



# 6<sup>th</sup> U.S. Drought Monitor Forum

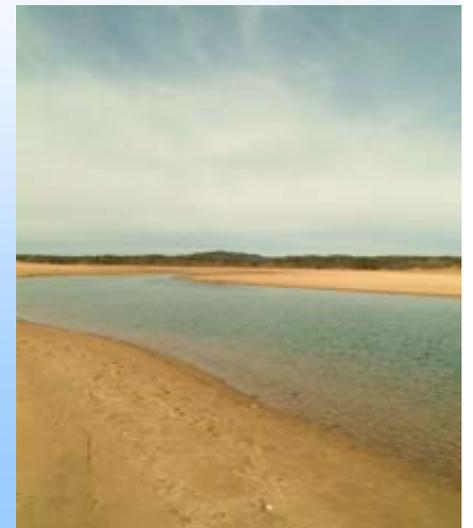


**Drought monitoring is vital to helping  
our nation and its communities...  
to be more resilient !**



**LCRA Redbud Center  
Austin, TX - Oct. 7, 2009**

**Bill Proenza, Regional Director  
National Weather Service  
Southern Region**

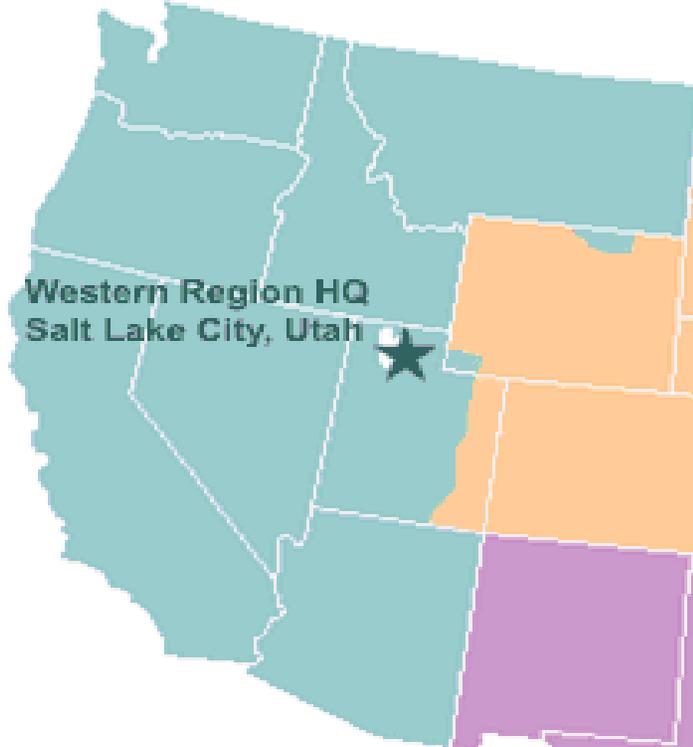


# NWS has 4 large contiguous Regions and 2 “oconus” Regions

Alaska Region HQ  
Anchorage, Alaska



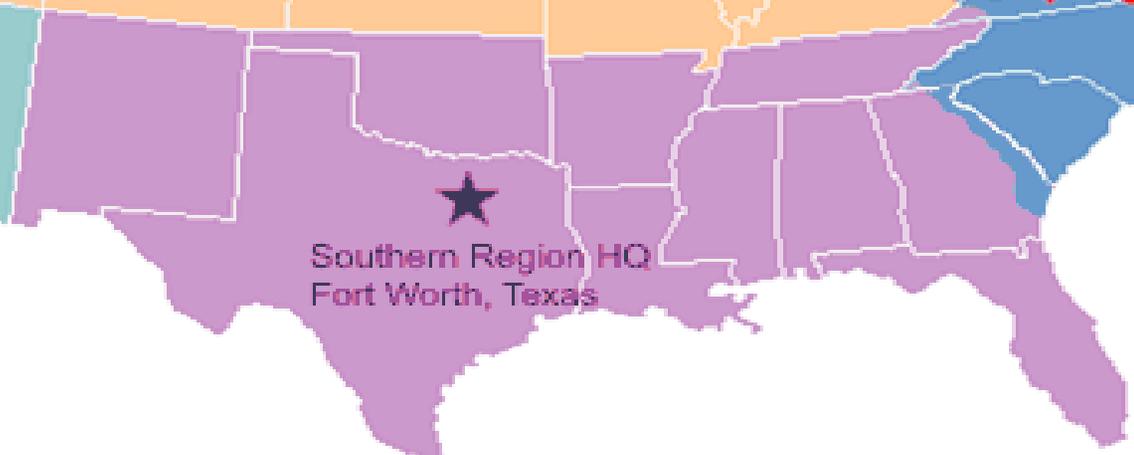
Western Region HQ  
Salt Lake City, Utah



Central Region HQ  
Kansas City, Missouri



Southern Region HQ  
Fort Worth, Texas



Pacific Region HQ  
Honolulu, Hawaii



Eastern Region HQ  
Bohemia, New York



National Headquarters  
Silver Spring, Maryland





# BILLION DOLLAR CLIMATE AND WEATHER DISASTERS



1980-2008 \*



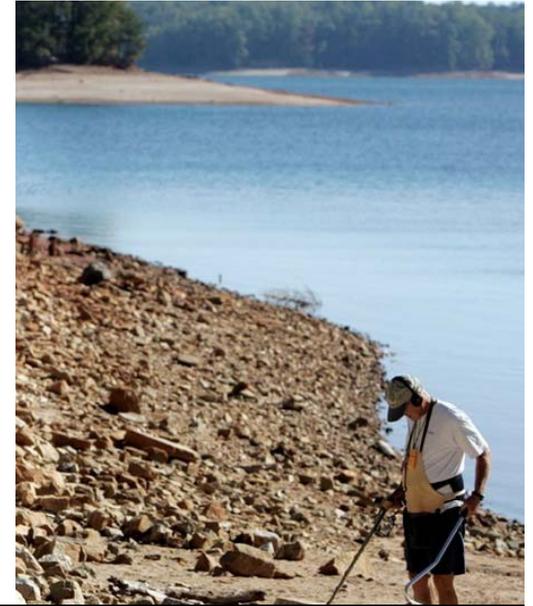
NUMBER OF EVENTS

Black	26 - 30
Light Blue	21 - 25
Red	16 - 20
Orange	13 - 15
Yellow	10 - 12
Green	7 - 9
Dark Blue	4 - 6

