



Ten Years of the Drought Monitor: A Look Back and a Look Forward

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Monitoring Program Area Leader
National Drought Mitigation Center
University of Nebraska-Lincoln**

Drought Monitor Forum, Austin, TX October 7-8, 2009

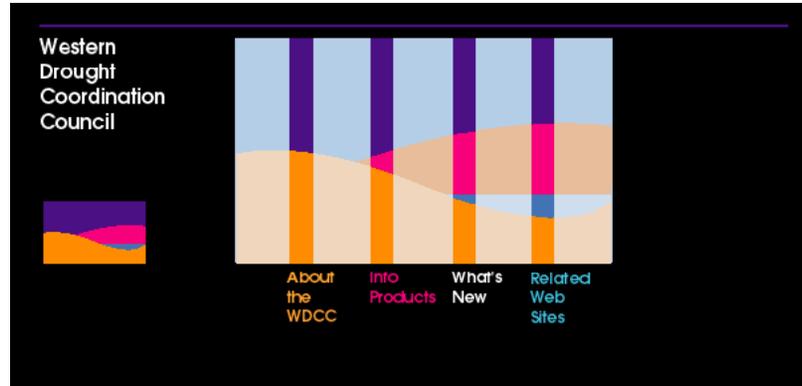


Western Climate and Water Status

October 1997: Quarterly Report

1. [Executive Summary](#)
2. [Climate Conditions](#)
3. [Streamflow and storage](#)
4. [Description of principal impacts](#)
5. [Noteworthy events: El Niño](#)
6. [The Future](#)

Western Drought Coordination Council



1. Executive Summary

Recent Past and Present

- No serious widespread drought problems were noted anywhere in the region. In most places moisture excess is more likely to be a problem than moisture deficit. In the West, such situations seldom last for long.
- Developing dryness was noted in September in eastern Montana and western North Dakota and in central Texas.
- Developing wet areas occurred in September in the western Pacific Northwest, and in the Southwest and much of the Lower Colorado Basin.
- Some areas in the northern Rockies continued to receive abundant precipitation through most of the summer, following a very wet winter. As a result, precipitation-based indices there are at high levels.
- The Missouri River has carried more water this year than any other year on record.
- The western fire season was much less active than in recent years, except in Alaska where large acreages burned.
- The southwest monsoon began considerably later than usual, proceeded at an "average" rate thereafter, and continued through September.
- Five major hurricanes have occurred in the eastern Pacific, including the two most powerful ever recorded in that region. A sixth was in progress.
- Several tropical systems have affected the various portions of the western states, either directly or through moisture feeds, not atypical for El Niño.

*1997:
WDCC
MAP
WCWS*

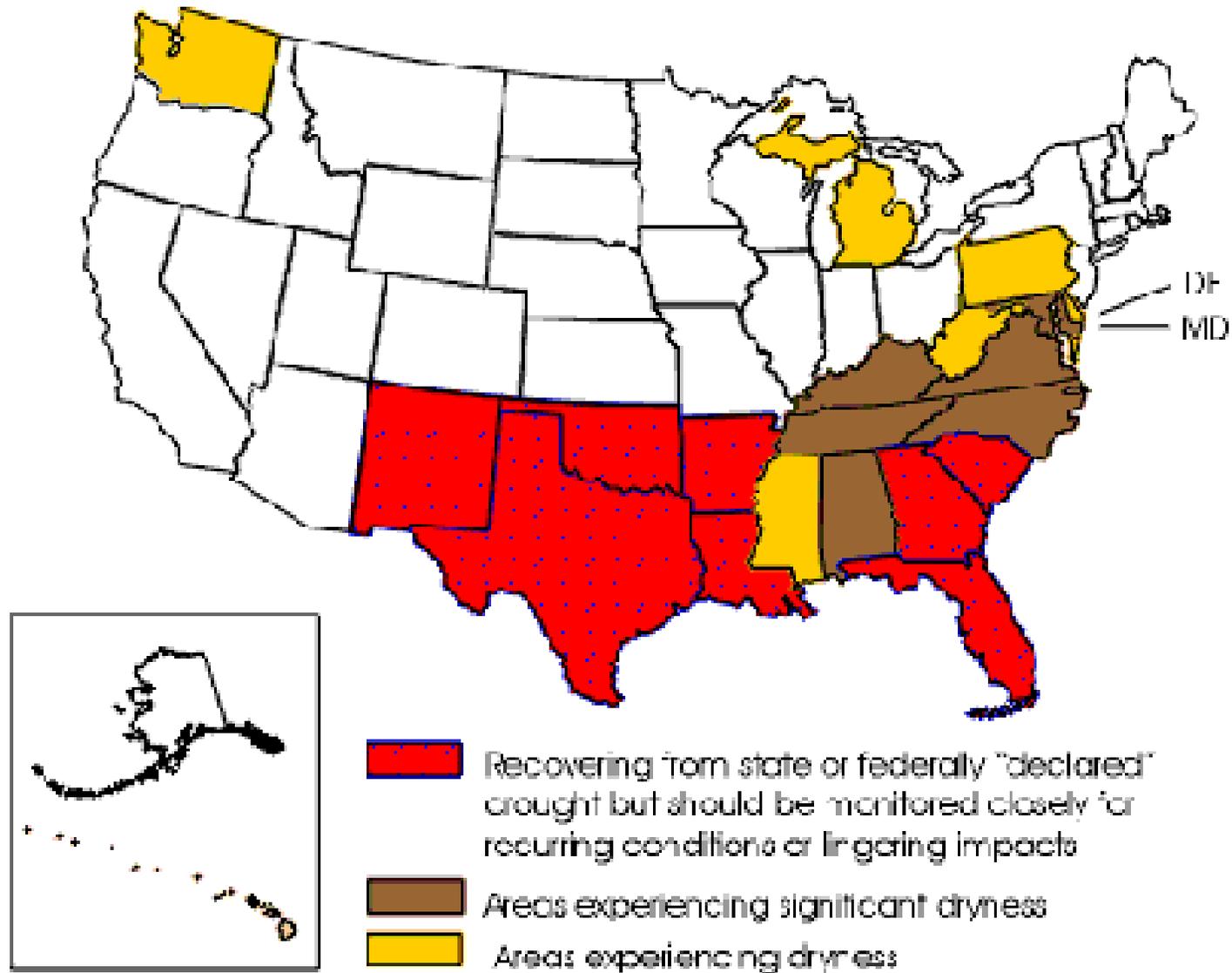
Evolution.....

*1998:
NDMC Drought
Monitoring product*



- Recovering from "declared" drought but should be monitored closely for recurring conditions or lingering impacts
- Experiencing state or federally "declared" drought
- Areas experiencing significant dryness
- Areas experiencing dryness

U.S. Drought Impact Map: circa October 1998

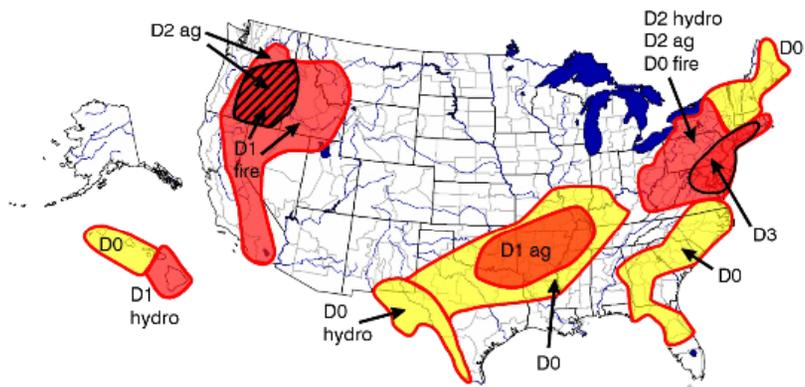


1999: The U.S. Drought Monitor

Since 1999, NOAA (CPC and NCDC), USDA, and the NDMC have produced a weekly composite drought map -- the U.S. Drought Monitor -- with input from numerous federal and non-federal agencies

August 3, 1999

Experimental U.S. Drought Monitor U.S. Drought Monitor April 16, 2002
Valid 8 a.m. EDT



"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.

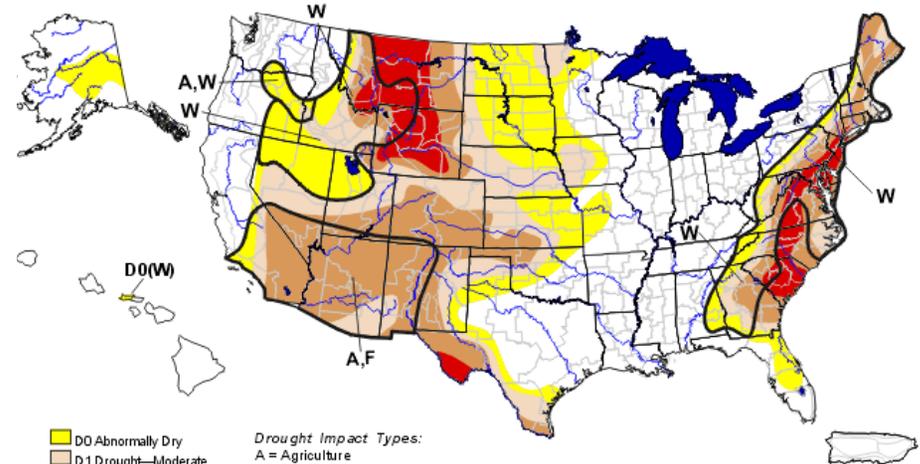
Yellow (D0) = Drought Watch Area (abnormally dry but not full drought status)

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

Crosshatching () = 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



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

Drought Impact Types:
 A = Agriculture
 W = Water (Hydrological)
 F = Fire danger (Wildfires)
 — Delineates dominant impacts
 (No type = All 3 impacts)

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

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

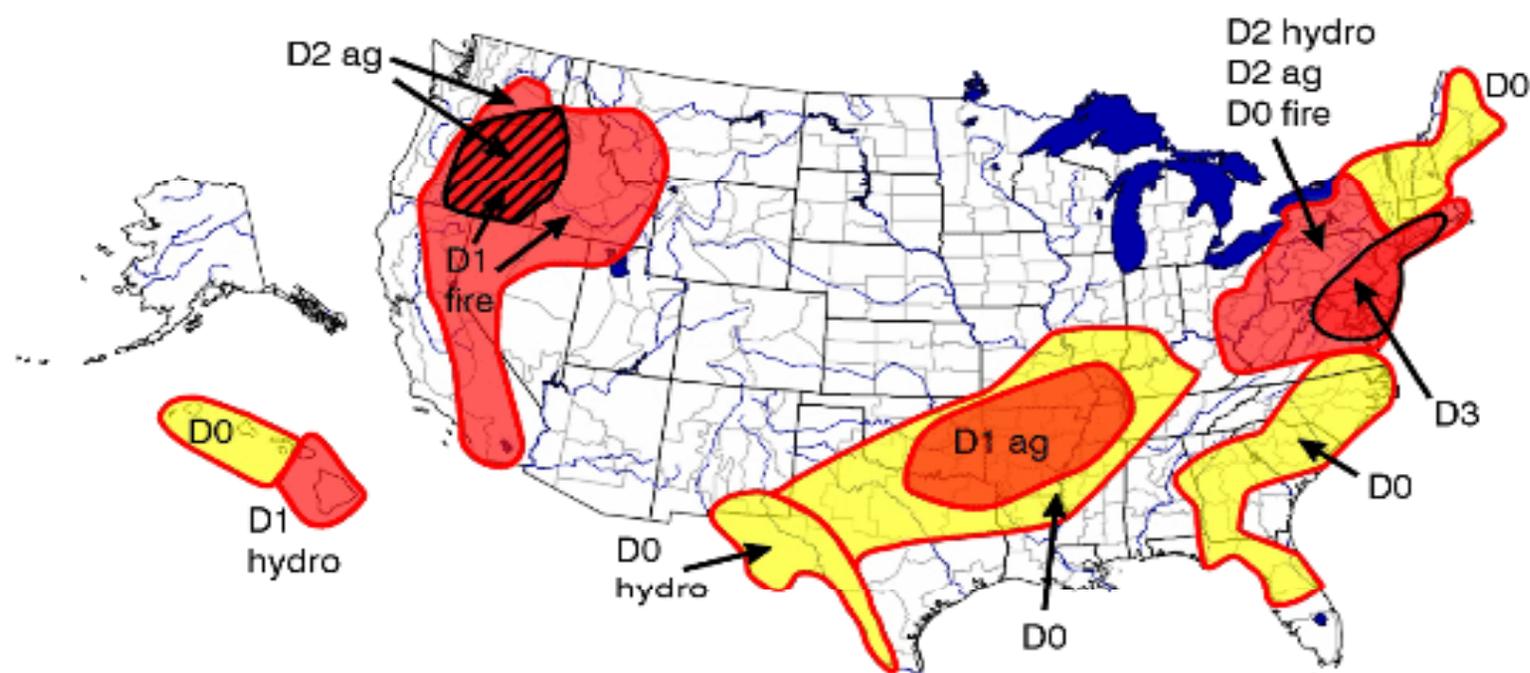


Released Thursday, April 18, 2002
 Author: David Miskus, JAWF/CPC/NOAA



August 3, 1999

Experimental U.S. Drought Monitor



"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.

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The DM is only a NDMC product.

FICTION!

The U.S. Drought Monitor

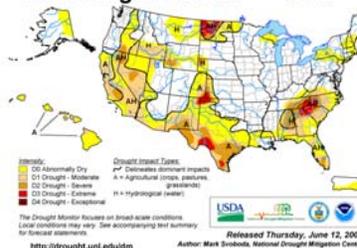
Since 1999, **NOAA (CPC and NCDC), USDA, and the NDMC** have produced a weekly composite drought map -- the U.S. Drought Monitor -- with input from numerous federal and non-federal agencies

- **Western Region Climate Center** on board 2008
- 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.) (**~270 experts**)

August 3, 1999
Experimental U.S. Drought Monitor



U.S. Drought Monitor June 10, 2008





***The Drought Monitor is a
forecast.***

FICTION

***The Drought Monitor is a
declaration.***

FICTION

Original Objectives



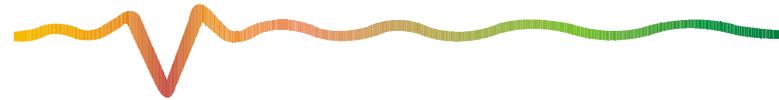
- “Fujita-like” scale
- **NOT** a forecast!
- **NOT** a drought declaration!
- Identify **impacts** (A, H)
- Assessment of **current** conditions
- Incorporate **local expert** input
- Be as **objective** as possible



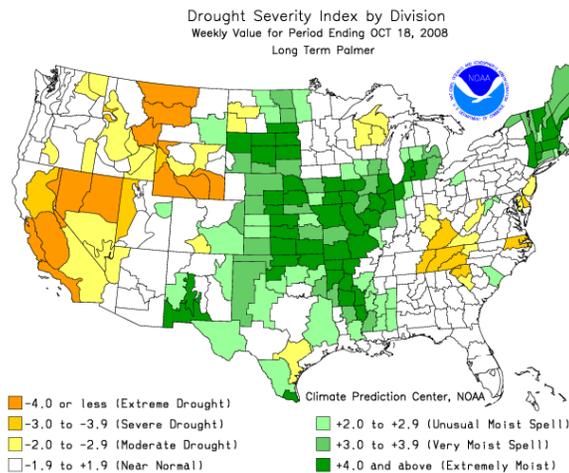
*The Drought Monitor is
an index.*

FICTION

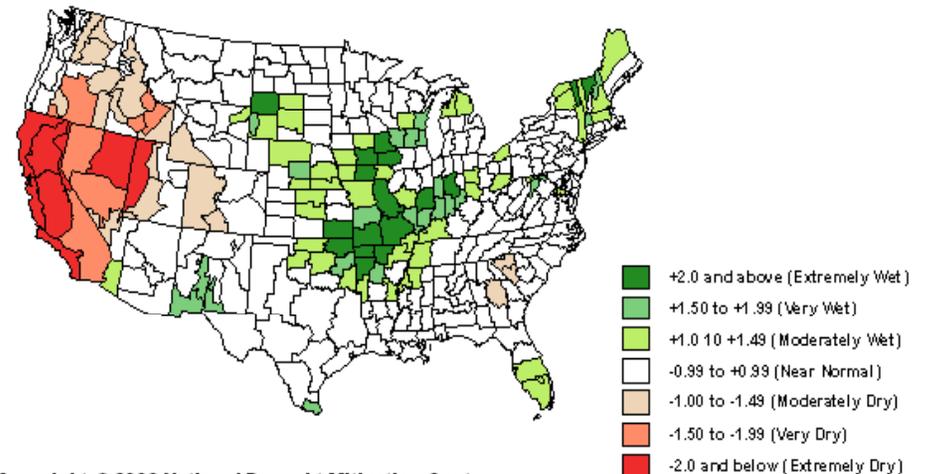
Approaches to Drought Assessment



- Single index or indicator (parameter)
- Multiple indices or indicators
- **Composite Indicator**



6-month SPI through the end of August 2008





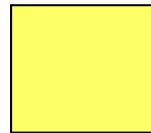
The drought monitor categories (D0-D4) have a quantitative basis.

