



Drought Update: What's in Store for 2012

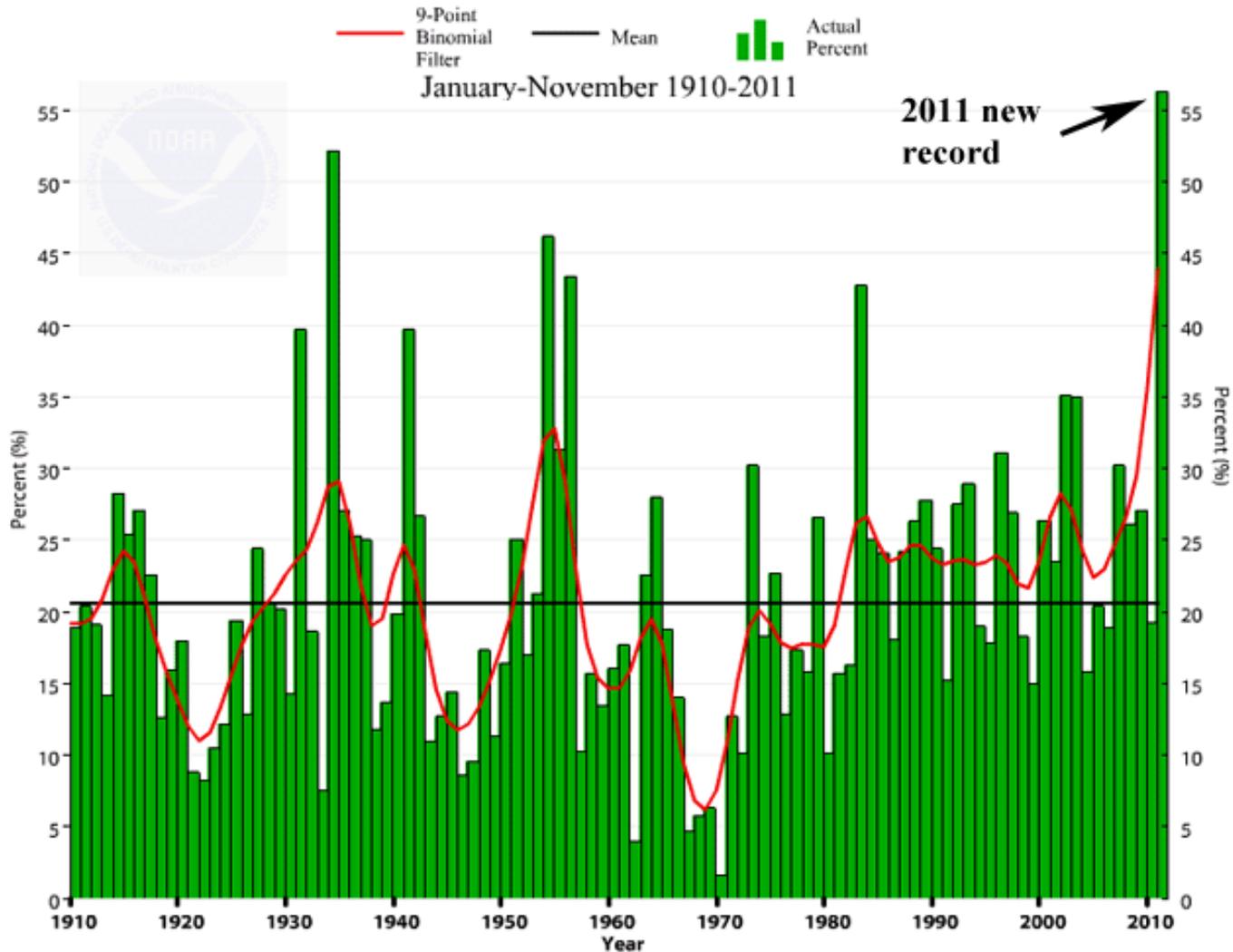
WaterWise Irrigation Professional Seminar