**14 Drought/heatwave events =  
25% of the total U.S. dollar  
losses... ~ \$180 Billion !**



**Drought** has many kinds of **dangerous** and costly impacts!

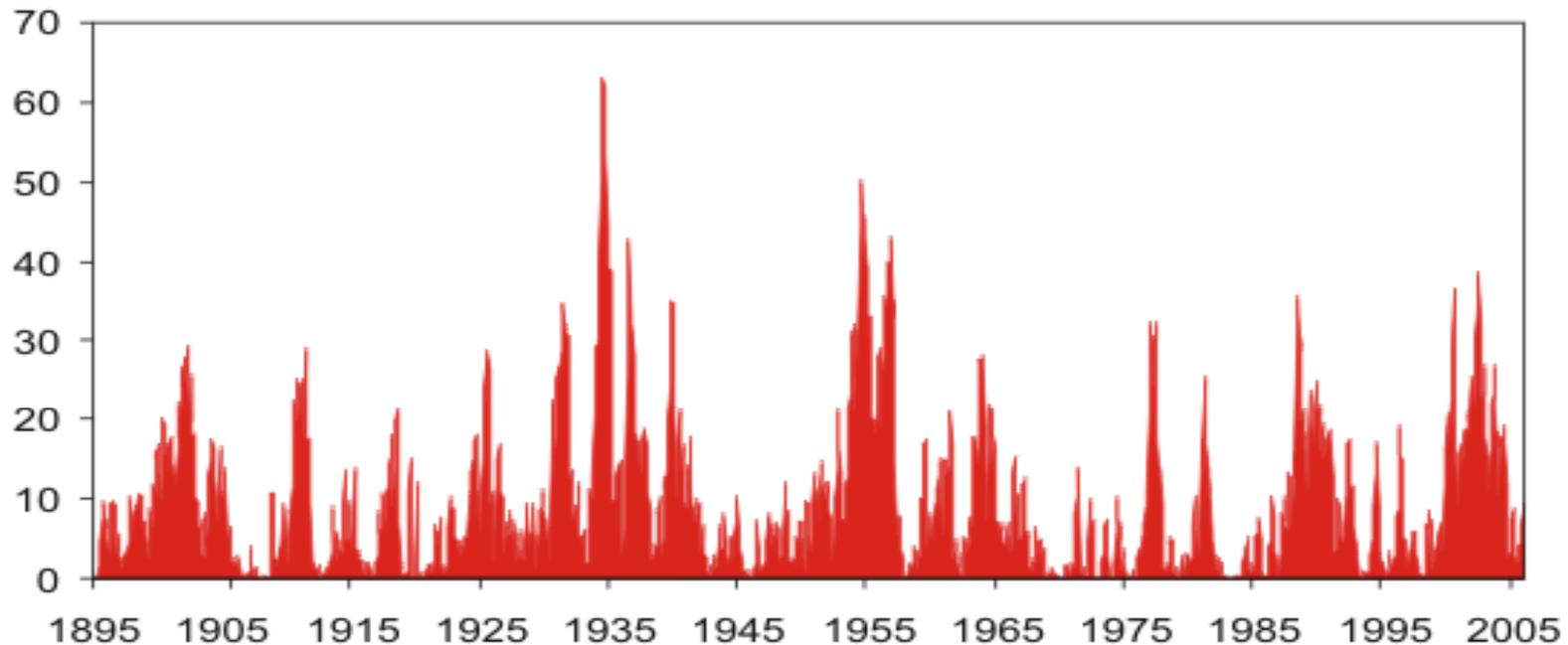




# Drought is a naturally recurring feature of our climate

## Percent Area of the United States in Severe and Extreme Drought

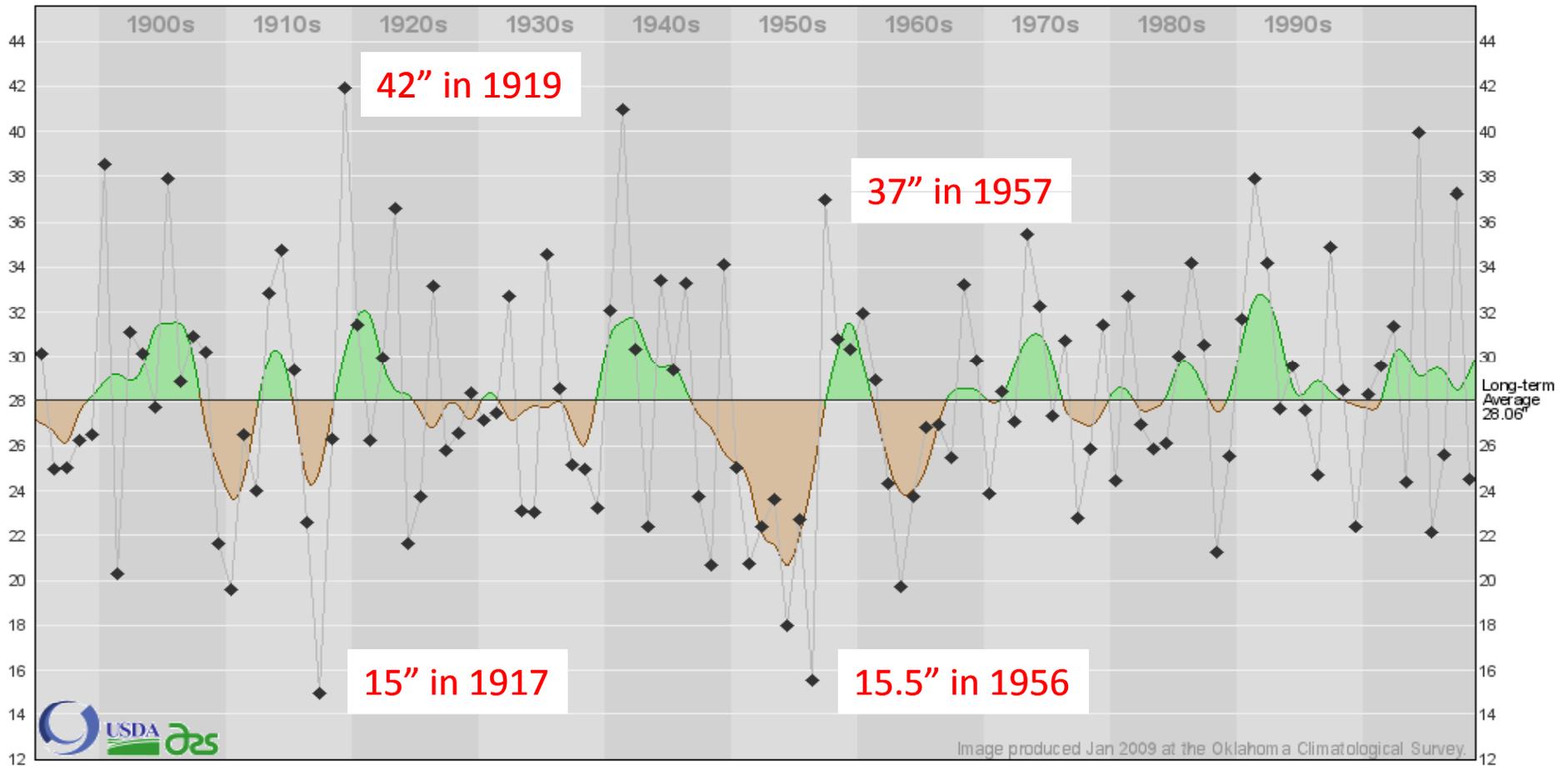
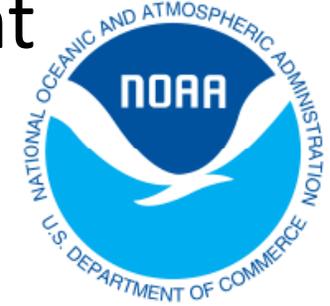
January 1895–January 2006



Based on data from the National Climatic Data Center/NOAA



Drought can certainly be persistent but also can end abruptly as we see in this Texas historical chart.



Annual Precipitation History with 5-year Tendencies  
Texas Statewide: 1895-2008

- Wetter historical periods
- Drier historical periods
- Individual Annual precipitation value



# From a May, 1999 start...



## EXPERIMENTAL **DROUGHT MONITOR**

May 20, 1999



D0a

D0a,h

D1a/D0h

D0a,h+

D1a,h

Areas depicted on chart are derived by consolidating information from a number of sources based on surface observation networks and satellite. "Drought" is used to mean abnormal moisture shortages resulting in imminent or actual damage to crops, or pastures; high wildfire risk; or water shortages. Only relatively large areas are shown; local conditions may differ markedly from those shown on the map.

### LEGEND:

D0 = Abnormal dryness but not currently classified as a drought.  
D1 to D4 = Droughts ranging in severity from standard to exceptional.

a = impact on plant life (agric. or forests)

h = impact on water supplies (reservoirs, streams, wells)

+ or - refer to forecast 2-wk trend, where "+" means intensifying and "-" means weakening. No sign means no significant change.



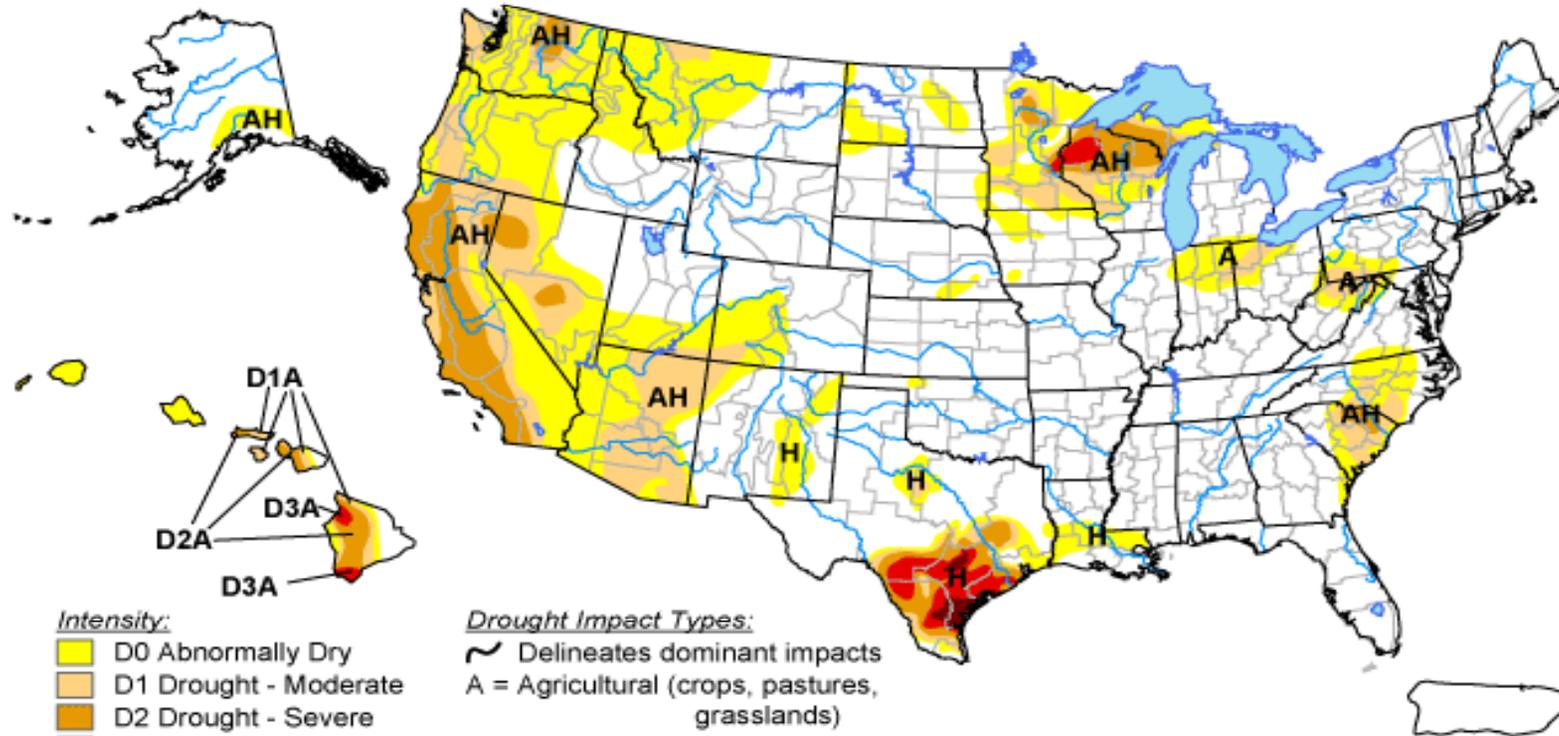
# To a vitally important, renowned and dependable service to the Nation



## 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



# ...now with GIS County Level Drought Assessments since 2007 !

Return to [U.S. Drought Monitor](#)

Return to [Region](#)

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.

