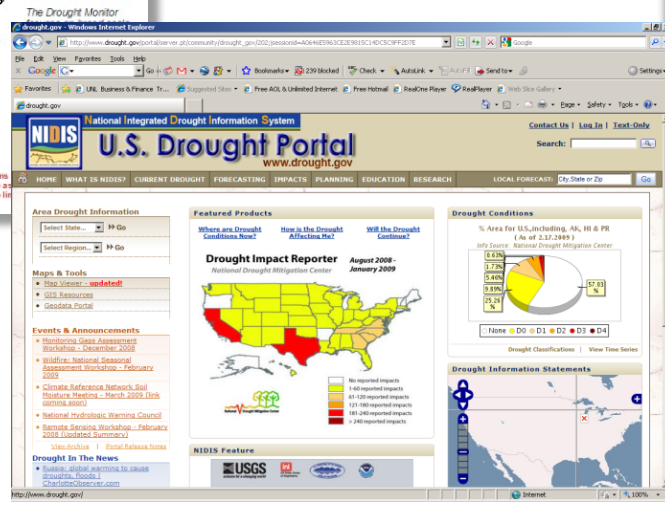
Goal: Make NDMC tools so easy to use a Caveman can do it!



NDMC's Monitoring Program Area



Released Thursday, April 30, 2009
 Author: Brad Rippey, U.S. Department of Agriculture



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 Lincoln

National Drought Mitigation Center

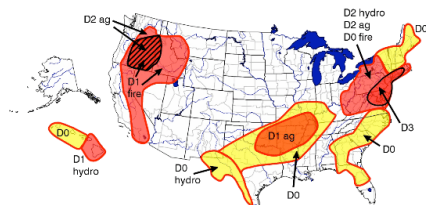
The U.S. Drought Monitor

Since 1999, **NOAA (CPC, NCDC, WRCC), USDA, and the NDMC** have produced a weekly composite drought map with input from numerous federal and non-federal agencies

- **Western Region Climate Center** on board 2008
- CalDry listserver hosted by CA DWR
- **10** authors in all
- **Incorporate** relevant information and products from all entities (and levels of government) dealing with drought (RCC's, SC's, federal/state agencies, etc.) (**~260 experts**)

August 3, 1999

Experimental U.S. Drought Monitor



N

"Drought" means moisture shortages leading to damaged crops or pastures, high wildfire risk, or water shortages. The map is based on information from many sources, including both satellite and surface data, and it focuses on widespread drought. Local conditions may vary.

Yellow (D0) = Drought Watch Area (abnormally dry but not full drought status)

Red (D1-D4) = Current drought ranging in severity from standard (D1) to severe (D2-D3) to extreme (D4)

Crosshatching (X) = Overlapping drought type areas

Drought type: Used when impacts differ

Ag = agricultural (crops, grasslands)

Fire = forestry (wildfire potential)

Hydro = hydrological (rivers, wells, reservoirs)

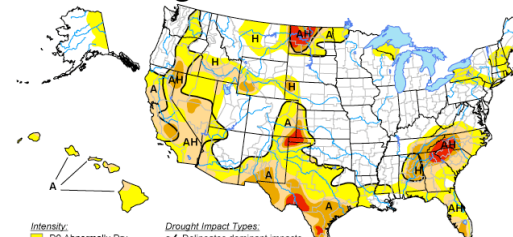
Plus (+) = Forecast to intensify

Minus (-) = Forecast to diminish



U.S. Drought Monitor

June 10, 2008
Valid 8 a.m. EDT



Intensity:
 D0 Abnormally Dry
 D1 Drought - Moderate
 D2 Drought - Severe
 D3 Drought - Extreme
 D4 Drought - Exceptional

Drought Impact Types:
 Delimites dominant impacts
 A = Agricultural (crops, pastures, grasslands)
 H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, June 12, 2008

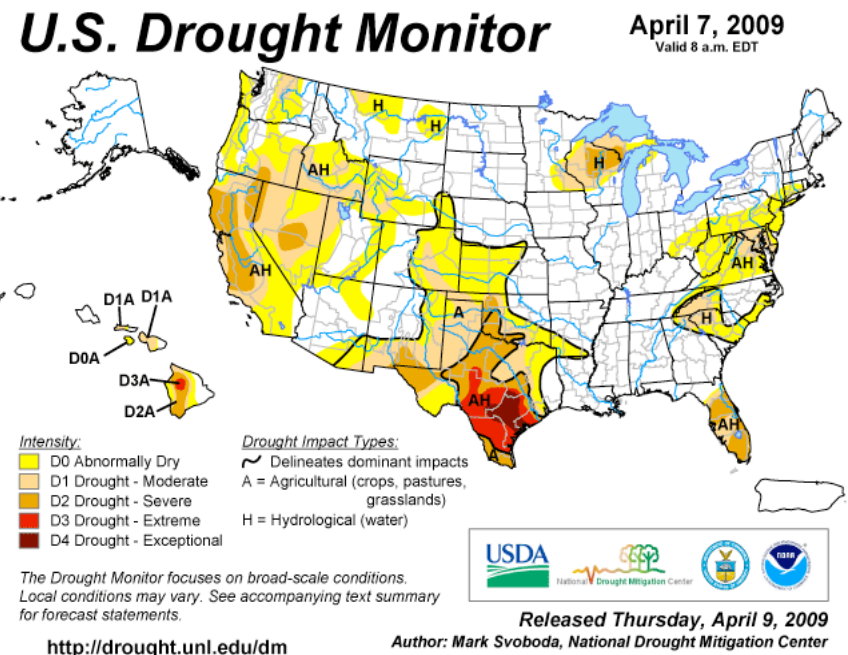
Author: Mark Svoboda, National Drought Mitigation Center



Some Drought Monitor Factoids

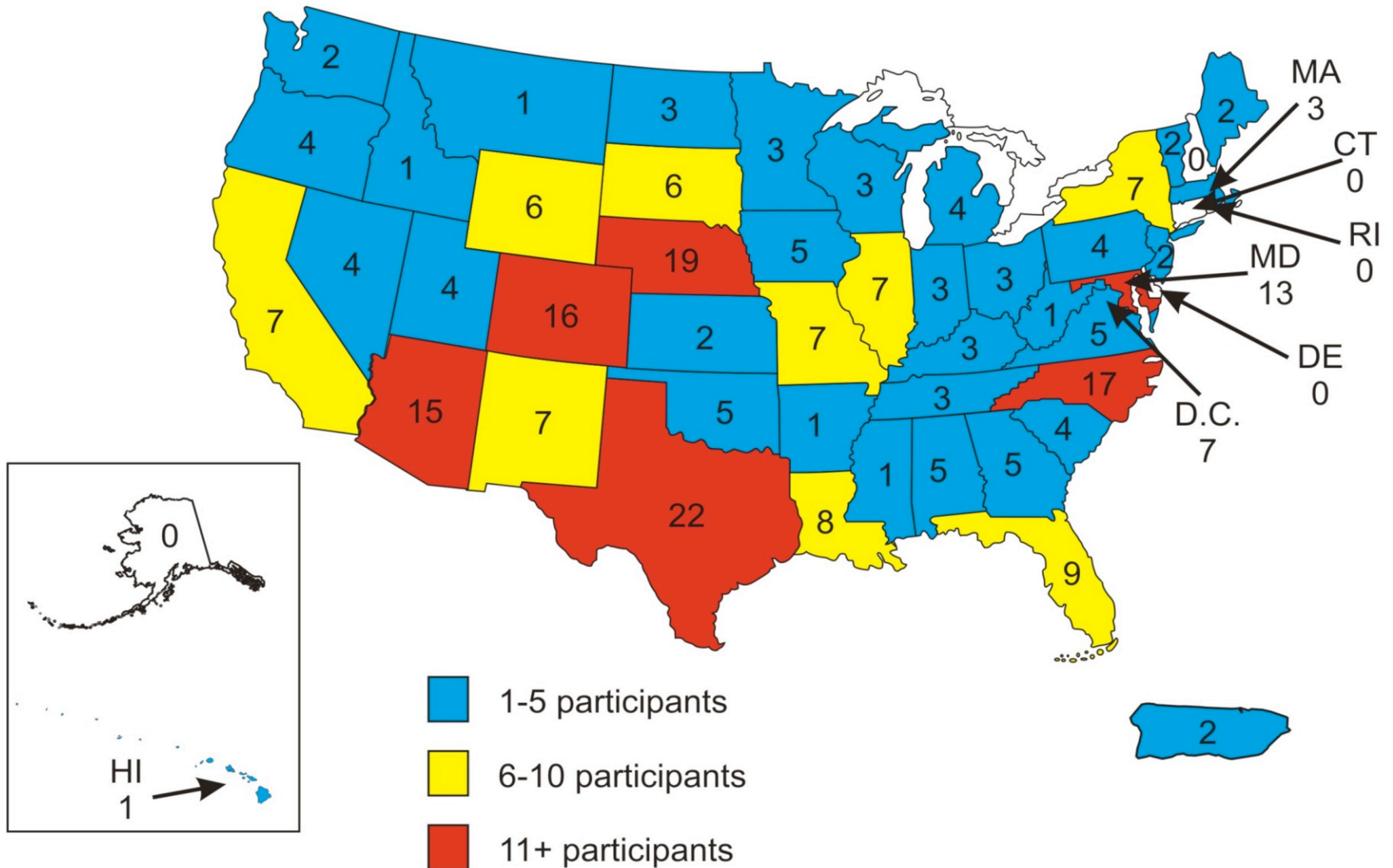


- Happy Birthday: 10 Years Old!
- Map #500 (4/7/09)
- Smallest D1-D4 extent: 6.64% on 2/9/10
- Largest D1-D4 extent: 45.64% on 9/10/02
- 20 states have never had any D4 w/in their borders



USDM Listserve Subscribers

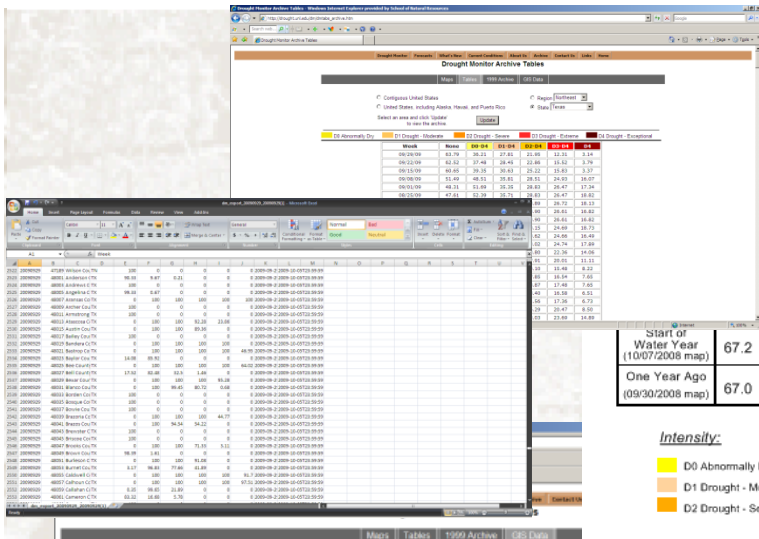
(as of January 13, 2010)



Total: 264 (does not include 1 participant from Canada and 2 participants from Mexico)

The Drought Monitor is widely used:

- **Policy:** Farm Bill/IRS/USDA/NOAA DGT/State drought plan triggers
- **~3.5M+** page views and **~2M+** visitors/year
- **Media:** The Weather Channel/USA Today and all major newspapers/Internet Media/ Network News/ CNN/NPR/etc.
- Presidential/Congressional **briefings**
- **NIDIS** portal/portlet
- A **model** of interagency/level collaboration



Drought Monitor

Texas

September 29, 2009
Valid 7 a.m. EST

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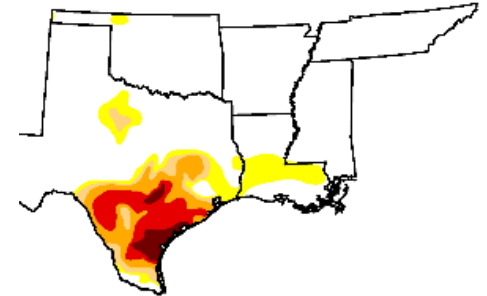
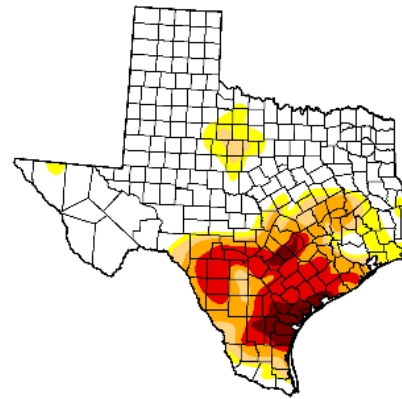
September 29, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	D0-D4	D1-D4	D2-D4	D3-D4	D4
67.2	27.8	21.9	12.3	3.1	
37.5	28.5	22.9	15.5	3.8	
62.3	39.4	28.8	22.4	14.1	
58.3	24.5	15.0	9.1	4.2	
Start of Water Year (10/07/2008 map)	67.2	32.8	20.5	11.0	3.6
One Year Ago (09/30/2008 map)	67.0	33.0	20.1	9.5	3.6

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



For more information regarding the Drought Monitor datasets, please contact Soren [smil](mailto:smil@unl.edu) or at [402-472-2222](tel:402-472-2222).