FACT



U.S. Drought Monitor Map

Drought Intensity Categories



D0 Abnormally Dry (30%tile)



D1 Drought – Moderate (20%tile)



D2 Drought – Severe (10%tile)



D3 Drought – Extreme (5%tile)



D4 Drought – Exceptional (2%tile)



*Precipitation is the
only indicator*

FICTION



Key Variables For Monitoring Drought



- climate data
- soil moisture
- stream flow
- ground water
- reservoir and lake levels
- snow pack
- short, medium, and long range forecasts
- vegetation health/stress and fire danger
- **impacts**



The DM authors have limited knowledge about the complex drought climatologies at the local scale

FACT and FICTION

The Importance of Local Expert Input

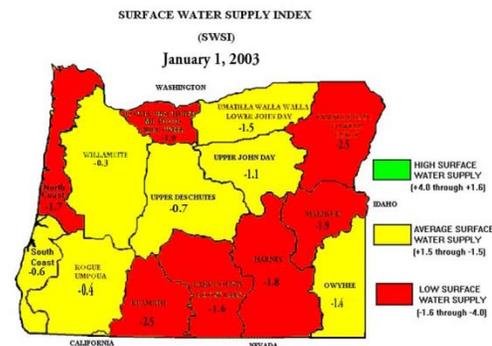
- **The U.S. Drought Monitor Team Relies on Field Observation Feedback from the Local Experts for Impacts Information & “Ground Truth”**
 - **Listserver (270 Participants: 2/3 Federal, 1/3 State/Univ.)**

Local NWS & USDA/NRCS Offices

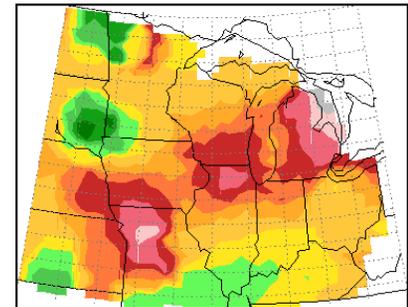
State Climate Offices

State Drought Task Forces

Regional Climate Centers

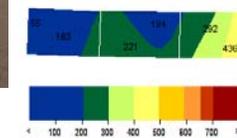
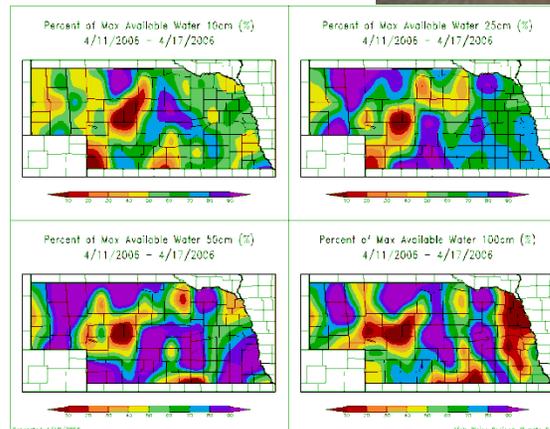


Current Soil Moisture Deviation (%), Depth = 0-72
March-23-2003

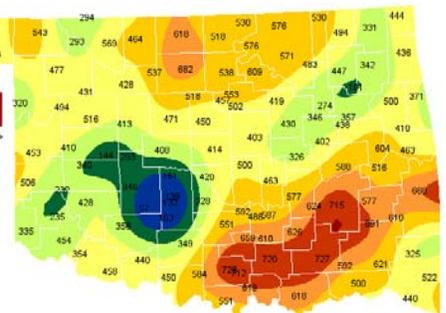


-40 -30 -20 -15 -10 -5 0 5 10 15 20 30 40 50 60

Midwestern Regional Climate Center
Illinois State Water Survey
Champaign, Illinois



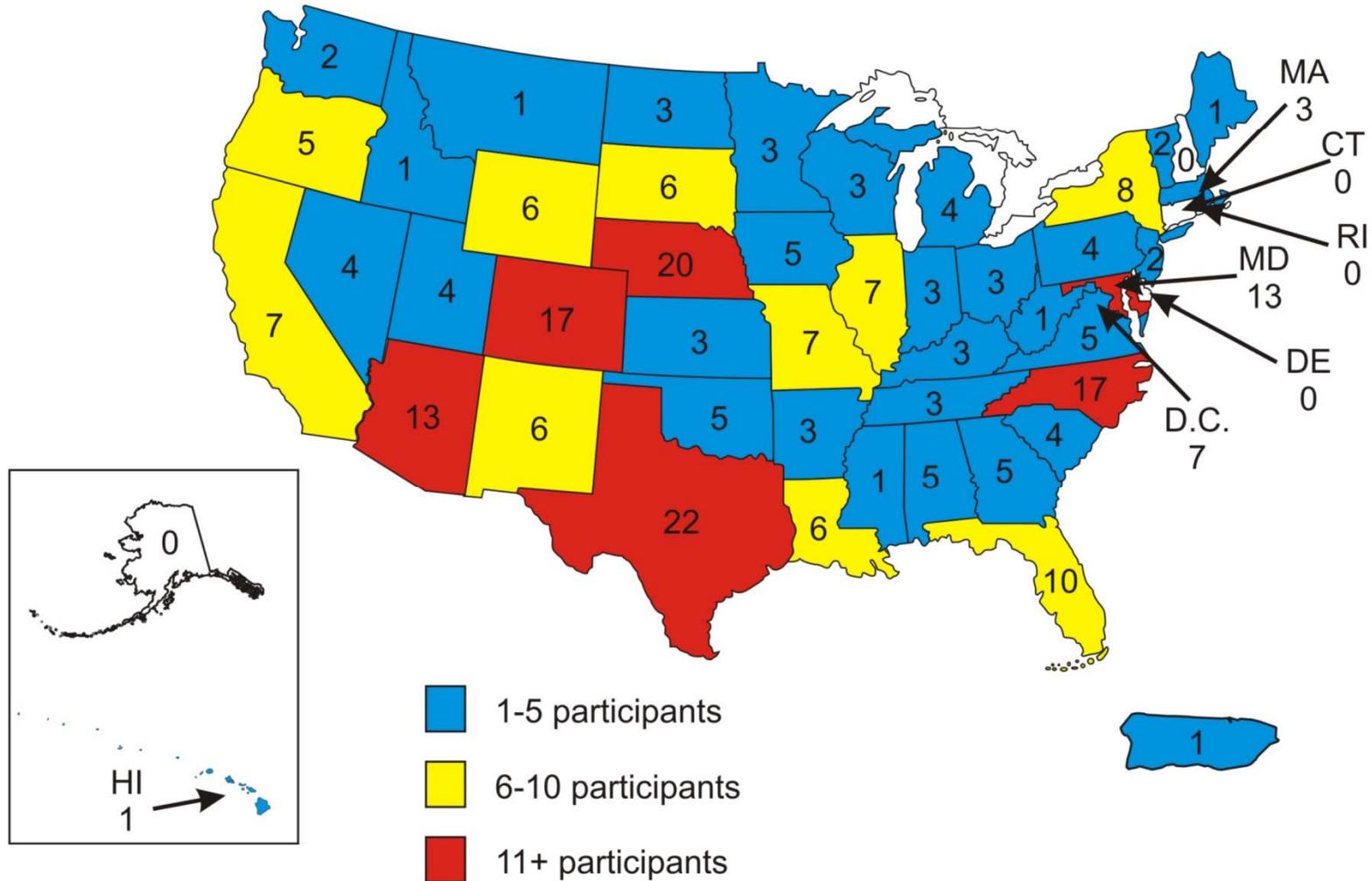
Oklahoma Climatological Survey
Keetch-Byram Drought Index
as of Sep 18, 2006



Copyright © 2006 Oklahoma Climatological Survey. All rights reserved.

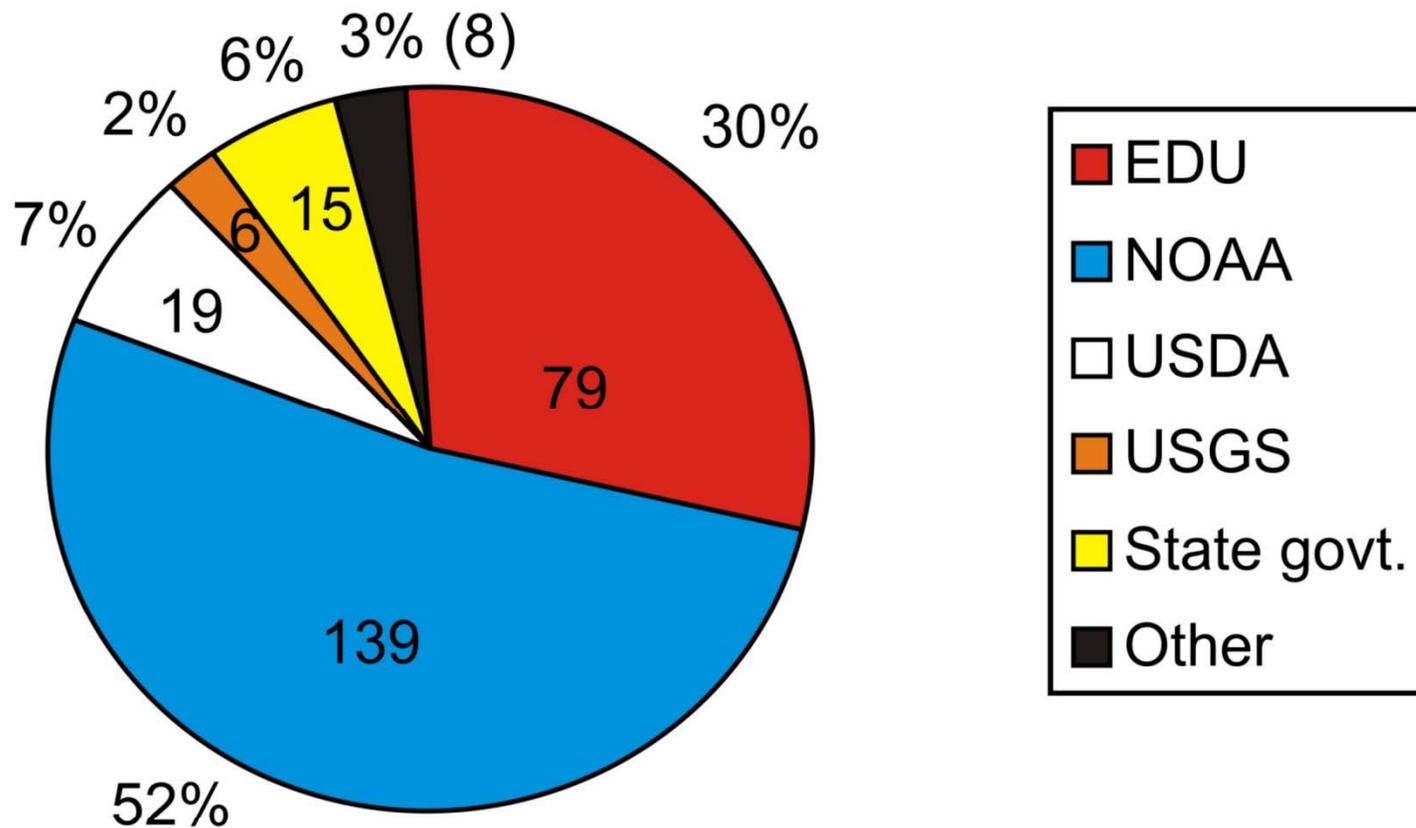
USDM Listserve Subscribers

(as of June 22, 2009)

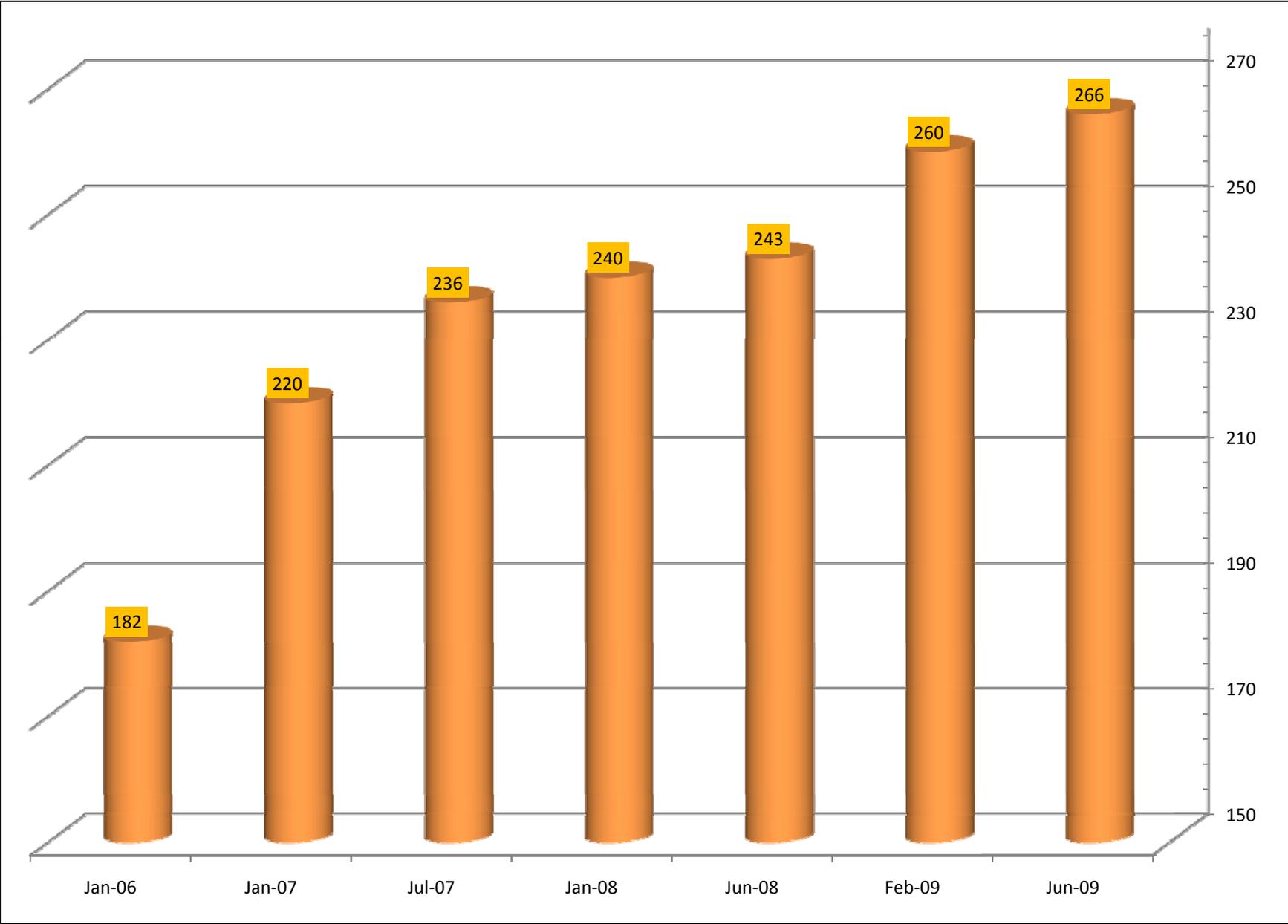


USDM Listserve Subscribers

(as of June 22, 2009)



USDM Listserve Subscribers



U.S. Drought Monitor

Integrates Key Drought Indicators:

- Palmer Drought Index
- SPI
- KBDI
- Modeled Soil Moisture
- 7-Day Avg. Streamflow
- Precipitation Anomalies

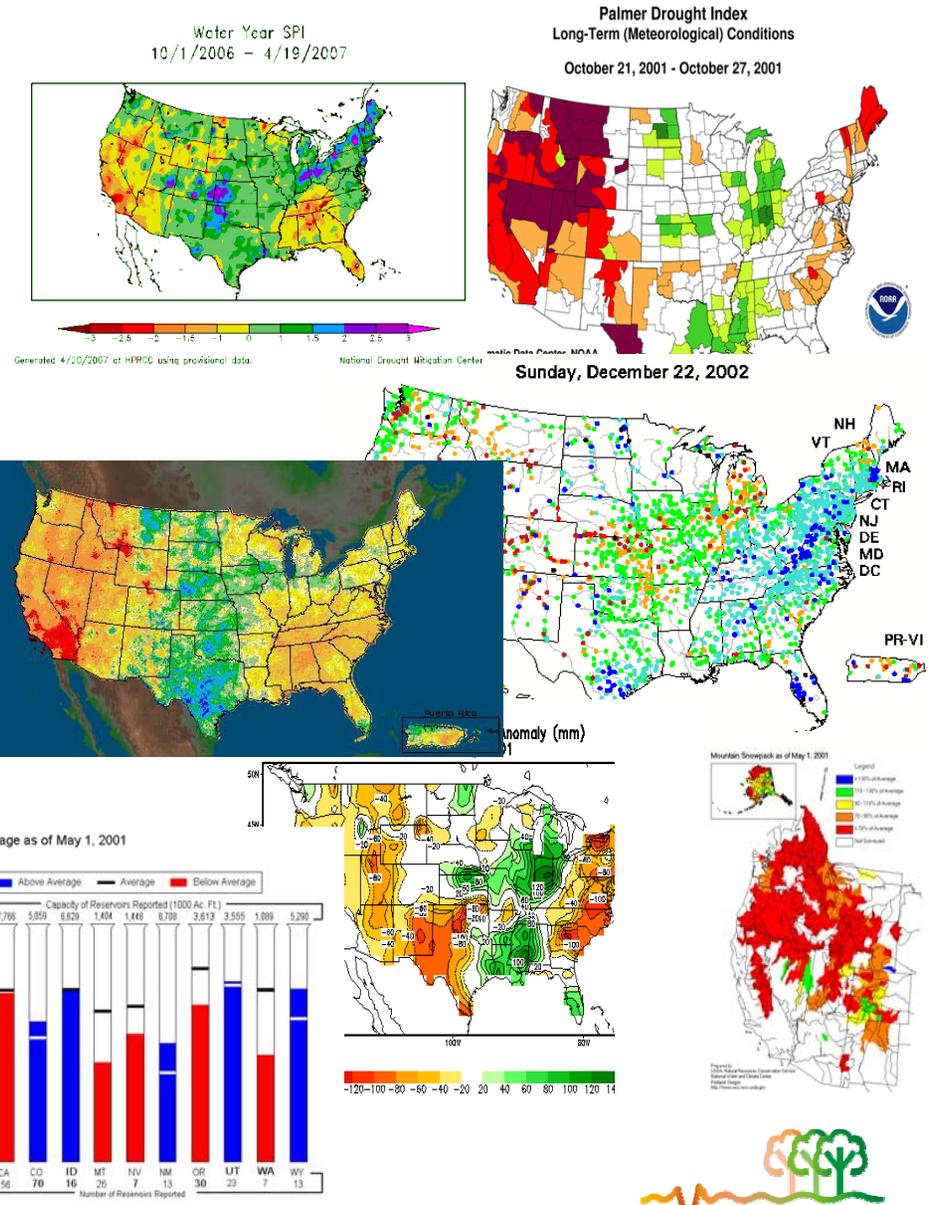
Growing Season:

- Crop Moisture Index
- Sat. Veg. Health Index
- Soil Moisture
- Mesonet data

In The West:

- SWSI
- Reservoir levels
- Snowpack
- Streamflow

Created in ArcGIS



Prepared by: USDA, Natural Resources Conservation Service, National Water and Climate Center, Portland, OR
http://www.nrcs.usda.gov

The Drought Monitor Concept

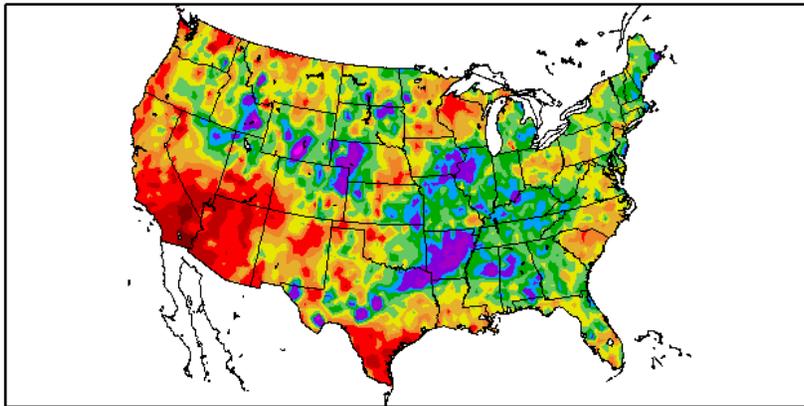
- A **consolidation of indices and indicators** into one comprehensive national drought map
- Trying to capture these characteristics:
 - the drought's magnitude (duration + intensity)
 - spatial extent
 - probability of occurrence
 - Impacts
- Rates drought intensity by **percentile ranks**



***Input to the DM is all climate
division based.***

FICTION

Percent of Normal Precipitation (%)
1/1/2009 - 10/4/2009

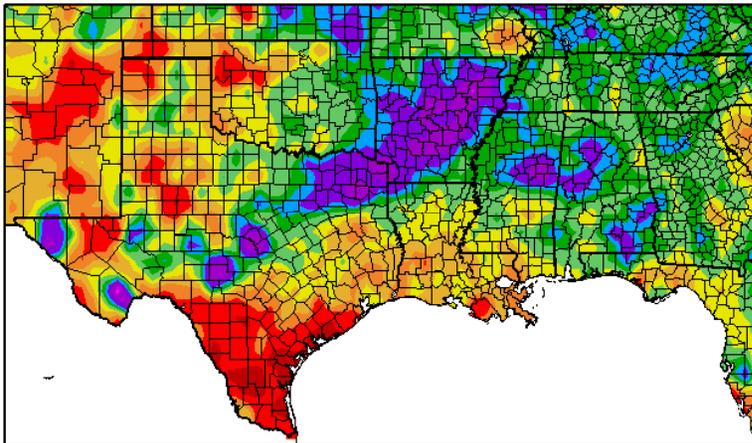


Generated 10/5/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

Applied Climate Information System (ACIS) is a key player.....