## U.S. Drought Monitor Texas

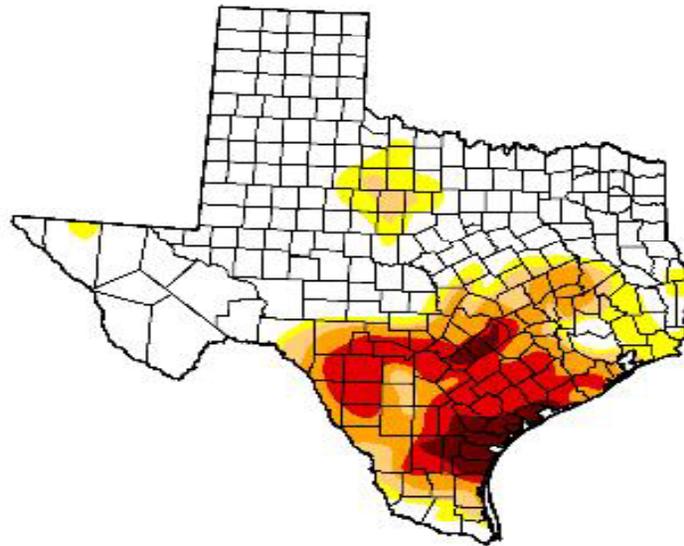
September 29, 2009  
Valid 7 a.m. EST

*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



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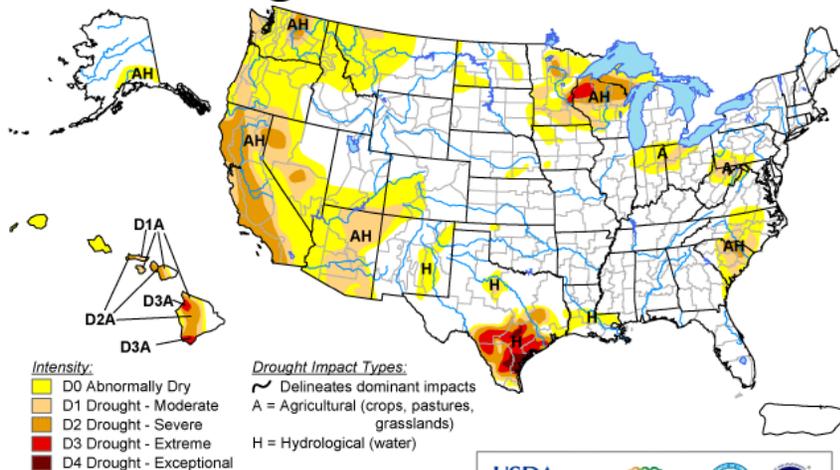


Released Thursday, October 1, 2009  
Author: D. Miskus, JAWF/CPC/NOAA



# Ten Years of Drought Monitoring and Forecasting

## U.S. Drought Monitor September 29, 2009 Valid 8 a.m. EDT

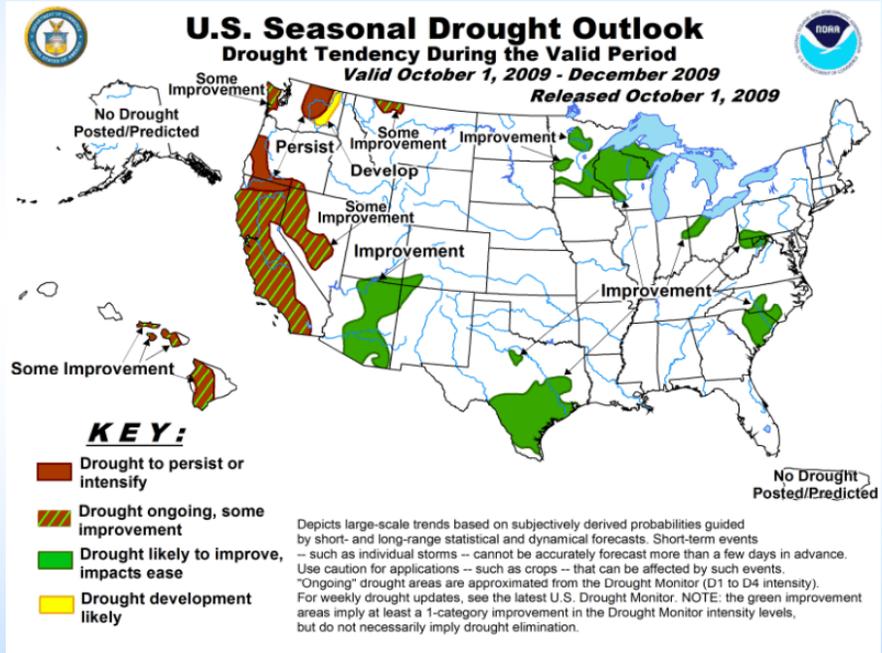


The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

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



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



The USDM is a most successful example of interagency cooperation

Your NWS CPC plays a vital role in producing important weather and climate products, such as this new drought forecasts

# Creating the Drought Monitor: An Impact Based Product

An excellent example of interagency collaboration.

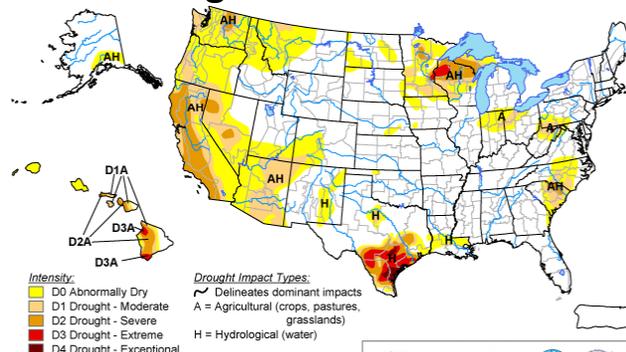
[www.drought.unl.edu/dm/monitor.html](http://www.drought.unl.edu/dm/monitor.html)

## Interagency Partners:

- NWS/CPC
- USDA/JAWF
- NDMC
- WRCC

## U.S. Drought Monitor

September 29, 2009  
Valid 8 a.m. EDT



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text for forecast statements.  
<http://drought.unl.edu/dm>

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

## Outside Experts:

- USGS
- State Climatologists
- RCCs
- NWS WFO/RFCs

Posted on the Internet  
every Thursday morning

Media/Public

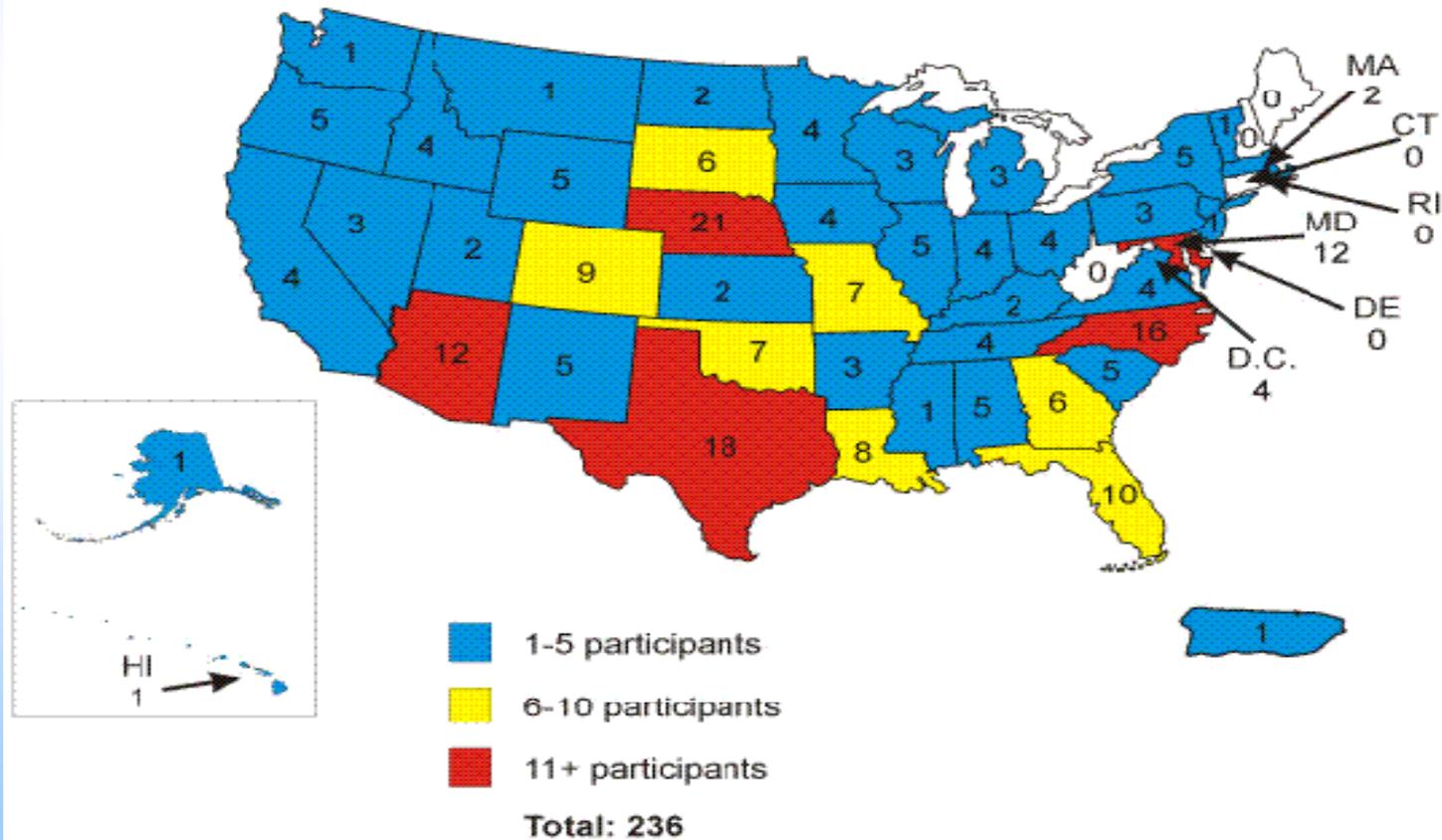
Government & EM officials

Academia &  
Private Sector



The USDM is the product of an excellent team of partners, their tools and data plus local impacts from across the U.S.