View the most current Drought Monitor in Google Earth: [Current Drought Monitor](#)

View the most current Drought Monitor WMS service: [Current Drought Monitor WMS](#)

For more information regarding the file formats, click on the appropriate format: [Drought Mon GML files](#) [OGC WMS files](#) [Excel files](#)

For more information regarding the Drought Monitor color scheme, please visit: [DM Colors](#)

Please cite the Drought Monitor by including the National Drought Mitigation Center (NDMC), Agriculture (USDA) and the National Oceanic and Atmospheric Association (NOAA).

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements



Released Thursday, October 1, 2009
Author: D. Miskus, JAWF/CPC/NOAA

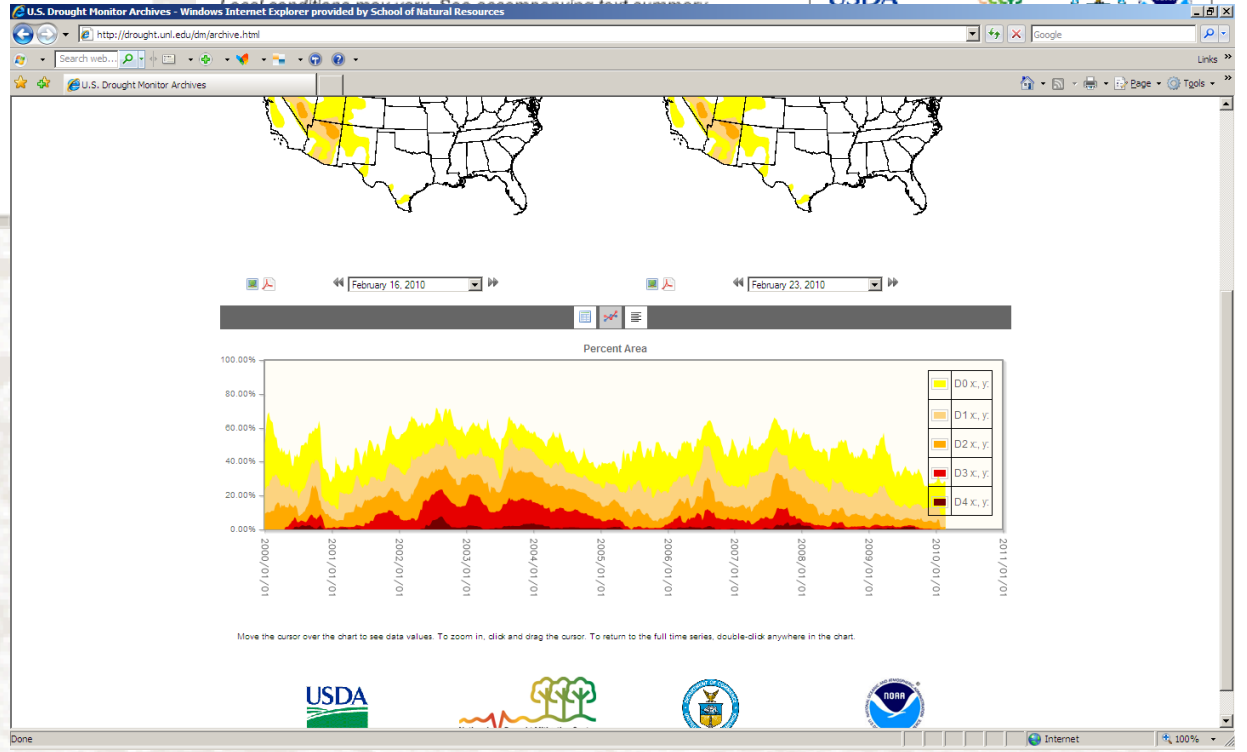
<http://drought.unl.edu/dm>

The Drought Monitor focuses on broad-scale conditions.

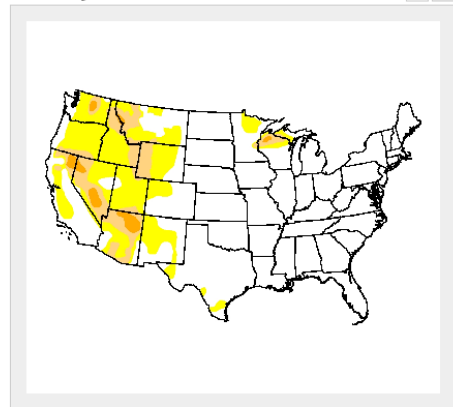


2009 2008 2007 2006 2005 2004 2003 2002 2001 2000

Date	KML	Shapefile	GML	WMS	U.S.	State	County
2009-09-29	KML	SHP	Impacts	GML	WMS	U.S.	County
2009-09-22	KML	SHP	Impacts	GML	WMS	U.S.	County
2009-09-15	KML	SHP	Impacts	GML	WMS	U.S.	County
2009-09-08	KML	SHP	Impacts	GML	WMS	U.S.	County
2009-09-01	KML	SHP	Impacts	GML	WMS	U.S.	County
2009-08-25	KML	SHP	Impacts	GML	WMS	U.S.	County
2009-08-18	KML	SHP	Impacts	GML	WMS	U.S.	County



February 23, 2010



Previous Weeks: 4 12 24 52

Hover over the image to pause. Click the image to move to the next week.



Home | Mark D Svoboda - Inbox... | Mark D Svoboda - Calendar | Re: Fw: I SPI | reminder draft thesis subject... | more DM in the wild

1 New Memo | 2 Reply | 3 Reply To All | 4 Forward | 5 Delete | 6 Follow Up | 7 Bolder | 8 Copy Into New | 9 Hat | Show | Tools

file Edit View Controls Store Advanced Help

iTunes

View Search drought

LIBRARY

- Music
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- Podcasts
- Radio

STORE

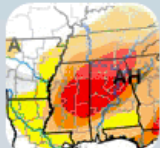
- iTunes Store

PLAYLISTS

- iTunes DJ
- Genius
- 90's Music
- Music Videos
- My Top Rated
- Recently Added
- Recently Played
- Top 25 Most Played
- untitled playlist

App Store > Weather > Drought Monitor

Steve Parker



Drought Monitor

Category: Weather
Released Apr 02, 2009
Version: 1.0
Seller: Steve Parker
© 2009 iPhone EZ Products
0.1 MB

\$0.99

Rated 4+

APPLICATION DESCRIPTION

Click on "Steve Parker Web Site" to view our other great app. Click on "Drought Monitor Support" to check out our website viewing in iTunes, please click on "more" to the right to see description. Follow us on Twitter @twitter.com/iPhonezapps promos!

*Drought Monitor is an application that lets you see what parts of the United States is being impacted by a drought and what future forecasts are.

*This application features maps that show last weeks and this weeks drought maps, areas with the highest fire danger, Soil Moisture drought forecast and 30 day precipitation outlook.

All data is powered by The National Weather Service and is constantly updated.

Maps are large and highly detailed, just move them around with your finger.

- ✓ Our Website: <http://www.iphonezproducts.com>
- ✓ On Twitter: twitter.com/iphonezapps
- ✓ Comments/Support/Suggestions: iphonesteve79@yahoo.com

Thank you for your interest in our iPhone/iPod Touch Products

LANGUAGES:
English

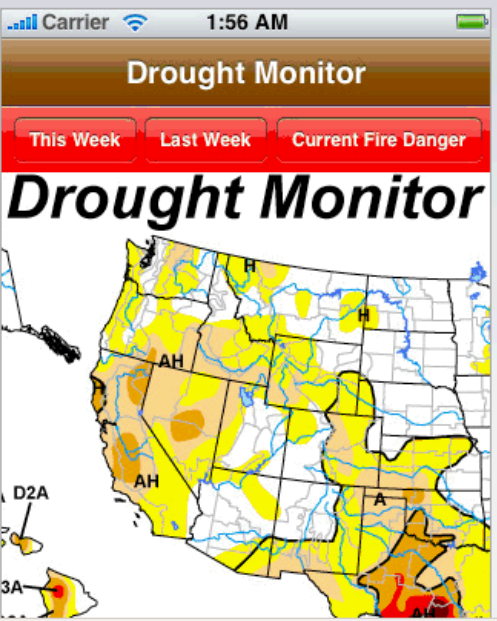
REQUIREMENTS:
Compatible with iPhone and iPod touch.
Requires iPhone OS 2.1 or later.

Steve Parker Web Site

Drought Monitor Support

ALL APPLICATIONS BY STEVE PARKER

TELL A FRIEND



Carrier 1:56 AM

Drought Monitor

This Week Last Week Current Fire Danger

Drought Monitor

D2A AH AH A 3A

Office



The Drought Impact Reporter v2

<http://droughtreporter.unl.edu>

Map Options

Impact Categories:

- Agriculture
- Water/Energy
- Environment
- Fire
- Social
- Other

Source:

Time Period:

[Show Drought Monitor Layers](#)

Legend

- No reported impacts
- 1 - 14 reported impacts
- 15 - 28 reported impacts
- 29 - 42 reported impacts
- 43 - 56 reported impacts
- 57 - 70 reported impacts

Instructions: Click on a state to see the reported drought impacts that affect that state.

Sponsor: USDA-Risk Management Agency and National Oceanic and Atmospheric Administration's Transition of Research Applications to Climate Services Program (TRACS)

UNIVERSITY OF
Nebraska
Lincoln



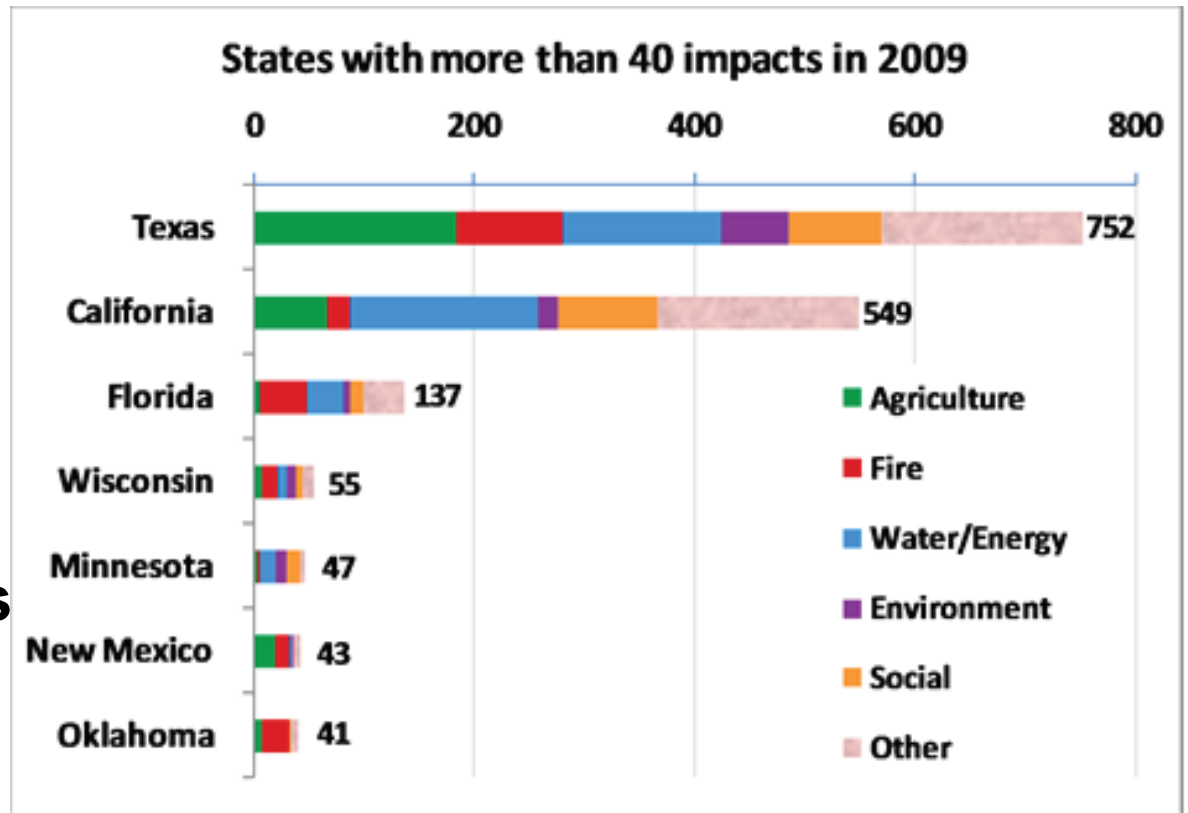
Why Track Drought Impacts?