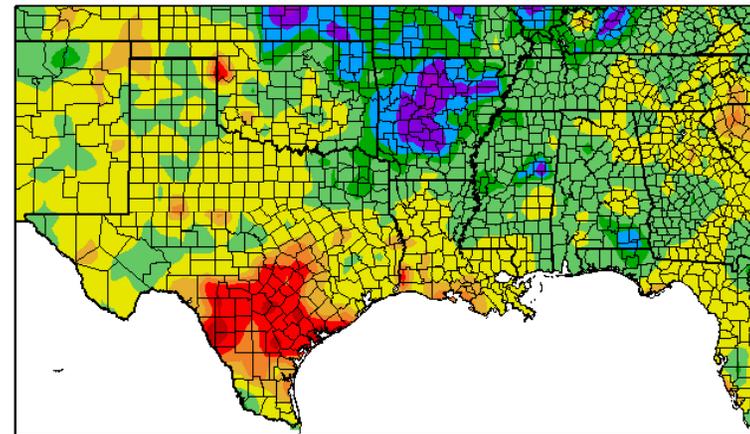
Percent of Normal Precipitation (%)
1/1/2009 - 10/4/2009



Generated 10/5/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

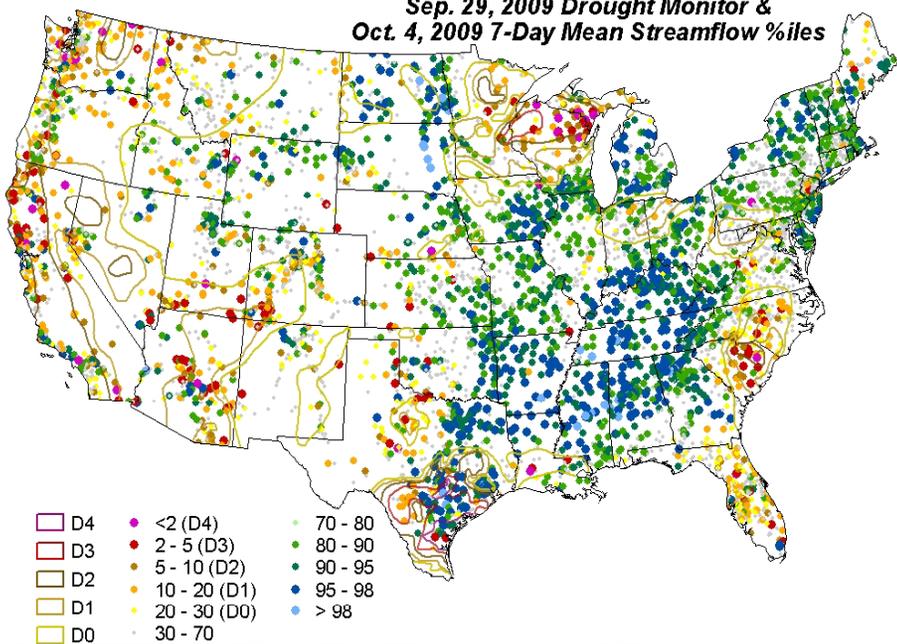
24 Month SPI
10/5/2007 - 10/4/2009



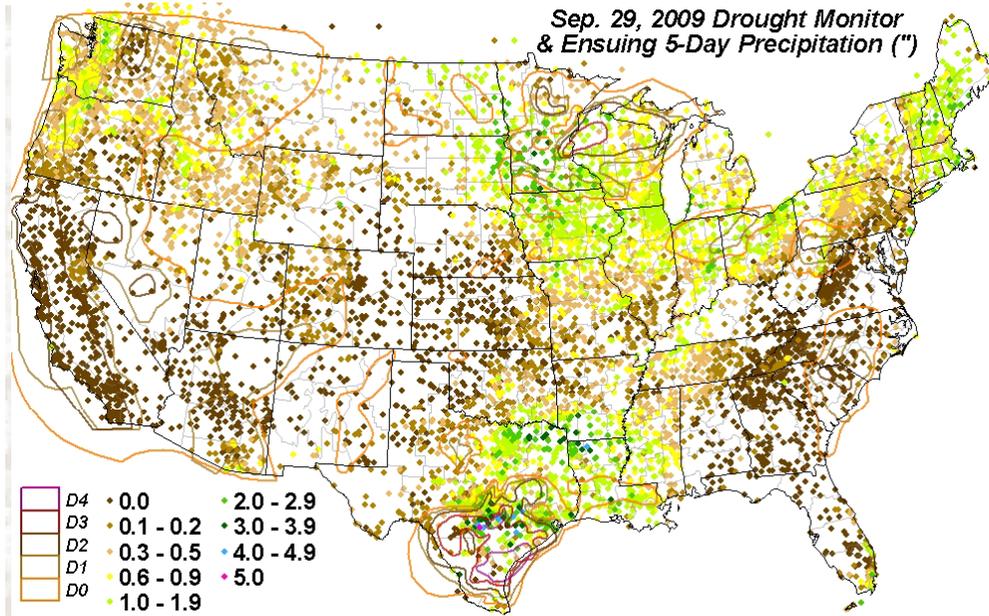
Generated 10/5/2009 at HPRCC using provisional data.

NOAA Regional Climate Centers

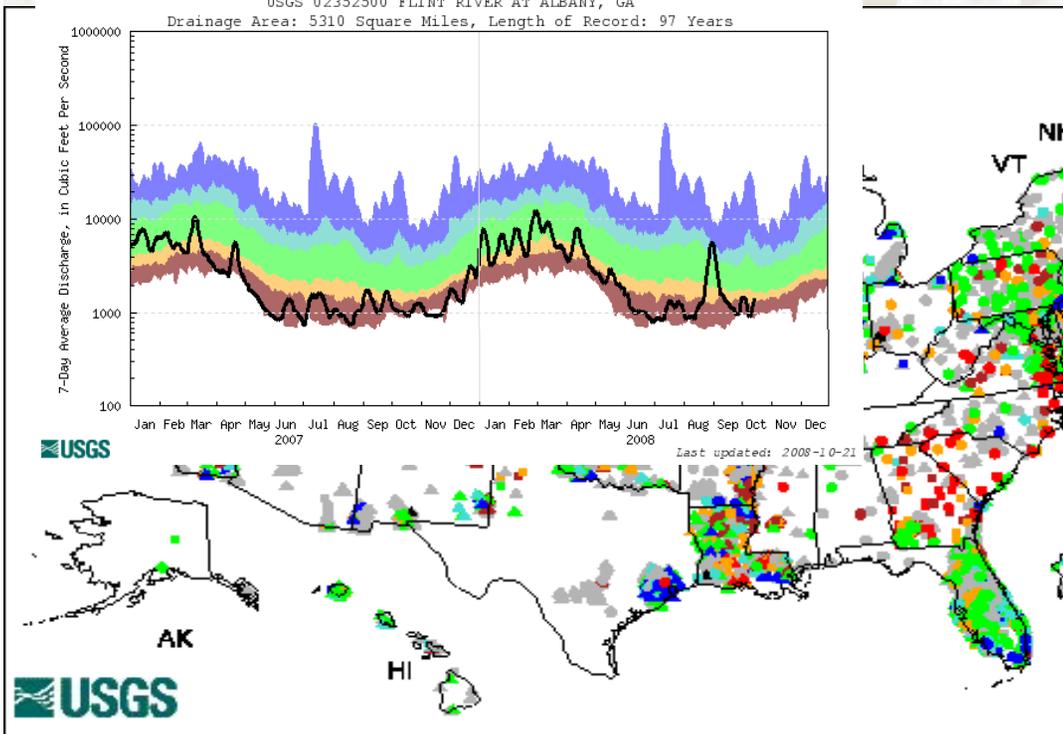
Sep. 29, 2009 Drought Monitor & Oct. 4, 2009 7-Day Mean Streamflow %iles



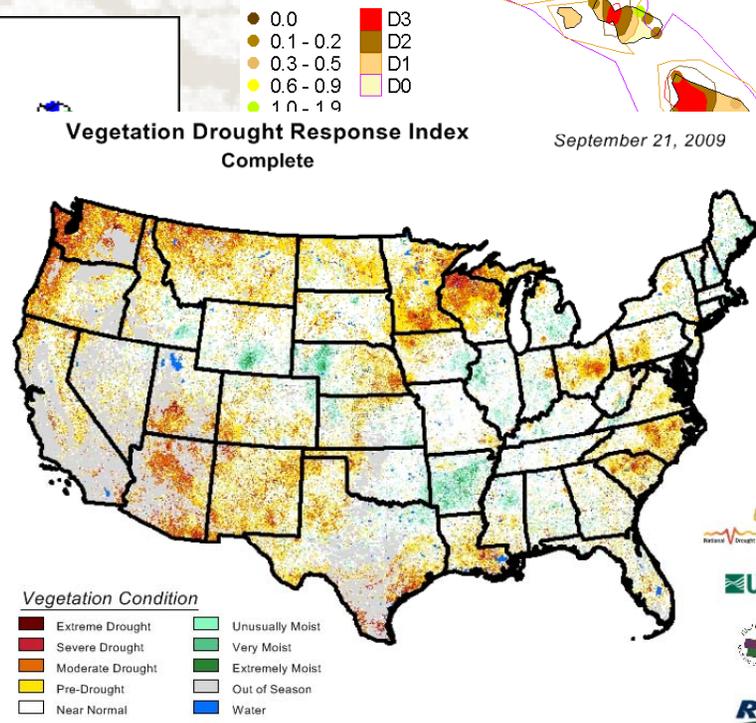
Sep. 29, 2009 Drought Monitor & Ensuing 5-Day Precipitation (")



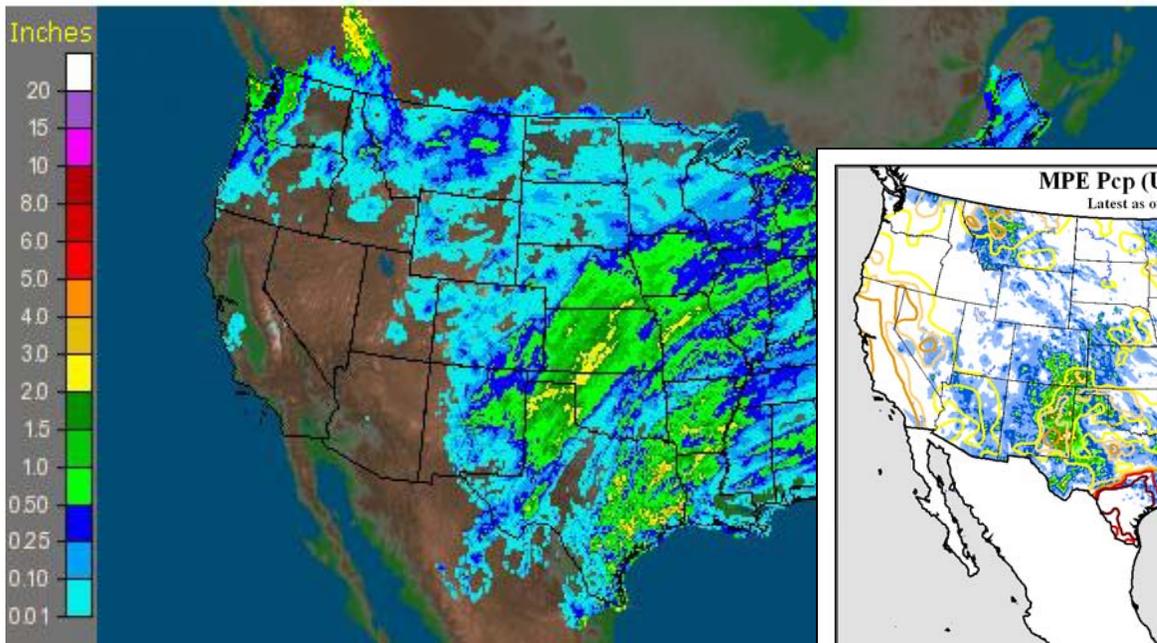
USGS 02352500 FLINT RIVER AT ALBANY, GA
Drainage Area: 5310 Square Miles, Length of Record: 97 Years



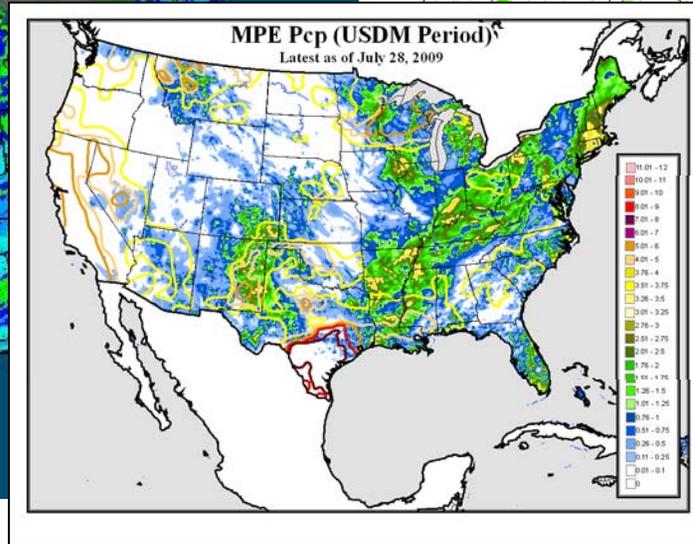
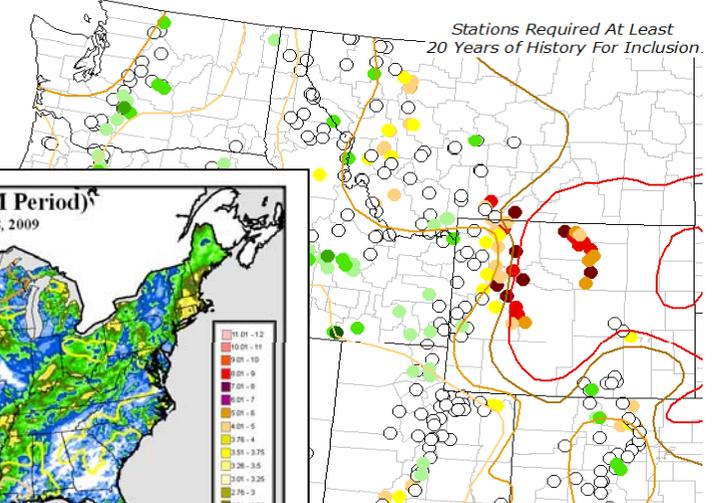
Vegetation Drought Response Index Complete



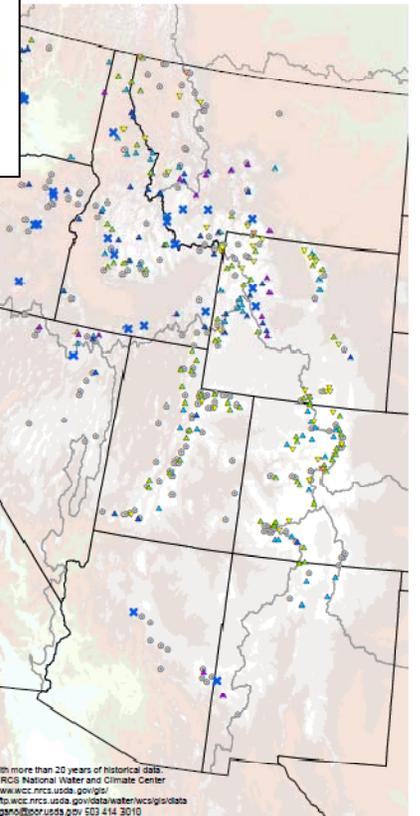
CONUS + Puerto Rico: Current 7-Day Observed Precipitation
Valid at 10/21/2008 1200 UTC - Created 10/21/08 22:38 UTC



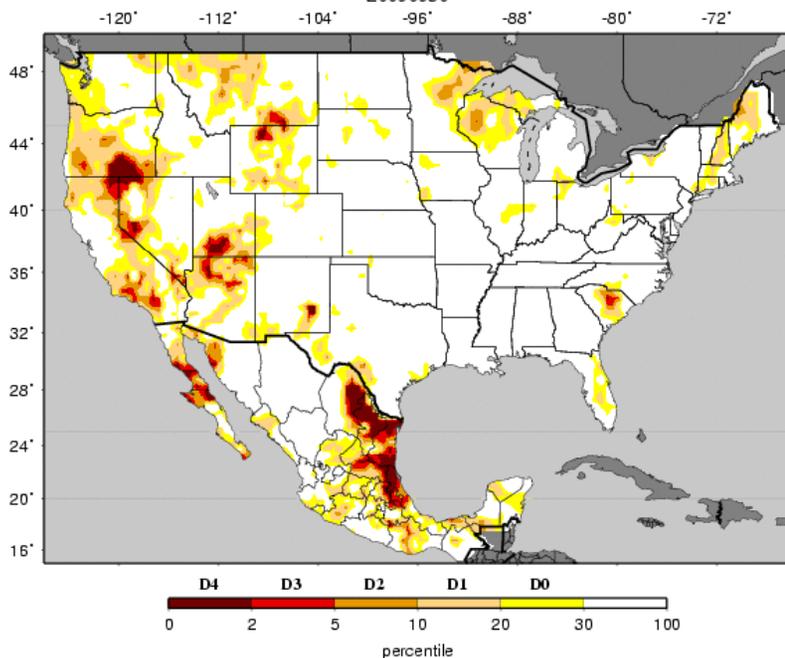
SNOTEL Water Year Precipitation Percentiles
October 1, 2005 - September 12, 2006



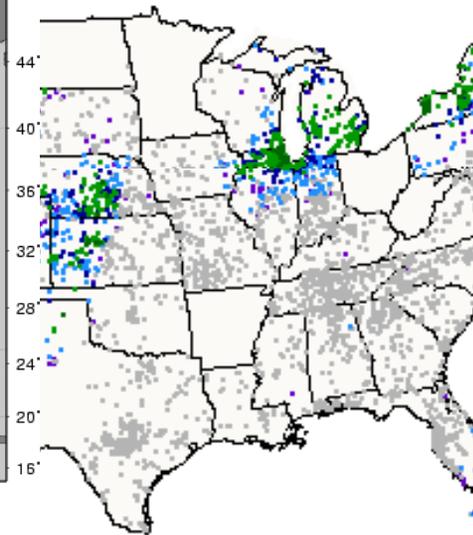
Water Equivalent (SWE) Ranking Percentile