February 23, 2012

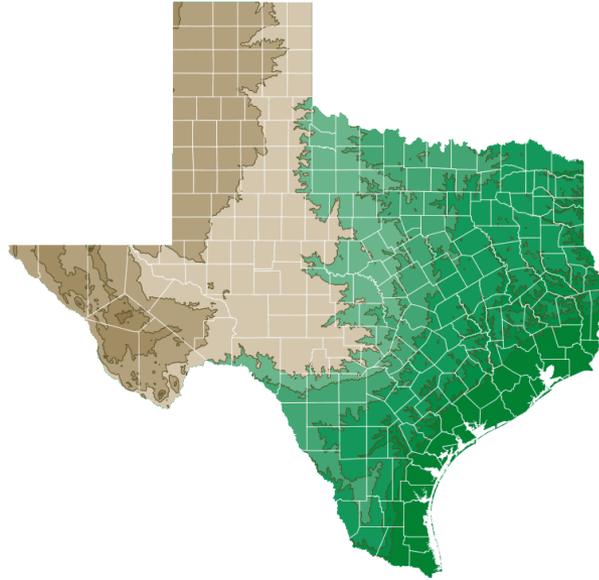
Bob Rose, LCRA Chief Meteorologist

A Year for US Weather Extremes

Percentage of U.S. in severe drought or extremely wet



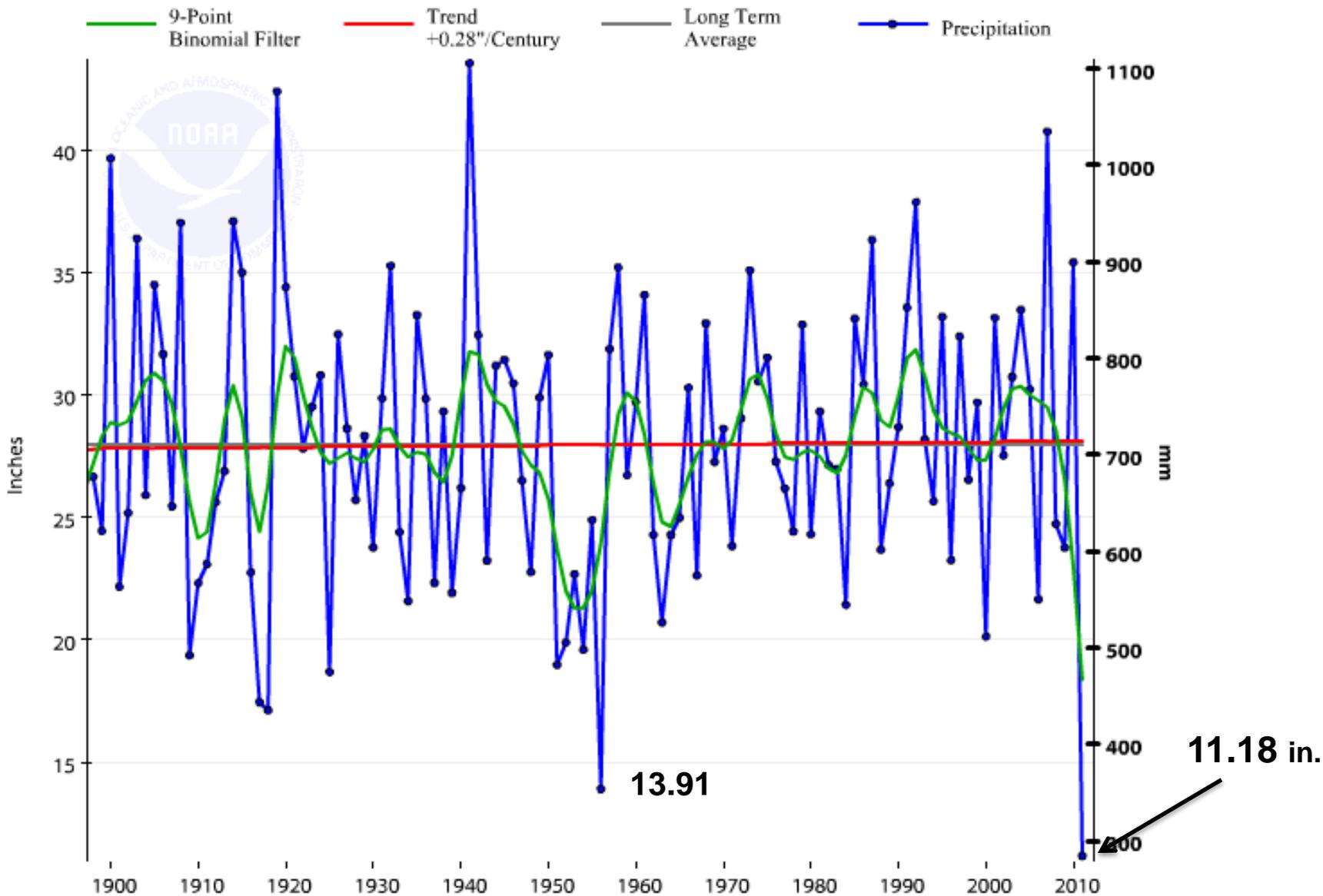
Worst Short Term Drought in Texas History