- Establish an impacts **baseline** for monitoring
 - Climate change
- To know where to direct **relief**
- To reduce **vulnerability** in advance of the next drought
- **“Ground truth”** indices
- No single method exists for collecting and/or **quantifying** drought losses

Some DIR Factoids

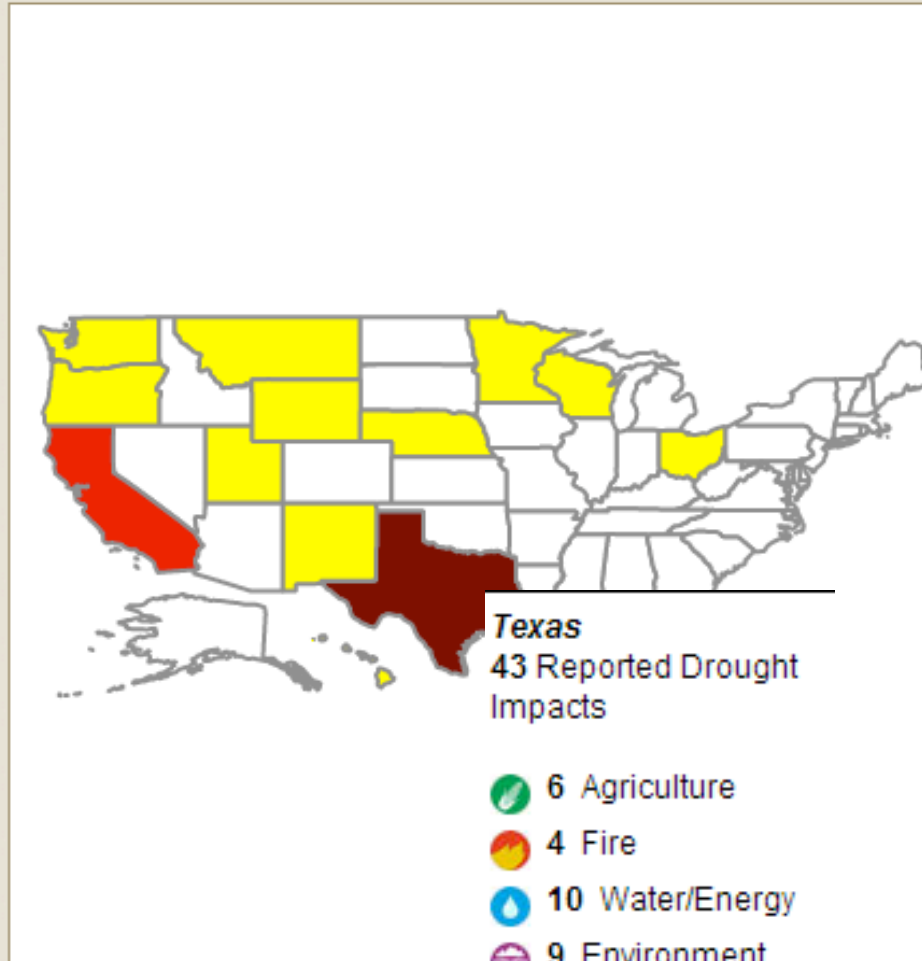


- Established in 2005
- DIR DB now contains ~11,000 impacts
- 1,891 impacts added in 2009



Drought Impact Reporter, October 5, 2009

[View Drought Impacts](#) | [Add A Drought Impact](#) | [Time-Lapse Animation](#) | [About](#) | [Help](#) | [User Login](#)



Instructions: Click or reported drought impact

Map Options

Impact Categories:

- Agriculture
- Fire
- Water/Energy
- Social
- Environment
- Other

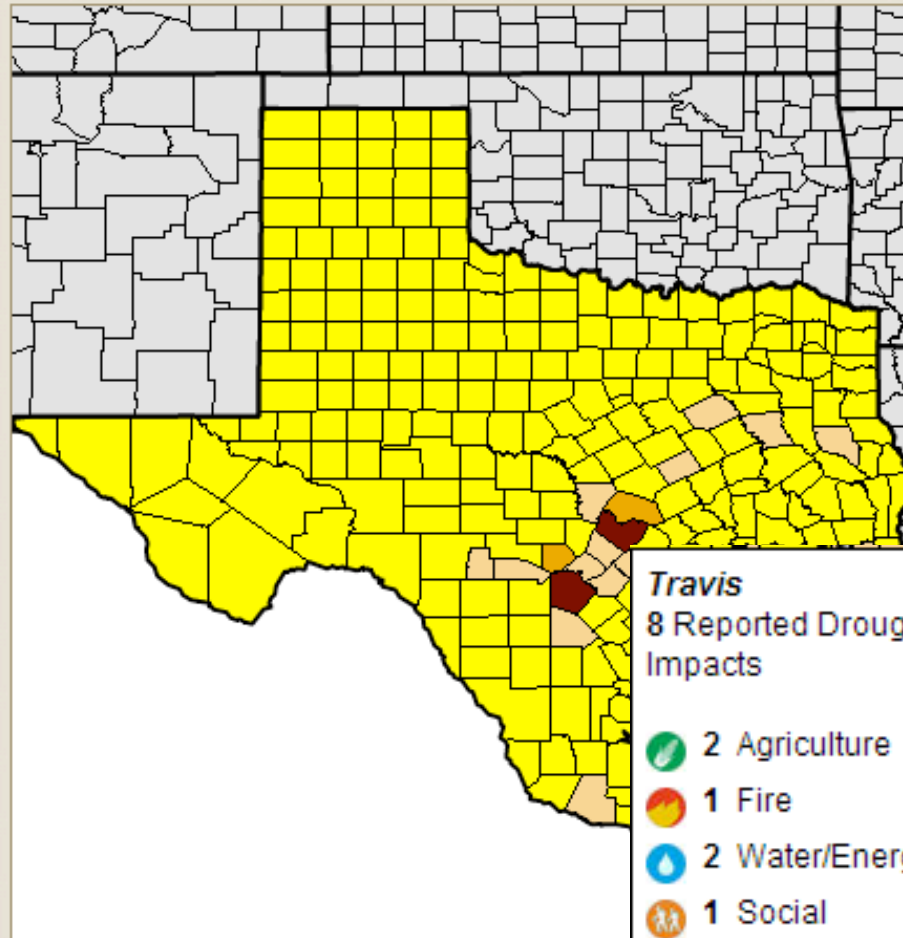
Source:

Time Period:

[Show Drought Monitor Layers](#)

Legend

- No reported impacts
- 1 - 9 reported impacts
- 10 - 17 reported impacts
- 18 - 26 reported impacts
- 27 - 34 reported impacts
- 35 - 43 reported impacts



Map Options

Impact Categories:

- Agriculture
- Fire
- Water/Energy
- Social
- Environment
- Other

Source:

Time Period:

[Show Drought Monitor Layers](#)

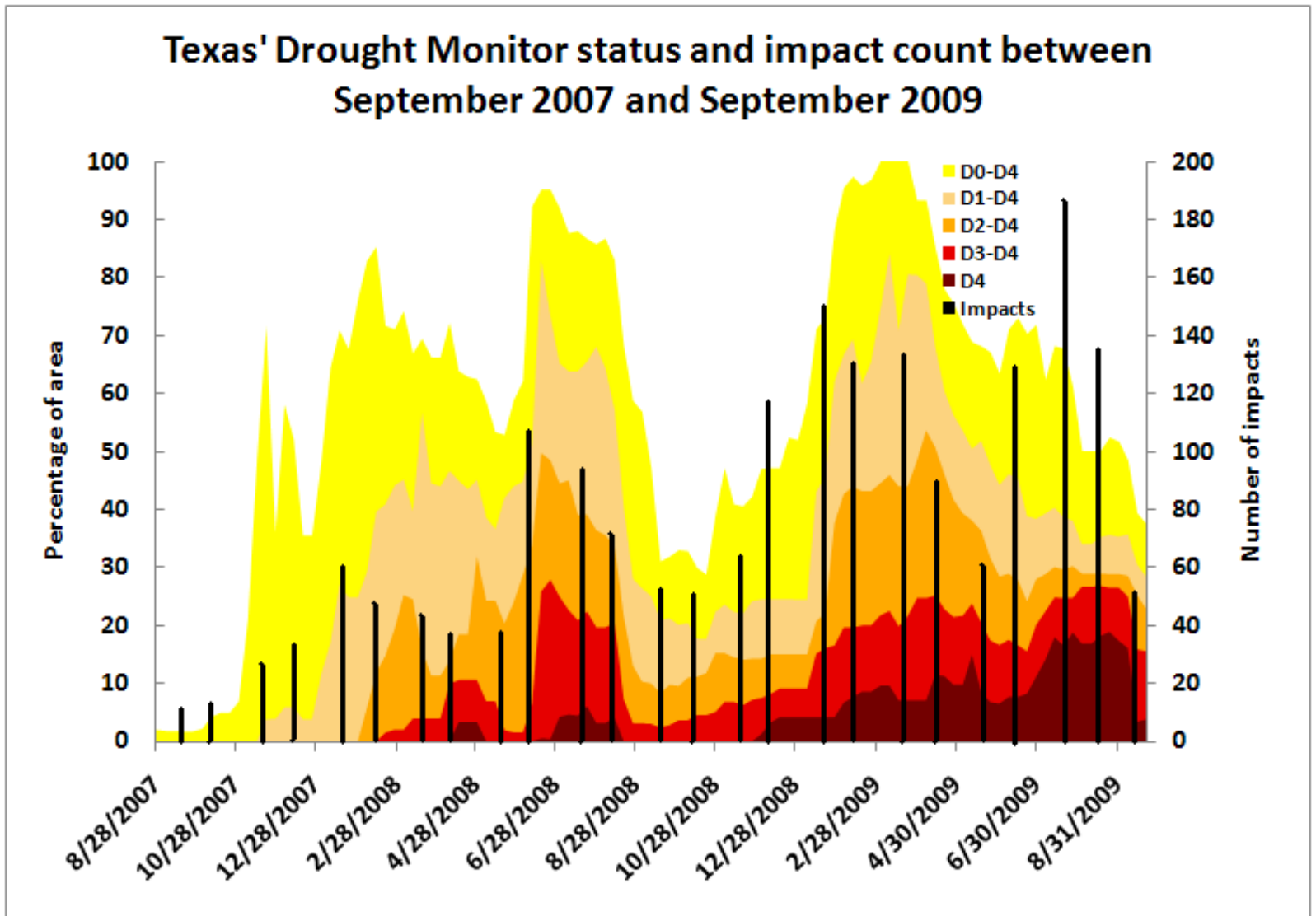
Legend

- No reported impacts
- 1 - 2 reported impacts
- 3 - 4 reported impacts
- 5 reported impacts
- 6 - 7 reported impacts
- 8 - 9 reported impacts

[Zoom To Entire U.S.](#)

Instructions: Click on a county to list the reported drought impacts that affect it.

Drought Status & Impacts, TX









What We've Learned: Refine Categories

Current

Map Options











Impact Categories:

<input checked="" type="checkbox"/>  Agriculture	<input checked="" type="checkbox"/>  Fire
<input checked="" type="checkbox"/>  Water/Energy	<input checked="" type="checkbox"/>  Social
<input checked="" type="checkbox"/>  Environment	<input checked="" type="checkbox"/>  Other

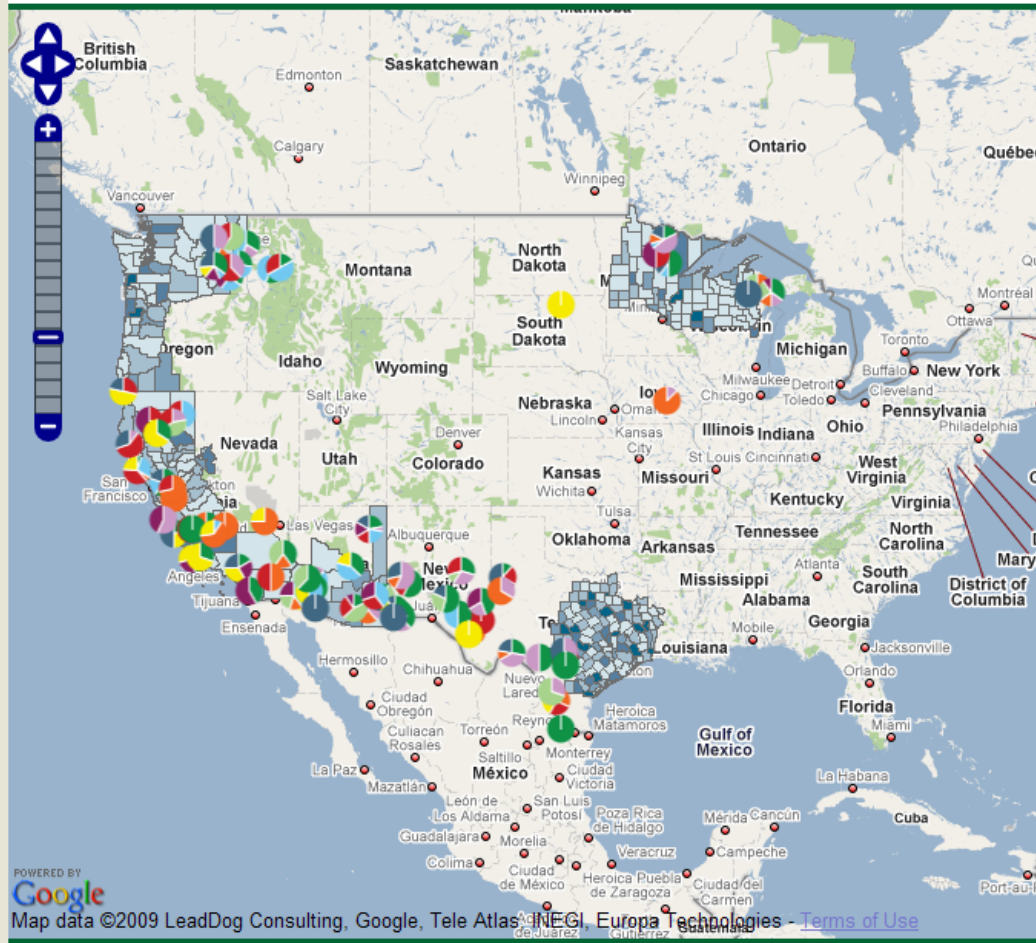
Source:

Time Period:

Planned

- [+] Media Reports
-  Society & Public Health
 -  Agriculture
 -  Disaster Declarations & Aid
 -  Energy
 -  Water Supply & Quality
 -  Wildfire
 -  Plants & Wildlife
 -  Other Business & Industry
 -  Tourism & Recreation
 -  General Awareness

Welcome, Drought Fan!