VIC Soil Moisture Percentiles (wrt/ 1916-2004)
20090930



CoCoRaHS



- Current Snow Water Equivalent (SWE) Ranking Percentile
- ★ wettest 5%
- ▲ 01% - 05%
- ▲ 01% - 05%
- ▲ 71% - 80%
- ▲ 51% - 70%
- ▲ 31% - 50%
- ▲ 21% - 30%
- ▼ 11% - 20%
- ▼ 0% - 10%
- ◆ driest 5%
- snow free



Analysis includes sites with more than 20 years of historical data.
Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon <http://www.wcc.nrcs.usda.gov/>
Based on data from <ftp://ftp.wcc.nrcs.usda.gov/data/wcc/gis/data>
Science contact: Tom Pagano tpagano@nrcs.usda.gov 503 434 3010



***The Drought Monitor depicts
both short- and long-term
drought.***

FACT

***The Drought Monitor is
purely subjective.***

FICTION

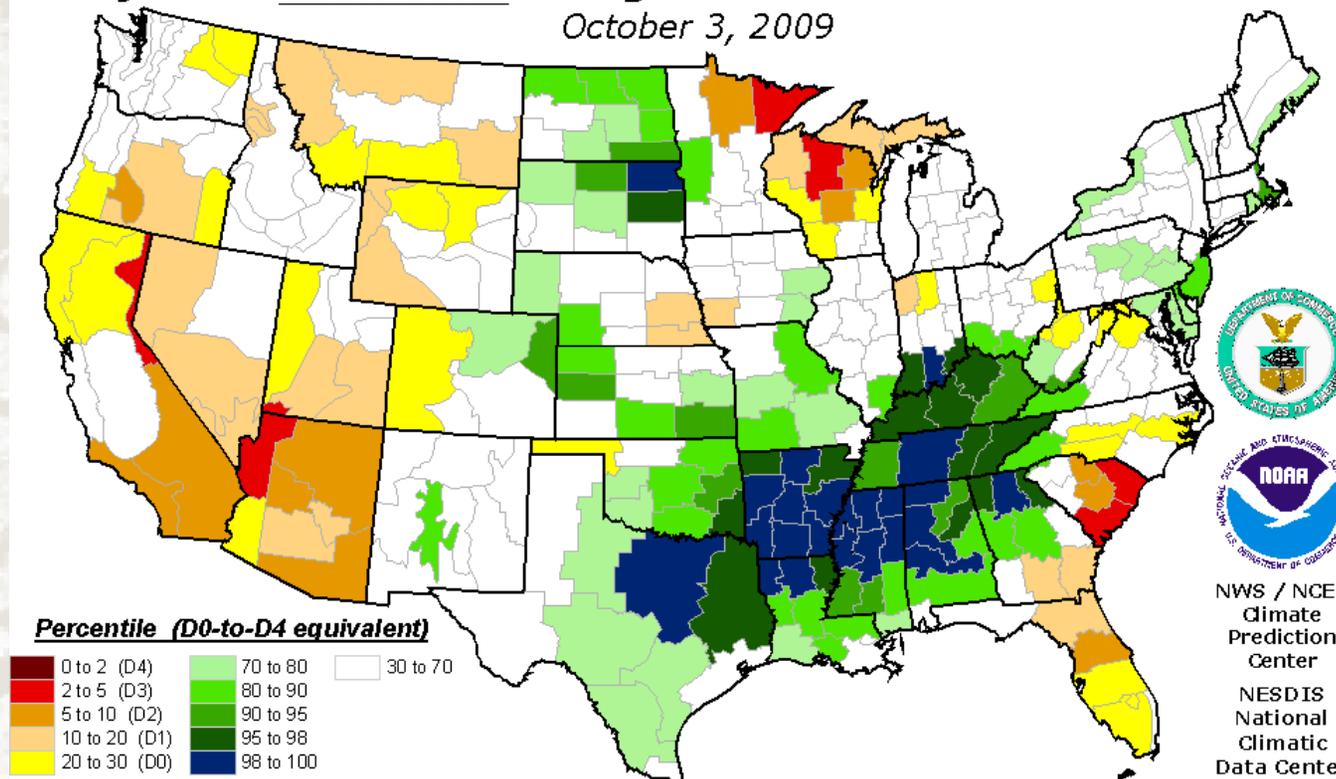
Objective Blends

➤ Short-Term Blend

35% Palmer Z Index
 25% 3-Month Precip.
 20% 1-Month Precip.
 13% CPC Soil Model
 7% Palmer Drought Index

Objective Short-Term Drought Indicator Blend Percentiles

October 3, 2009



Inputs (as percentiles):

35% Palmer Z-Index
 25% 3-Month Precipitation
 20% 1-Month Precipitation
 13% CPC Soil Moisture Model
 7% Palmer Drought Index

This map approximates impacts that respond to precipitation over several days to a few months, such as agriculture, topsoil moisture, unregulated streamflows, and most aspects of wildfire danger. The relationship between indicators and impacts can vary significantly with location and season. Do not interpret this map too literally.

This map is based on preliminary climate division data. Local conditions and/or final data may differ. See the detailed product suite description for more details.



NWS / NCEP
 Climate
 Prediction
 Center

NESDIS
 National
 Climatic
 Data Center

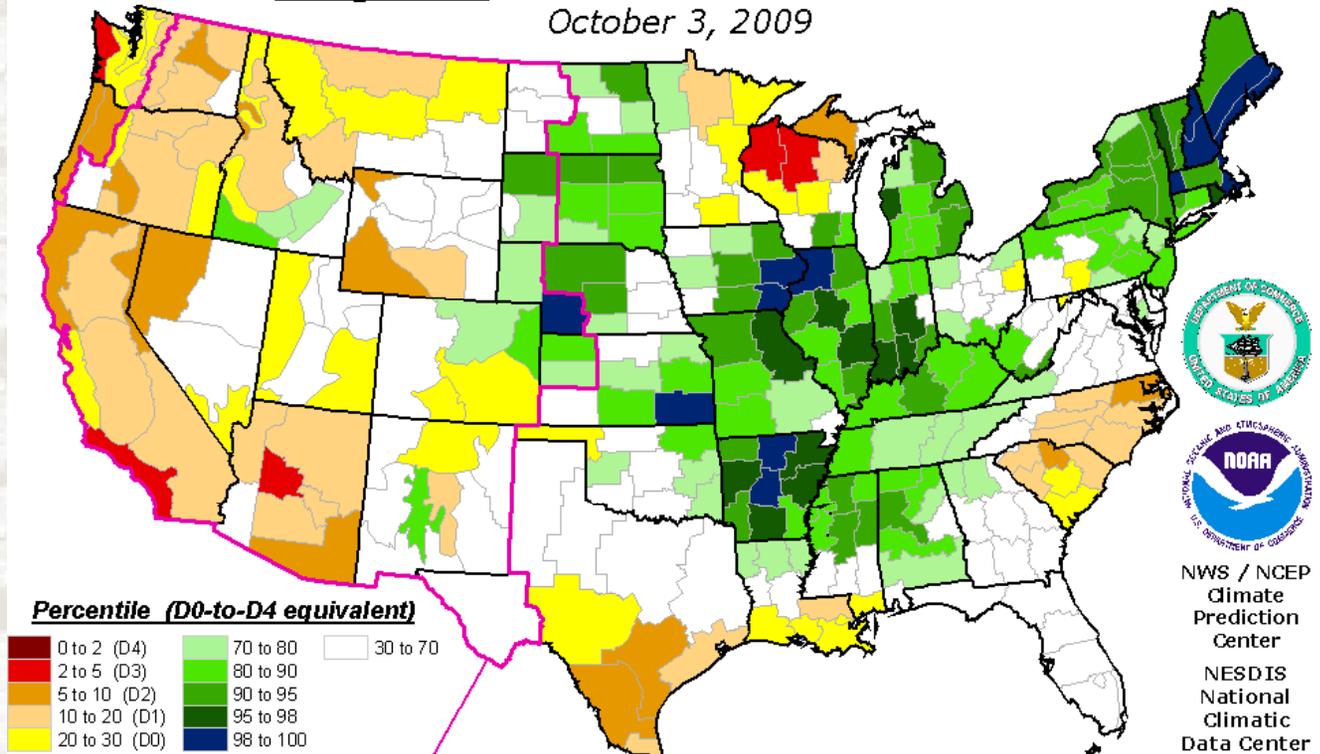
Objective Blends

➤ Long-Term Blend

25% Palmer Hydrological Index
 20% 24-Month Precip.
 20% 12-Month Precip.
 15% 6-Month Precip.
 10% 60-Month Precip.
 10% CPC Soil Model

Objective **Long-Term** Drought Indicator Blend Percentiles

October 3, 2009



Inputs (as percentiles):

- 25% Palmer Hydrologic Index
- 20% 24-Month Precipitation
- 20% 12-Month Precipitation
- 15% 6-Month Precipitation
- 10% 60-Month Precipitation
- 10% CPC Soil Moisture Model

Western Formulation Inputs (as percentiles):

- 30% Palmer Hydrologic Index
- 30% 60-Month Average Z-Index
- 10% 60-Month Precipitation
- 10% 24-Month Precipitation
- 10% 12-Month Precipitation
- 10% CPC Soil Moisture Model

This map approximates impacts responding to precipitation over the course of several months to a few years, such as reservoir content, groundwater, and lake levels. **HOWEVER, THE RELATIONSHIP BETWEEN INDICATORS AND WATER SUPPLIES CAN VARY MARKEDLY WITH LOCATION, SEASON, SOURCE, AND MANAGEMENT PRACTICE. Do not interpret this map too literally.**

This map is based on preliminary climate division data. Local conditions and/or final data may differ. See the detailed product suite description for more details.



NWS / NCEP
Climate Prediction Center
NESDIS
National Climatic Data Center



***The Drought Monitor is
widely used.***

FACT

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***

Some Examples of Decision Making Using the DM

- USDA Dried Milk Program
- USDA CRP Release hot spot trigger
- Numerous states use as a drought trigger (Governor's declarations)
- USDA Livestock Assistance
- IRS (tax deferral on livestock losses)
- 2008 Farm Bill (**NOT** the only trigger)
- NWS Drought Information Statements (DGTs)



***The DM authors have engaged
stakeholder communities***

FACT



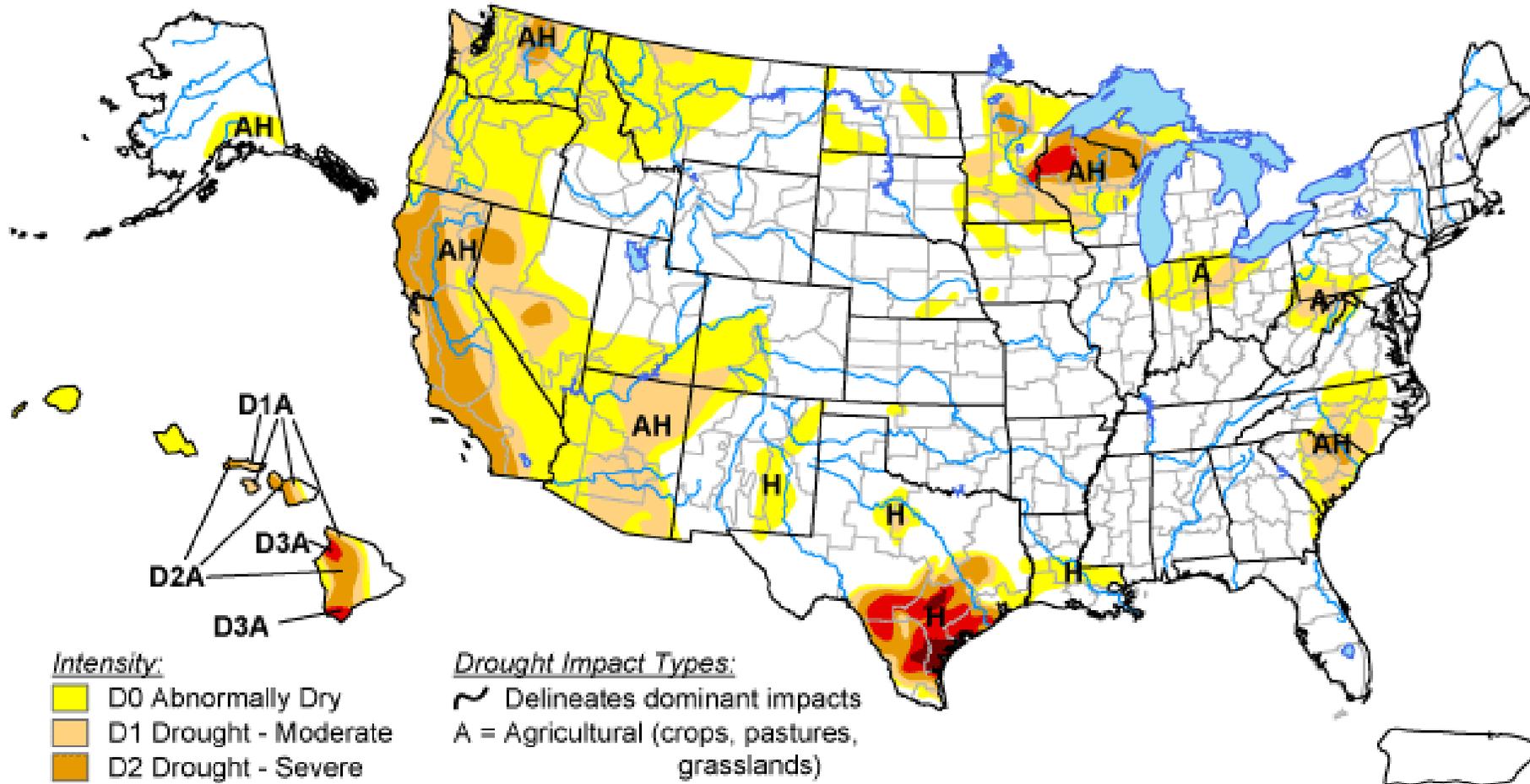
The NDMC (and DM authors) have engaged stakeholder communities :

- ***USDM/NADM Forums and surveys***
- ***USDM/NADM Listservers (participatory)***
- ***USDA/RMA and other projects: workshops, listening session, focus groups w/ producers/etc. (60 since 2003)***
- ***Meetings w/ Media (face-to-face, conferences)***
- ***Meetings at annual conferences/trade shows/etc.***
- ***Meetings/briefings/workshops with/for various federal/state/tribal officials***

U.S. Drought Monitor

September 29, 2009

Valid 8 a.m. EDT



Intensity:

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

Drought Impact Types:

-  Delineates 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, October 1, 2009

Author: David Miskus, JAWF/CPC/NOAA

North American Drought Monitor

August 31, 2009

Released: Friday, September 18, 2009

<http://www.ncdc.noaa.gov/nadm.html>

Analysts:

Canada - Trevor Hadwen
Richard Rieger
Dwayne Chobanik

Mexico - Valentina Davydova
Adelina A Ibanil
Elvia Delgado
Reynaldo Pascual
Fernando Romero

U.S.A. - Brad Rippey
Richard Heim*
Liz Love-Brotak

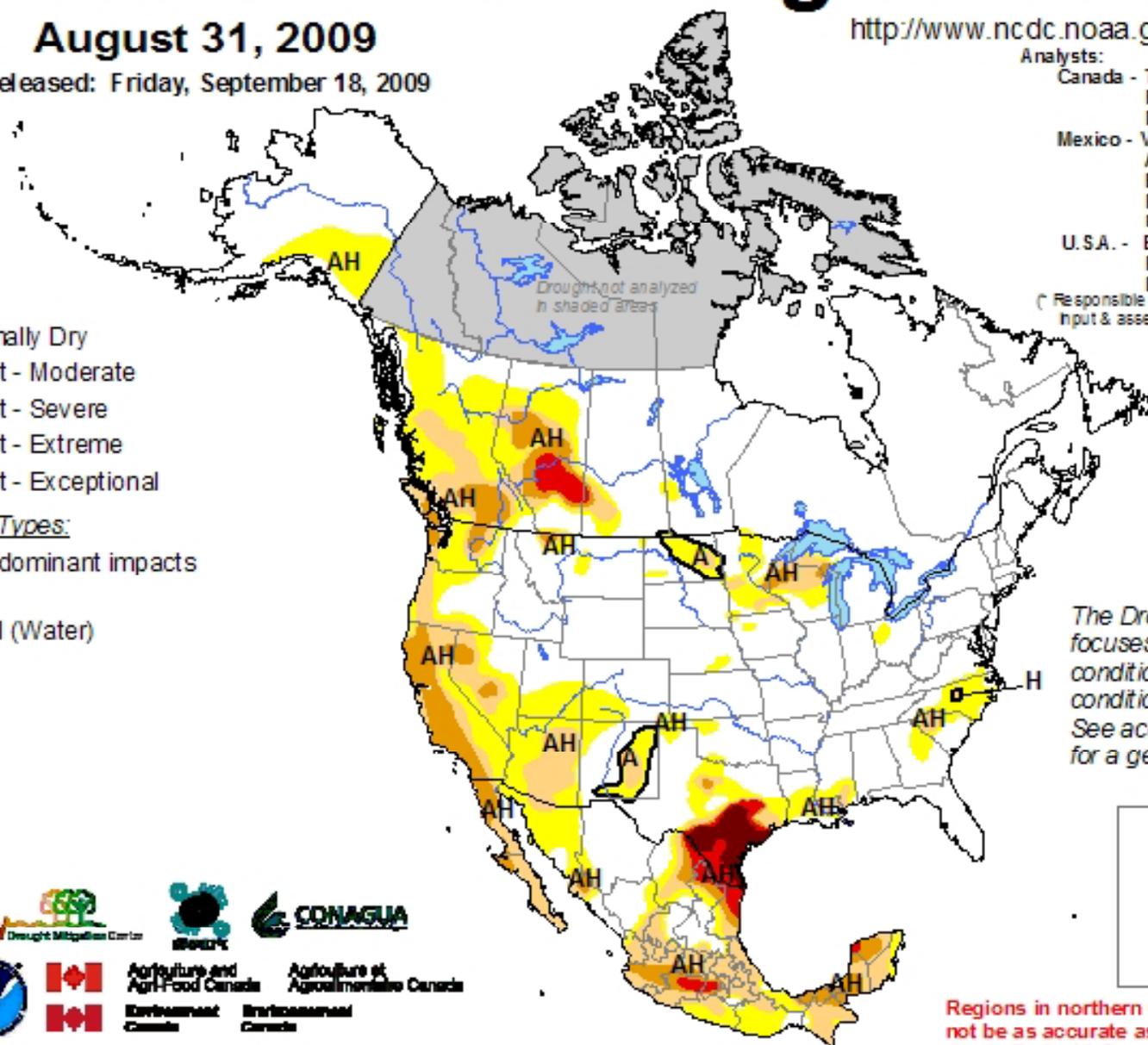
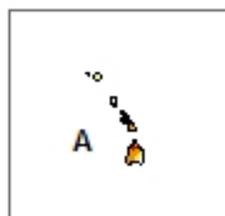
(* Responsible for collecting analysts' input & assembling the NA-DM map)

Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
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Drought Impact Types:

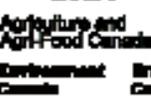
- Delineates dominant impacts
- A = Agriculture
- H = Hydrological (Water)



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



Regions in northern Canada may not be as accurate as other regions due to limited information.