***Driest October-September on record
with 11.18 inches. Normal is 29.11.
Record low was 13.91 inches
Oct 1955-Sep 1956.***

Texas Rainfall, Oct.-Sep.

Texas, Precipitation, October-September



Worst Short Term Drought in Central Texas History

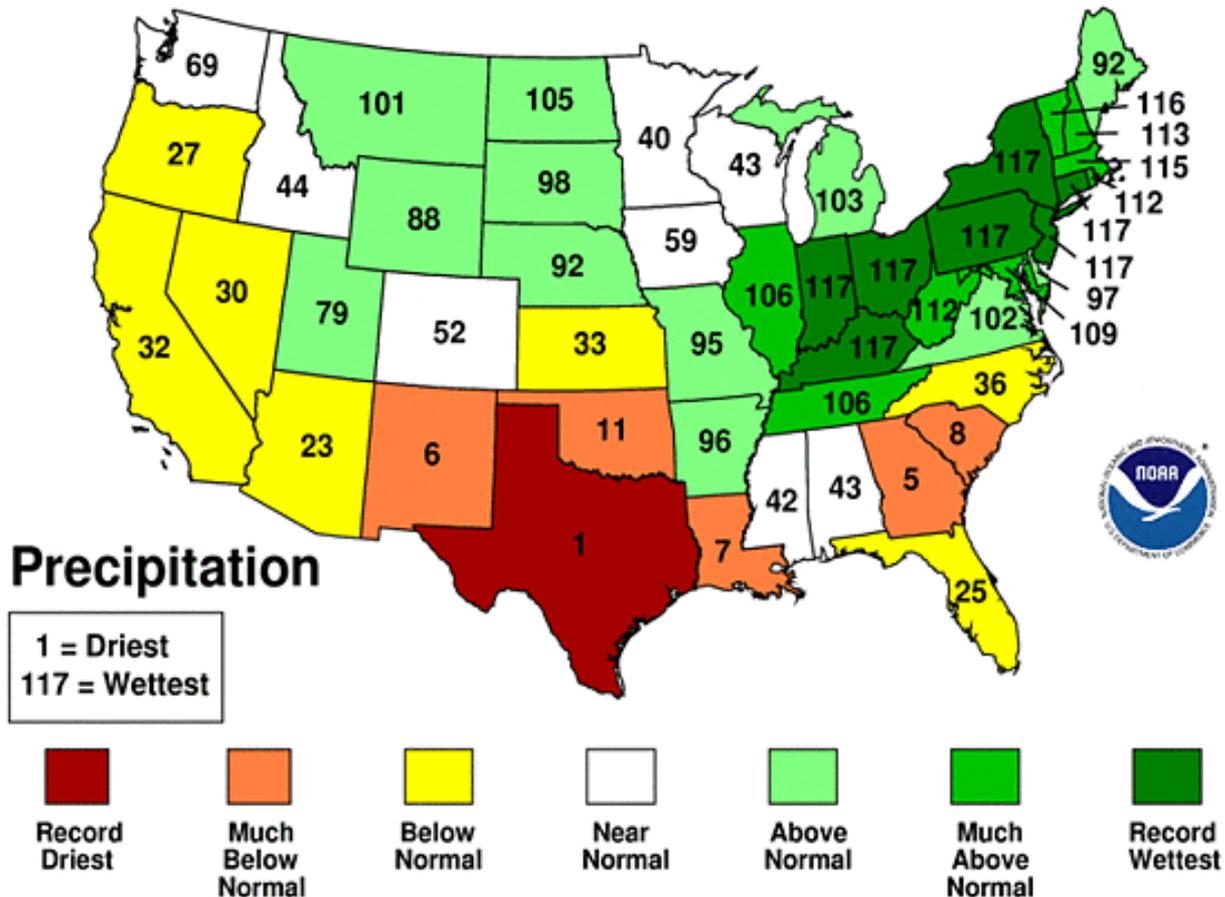


***Driest October-September on record
with 11.42 inches. Normal is 35.66.
Record low was 15.91 inches
Oct 1955-Sep 1956.***