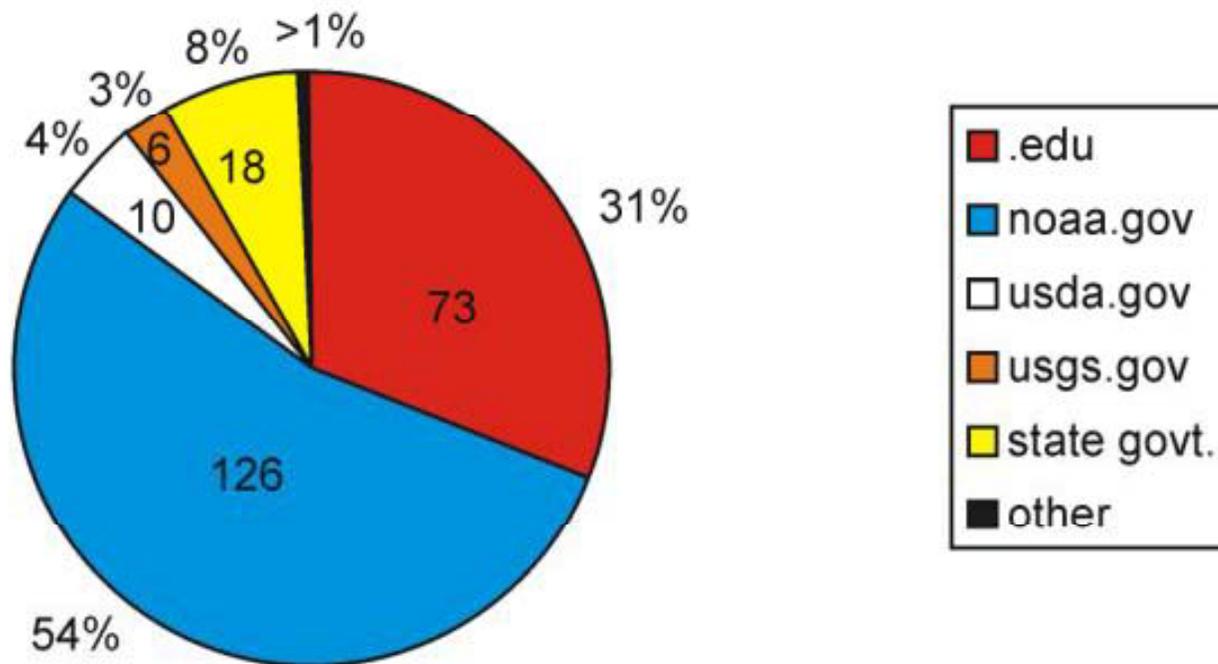
### USDM Listserve Participants (as of July 23, 2007)



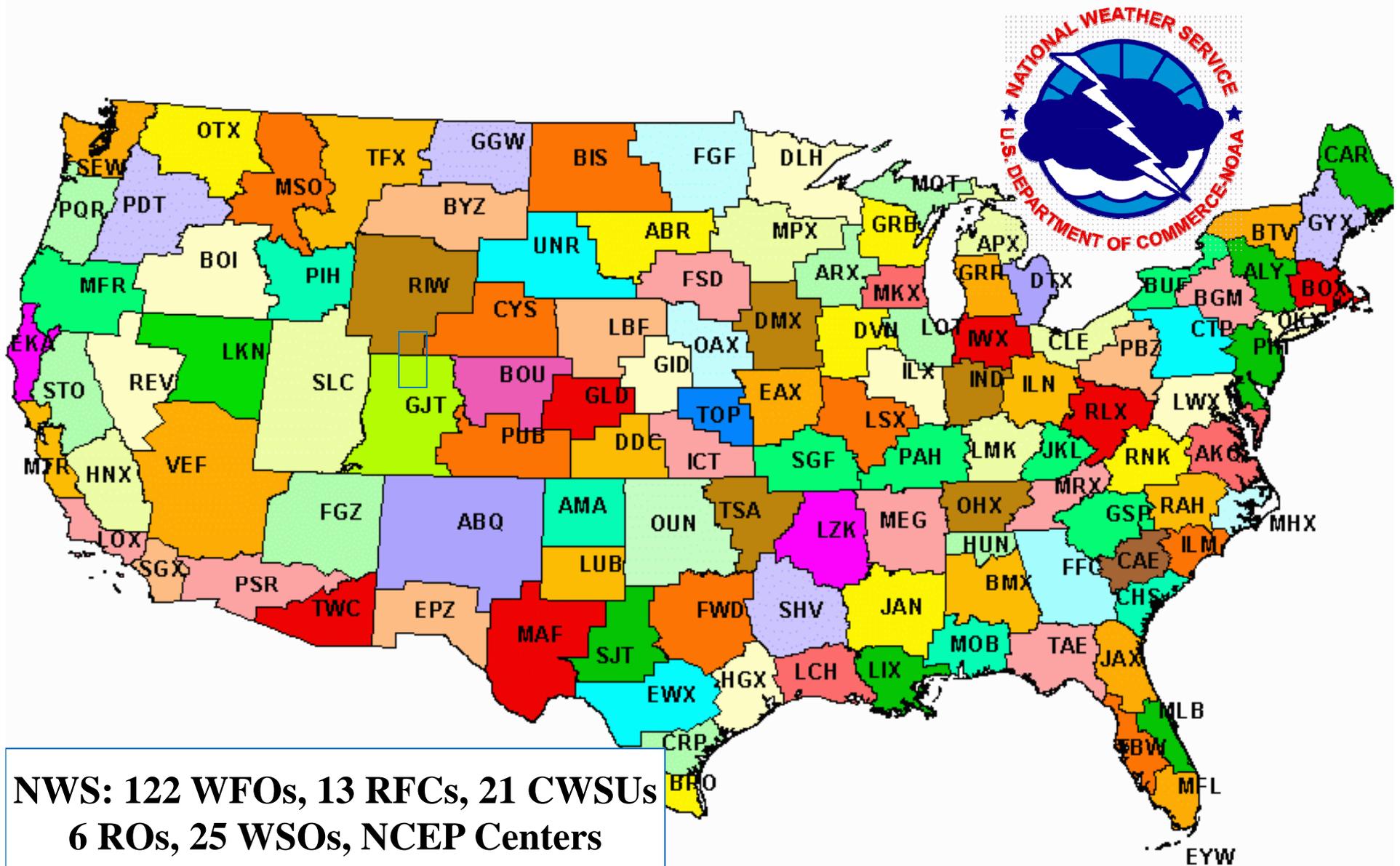


# An illustration of the partners and local participants each week from...

Number and Breakdown of USDM Local Participants



Your National Weather Service is strategically located to provide you the latest drought data and impacts.





# Some USDM uses by decision makers to mitigate drought impacts and improve our nation's resiliency

- USDA: Farm Service Agency and Risk Management Agency.
- State Climatologists & Drought Committees.
- County Judges, EMs and other local officials for declaring burn bans.
- Water management authorities to declare water use restrictions.
- Emergency managers for federal disaster declarations.



# ...declaring burn bans based on the USDM and current weather.



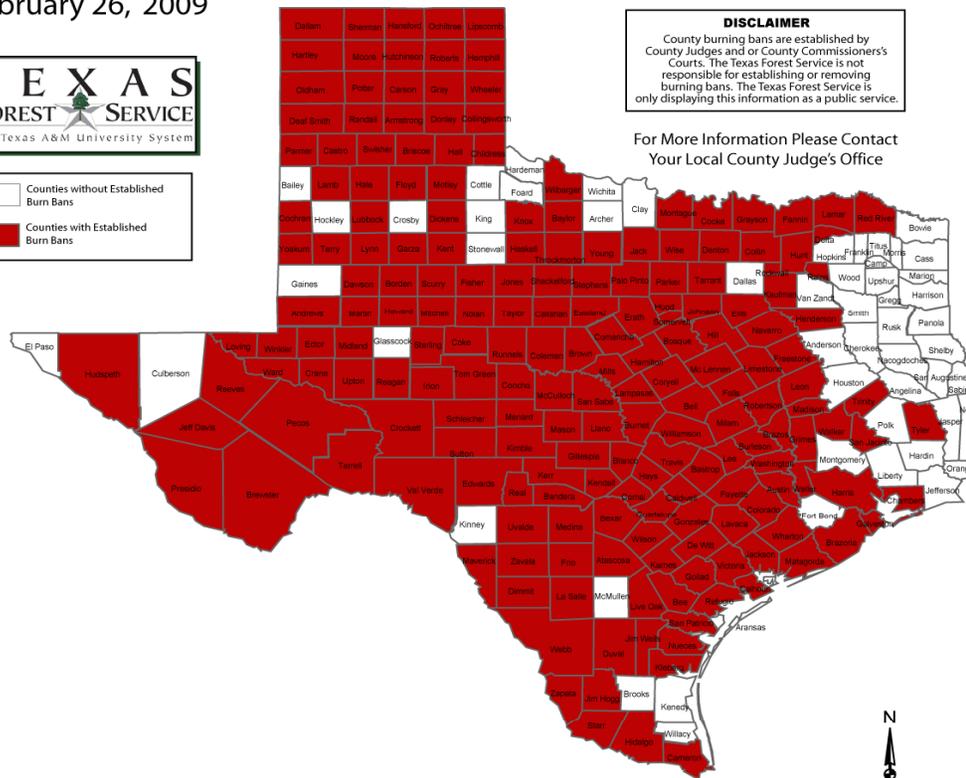
## Outdoor Burn Bans February 26, 2009



Counties without Established Burn Bans  
 Counties with Established Burn Bans

**DISCLAIMER**  
County burning bans are established by County Judges and or County Commissioners's Courts. The Texas Forest Service is not responsible for establishing or removing burning bans. The Texas Forest Service is only displaying this information as a public service.

For More Information Please Contact  
Your Local County Judge's Office



### Counties with Burn Bans: 200

- |               |            |              |
|---------------|------------|--------------|
| Andrews       | Grayson    | Nueces       |
| Armstrong     | Grimes     | Ochiltree    |
| Atascosa      | Guadalupe  | Oldham       |
| Austin        | Hale       | Palo Pinto   |
| Bandera       | Hall       | Parker       |
| Bastrop       | Hamilton   | Parmer       |
| Baylor        | Hansford   | Pecos        |
| Bee           | Harris     | Potter       |
| Bell          | Hartley    | Presidio     |
| Bexar         | Haskell    | Rains        |
| Blanco        | Hays       | Randall      |
| Borden        | Hemphill   | Reagan       |
| Bosque        | Henderson  | Real         |
| Brazoria      | Hidalgo    | Red River    |
| Brazos        | Hill       | Reeves       |
| Brewster      | Hood       | Refugio      |
| Briscoe       | Howard     | Roberts      |
| Brown         | Hudspeth   | Robertson    |
| Burleson      | Hunt       | Rockwall     |
| Burnet        | Hutchinson | Runnels      |
| Caldwell      | Iron       | San Jacinto  |
| Calhoun       | Jack       | San Patricio |
| Callahan      | Jackson    | San Saba     |
| Cameron       | Jeff Davis | Schleicher   |
| Carson        | Jim Hogg   | Scruffy      |
| Castro        | Jim Wells  | Shackelford  |
| Chambers      | Johnson    | Sherman      |
| Childress     | Jones      | Somervell    |
| Cochran       | Karnes     | Starr        |
| Coke          | Kaufman    | Stephens     |
| Coleman       | Kendall    | Sterling     |
| Collin        | Kent       | Sutton       |
| Collingsworth | Kerr       | Swisher      |
| Colorado      | Kimble     | Tarrant      |
| Comal         | Kleberg    | Taylor       |
| Comanche      | Knox       | Terry        |
| Concho        | La Salle   | Terrill      |
| Cooke         | Lamar      | Throckmorton |
| Coryell       | Lamb       | Tom Green    |
| Crane         | Lampasas   | Travis       |
| Crockett      | Lavaca     | Trinity      |
| De Witt       | Lee        | Tyler        |
| Dallam        | Leon       | Upton        |
| Dawson        | Limestone  | Uvalde       |
| Deaf Smith    | Lipscomb   | Val Verde    |
| Delta         | Live Oak   | Victoria     |
| Denton        | Llano      | Walker       |
| Dickens       | Lowing     | Walker       |
| Dimmit        | Lubbock    | Ward         |
| Donley        | Lynn       | Washington   |
| Duval         | Madison    | Webb         |
| Eastland      | Martin     | Wharton      |
| Ector         | Mason      | Wheeler      |
| Edwards       | Matagorda  | Wiltarger    |
| Ellis         | Maverick   | Williamson   |
| Erath         | McCulloch  | Wilson       |
| Falls         | McLennan   | Winkler      |
| Fannin        | Medina     | Wise         |
| Fayette       | Menard     | Yoakum       |
| Fisher        | Midland    | Young        |
| Floyd         | Milam      | Zapata       |
| Freestone     | Mills      | Zavala       |
| Frio          | Mitchell   |              |
| Galveston     | Montague   |              |
| Garza         | Moore      |              |
| Gillespie     | Morris     |              |
| Goliad        | Motley     |              |
| Gonzales      | Navarro    |              |
| Gray          | Nolan      |              |