*The DM is so easy to make a
Caveman can do it???*



Did you know?????



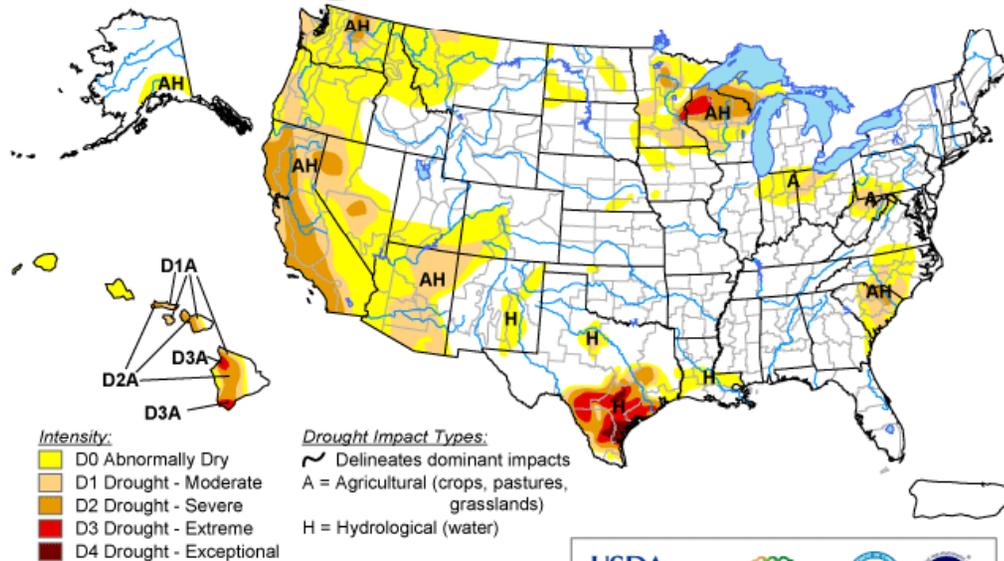
Visit the [NDMC Photo Gallery](#) to see photos of drought conditions in [California](#), [Georgia](#), [South Carolina](#), and other states. If you have photos showing drought conditions, please consider [submitting](#) them to the Photo Gallery.

The data cutoff for Drought Monitor maps is Tuesday at 7 a.m. Eastern Standard Time. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time.

NOTE: To view regional drought conditions, click on map below. State maps can be accessed from regional maps.

U.S. Drought Monitor

September 29, 2009
Valid 8 a.m. EDT



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



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

- To compare current drought conditions with last week's map, click [here](#).
- To view tabular statistics of this week's Drought Monitor, click [here](#).
- To view tabular statistics for the Drought Monitor archive, click [here](#).
- To view Drought Monitor Change Maps, click [here](#).

NDMC's Drought Impact Reporter	6-week animation	12-week animation	short-term drought indicator blends	long-term drought indicator blends
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U.S. Drought Monitor

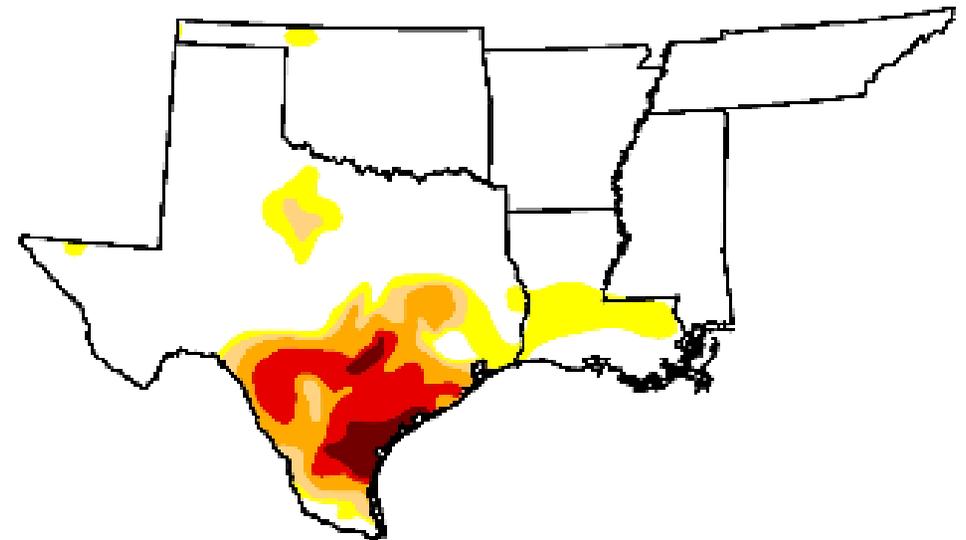
South

September 29, 2009

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	78.6	21.4	14.0	11.1	6.2	1.6
Last Week (09/22/2009 map)	76.3	23.7	14.4	11.5	7.8	1.9
3 Months Ago (07/07/2009 map)	47.4	52.6	28.7	14.5	11.3	7.1
Start of Calendar Year (01/06/2009 map)	54.4	45.6	18.0	8.0	4.6	2.1
Start of Water Year (10/07/2008 map)	73.3	26.7	17.3	10.7	2.9	0.0
One Year Ago (09/30/2008 map)	73.1	27.0	17.2	10.0	2.9	0.0



Intensity:

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

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, October 1, 2009

Author: D. Miskus, JAWF/CPC/NOAA

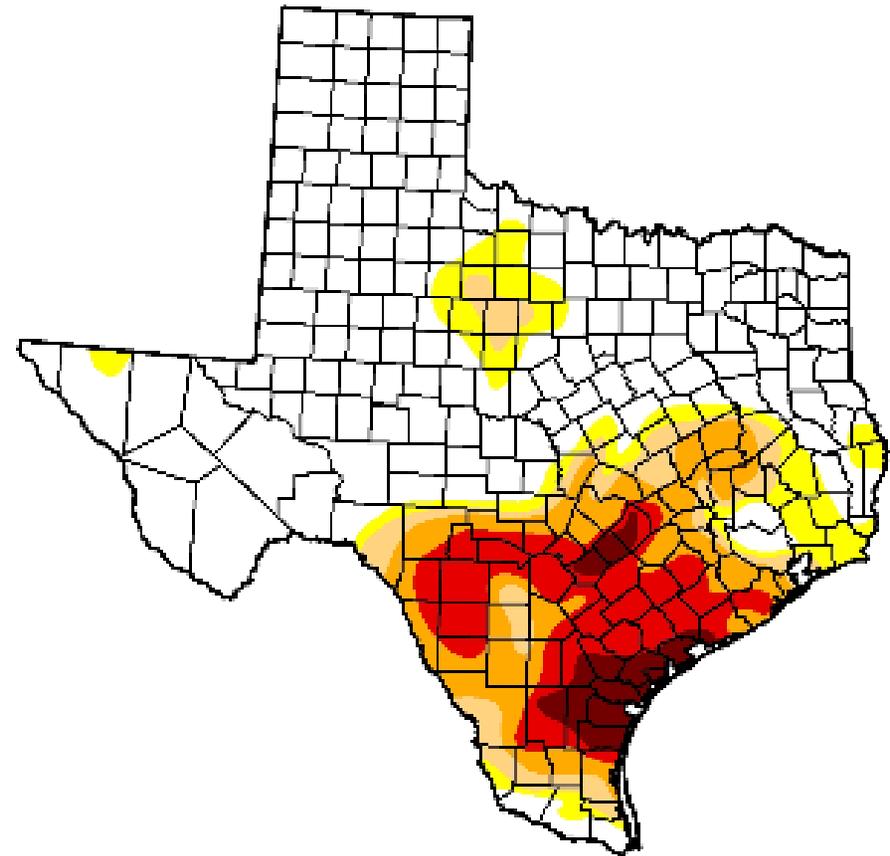
U.S. Drought Monitor

Texas

September 29, 2009
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.8	36.2	27.8	21.9	12.3	3.1
Last Week (09/22/2009 map)	62.5	37.5	28.5	22.9	15.5	3.8
3 Months Ago (07/07/2009 map)	37.7	62.3	39.4	28.8	22.4	14.1
Start of Calendar Year (01/06/2009 map)	41.7	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	0.0
One Year Ago (09/30/2008 map)	67.0	33.0	20.1	9.5	3.6	0.0



Intensity:

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

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

Drought Monitor Archives

Maps Tables 1999 Archive GIS Data

Select an area and click the 'Update' button to view the archive.

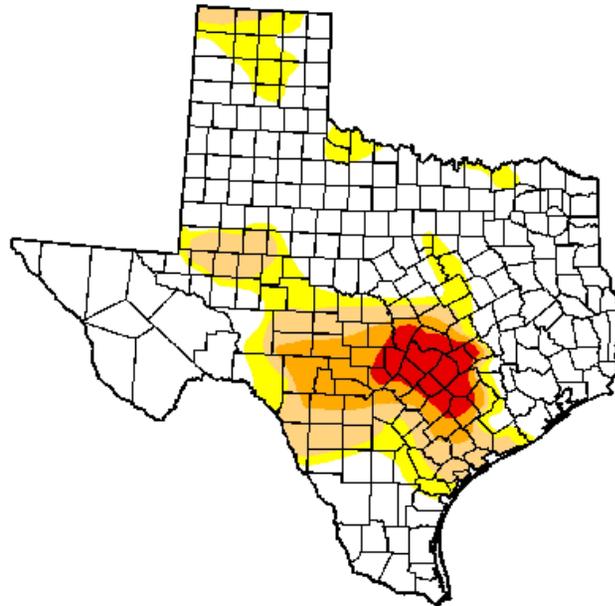
Contiguous United States Region Northeast State Update

Drought Severity

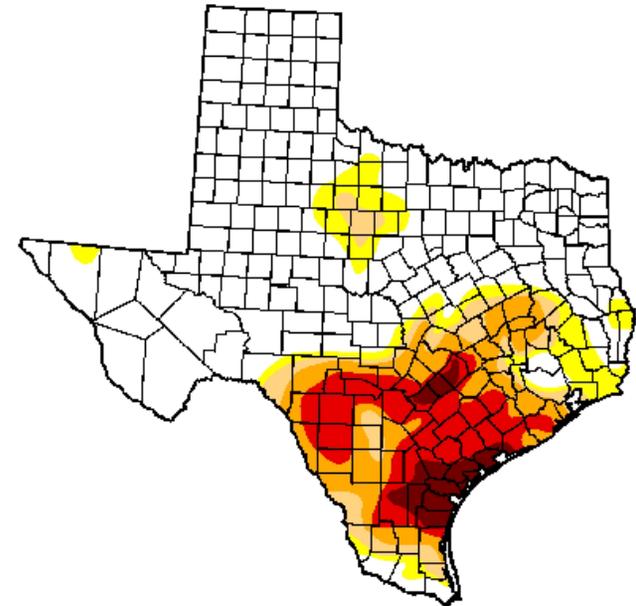
D0 Abnormally Dry D1 Drought - Moderate D2 Drought - Severe D3 Drought - Extreme D4 Drought - Exceptional

<< >>

<< >>



Download [image](#) or [PDF](#)
[Read the summary](#)



Download [image](#) or [PDF](#)
[Read the summary](#)

Drought Monitor Archive Tables

Maps **Tables** 1999 Archive GIS Data

- Contiguous United States
- United States, including Alaska, Hawaii, and Puerto Rico

Region Northeast
 State Texas

Select an area and click 'Update' to view the archive.

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

Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
09/29/09	63.79	36.21	27.81	21.95	12.31	3.14
09/22/09	62.52	37.48	28.45	22.86	15.52	3.79
09/15/09	60.65	39.35	30.63	25.22	15.83	3.37
09/08/09	51.49	48.51	35.81	28.51	24.93	16.07
09/01/09	48.31	51.69	35.35	28.83	26.47	17.34
08/25/09	47.61	52.39	35.71	28.83	26.47	18.82
08/18/09	49.94	50.06	35.28	28.89	26.72	18.13
08/11/09	49.97	50.03	34.07	28.90	26.61	16.82
08/04/09	49.97	50.03	34.07	28.90	26.61	16.82
07/28/09	38.95	61.05	38.13	30.15	24.69	18.73
07/21/09	32.28	67.72	38.73	29.62	24.66	16.49
07/14/09	31.83	68.17	40.39	30.02	24.74	17.89
07/07/09	37.65	62.35	39.38	28.80	22.36	14.06
06/30/09	28.19	71.82	38.43	27.91	20.01	11.11
06/23/09	29.74	70.26	38.91	24.10	15.48	8.22
06/16/09	27.01	73.00	45.49	27.85	16.54	7.65
06/09/09	28.96	71.05	46.17	28.87	17.48	7.65
06/02/09	36.56	63.44	44.29	28.40	16.58	6.51
05/26/09	32.91	67.09	47.77	31.56	17.36	6.73
05/19/09	31.87	68.13	51.90	36.29	20.47	8.50
05/12/09	31.17	68.84	50.53	38.03	23.69	14.89



Drought Monitor Data Downloads

Maps Tables 1999 Archive GIS Data

For more information regarding the Drought Monitor datasets, please contact Soren Scott at the NDMC via [e-mail](#) or at [402-472-6717](tel:402-472-6717).

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 Monitor shapefiles](#), [KML files](#), [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), the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Association (NOAA).

[2009](#) [2008](#) [2007](#) [2006](#) [2005](#) [2004](#) [2003](#) [2002](#) [2001](#) [2000](#)

2009									
Date	KML	Shapefile	GML	WMS	Tables				
2009-09-29	KML	SHP	Impacts	GML	WMS	U.S.	State	County	
2009-09-22	KML	SHP	Impacts	GML	WMS	U.S.	State	County	
2009-09-15	KML	SHP	Impacts	GML	WMS	U.S.	State	County	
2009-09-08	KML	SHP							
2009-09-01	KML	SHP							
2009-08-25	KML	SHP							
2009-08-18	KML	SHP							
2009-08-11	KML	SHP							
2009-08-04	KML	SHP							
2009-07-28	KML	SHP							
2009-07-21	KML	SHP							
2009-07-14	KML	SHP							
2009-07-07	KML	SHP							
2009-06-30	KML	SHP							
2009-06-23	KML	SHP							

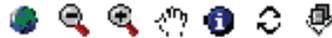
dm_export_20090929_20090929[1] - Microsoft Excel

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A1 Week													
A	B	C	D	E	F	G	H	I	J	K	L	M	N
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2523	20090929	48001	Anderson C	TX	90.33	9.67	0.21	0	0	0	2009-09-21	2009-10-05T23:59:59	
2524	20090929	48003	Andrews C	TX	100	0	0	0	0	0	2009-09-21	2009-10-05T23:59:59	
2525	20090929	48005	Angelina C	TX	99.33	0.67	0	0	0	0	2009-09-21	2009-10-05T23:59:59	
2526	20090929	48007	Aransas Co	TX	0	100	100	100	100	100	2009-09-21	2009-10-05T23:59:59	
2527	20090929	48009	Archer Cou	TX	100	0	0	0	0	0	2009-09-21	2009-10-05T23:59:59	
2528	20090929	48011	Armstrong	TX	100	0	0	0	0	0	2009-09-21	2009-10-05T23:59:59	
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2530	20090929	48015	Austin Cou	TX	0	100	100	89.36	0	0	2009-09-21	2009-10-05T23:59:59	
2531	20090929	48017	Bailey Cou	TX	100	0	0	0	0	0	2009-09-21	2009-10-05T23:59:59	
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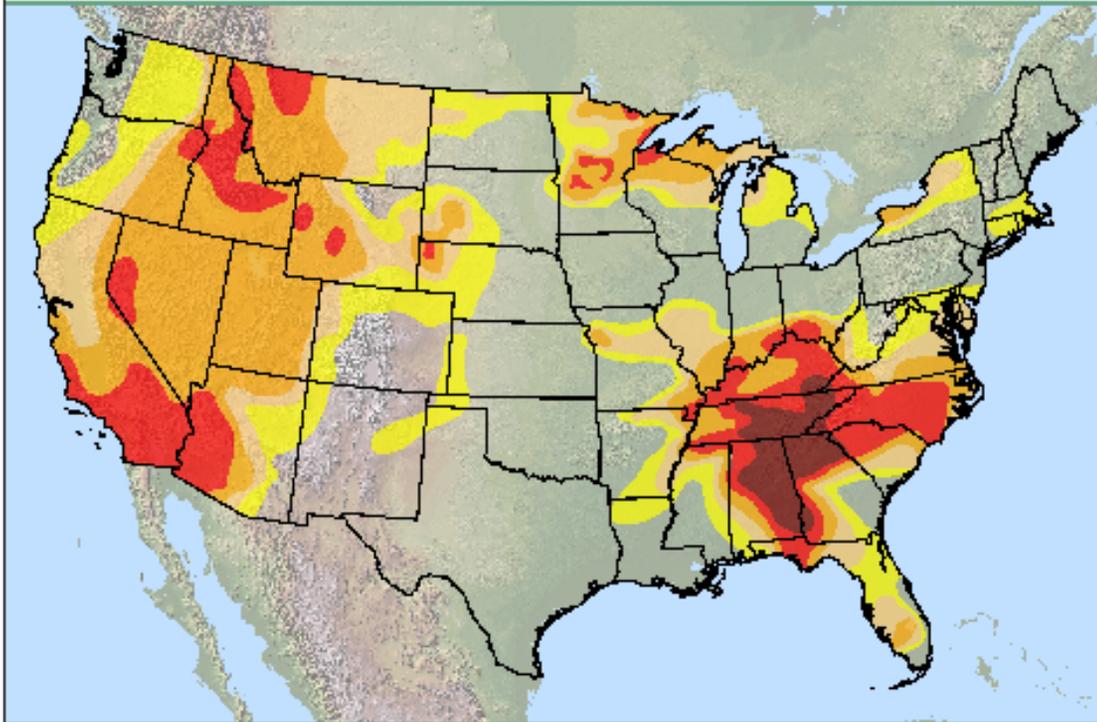
http://drought.unl.edu/dm/dmshps_archive.htm

Coming Soon.....





?