Impacts

First 1 2 3 4 5 Last

Pecan Crop in Guadalupe County devastated by drought

12/14/2009 • 12/20/2009

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.

Monte Vista Water District in stage two water restrictions

12/20/2009 • 12/30/2009

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.

Geese drawn to Lubbock lakes as area lakes dwindle

12/15/2009 • 12/15/2009

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Vestibulum tortor quam, feugiat vitae, ultricies eget, tempor sit amet, ante. Donec eu libero sit amet quam egestas semper.

Welcome, Drought Fan!

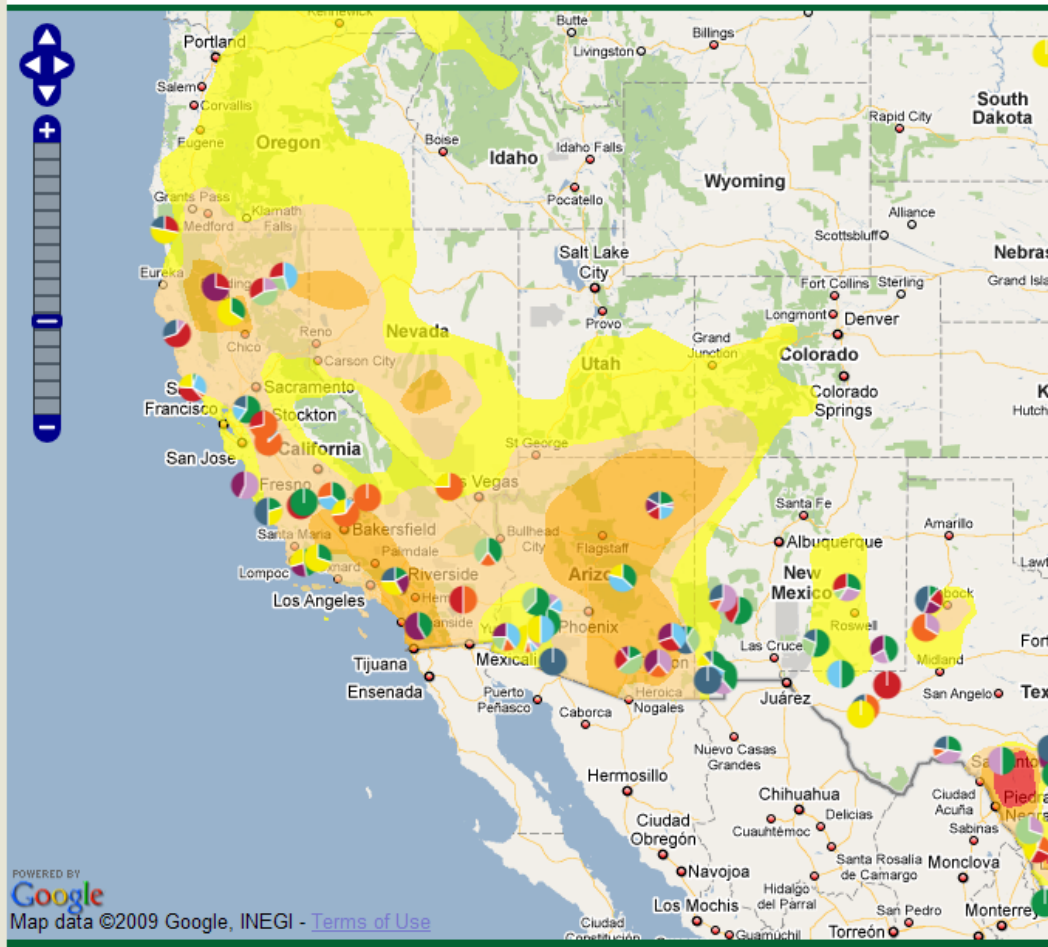


Table of Contents

- Impacts
- Reports
 - Agriculture
 - Business & Industry
 - Relief, Response & Restrictions
 - Energy
 - Fire
 - General Awareness
 - Plants & Wildlife
 - Society & Public Health
 - Tourism & Recreation
 - Water Supply & Quality
- Burn Bans
- Water Restrictions
- CoCoRaHS Reports
- NWS Drought Statements
- Drought Monitor
 - D0 - Abnormally Dry
 - D1 - Moderate Drought
 - D2 - Severe Drought
 - D3 - Extreme Drought

Welcome, Drought Fan!

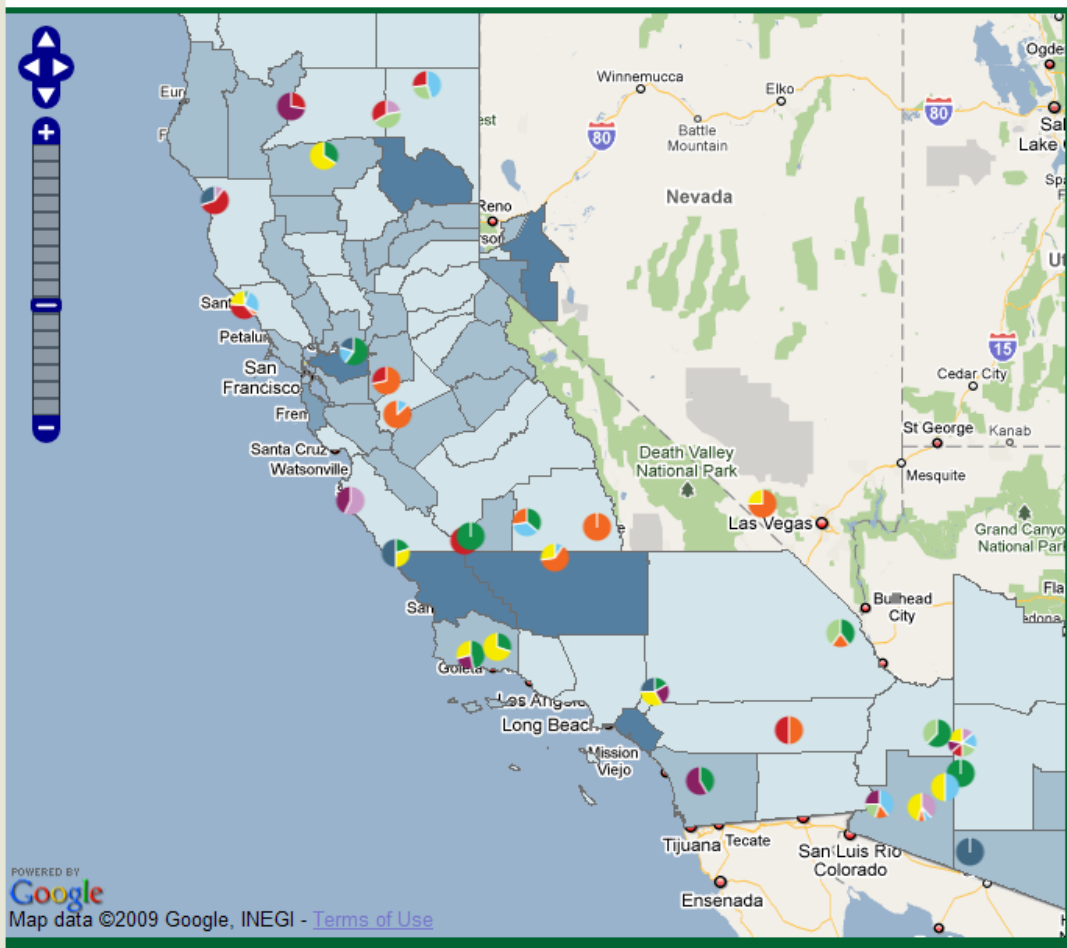


Table of Contents

- Impacts
 - No Impacts
 - 1-5 Impacts
 - 6-10 Impacts
 - 11-20 Impacts
 - 20-50 Impacts
 - 50+ Impacts
- Reports
 - Burn Bans
 - Water Restrictions
 - CoCoRaHS Reports
 - NWS Drought Statements
 - Drought Monitor
 - HUC 2
 - HUC 4
 - HUC 6
 - HUC 8
 - Climate Divisions
 - County Warning Areas

Promoting the “drought impacts reporting” idea to their volunteers

CoCoRaHS
Community Collaboration Rain, Hail & Snow Reporting

National Drought Mitigation Center

COCORAHS & DROUGHT
HOW HAS THE LACK OF RAIN IMPACTED YOU? LET US KNOW

WWW.COCORAHS.ORG

ARE YOUR COWS ONLY GIVING POWDERED MILK? YOUR FAVORITE FISHING HOLE GONE?
LET US KNOW HOW DROUGHT HAS AFFECTED YOU ... YOUR COMMENTS ARE VERY IMPORTANT!

* **14,000+ volunteers covering all 50 states!!**

* **CoCoRaHS “Message of the Day”**

* **Monthly e-mail reminders**


* **Emphasis in training sessions**

* **Banners on the Web site**

Courtesy: Henry Reges, Colorado State University

CoCoRaHS drought impact reports



Drought Impact Reporter
National Drought Mitigation Center 

[View Drought Impacts](#) | [Add A Drought Impact](#) | [Time-Lapse Animation](#) | [About](#) | [Help](#) | [User Login](#)

Map Options

Impact Categories:

Agriculture Fire

Water/Energy Social

Environment Other

Source: All Sources

Time Period: Last Month

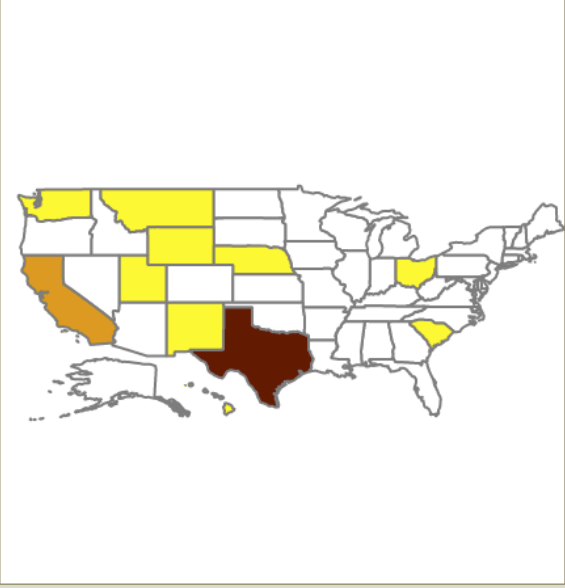
Submit

Show Drought Monitor Layers

Legend

	No reported impacts
	1 - 19 reported impacts
	20 - 37 reported impacts
	38 - 56 reported impacts
	57 - 74 reported impacts
	75 - 93 reported impacts

Instructions: Click on a state to see the reported drought impacts that affect that state.



Courtesy: Henry Reges, Colorado State University

Enhancing the Advanced Hydrologic Prediction Service:

**A Program to Develop A Low-Flow/Stage Database
for Selected NWS Forecast Points in
the Upper Colorado River Basin**

Mark Svoboda, Climatologist, Monitoring Program Area Leader, NDMC

Dr. Donna L. Woudenberg, Drought Management Specialist, NDMC

Dr. Cody L. Knutson, Water Resources Scientist, NDMC

Doug Kluck, NOAA-NWS CRHQ



Development of a low flow/stage impacts database for AHPS forecast points

Objective 1: Identify low flow/stage related impacts near NWS forecast points

Objective 2: Use impact information to establish low flow/stage warning triggers (drought stages)

Objective 3: Develop low flow/stage river forecasts

Incorporate data into the NWS National Hydrologic Database and the AHPS system



Low-flow / Drought Impacts

■ Economic

- Costs and losses to agricultural and livestock producers
- Loss from timber production
- Loss from fishery production
- Loss to recreation and tourism industry
- Energy-related effects
- Water Suppliers
- Transportation Industry / navigation
- Decline in food production/disrupted food supply

■ Environmental

- Damage to animal species
- Hydrological effects
- Damage to plant communities
- Increased number and severity of fires
- Wind and water erosion of soils, reduced soil quality
- Air quality effects (e.g., dust, pollutants)
- Visual and landscape quality (e.g., dust, vegetative cover, etc.)