Driest Calendar Year on Record for Texas

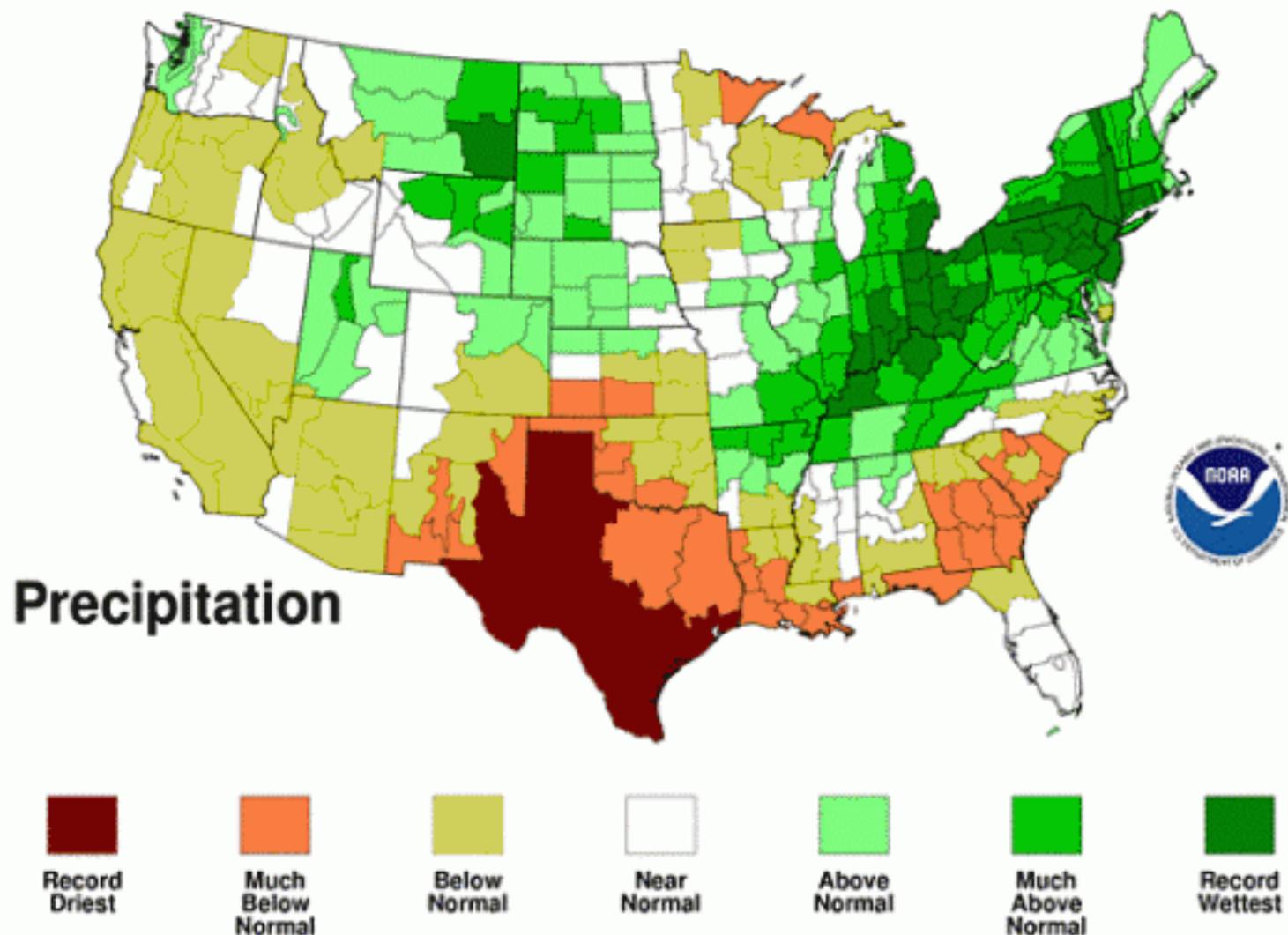
January-December 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