Continental United States Alaska Hawaii Puerto Rico

Legend

Visible

Drought Monitor

- D0
- D1
- D2
- D3
- D4

Date

September 18, 2007

Transparency

60%

ACIS Stations

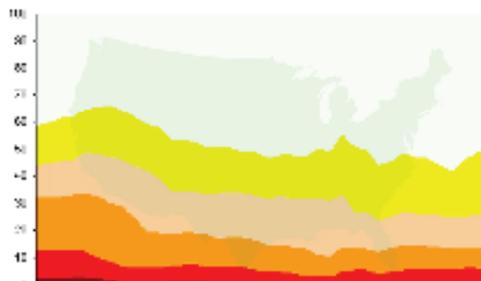
Climate Layers

- Standardized Precipitation Index
- Palmer Drought Severity Index
- ACIS Precipitation/Temperature Overlay
- NWS Hybrid Radar/Gauge Precipitation Analysis

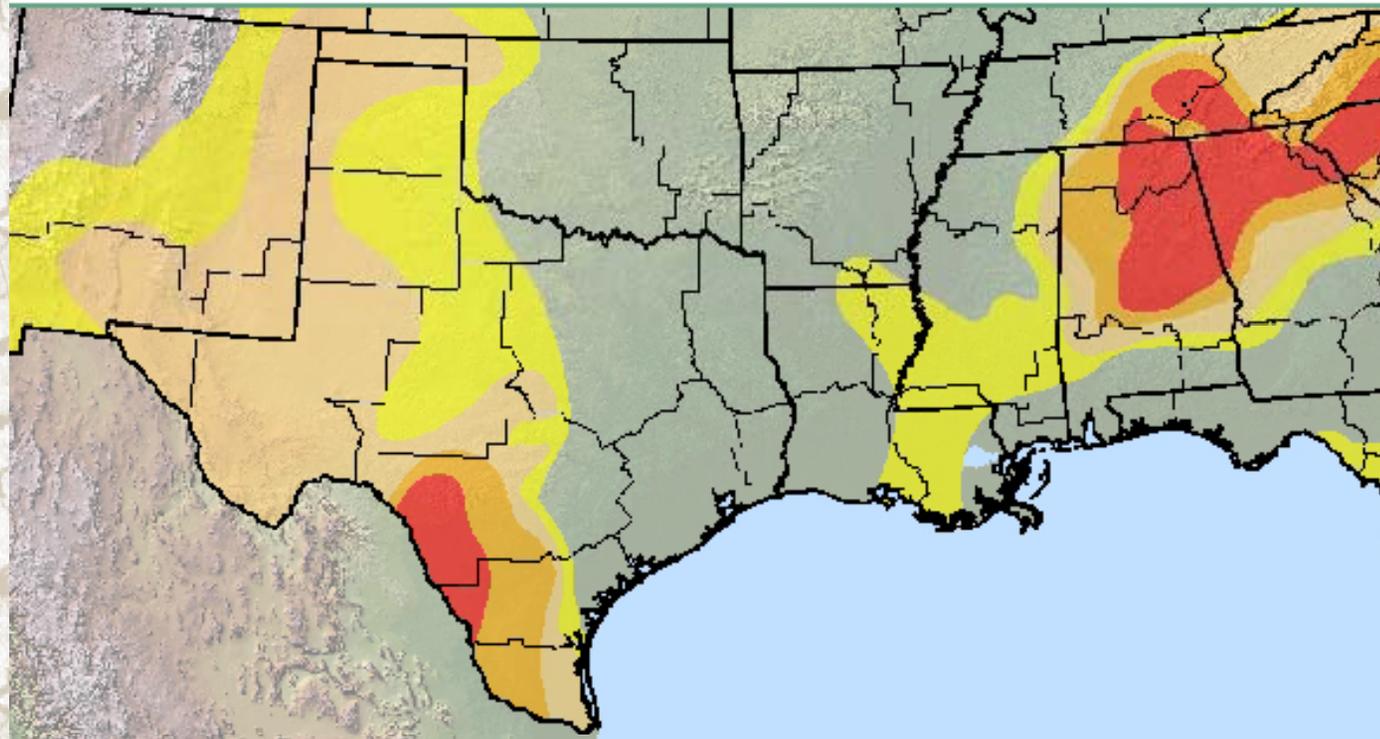
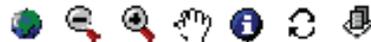
Boundaries

- Rivers
- Hydrologic Units (HUCs)
- Congressional Districts
- Climate Divisions
- Counties
- Cities
- Roads
- County Warning Areas
- States

Drought Conditions: 2007



Date	D0	D1	D2	D3	D4
Sep 18, 2007	41	4	0	0	0
Sep 11, 2007	40	4	0	0	0
Sep 4, 2007	30	4	0	0	0
Aug 27, 2007	30	4	0	0	0
Aug 20, 2007	25	4	0	0	0
Aug 14, 2007	25	4	0	0	0
Aug 7, 2007	25	4	0	0	0
Jul 31, 2007	25	4	0	0	0
Jul 24, 2007	25	4	0	0	0
Jul 17, 2007	25	4	0	0	0
Jul 10, 2007	25	4	0	0	0
Jul 3, 2007	25	4	0	0	0
Jun 26, 2007	25	4	0	0	0
Jun 19, 2007	25	4	0	0	0
Jun 12, 2007	25	4	0	0	0



Continental United States

Alaska

Hawaii

Puerto Rico

Legend

Visible

Drought Monitor

- D0
- D1
- D2
- D3
- D4

Date

April 01, 2008

Transparency

40%

ACIS Stations

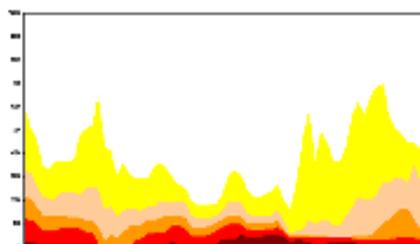
Climate Layers

- Standardized Precipitation Index
- Palmer Drought Severity Index

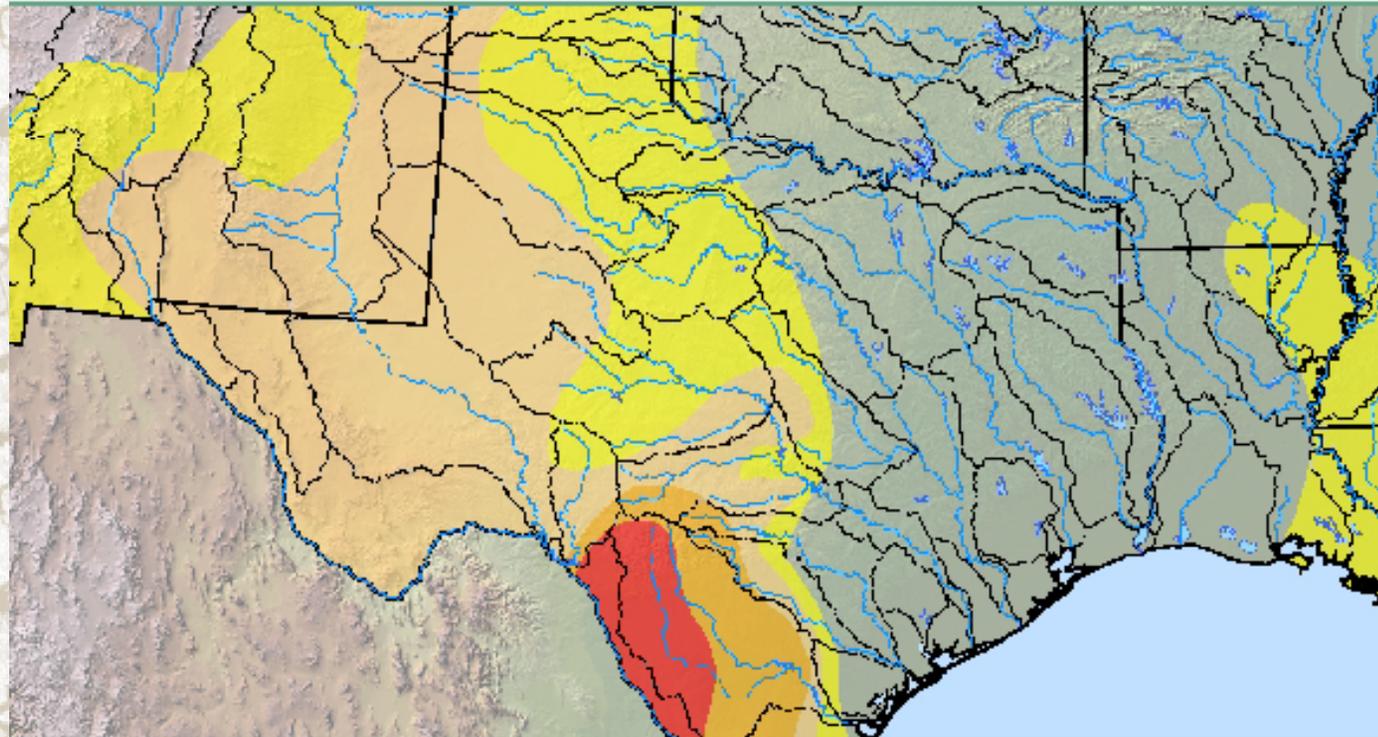
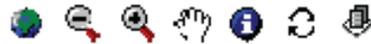
Boundaries

- Rivers
- Hydrologic Units (HUCs)
- Congressional Districts
- Climate Divisions
- Counties
- Cities
- Roads
- County Warning Areas
- States

Drought Conditions: January 2007-April 2008



Week	Nothing	D0	D1	D2	D3	D4
April 1, 2008	51.02	48.99	28.51	8.13	3.17	0.00
March 25, 2008	58.11	41.89	28.71	8.13	3.51	0.00
March 18, 2008	55.69	44.31	35.53	11.78	3.00	0.49
March 11, 2008	55.43	44.57	26.85	16.10	3.00	1.28
March 4, 2008	51.63	48.37	29.65	16.72	3.65	1.34
February 26, 2008	49.91	50.09	29.50	14.11	3.79	1.37
February 19, 2008	43.93	56.07	27.82	11.83	3.03	1.49
February 12, 2008	30.16	69.84	27.53	10.42	2.92	1.50
February 5, 2008	31.89	68.11	21.94	7.42	2.92	1.50
January 29, 2008	35.34	64.66	20.55	5.20	3.19	1.44
January 22, 2008	43.28	56.72	20.47	4.50	3.10	1.43



Continental United States
 Alaska
 Hawaii
 Puerto Rico

Legend

Visible

Drought Monitor

- D0
- D1
- D2
- D3
- D4

Date

April 01, 2008

Transparency

40%

ACIS Stations

Climate Layers

- Standardized Precipitation Index
- Palmer Drought Severity Index

Select

Boundaries

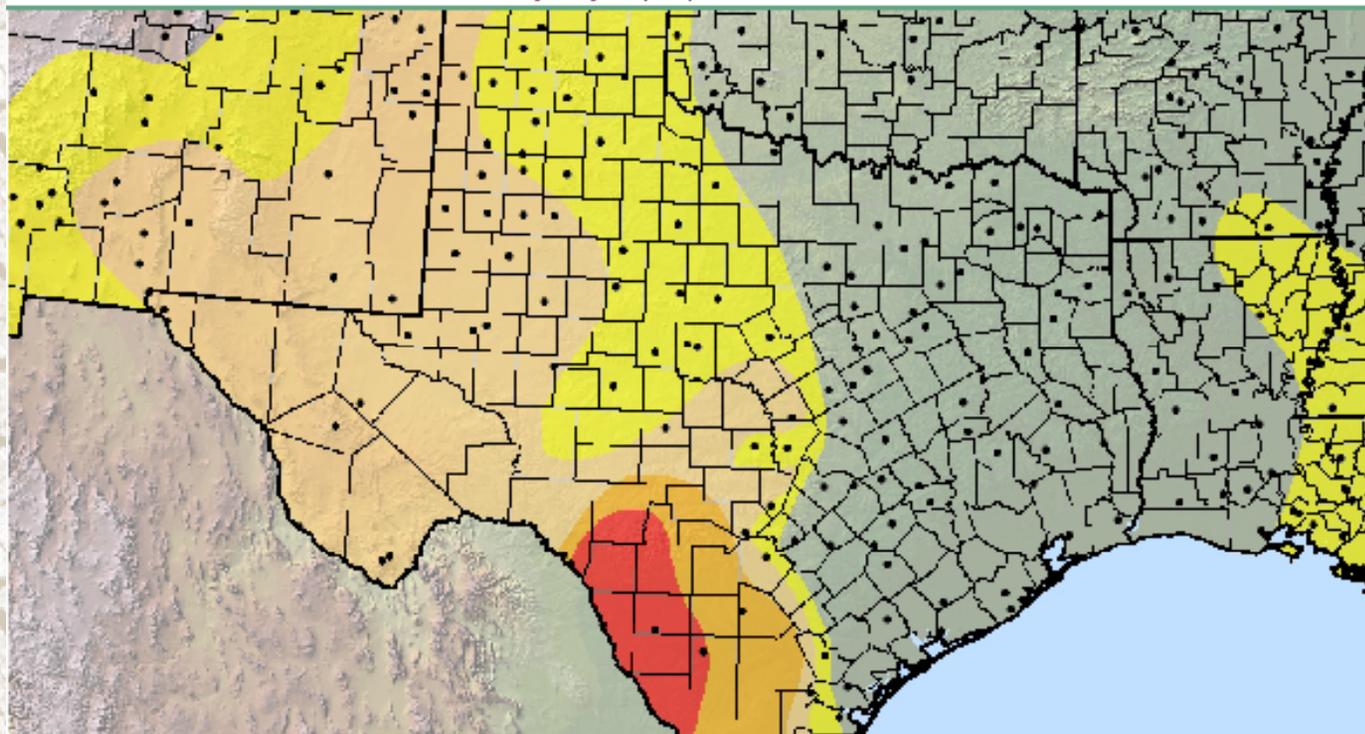
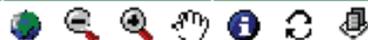
- Rivers
- Hydrologic Units (HUCs)
- Congressional Districts
- Climate Divisions
- Counties
- Cities
- Roads
- County Warning Areas
- States

Climate Links for Texas

Southern Regional Climate Center:
<http://www.srcc.lsu.edu>

Bureau of Reclamation Reservoir Levels:
<http://www.usbr.gov/gp/water/rflow.cfm>

USGS Real-Time Streamflow Data:
<http://waterdata.usgs.gov/tx/nwis/rt>



Continental United States
 Alaska
 Hawaii
 Puerto Rico

Legend

- Visible
- Drought Monitor
 - D0
 - D1
 - D2
 - D3
 - D4
 - Date: April 01, 2008
 - Transparency: 40%
 - ACIS Stations
 - Climate Layers
 - Standardized Precipitation Index
 - Palmer Drought Severity Index
 - Boundaries
 - Rivers
 - Hydrologic Units (HUCs)
 - Congressional Districts
 - Climate Divisions
 - Counties
 - Cities
 - Roads
 - County Warning Areas
 - States

Climate Links for Texas

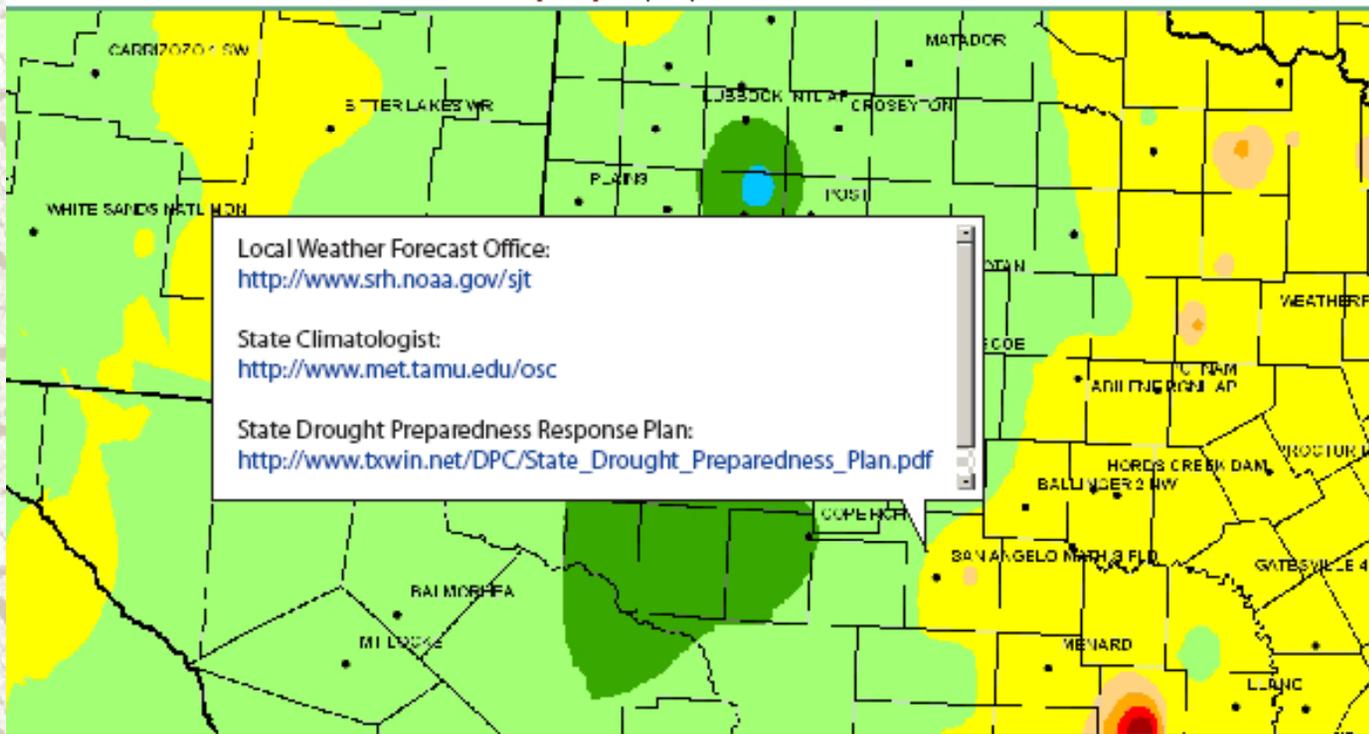
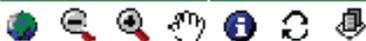
Southern Regional Climate Center:
<http://www.srcc.lsu.edu>

Bureau of Reclamation Reservoir Levels:
<http://www.usbr.gov/gp/water/rflow.cfm>

USGS Real-Time Streamflow Data:
<http://waterdata.usgs.gov/tx/nwis/rt>



- About the Drought Monitor
- Impacts
- Animations
- Current
- Forecasts
- Search the Archives
- Submit Feedback
- NIDIS



Local Weather Forecast Office:
<http://www.srh.noaa.gov/sjt>

State Climatologist:
<http://www.met.tamu.edu/osc>

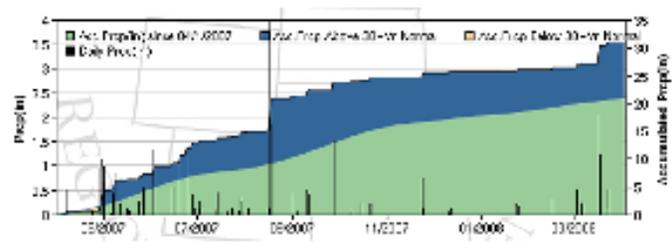
State Drought Preparedness Response Plan:
http://www.twin.net/DPC/State_Drought_Preparedness_Plan.pdf