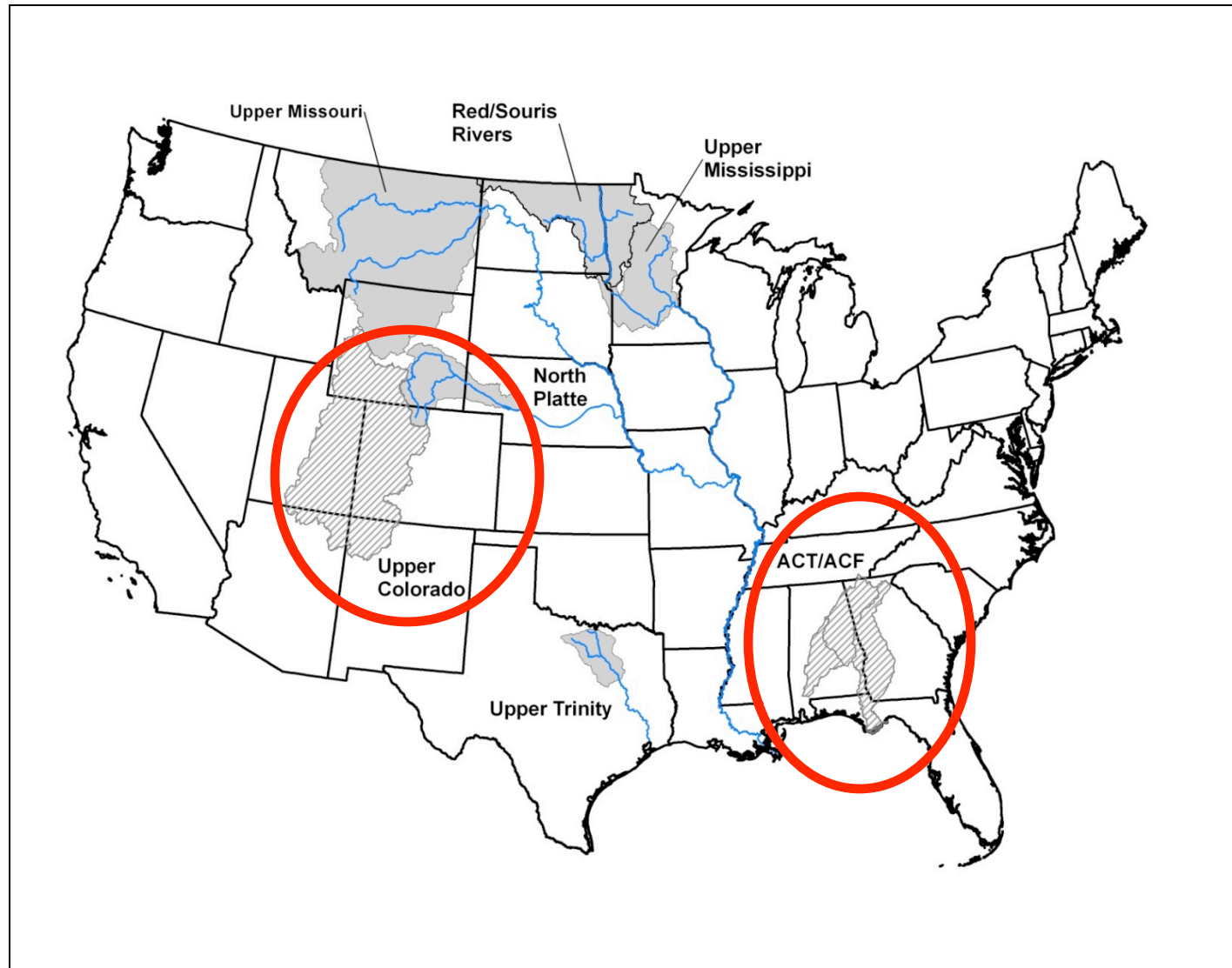
Low-flow / Drought Impacts

■ Social

- Health
- Increased conflicts (“water wars”)
- Reduced quality of life, changes in lifestyle
- Disruption of cultural belief systems (e.g., religious and scientific views of natural hazards)
- Reevaluation of social values (e.g., priorities, needs, rights)
- Public dissatisfaction with government drought response
- Perceptions of inequity in relief, possibly related to socioeconomic status, ethnicity, age, gender, seniority
- Loss of cultural sites
- Increased data/information needs, coordination of dissemination activities
- Recognition of institutional restraints on water use

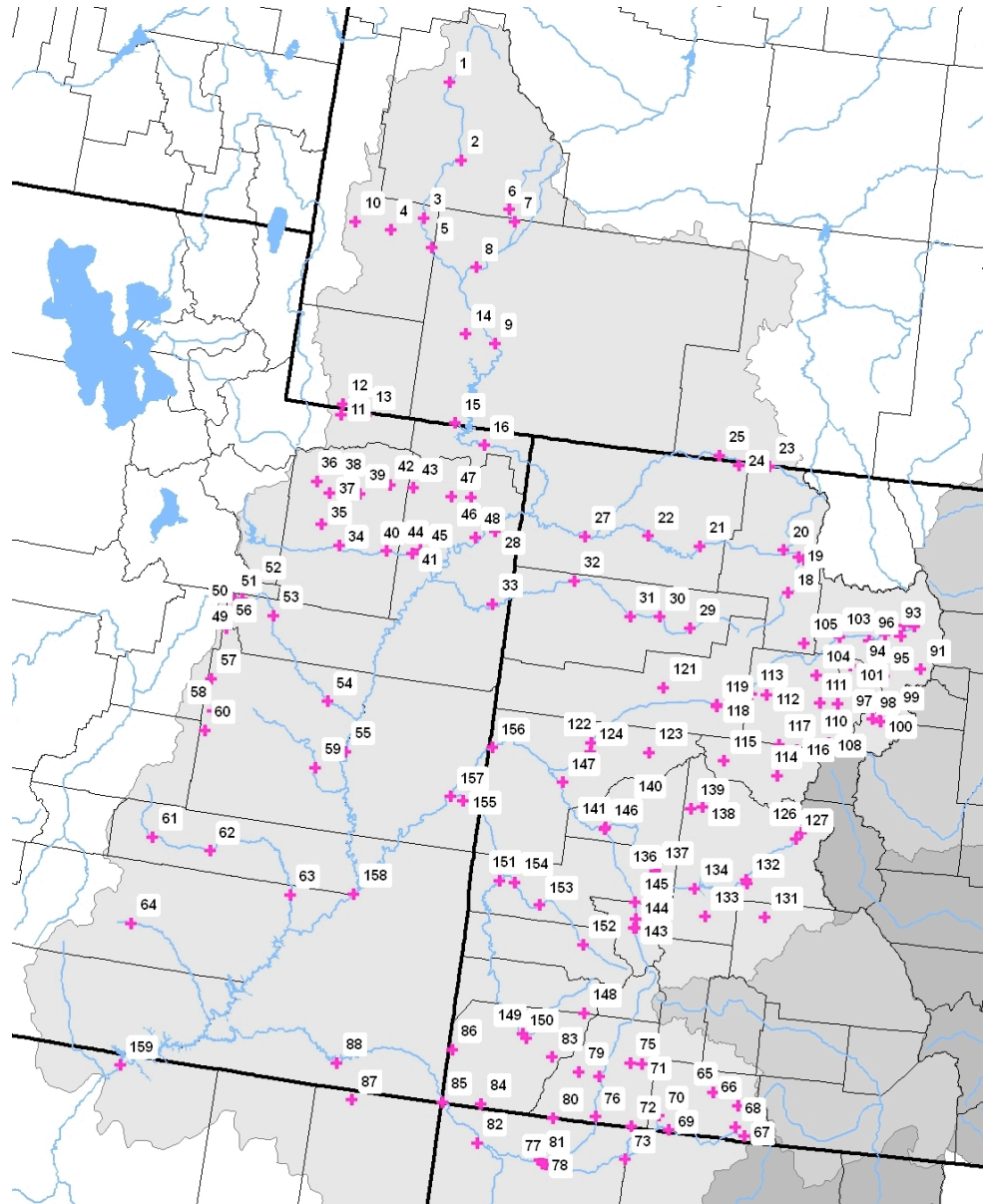
NWS-NIDIS Low-flow Projects

2009-2010: Upper Colorado (164) & ACT-ACF (58)



2008-2010 Upper Colorado River Low-Flow Project

Identify potential low flow/stage impacts near 164 forecast



Low-Flow Related Impacts in the Upper Colorado River Basin

National Weather Service / National Drought Mitigation Center

Station ID: **14 – SLRW4 (Smiths Fork at Stateline Reservoir, WY)**

Flow (cfs)	Stage (ft)	Impacts	Timing/Other Considerations	Submitted by
	9163.2	Top of Active Conservation for Stateline Dam		Source – U.S. Bureau of Reclamation – Data web http://www.usbr.gov/dataweb/dams/ut82904.htm
	9096.5	Top of Inactive Conservation for Stateline Dam		Source – U.S. Bureau of Reclamation – Data web http://www.usbr.gov/dataweb/dams/ut82904.htm
	9062	Top of Dead Storage for Stateline Dam		Source – U.S. Bureau of Reclamation – Data web http://www.usbr.gov/dataweb/dams/ut82904.htm
2.2 -2.8 cfs		Advise water restrictions for residents in the town of Valley. Only allowed to water trees and shrubs, and watering only to be performed every other day.		Rocky Irick – Bridger Valley Joint Powers Board (personal communication)
2.6 – 2.8 cfs		Restrict farmer’s use of irrigation water to maintain adequate water supply for residents of . Water diversion from Smiths Fork to Blacks Fork for longer period than normal.	** is in the process of changing water rights so this may not be a problem in the future**	Rocky Irick – Bridger Valley Joint Powers Board (personal communication)
7.0 cfs		Instream flow recommendation for a 4.6 mile stretch of the East Fork of Smith’s Fork Creek (below Stateline Dam)	**Application on file, but permit not yet granted.	Source – Green River Basin Water Planning Process (Final Report, 2001) – Technical Memoranda (Instream Flows in Wyoming), prepared for Wyoming Water Development Commission Basin Planning Program

Photos, Maps, Flood Stages, and Historical Data: How about low flows?

Flood Categories (in feet)

Major Flood Stage:	16
Moderate Flood Stage:	15
Flood Stage:	13
Action Stage:	10

Historical Crests

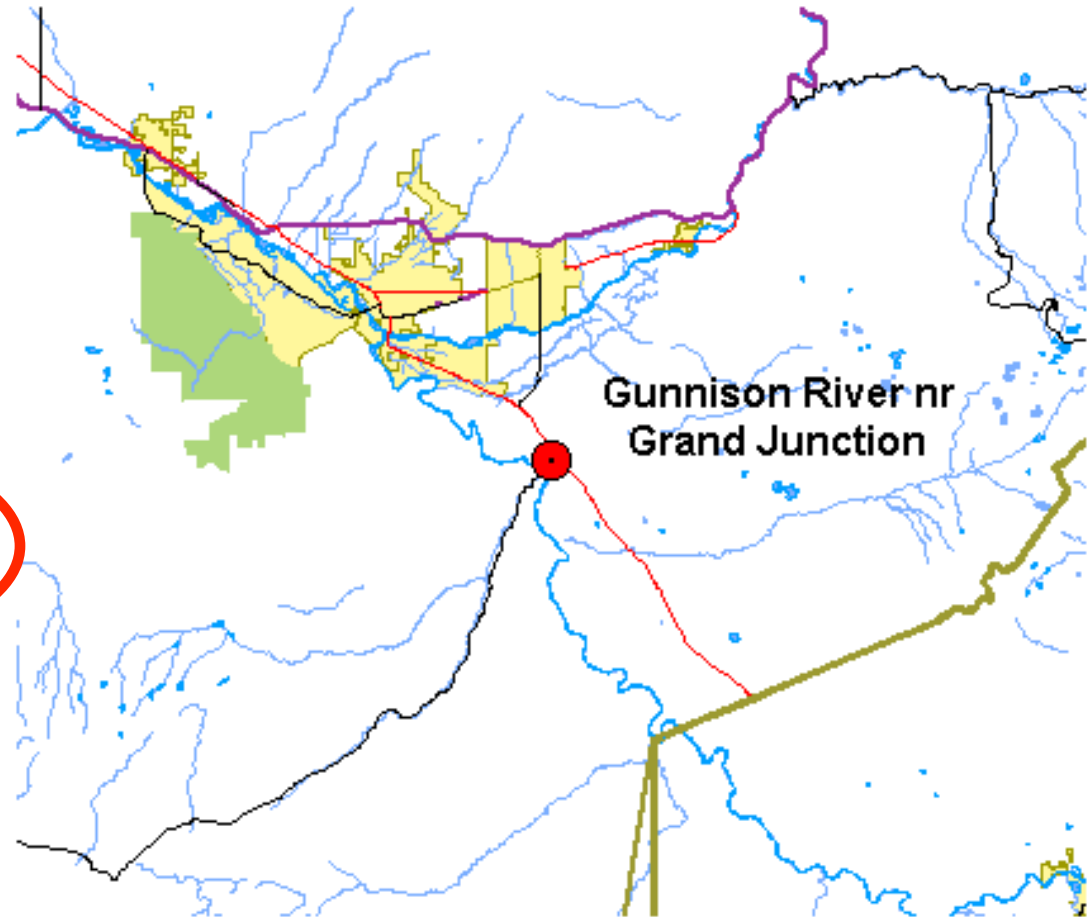
- (1) 19.00 ft on 05/23/1920
- (2) 17.40 ft on 06/15/1921
- (3) 17.10 ft on 06/09/1905