Jan - Dec 2011

National Climatic Data Center/NESDIS/NOAA



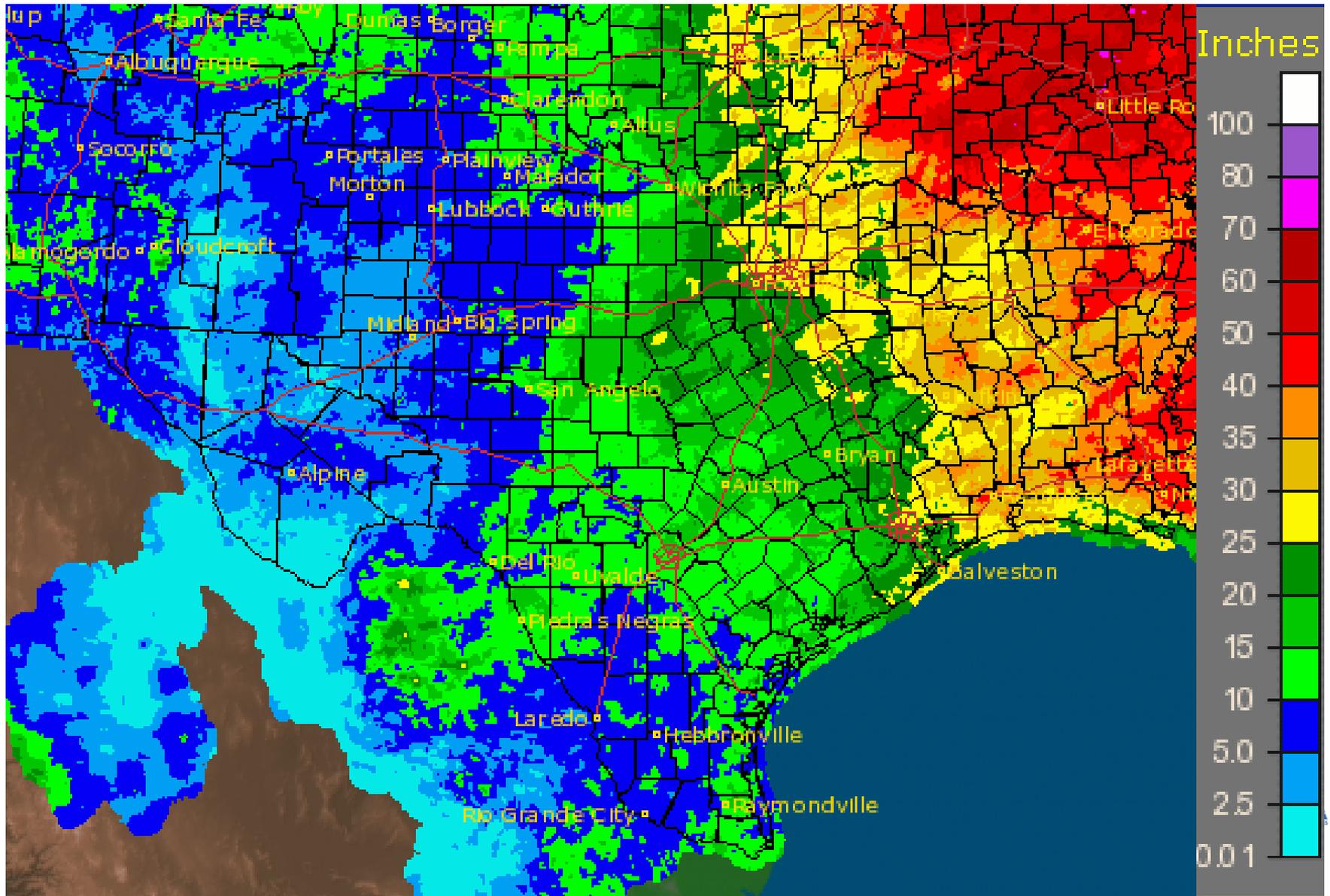
2011 Texas Weather Statistics

- **14.88 inches. *Driest calendar year on record!* Previous record was 14.99 inches in 1917.**
- **Average Temperature 67.2 degrees. *Second hottest year on record.* Hottest year was 67.5 degrees set in 1921.**