Report updates to: [burnban@tfs.tamu.edu](http://burnban@tfs.tamu.edu)



# USDM as a statewide trigger for proactive mitigation...



DRAFT FINAL



## ALABAMA DROUGHT MANAGEMENT PLAN

April 22, 2004



# NOAA continues to work towards being a strong USDM partner



**NIDIS** National Integrated Drought Information System  
**U.S. Drought Portal**  
www.drought.gov

HOME | WHAT IS NIDIS? | CURRENT DROUGHT | FORECASTING | IMPACTS | PLANNING | EDUCATION | RESEARCH | RECOVERY

**Area Drought Information**

Select State... [v] >> Go **updated!**

Select Region... [v] >> 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](#)

**Featured Products**

[Where are Drought Conditions Now?](#)    [How is the Drought Affecting Me?](#)    [Will the Drought Continue?](#)

**Drought Impact Reporter**    *March - August 2009*  
*National Drought Mitigation Center*

Legend:

- White: No reported impacts
- Yellow: 1-60 reported impacts
- Light Orange: 61-120 reported impacts
- Orange: 121-180 reported impacts
- Red: 181-240 reported impacts
- Dark Red: > 240 reported impacts

**NIDIS Feature**

Creation of NIDIS Program Office and the US Drought Portal and Regional NIDIS Pilot Projects e.g. in NWS.



# Two NIDIS drought warning pilot projects underway by NWS



National Integrated Drought Information System - NIDIS  
*A Pathway for National Resilience*  
 Fall 2009 Volume 1 Issue 1

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**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

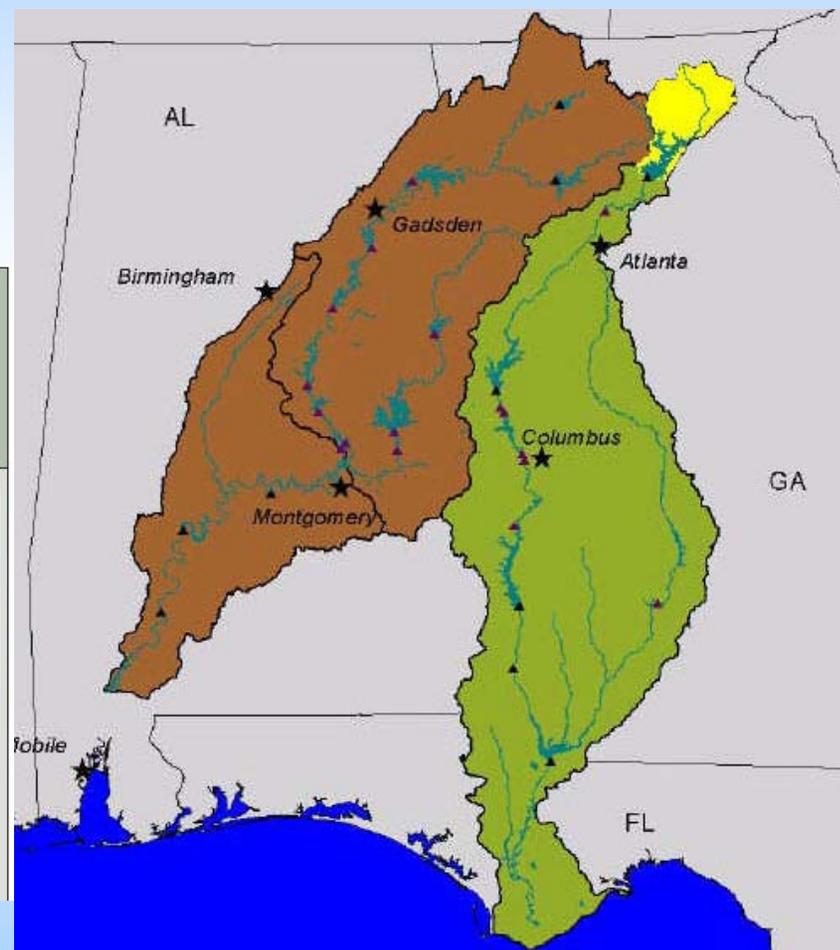
**Colorado State Climatologist is Key to the Success of the UCRB Pilot**.....2



Landsat image of Lake Mead 2003

**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



Upper Colorado River Basin

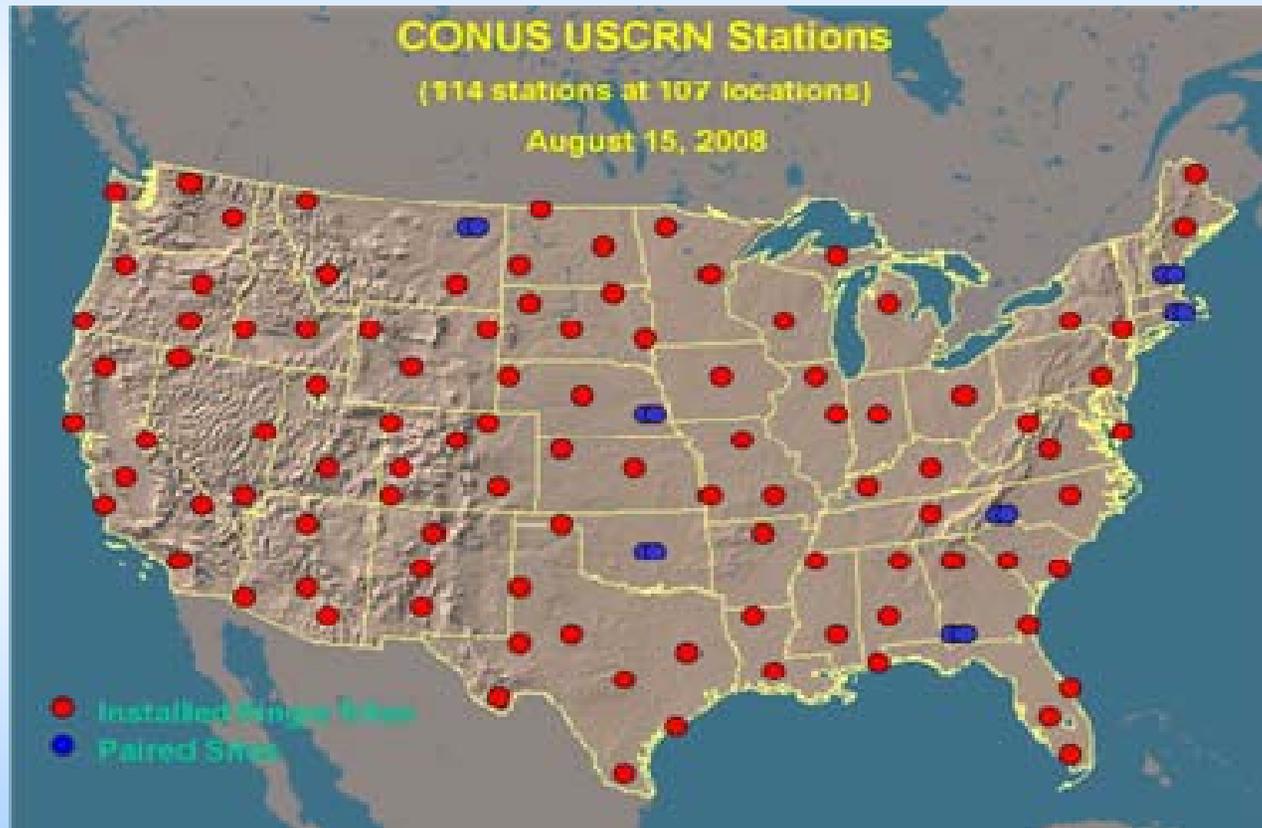
Apalachicola/Chattahoochee/Tallahpoosa Basin