[Show More Historical Crests](#)

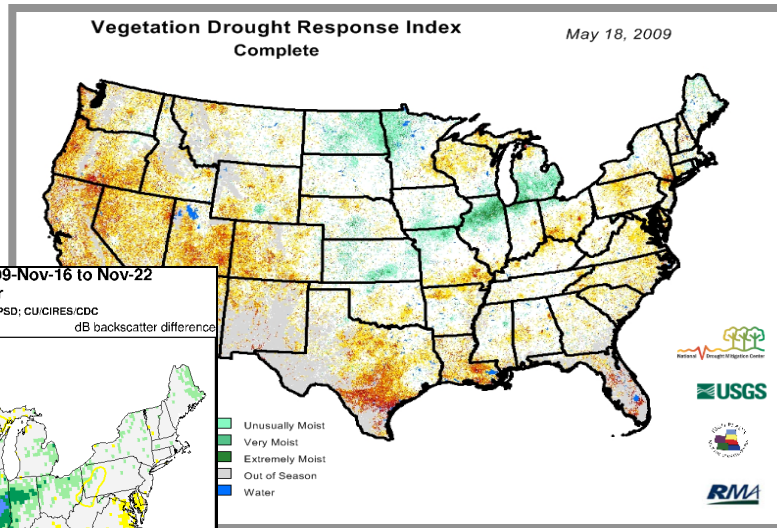
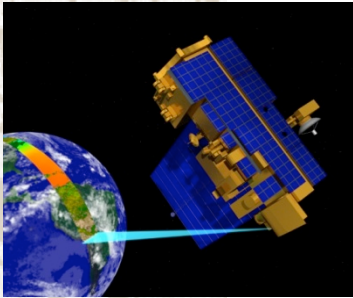
Low Water Records

- (1) 1.5 ft on 07/20/1934

[Show More Low Water Records](#)

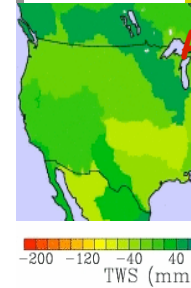


NDMC's GIScience Program Area

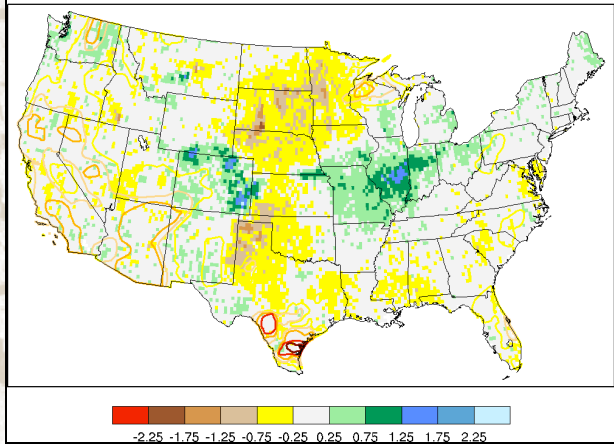


GRACE Observed TWS

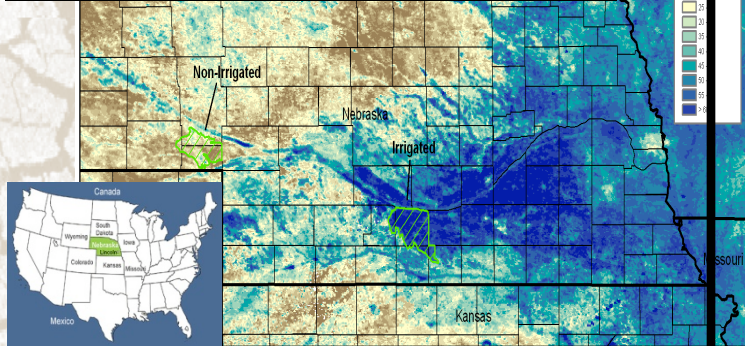
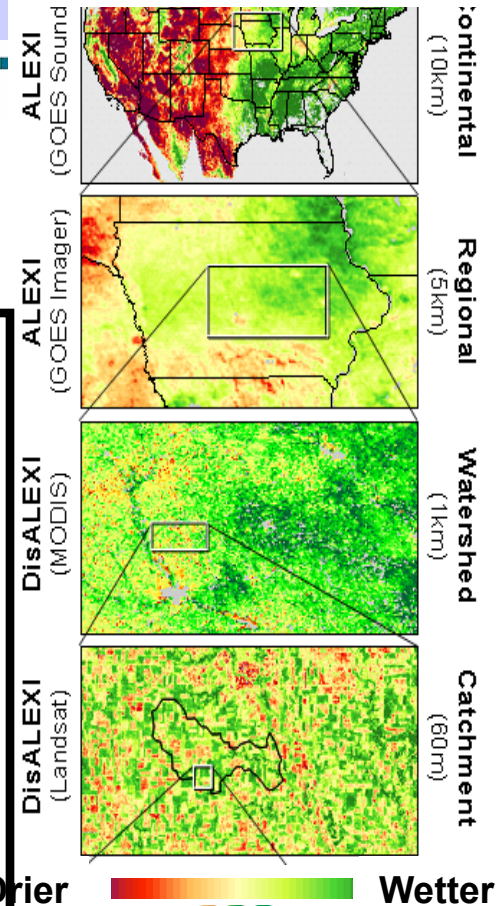
GRACE + LDAS Modeled TWS



Soil Moisture Change, 7 Day Average, 2009-Nov-16 to Nov-22 & 2009-Nov-17 Drought Monitor
 Experimental Product by NASA/JPL; CalTech; NOAA/ESRL/PSD; CU/CIRES/CDC
 From QuikSCAT satellite active radar



Evaporative Stress Index (ESI)

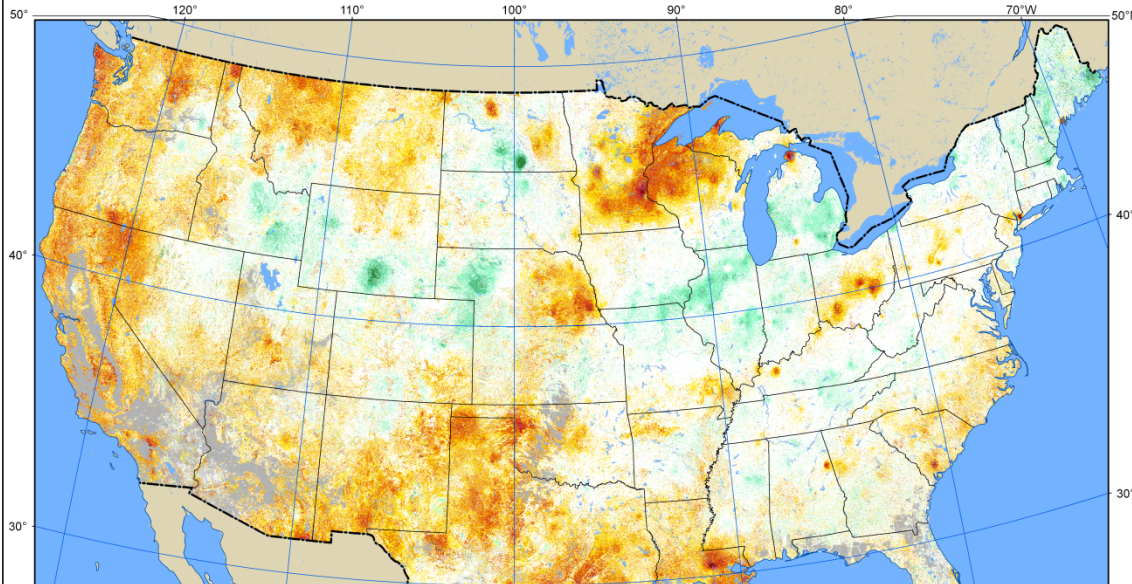


- * Remote Sensing
- * GIS
- * Partnerships (USGS-EROS, NASA-JPL, GSFC, USDA-ARS, NOAA)

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Nebraska
 Lincoln



Vegetation Drought Response Index (VegDRI) July 19th, 2009



Vegetation Condition

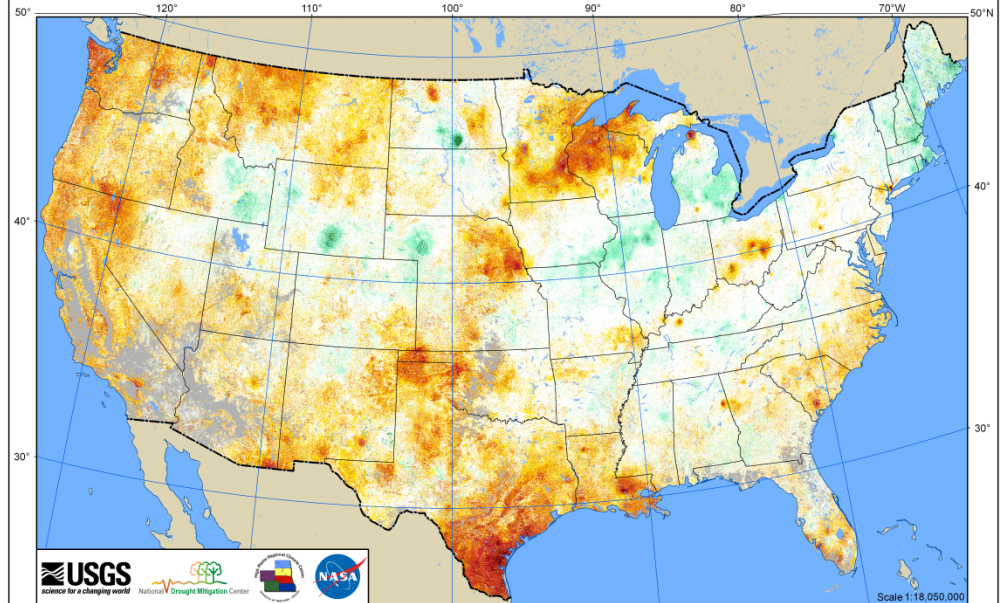
- | | | |
|------------------|-----------------|---------------|
| Extreme Drought | Near Normal | Out Of Season |
| Severe Drought | Unusually Moist | Water |
| Moderate Drought | Very Moist | |
| Pre-Drought | Extremely Moist | |

Data Source: eMODIS

Period: July 13 -

<http://gisdata.usgs.net/website/Droug>

Vegetation Drought Response Index (VegDRI) July 26th, 2009



Vegetation Condition

- | | | |
|------------------|-----------------|---------------|
| Extreme Drought | Near Normal | Out Of Season |
| Severe Drought | Unusually Moist | Water |
| Moderate Drought | Very Moist | |
| Pre-Drought | Extremely Moist | |

Data Source: eMODIS 7 Day Composite

Period: July 20 - July 26 (Week30)

http://gisdata.usgs.net/website/Drought_Monitoring/viewer.php

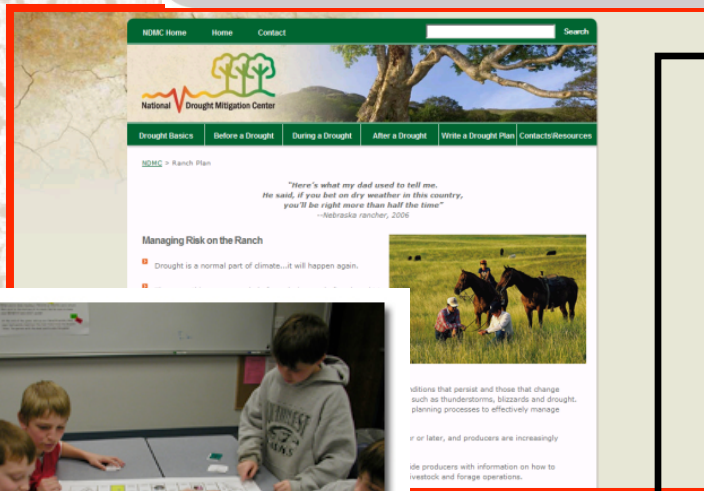
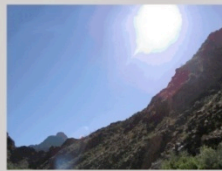


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Lincoln

NDMC's Planning and Social Science Program Area



How to Reduce Drought Risk



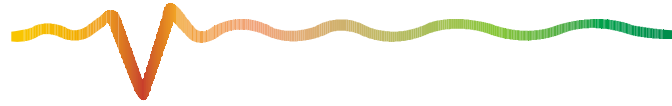
ditions that persist and those that change such as thunderstorms, blizzards and drought, planning processes to effectively manage or later, and producers are increasingly ide producers with information on how to livestock and forage operations.