2011 Austin Rainfall

- Austin-Camp Mabry: 19.68 inches (14.56 inches below normal), 11th driest on record. **Normal: 34.24**
- Austin-Bergstrom: 16.90 inches (15.25 inches below normal), 6th driest on record. **Normal: 32.15**

2011 Rainfall



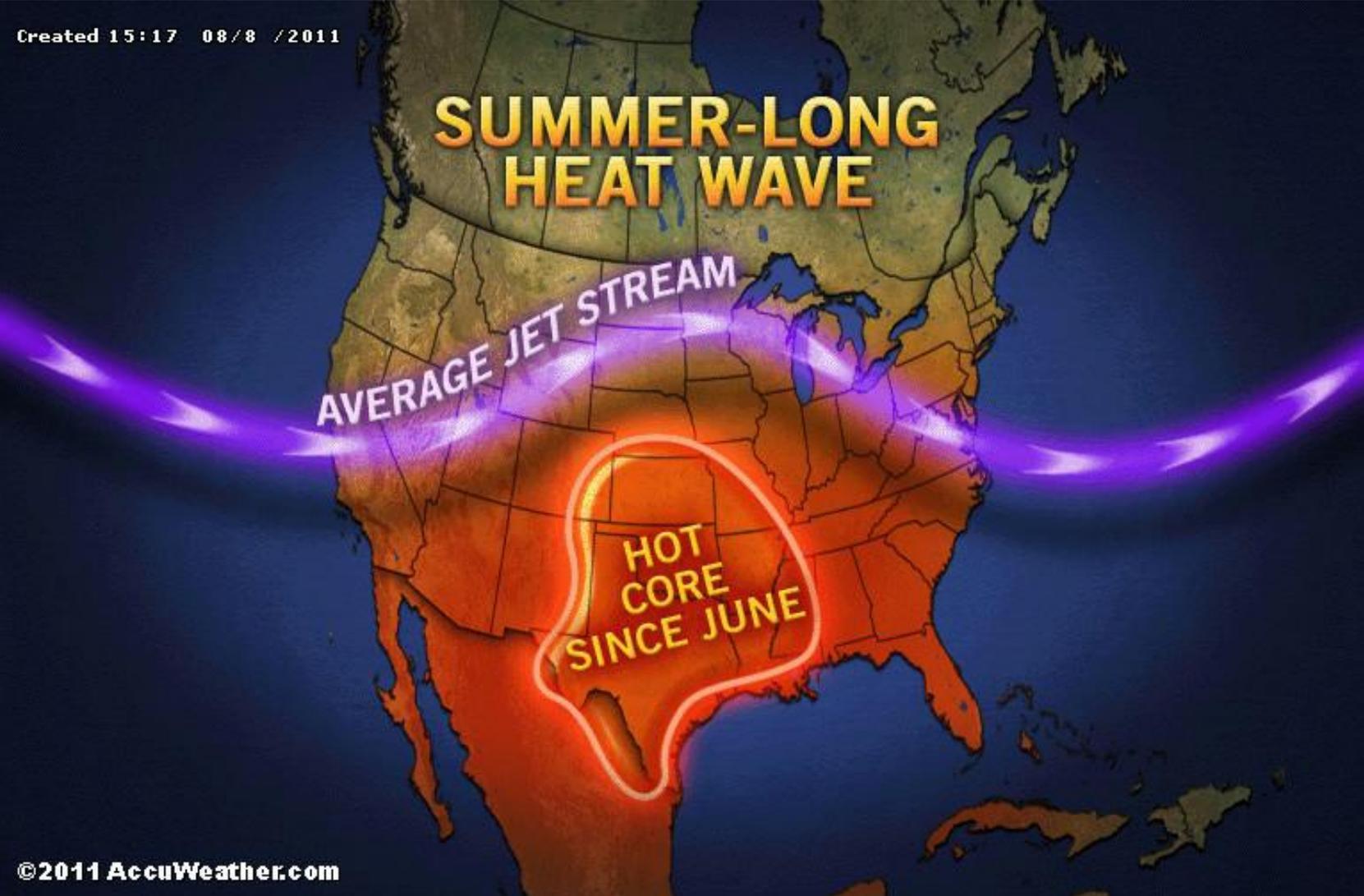
A bright sun is visible in the upper left quadrant of the image, set against a background of a clear sky transitioning from yellow at the top to orange at the bottom. The sun is a large, glowing white circle with a soft yellow halo. The overall scene is bright and warm, suggesting a clear, sunny day.