- Continental United States
- Alaska
- Hawaii
- Puerto Rico

Legend

- Drought Monitor
- ACIS Stations
 - Station Name
- Climate Layers
 - Standardized Precipitation Index
 - < -3
 - 3 to -2.5
 - 2.5 to -2
 - 2 to -1.5
 - 1.5 to -1
 - 1 to 0
 - 0 to 1
 - 1 to 1.5
 - 1.5 to 2
 - 2 to 2.5
 - 2.5 to 3
 - > 3
 - Palmer Drought Severity Index
 - Select Boundaries
 - Rivers
 - Hydrologic Units (HUCs)
 - Congressional Districts
 - Climate Divisions
 - Counties
 - Cities
 - Roads
 - County Warning Areas

Precipitation: January 2007-April 2008



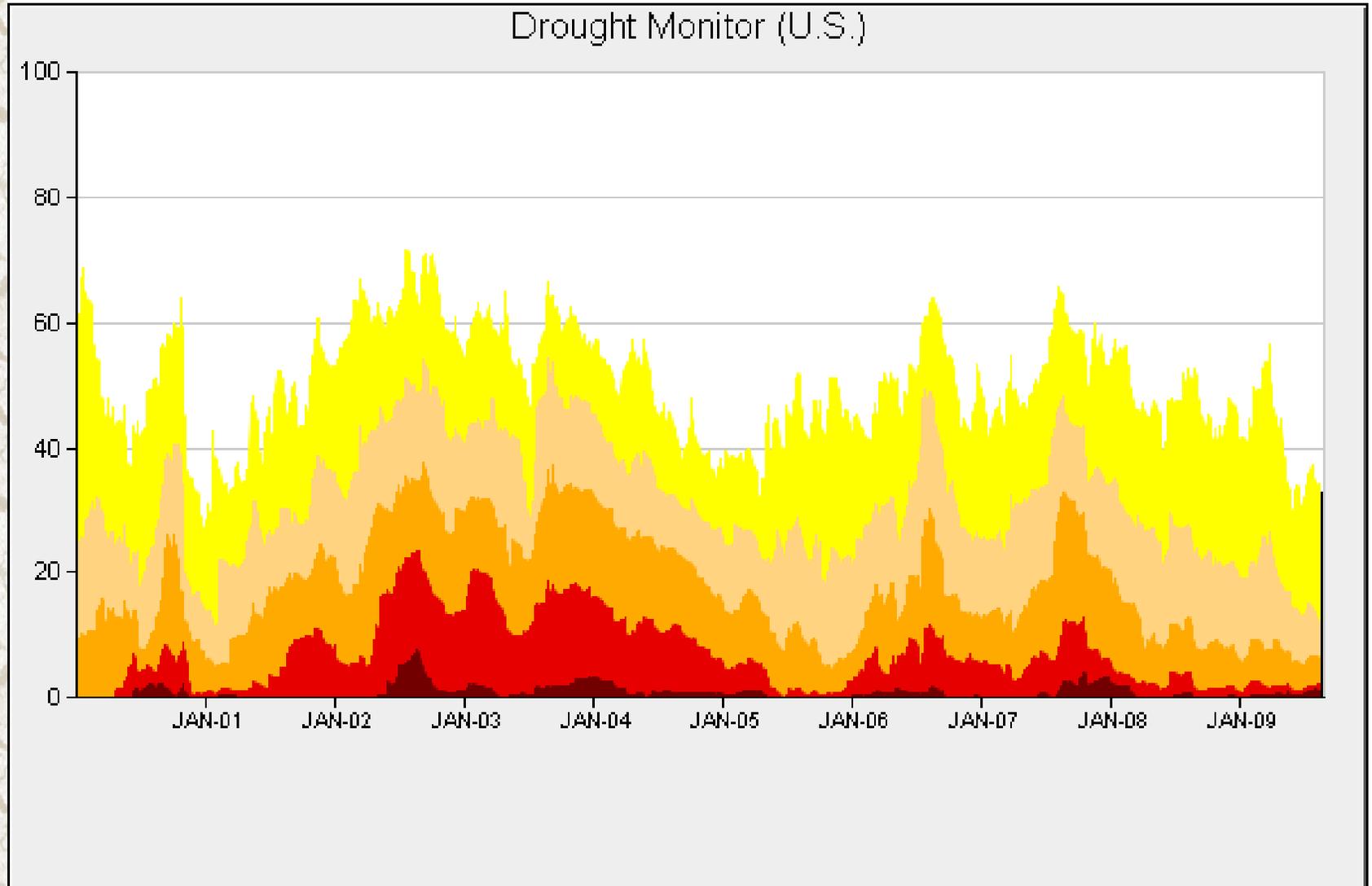
Drought Impacts for San Angelo, TX

Fire Impact 1/3/2008
 San Angelo, Texas—Tom Green county is one of 129 counties across Texas that have burn bans due to dry conditions as reported by the Texas Forest Service.



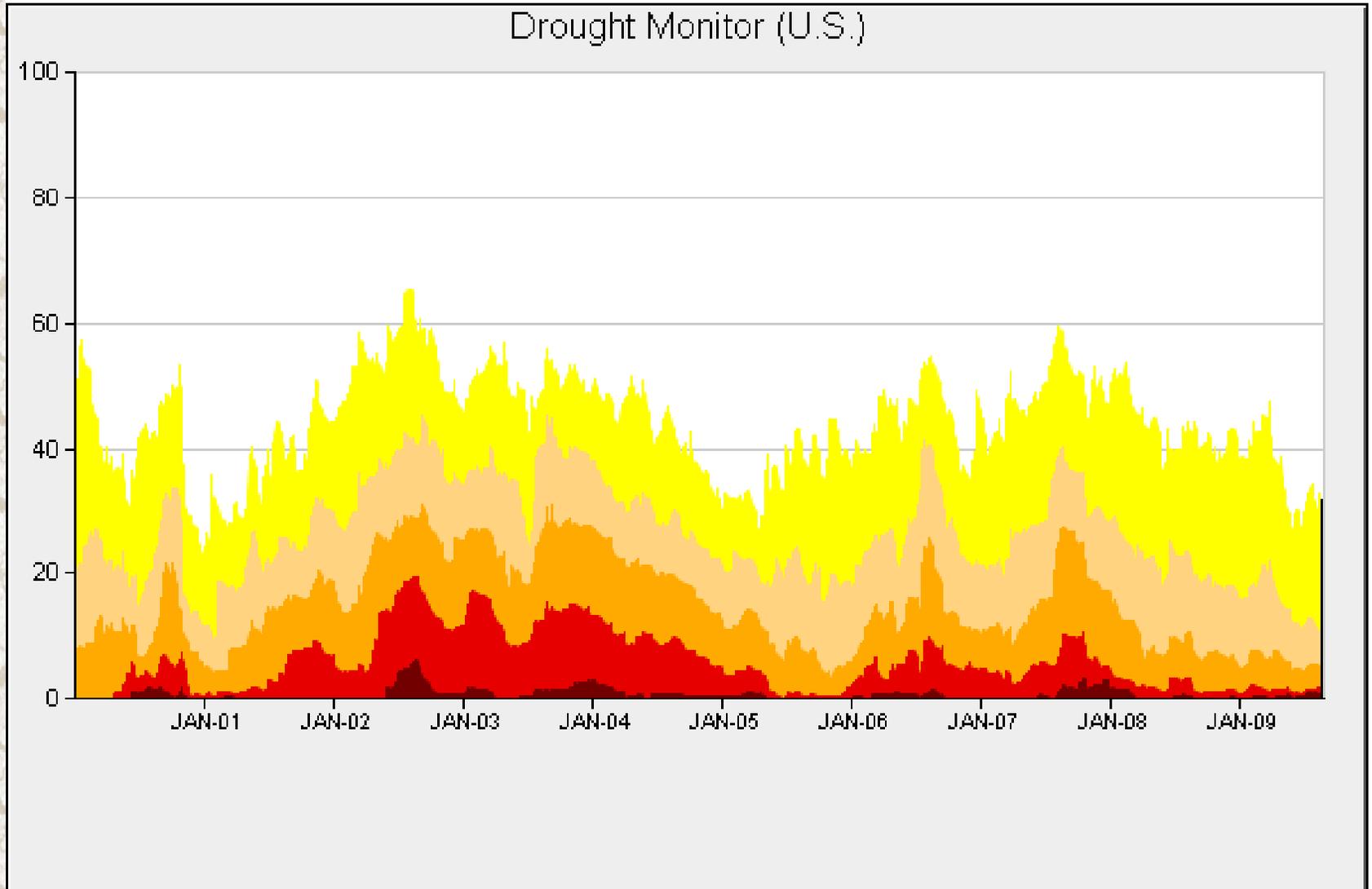
***Looking Back.....has the
Drought Monitor been all its
“cracked” up to be?***

CONUS DM Percent of Area Coverage 1999-2009



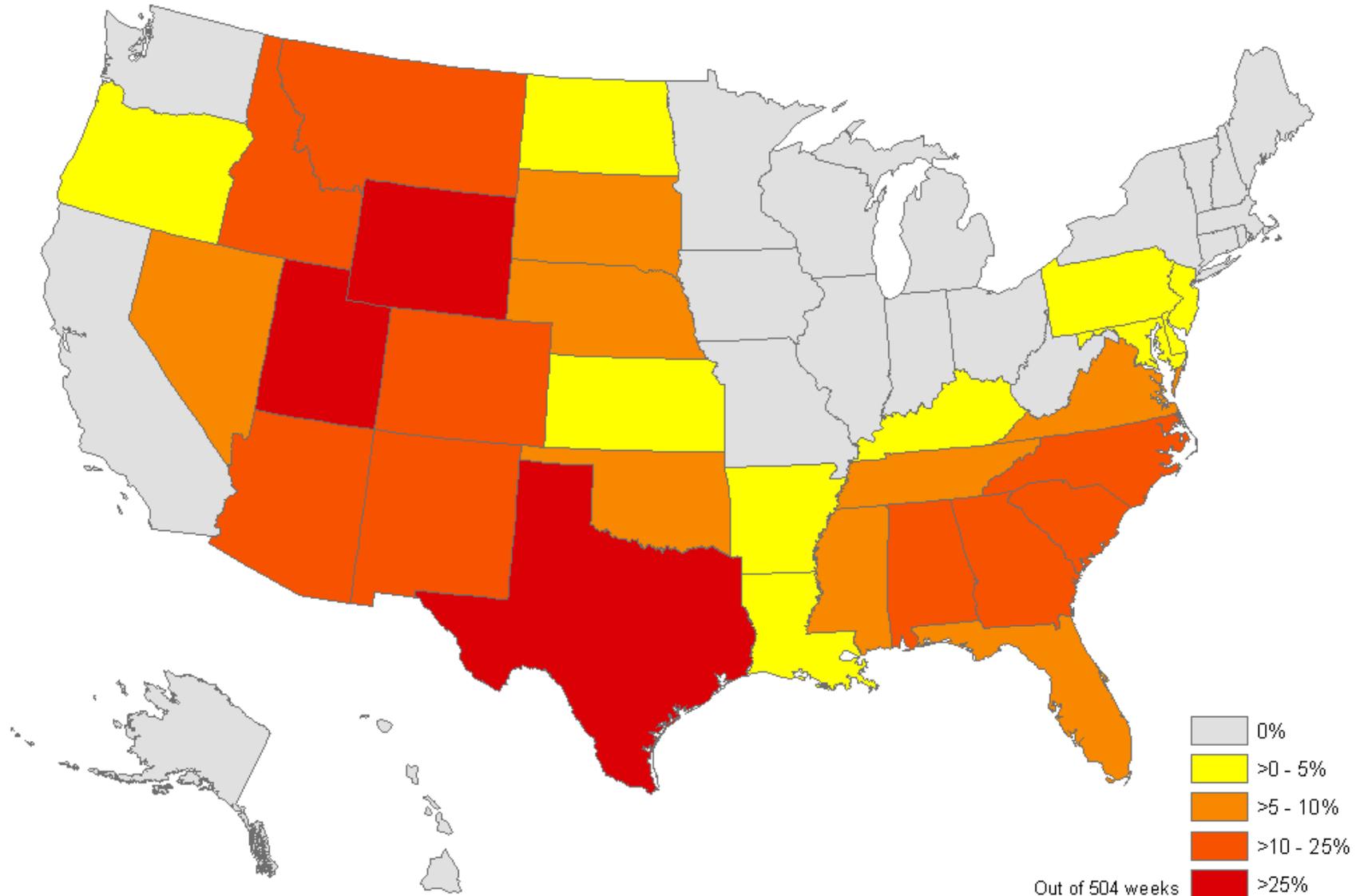
ChartDirector (unregistered) from www.advsofteng.com

U.S. DM Percent of Area Coverage 1999-2009



ChartDirector (unregistered) from www.advsofteng.com

Percent Time of Any Amount of D4 Coverage

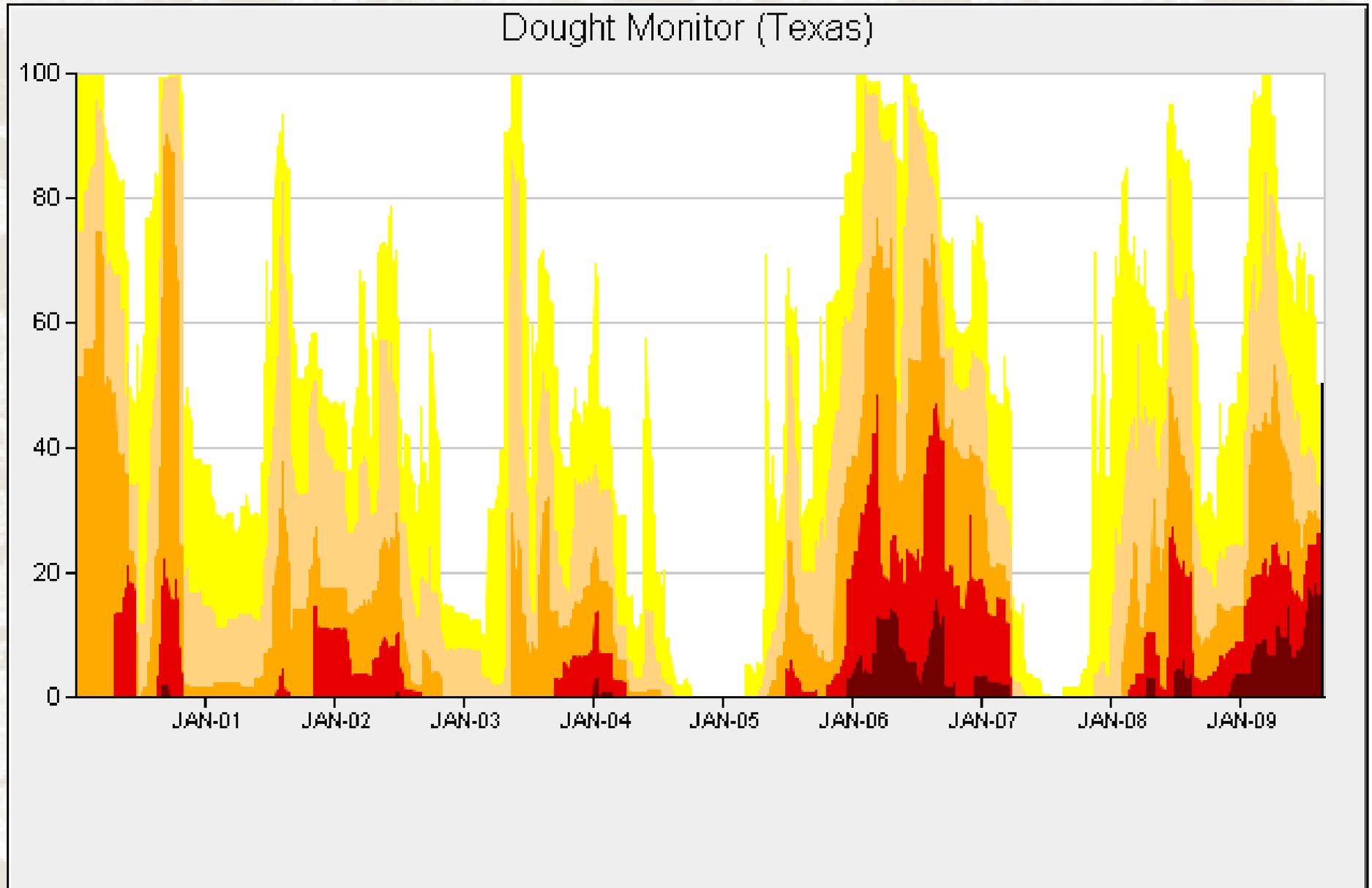


CONUS

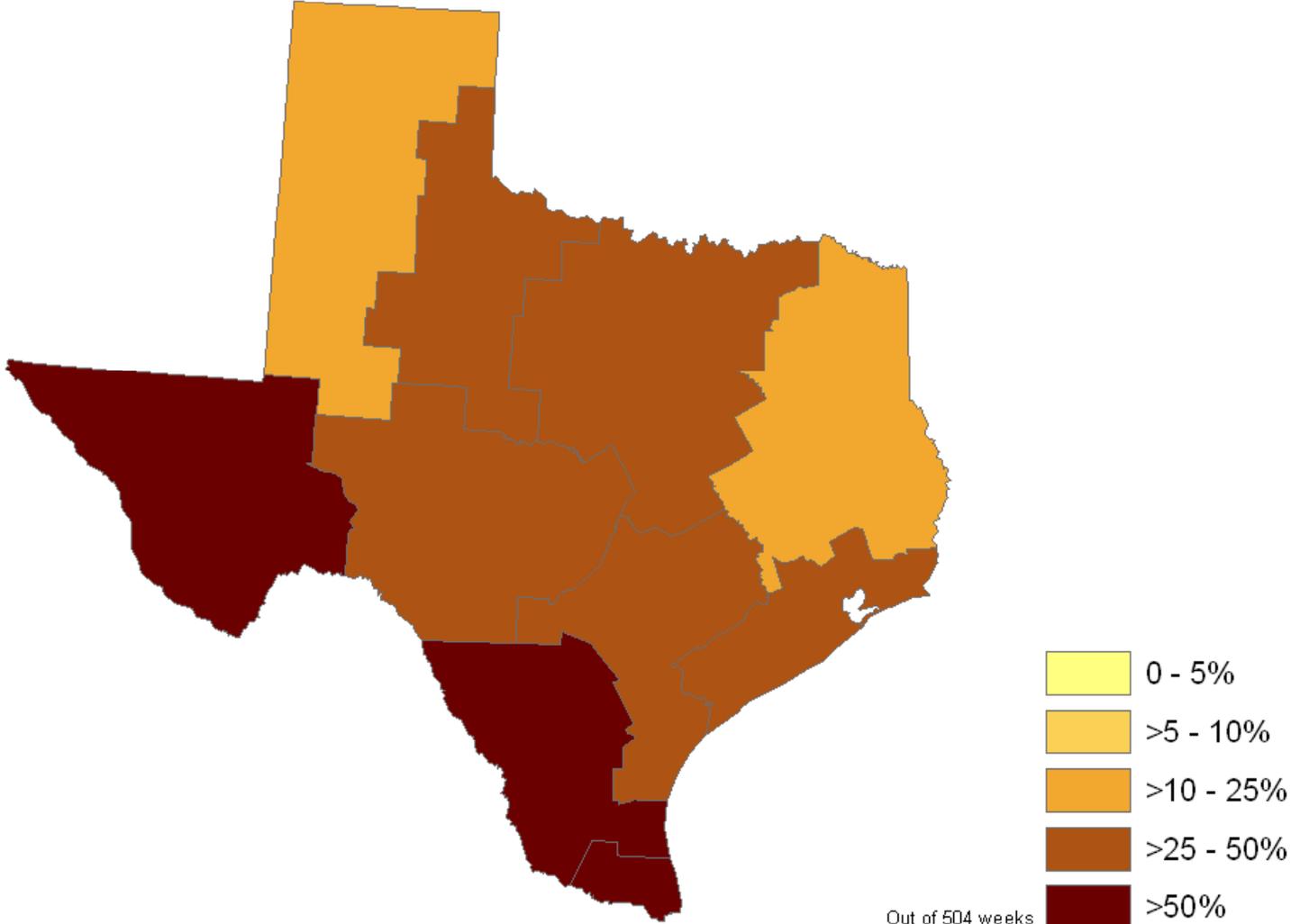
Percent of the Time Period in Each Areal Coverage