- *Guides**
- *Plans**
- *Impacts**
- *Strategies**
- *Education**
- *Stakeholders**



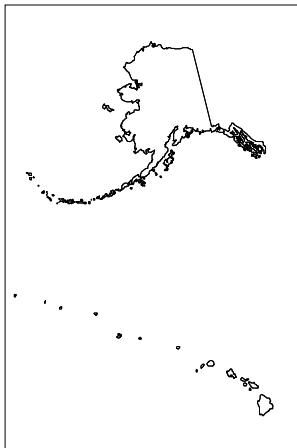
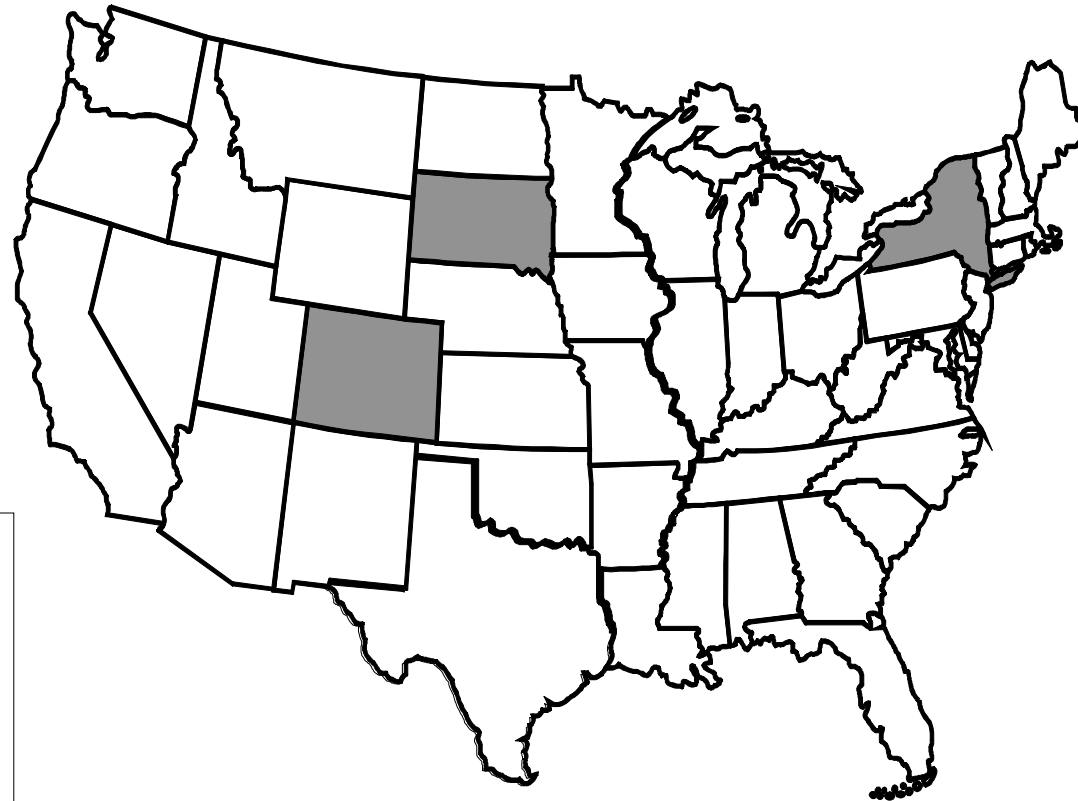
Drought Planning Progress



- Federal level
- State level
- Tribal
- Local level
 - Municipalities (*NOAA-SARP “Drought Ready Communities”*: drought planning kit and certification based on community/stakeholder input)
 - River Basins
 - Counties
 - Producers

Status of State Drought Planning

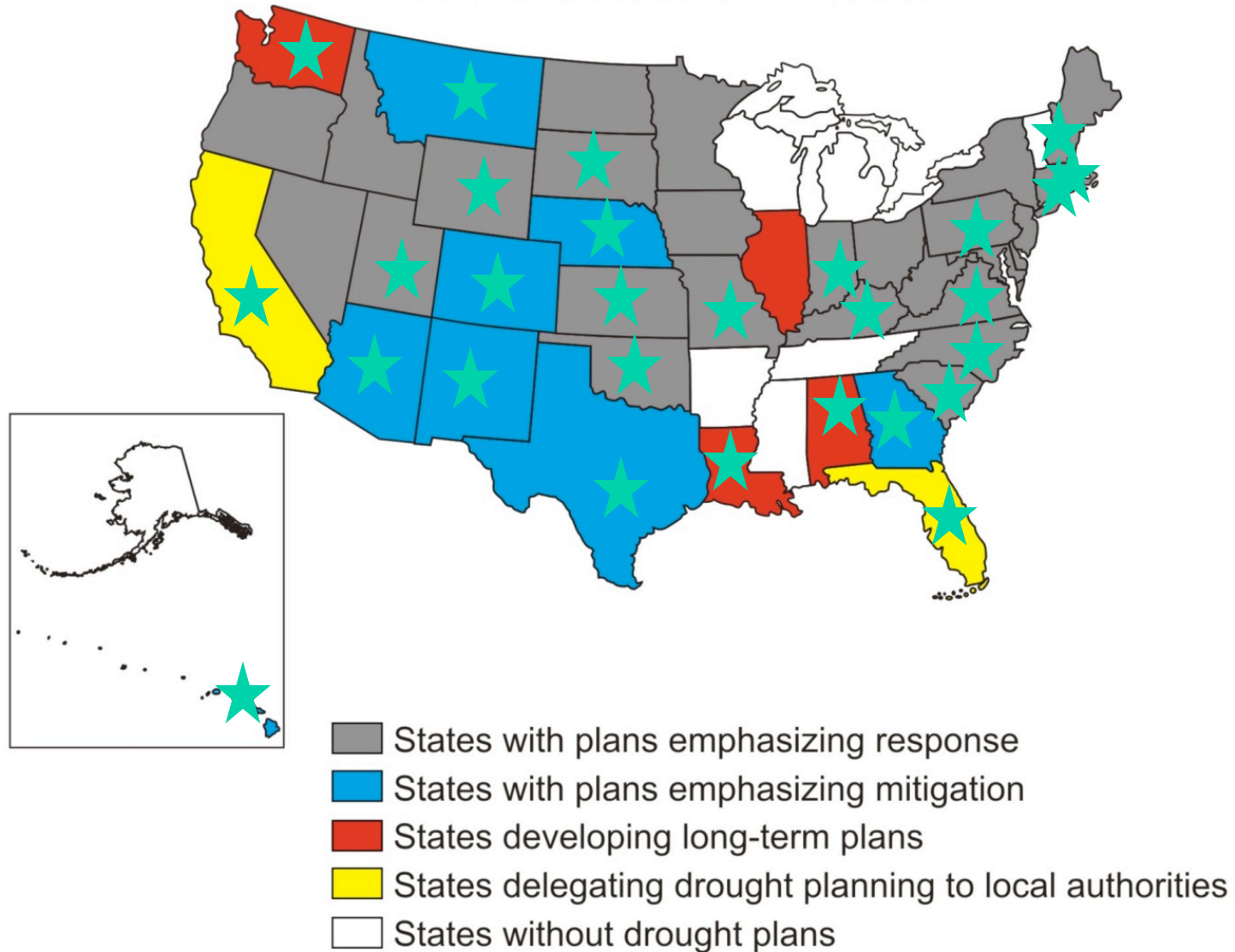
1982



States with plans

States without drought plans

Status of Drought Planning December 2009





Developing “Drought Ready Communities”

*NOAA-SARP Program: Drought in Support of the NIDIS
Award Number: NA08OAR4310696*

**Mark Svoboda (Lead P.I.), Kelly Smith, Cody Knutson, Melissa
Widhalm, Donna Woudenberg, and Tonya Bernadt
National Drought Mitigation Center, University of Nebraska-Lincoln**

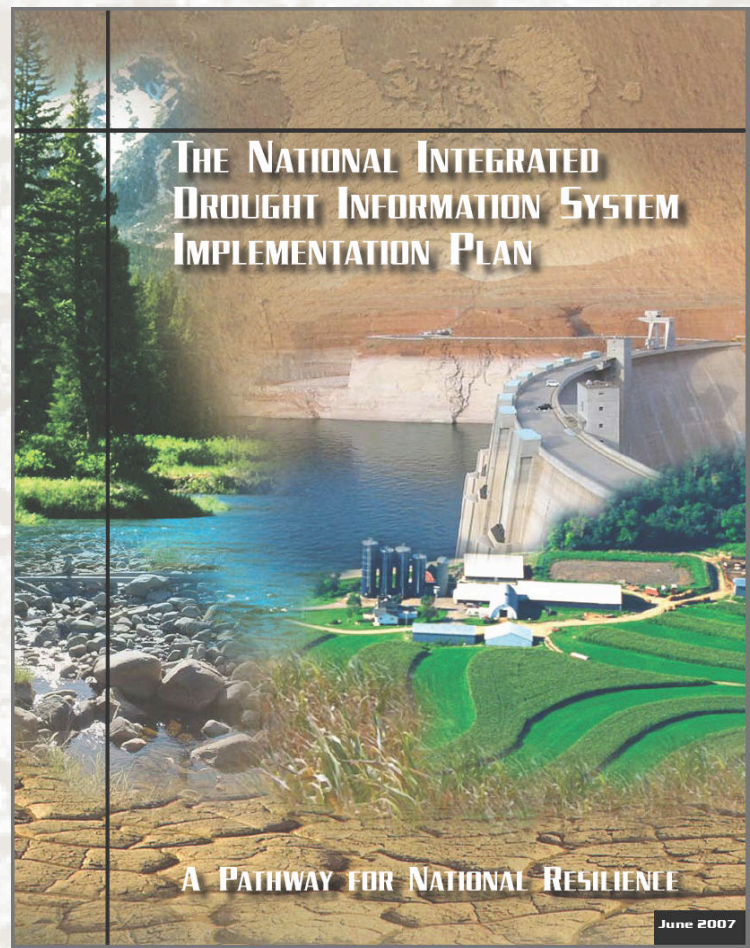
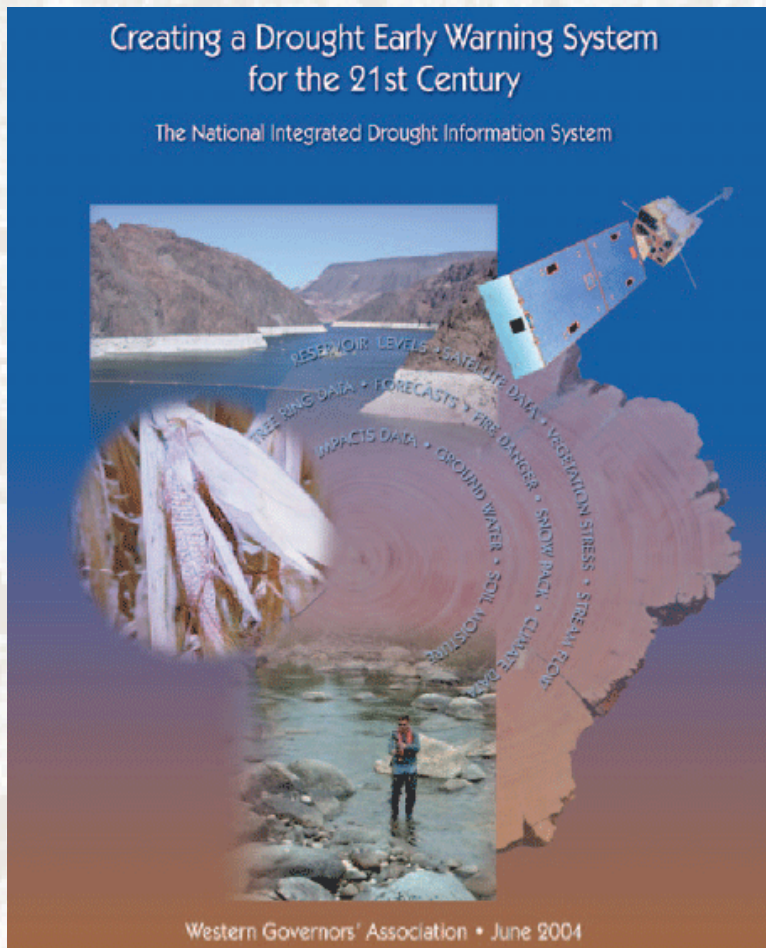
**Lower Platte River Corridor Alliance (Meghan Sittler)
University of Illinois (Jim Angel and Michael Spinar)
University of Oklahoma (Mark Shafer, Renee McPherson, and
Heather Lazarus)**

DRC Project Overview

- “Developing a ***community-driven process*** in integrating ***place-based planning*** to reduce vulnerability to drought”
- Develop a ***“drought resources kit”*** of educational, public awareness, climatological, planning and mitigation resources ***incorporating community feedback***
- Define what a community needs to do to be certified as ***“Drought Ready”***
- Wrap-up community workshops ***Spring 2010***

DRC Project Partners

- Nebraska City, NE (~7,000)
- Decatur, IL (~82,500)
- Ada, OK (~16,000)
- Cordell, OK (~3,000)
- Norman, OK (~100,000+)
- **University of Illinois**
- **University of Oklahoma**
- **University of Nebraska**



and then along comes . . .