# NOAA/NWS continues focus on data stewardship



**#1: Each WFO maintains a Local COOP Network to meet local, state and national weather/climate data needs.**



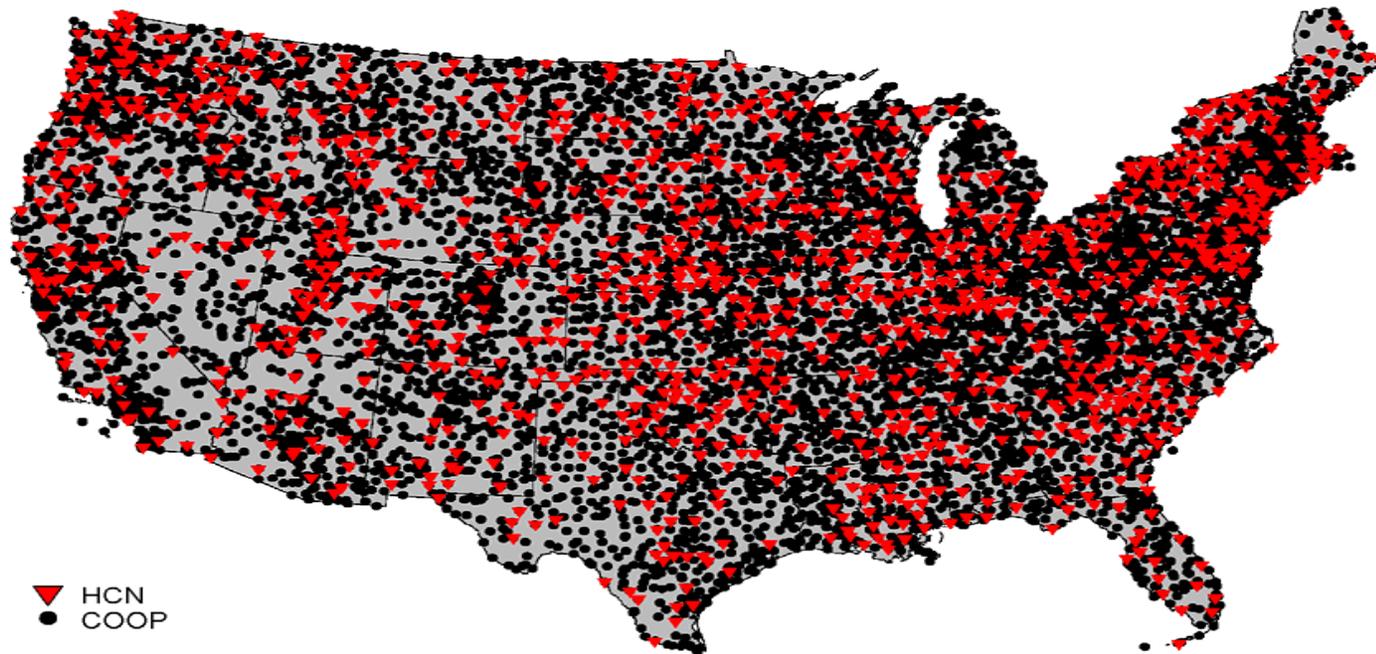
**#2: Map above shows all 114 Climate Reference Network sites installed.**



# Existing NWS COOP Network consists of over 11,000 sites and 1220 HCN sites.



Cooperative Observer Program (COOP) Network





# COOP Program Updates

- Fischer Porter punch tape gauges are being rebuilt with kits purchased from Sutron. These kits will be deployed across NWS over the next 3 years.
- NWS Southern Region has awarded a contract for the next generation telephone based IV-ROCS. System should be deployed in late summer of 2010.
- Weather Coder continues to be the internet based COOP data collection system.
- 1100 daily IV-ROCS users and 2200 daily Wx Coder users at latest count.



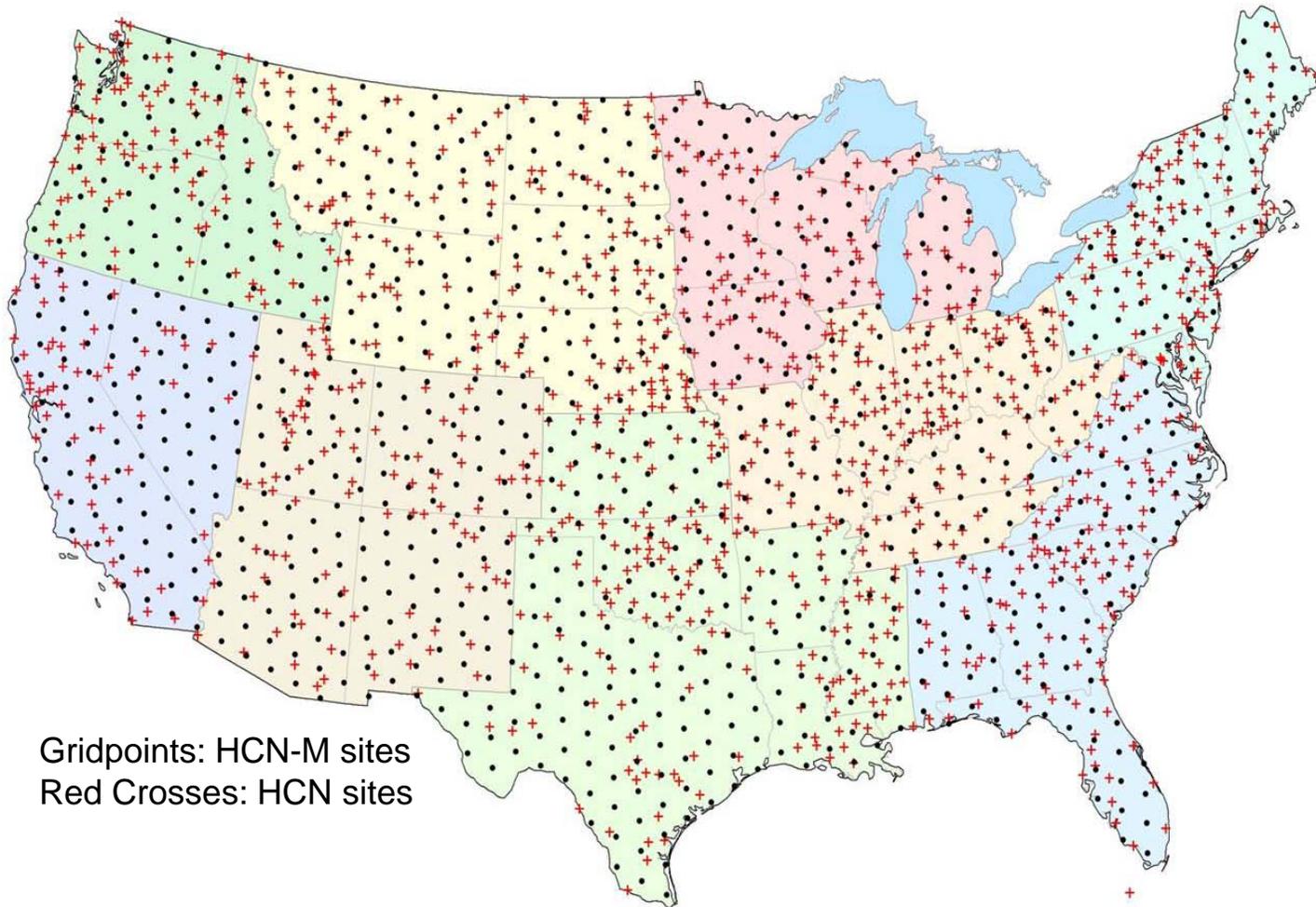
# Modernized Historical COOP Network (HCN-M)



- Plans are to deploy 1000 stations at uniform grid points for regional climate monitoring of temperature and precipitation across the nine US climate regions in the lower 48 states.
- Expansion capacity exists to collect additional data sets (i.e. snow).
- Site selections being completed and first few sites installed in the AZ, NM, CO, UT climate region.



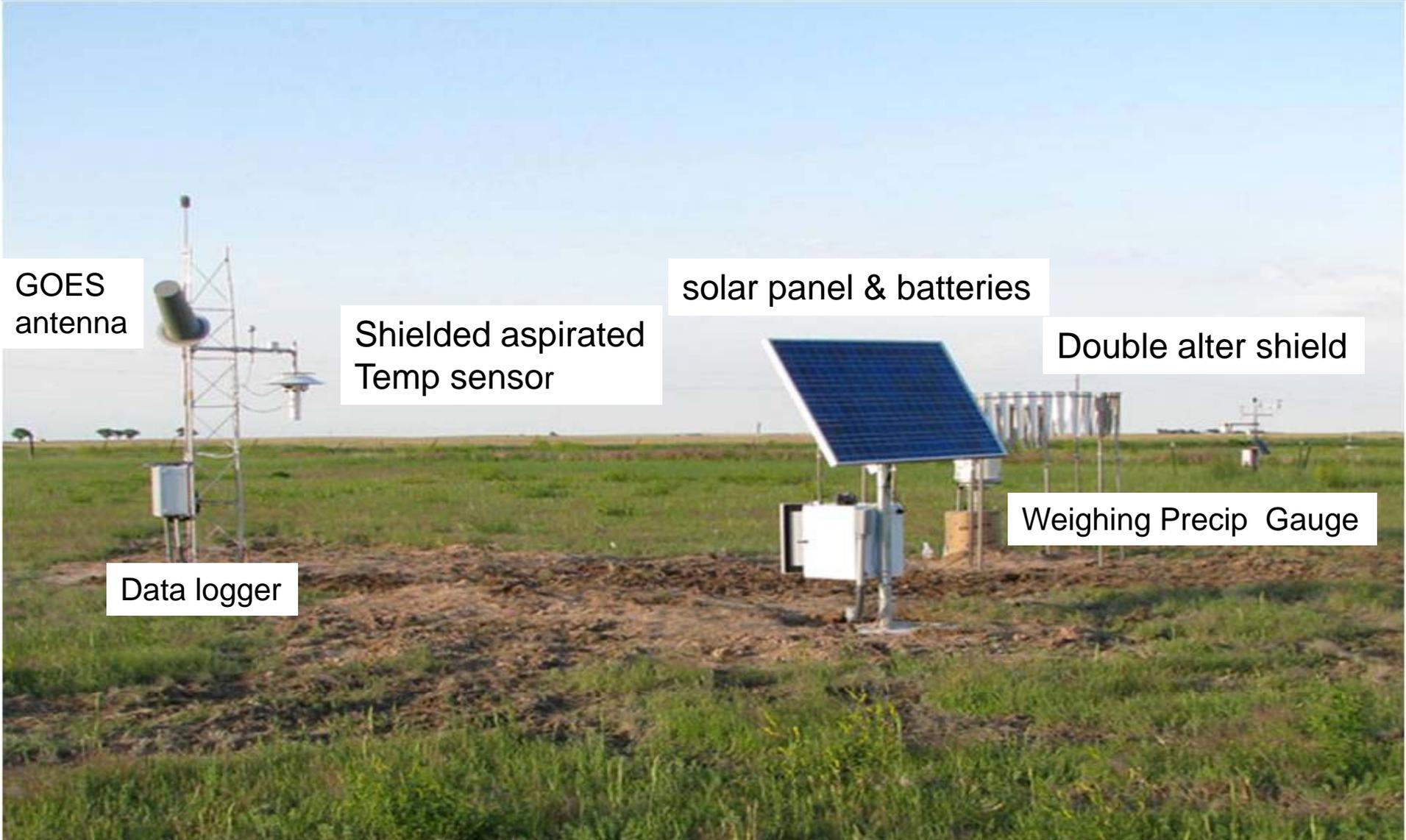
# HCN-M grid-points for the top 1000 locations