*Unprecedented
Summer Heat!!!*

Created 15:17 08/8 /2011

SUMMER-LONG HEAT WAVE

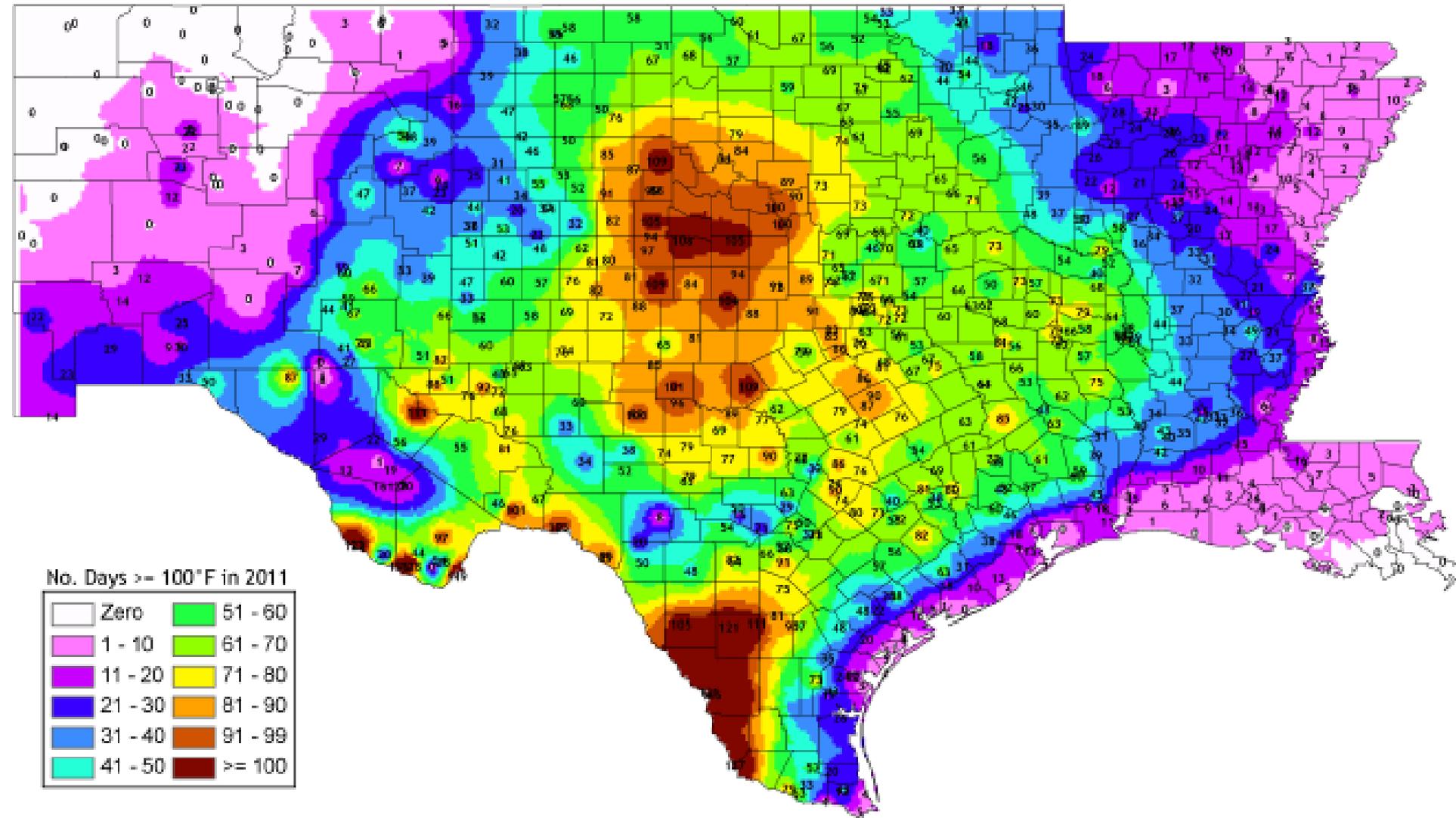
AVERAGE JET STREAM

A map of the United States with a color gradient from blue in the north to red in the south. A purple, glowing arc labeled 'AVERAGE JET STREAM' curves across the northern part of the country. A red, glowing outline labeled 'HOT CORE SINCE JUNE' encircles the southern and central regions. The background is a dark blue sky.