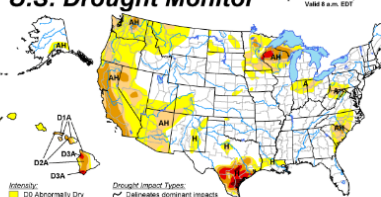
NIDIS

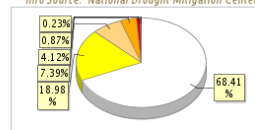
file edit view history bookmarks tools help
 http://www.drought.gov/portal/server.pt/community/drought.gov/202;jsessionid=0BF689545CA044F050F1C519203FC68D
 Most Visited Getting Started Latest Headlines
 Drought Monitor Forum 2009 Agen... drought.gov
NIDIS National Integrated Drought Information System
U.S. Drought Portal www.drought.gov
 Contact Us | Log In | Search: _____
 HOME WHAT IS NIDIS? CURRENT DROUGHT FORECASTING IMPACTS PLANNING EDUCATION RESEARCH RECOVERY

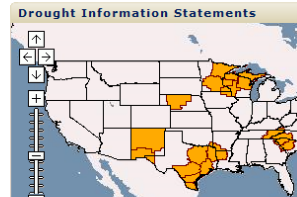
Area Drought Information
 Select State... Go updated!
 Select Region... Go

Maps & Tools
 Map Viewer
 GIS Resources
 Geodata Portal
 Drought Monitor Graphics - new!
 Data Visualizations - new!

Events & Announcements
 Southeast Pilot Planning Meeting - July 2009
 Climate, Drought and Early Warning on Western Native Lands - June 2009
 Climate Reference Network Soil Moisture Meeting - March 2009
 Monitoring Gaps Assessment Workshop - December 2008
 Wildfire: National Seasonal Assessment Workshop - February 2009
 National Hydrologic Warning Council - May 2009

Featured Products
 Where are Drought Conditions Now? How is the Drought Affecting Me? Will the Drought Continue?
U.S. Drought Monitor September 29, 2009

 Drought Impact Topics: D0 - Abnormally Dry, D1 - Drought - Moderate, D2 - Drought - Severe, D3 - Drought - Extreme, D4 - Drought - Catastrophic. Databases dominant impacts: A - Agricultural (crops, pastures, grasslands), H - Hydrological (water).
 Released Thursday, October 1, 2009
 Author: David M. Brown, JAW@CRN004
 http://drought.unl.edu/dm

Drought Conditions
 % Area for U.S., including AK, HI & PR (As of 9.29.2009)
 Info Source: National Drought Mitigation Center

 Drought Classifications | View Time

Drought Information Statements


NIDIS Feature
 NIDIS Fall 2009 Newsletter - A Pathway for National Resilience

National Integrated Drought Information System - NIDIS

A Pathway for National Resilience

Fall 2009

Volume 1 Issue 1

Upper Colorado River Basin Pilot

The first NIDIS drought early warning and information system pilot was successfully launched during October 2008 with a meeting of stakeholders in Boulder, CO. In this newsletter, find these related articles...



Upper Colorado River Basin Scoping Workshop

1-2 October, 2008, NOAA David Skaggs Research Center, Boulder, CO.....2

Colorado State Climatologist is Key to the Success of the UCRB Pilot.....2

NCAR Scientists Working on Analysis of Water Demand in the Upper Colorado River Basin.....3

Monitoring Gaps Assessment Workshop

10 December, 2008, NOAA David Skaggs Research Center, Boulder, CO.....3

Drought Index Planning Workshop

18-19 August, 2009, NOAA David Skaggs Research Center, Boulder, CO.....3

Welcome!

Welcome to the first edition of the NIDIS Newsletter. A lot has happened in the past year, and we want to update the drought risk management and water resources communities on NIDIS activities. In our newsletter you will find information about the various NIDIS meetings that have been held in the past year, along with the key outcomes from each meeting. We will also highlight early warning information system pilot and research activities.

Also in this issue...

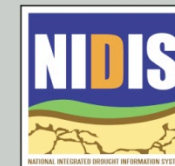
Southeast United States Drought Early Warning Information System Planning Meeting
 21-22 July, 2009, University of North Carolina - Chapel Hill.....4

Climate Reference Network Soil Moisture Workshop
 3-5 March, 2009, NOAA/Air Resources Laboratory, Oak Ridge, TN.....5

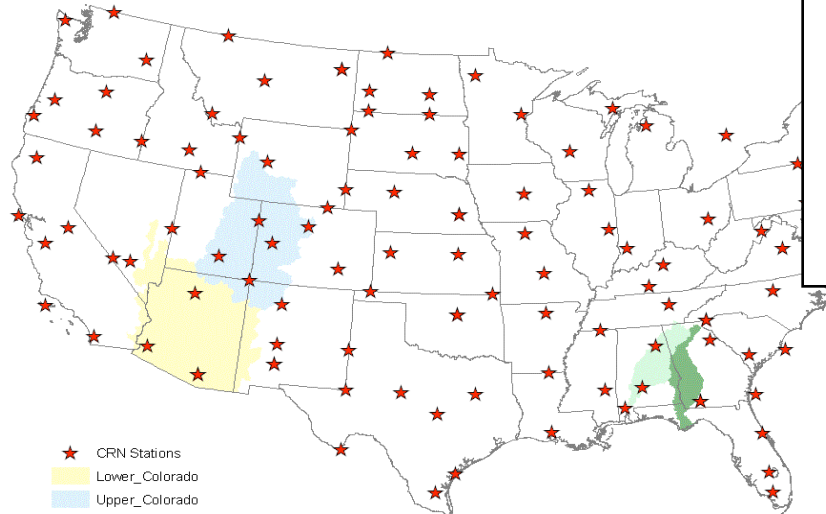
Research Papers of Note.....5

US Drought Portal Upgrades.....6

Climate Change, Drought and Early Warning on Western Native Lands
 9-11 June, 2009, Jackson Lodge, Grand Teton National Park, WY.....7

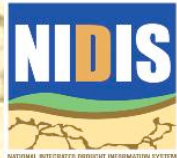


NIDIS Pilot Regions And CRN Stations



- ★ CRN Stations
- Lower_Colorado
- Upper_Colorado
- ACF
- ACT

Courtesy: NIDIS

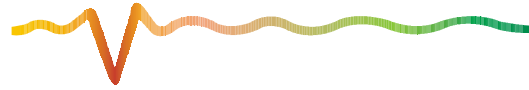


Challenges

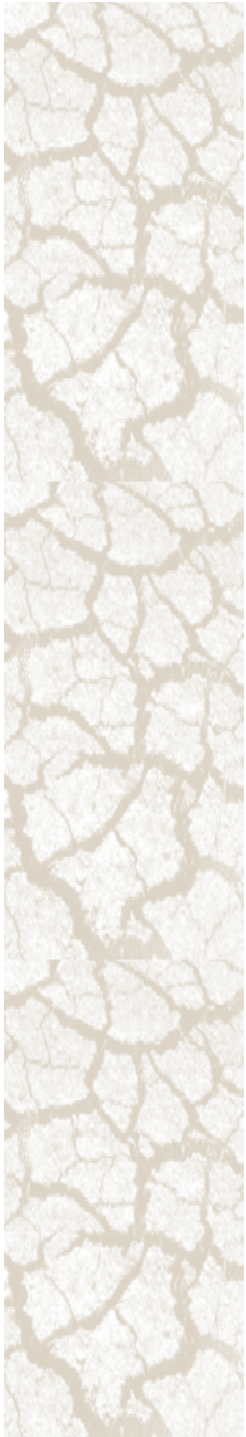


- Information technology advances
 - Future resources
- New ways to interact with decision-makers
 - Stakeholder “burnout”
- Convince decision-makers that their mitigation/adaptation actions will reduce impacts
 - Quantify impacts and benefits

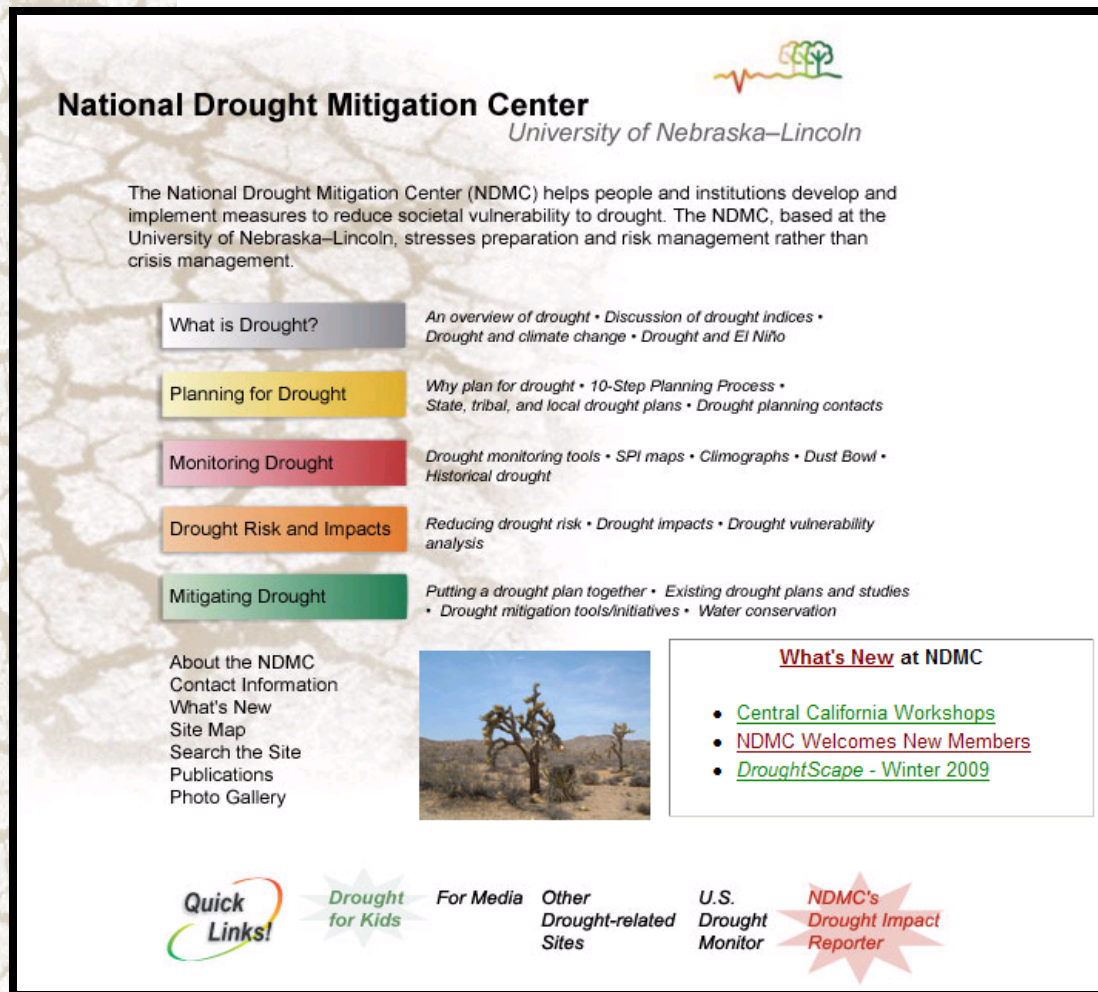
Summary



- Scale (flexible and relevant to the needs of our stakeholders)
- Tools and Technology (keep pace with scale issue)
- Impacts (establish a baseline)
- Citizen Science
 - Planning, Mitigation, and Adaptation



Please visit the NDMC website for more information: <http://www.drought.unl.edu>




National Drought Mitigation Center
University of Nebraska–Lincoln

The National Drought Mitigation Center (NDMC) helps people and institutions develop and implement measures to reduce societal vulnerability to drought. The NDMC, based at the University of Nebraska–Lincoln, stresses preparation and risk management rather than crisis management.

- What is Drought?** *An overview of drought • Discussion of drought indices • Drought and climate change • Drought and El Niño*
- Planning for Drought** *Why plan for drought • 10-Step Planning Process • State, tribal, and local drought plans • Drought planning contacts*
- Monitoring Drought** *Drought monitoring tools • SPI maps • Climographs • Dust Bowl • Historical drought*
- Drought Risk and Impacts** *Reducing drought risk • Drought impacts • Drought vulnerability analysis*
- Mitigating Drought** *Putting a drought plan together • Existing drought plans and studies • Drought mitigation tools/initiatives • Water conservation*

About the NDMC
Contact Information
What's New
Site Map
Search the Site
Publications
Photo Gallery



What's New at NDMC

- [Central California Workshops](#)
- [NDMC Welcomes New Members](#)
- [DroughtScope - Winter 2009](#)

Quick Links! **Drought for Kids** **For Media** **Other Drought-related Sites** **U.S. Drought Monitor** **NDMC's Drought Impact Reporter**

Thanks!

Contact me at:
Mark Svoboda
402-472-8238
msvoboda2@unl.edu