Gridpoints: HCN-M sites  
Red Crosses: HCN sites



# US HCN-M Pilot Site 24N Stratton



GOES  
antenna

Shielded aspirated  
Temp sensor

solar panel & batteries

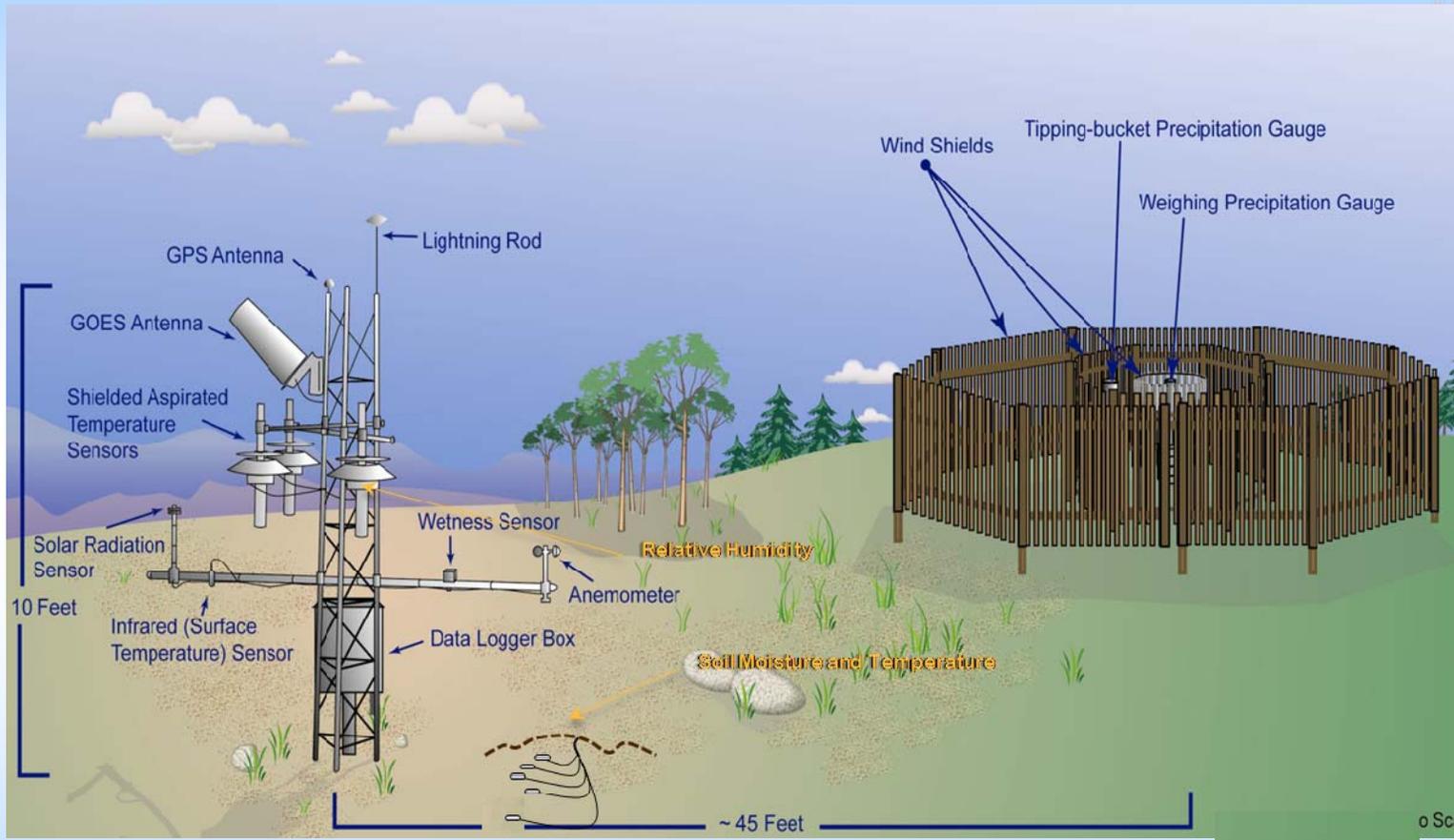
Double alter shield

Data logger

Weighing Precip Gauge



# CRN Station Model



Also, in cooperation with NIDIS, the CRN deploys soil moisture/temperature probes at depths of 5, 10, 20, 50, and 100 cm.



# The National Weather Service has a seamless suite of national and local climate services



These services are delivered 24x7 from the NWS network of 141 Forecast Offices, River Centers and Regional Headquarters serving the nation. Further, the WFOs downscale the very latest outlooks from the NWS Climate Prediction Center to their local areas.



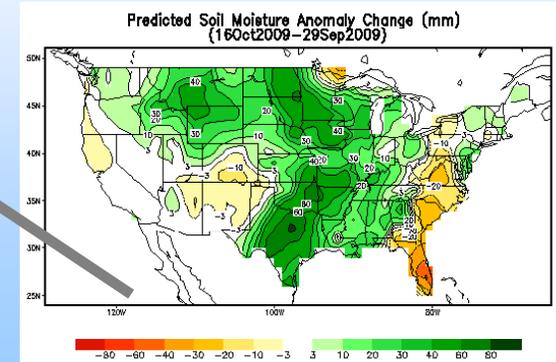
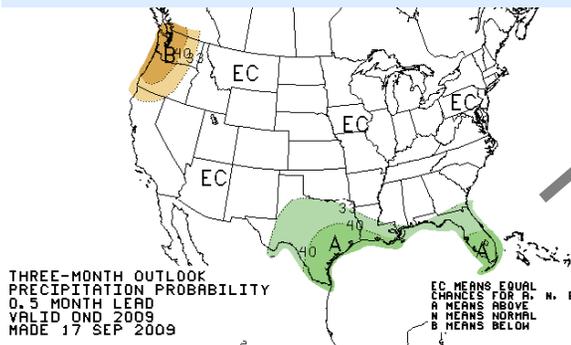
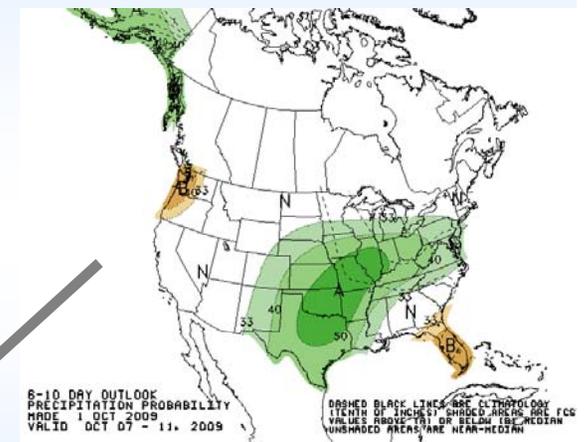
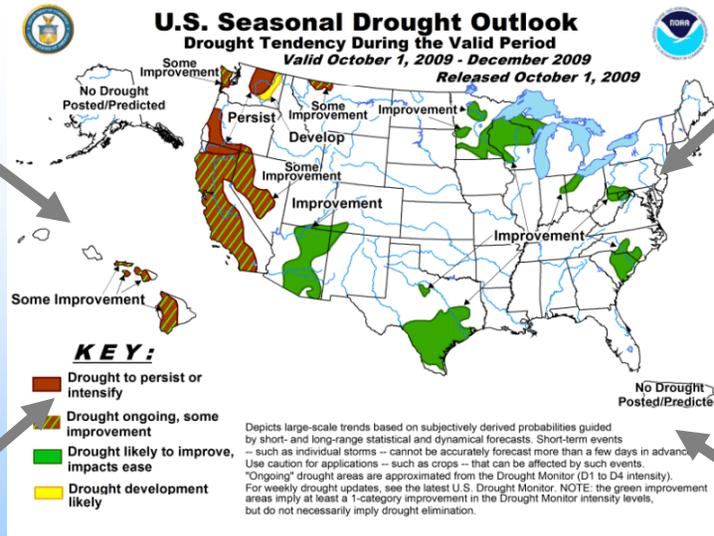
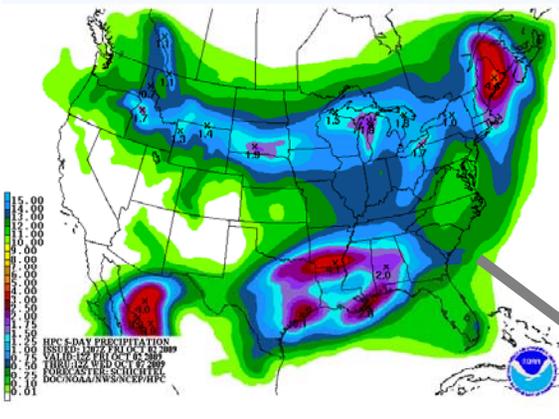
The NWS Forecast Offices downscale NWS CPC products and issue e.g. drought status statements



# NWS Putting Together the U.S. Seasonal Drought Outlook



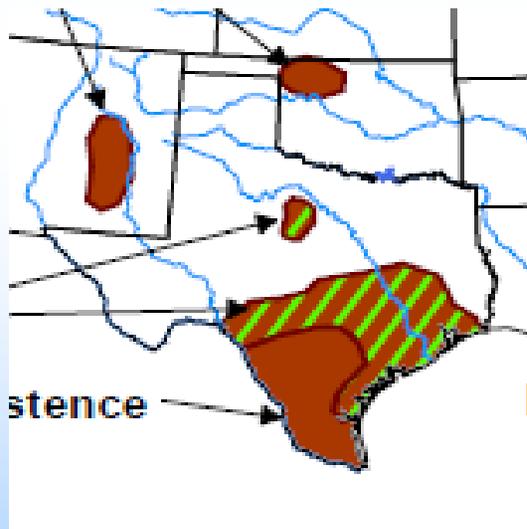
**NWS Climate Prediction Center incorporates models and existing forecasts to produce this relatively new timely product.**