Area	D0-D4	D1-D4	D2-D4	D3-D4	D4
0%	0.00	0.00	0.00	3.37	24.60
>1%	100.00	100.00	100.00	92.26	38.89
>5%	100.00	100.00	99.80	59.13	1.98
>10%	100.00	100.00	77.38	29.56	0.00
>25%	100.00	73.81	25.00	0.00	0.00
>50%	50.00	2.58	0.00	0.00	0.00
>75%	0.00	0.00	0.00	0.00	0.00
>90%	0.00	0.00	0.00	0.00	0.00
>95%	0.00	0.00	0.00	0.00	0.00
>99%	0.00	0.00	0.00	0.00	0.00
100%	0.00	0.00	0.00	0.00	0.00

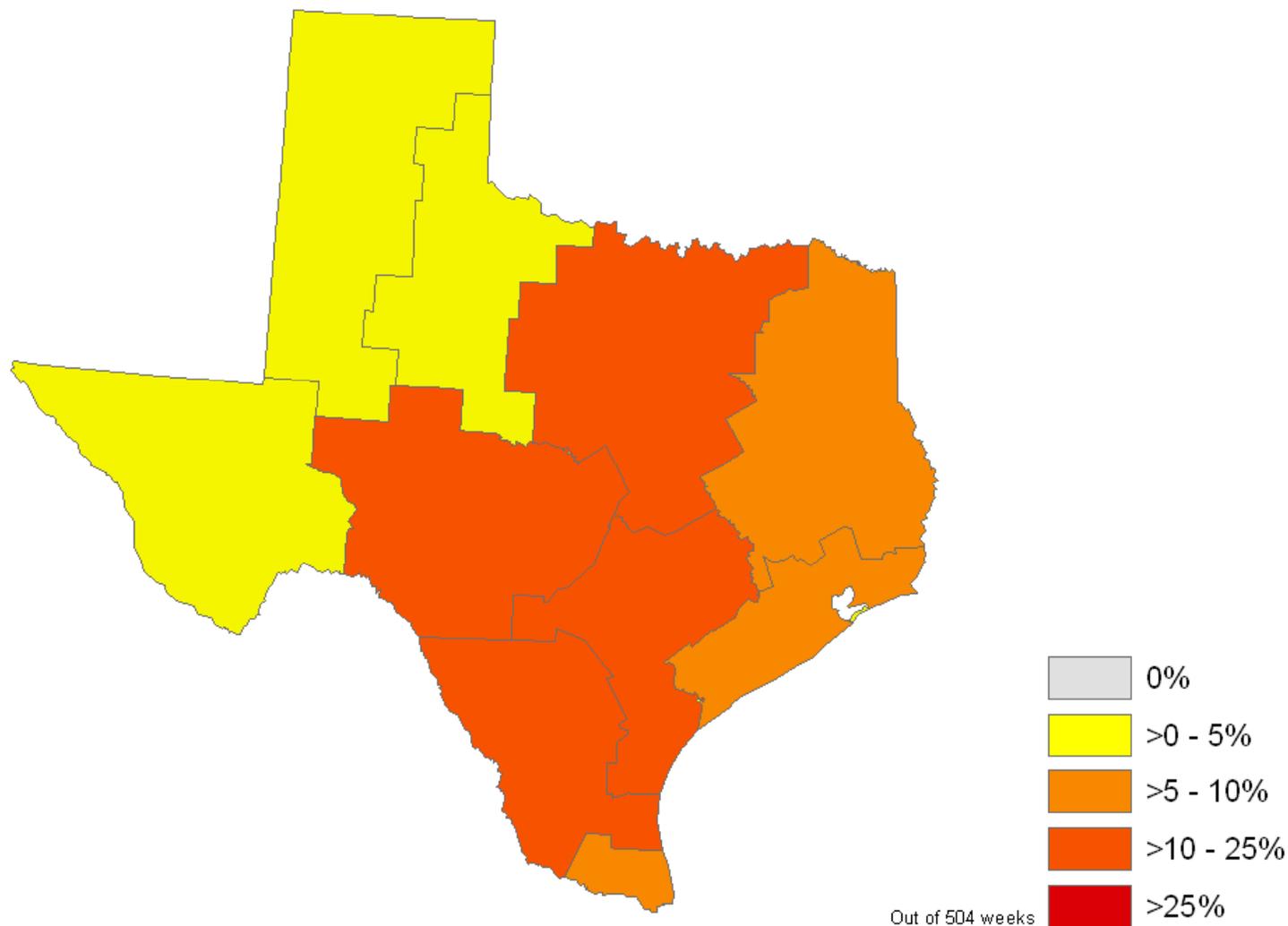
Texas % Coverage for D0-D4 (1999-2009)



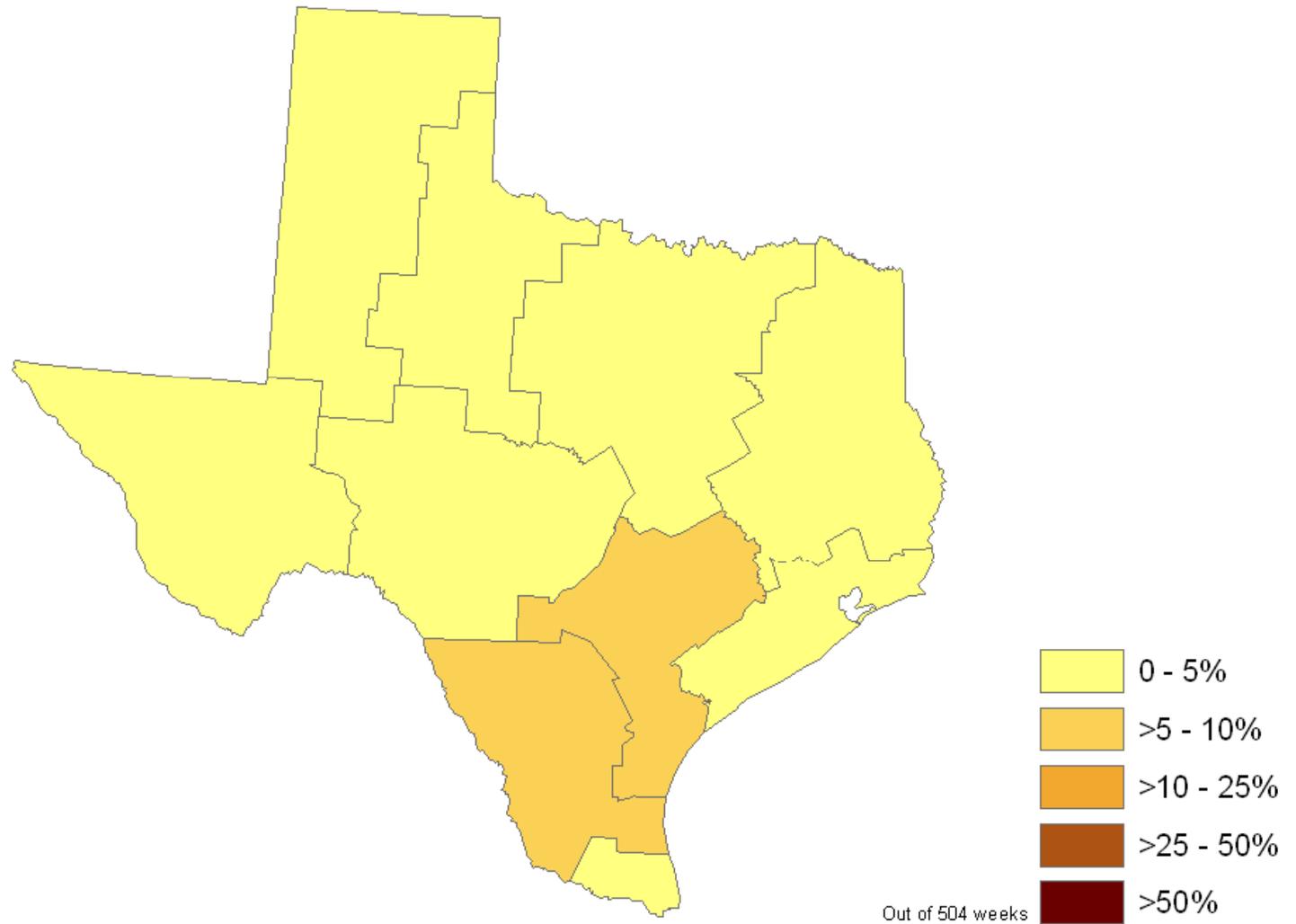
Percent Time of Greater Than 50 Percent Coverage of D2 or Worse



Percent Time of Any Amount of D4 Coverage



Percent Time of Greater Than 50 Percent Coverage of D4



Bastrop County, TX : DM % time by area

Percent of the Time Period in Each Areal Coverage					
Area	D0-D4	D1-D4	D2-D4	D3-D4	D4
0%	49.21	59.13	70.44	81.35	91.87
>1%	50.79	39.48	29.56	16.67	8.13
>5%	50.60	39.48	28.97	16.67	7.54
>10%	50.60	39.29	28.77	16.67	7.54
>25%	49.80	37.70	26.98	16.67	7.54
>50%	49.01	36.71	25.00	16.47	7.34
>75%	48.21	34.92	23.61	16.07	7.14
>90%	47.02	34.33	23.41	15.08	6.35
>95%	46.03	34.13	23.21	14.88	6.35
>99%	45.83	32.54	23.21	12.90	6.15
100%	44.25	32.14	23.21	12.50	3.57

Some closing thoughts:

- **An explosion of good work and tools/models/products out there over the past 5 years**
- **Some nice state efforts out there....**
- **How can we better detect “flash drought”?**
- **Are blends really objective? They are both...indicators and weights were chosen**
- **The DM is both: Indicators and Impacts with unique local input**
- **What resolution are you comfortable with?**
- **Monitoring of impacts globally is virtually non-existent**
- **Progress yes; Perfect, no....we’ll keep trying**

Next Steps

- **NIDIS---meeting customer needs at the county level**
 - **“No county left behind”**
- **Robust IMS/GIS query/analysis (DM-DSS) (NIDIS Portal)**
- **Incorporate new/enhanced/innovative tools: ACIS gridded SPI/PDSI, remote sensing derived, NWS Precipitation Analysis, NLDAS, etc...**
- **Taking the blends from a climate division base to a station-based/gridded layer**

DROUGHT MONITOR



drought monitor

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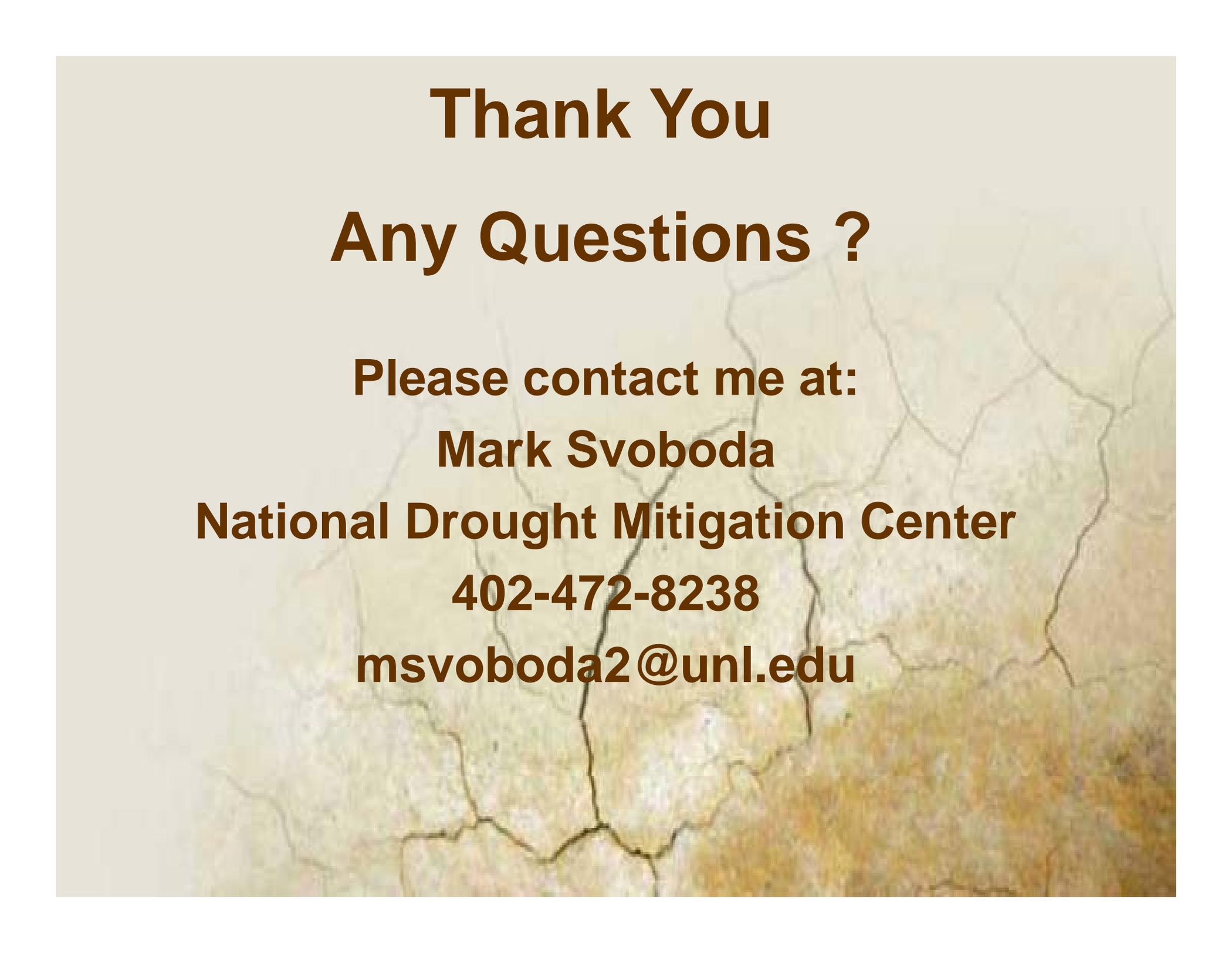
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<http://drought.unl.edu/dm>



Thank You
Any Questions ?

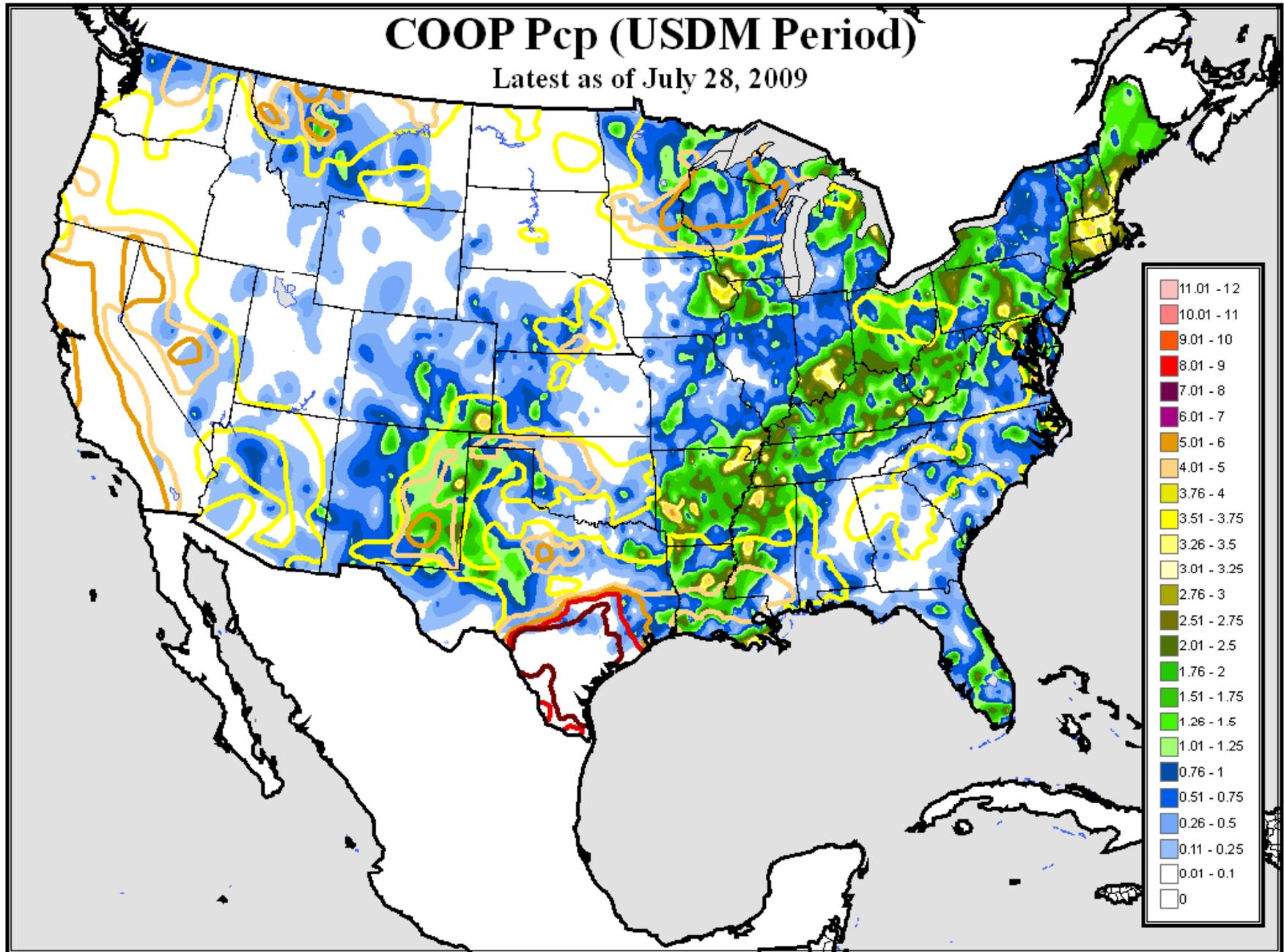
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COOP Pcp (USDAM Period)

Latest as of July 28, 2009



MPE Pcp (USDM Period)

Latest as of July 28, 2009