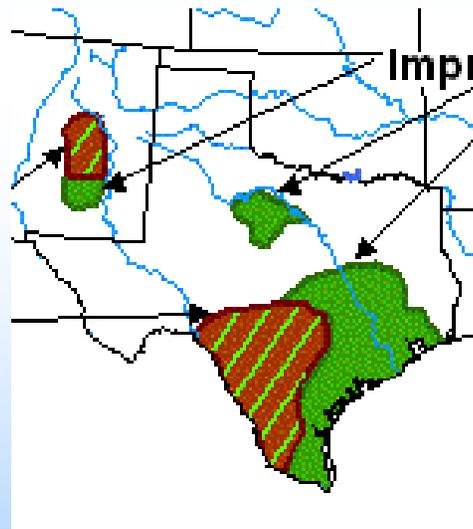


The current "El Nino" event, supports an optimistic outlook for a continued break in the south Texas drought

Aug 6, 2009 Outlook



Sep 3, 2009 Outlook



Oct 1, 2009 Outlook

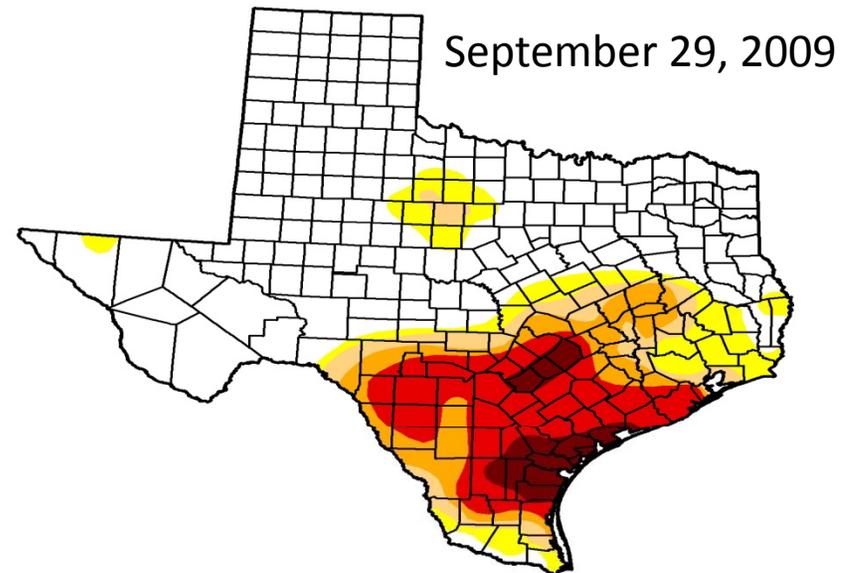
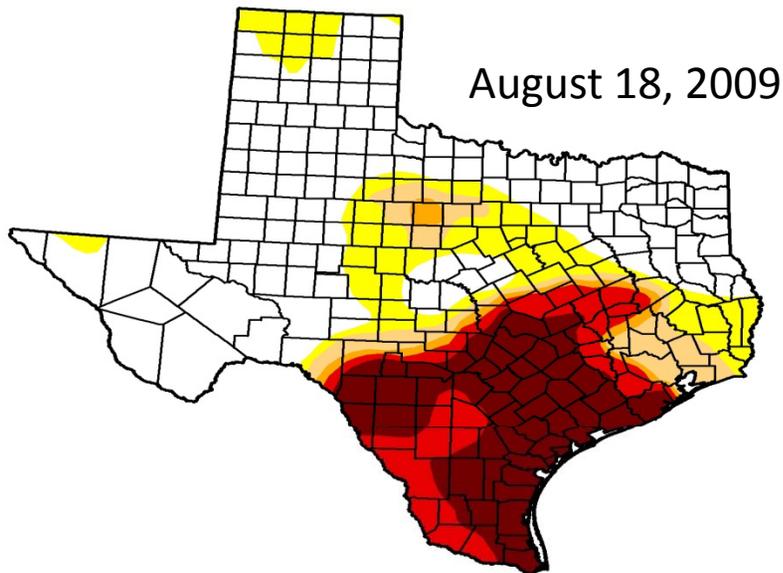




## We Have Seen Recent Improvement

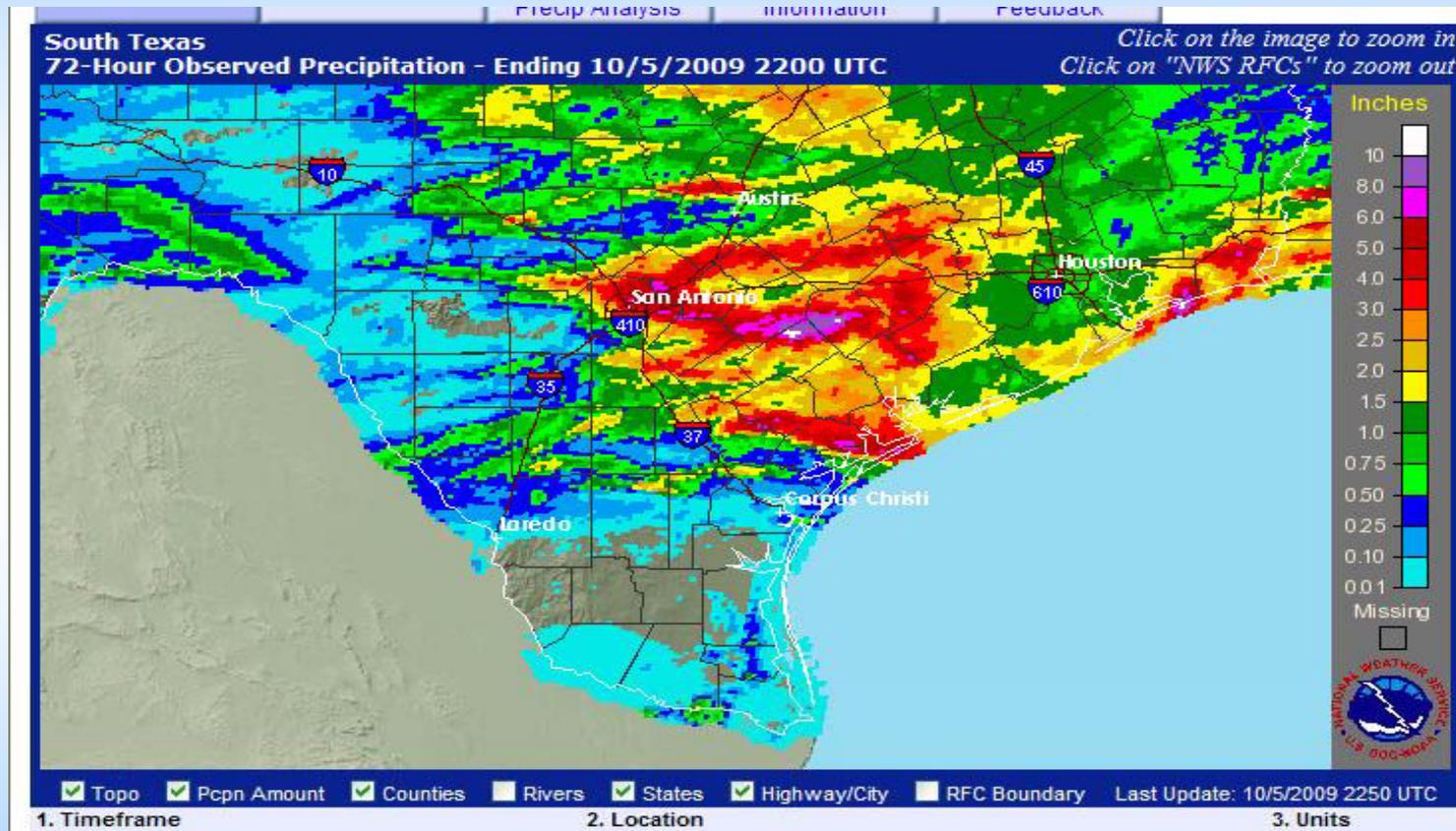


- As per the US Drought Monitor, 27% of Texas was in exceptionally Extreme Drought on August 18, 2009. With recent rainfall, this number is now down to 12%.





# Challenges: Creating High Resolution Products that can be used as is or ingested by customers to create further value added products.



NWS RFC 4km x 4km observed precipitation values created hourly and compiled to produce daily, weekly, monthly, etc. values.



# Examples of Customer Driven Value Added Products from NWS Base Data



office of the  
state climatologist



## TEXAS DROUGHT CONDITIONS

Office of the Texas State Climatologist  
College of Geosciences  
Department of Atmospheric Sciences  
Texas A&M University

[Assessment of the Meteorological Severity of the 2008-2009 Texas Drought through July 2009 \(PDF format\)](#)

### SPI Products

Date	Resolution	Accumulation Period	DM Overlay
October 5, 2009	4 km Grid	2 Months	No

Create Map

### SPI Blend Products

Date	Resolution	Accumulation Period	DM Overlay
October 5, 2009	4 km Grid	2 Months	No

Create Map

More on this new tool later on today!



To gain a greater  
National resiliency  
to climate variability...

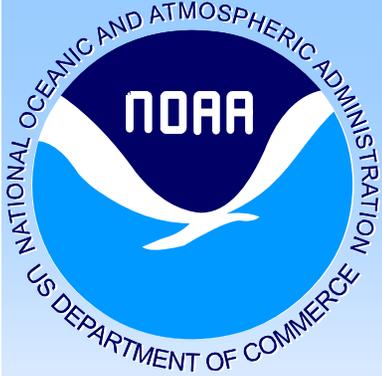


your NOAA National Weather Service (NWS)  
proudly serves the U.S Drought Monitor in line  
with the NWS' legislated mission to climate  
services since 1870.

NWS does this 24x7 with a network of 166  
field/regional offices working with our national  
experts at the NWS Climate Prediction Center.

A service approach that epitomizes:

Government closest to the people, serves  
*best.*



***“A nation monitoring, preparing and investing in climate services today... assures its resiliency to climate variability !”***

**Bill Proenza, Regional Director  
National Weather Service, Southern Region**

**[www.SRH.weather.gov](http://www.SRH.weather.gov)**