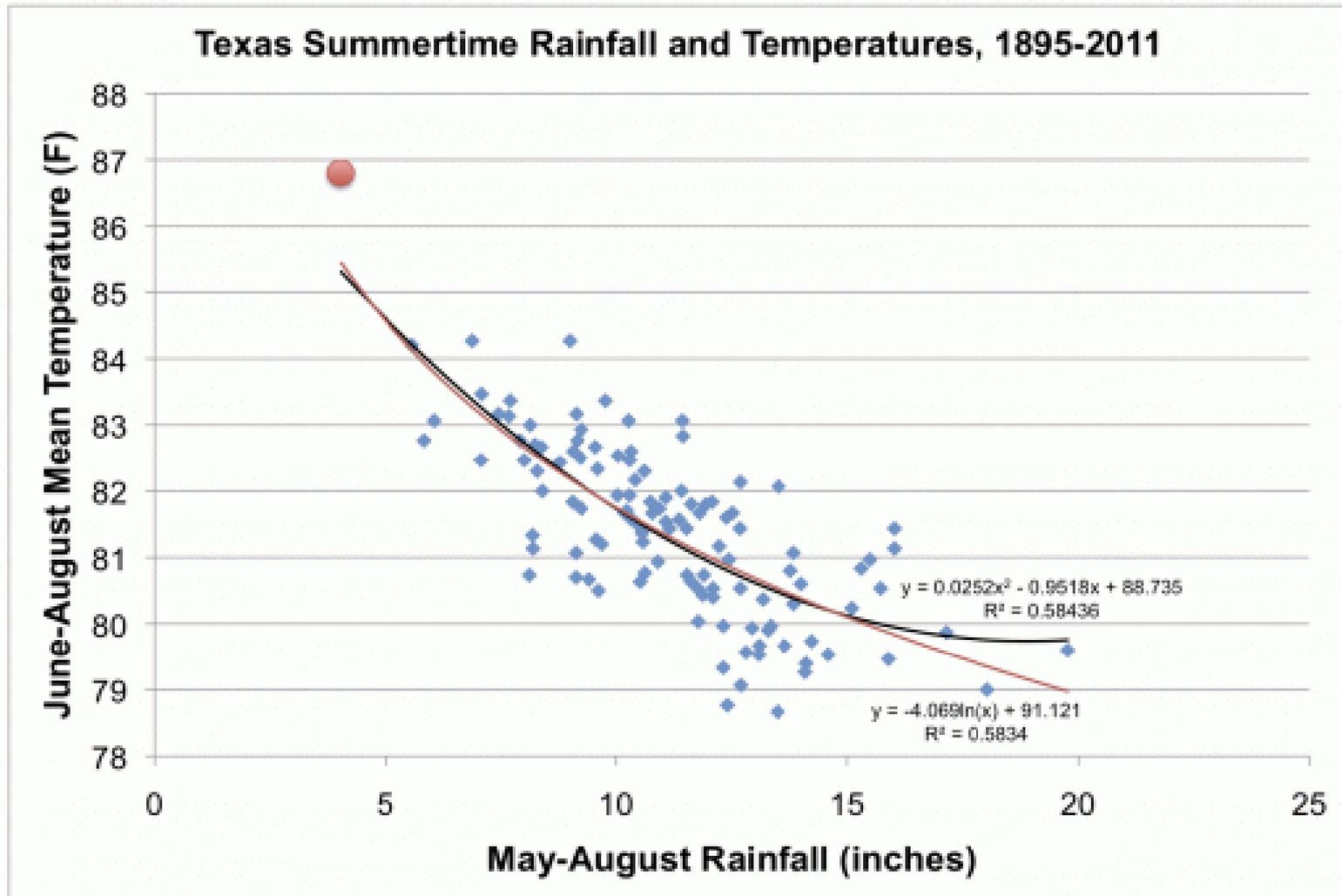
HOT
CORE
SINCE JUNE

©2011 AccuWeather.com

Number of Days at or Above 100



This summer's record heat and record dryness was off the chart!



Austin's Hottest Year on Record

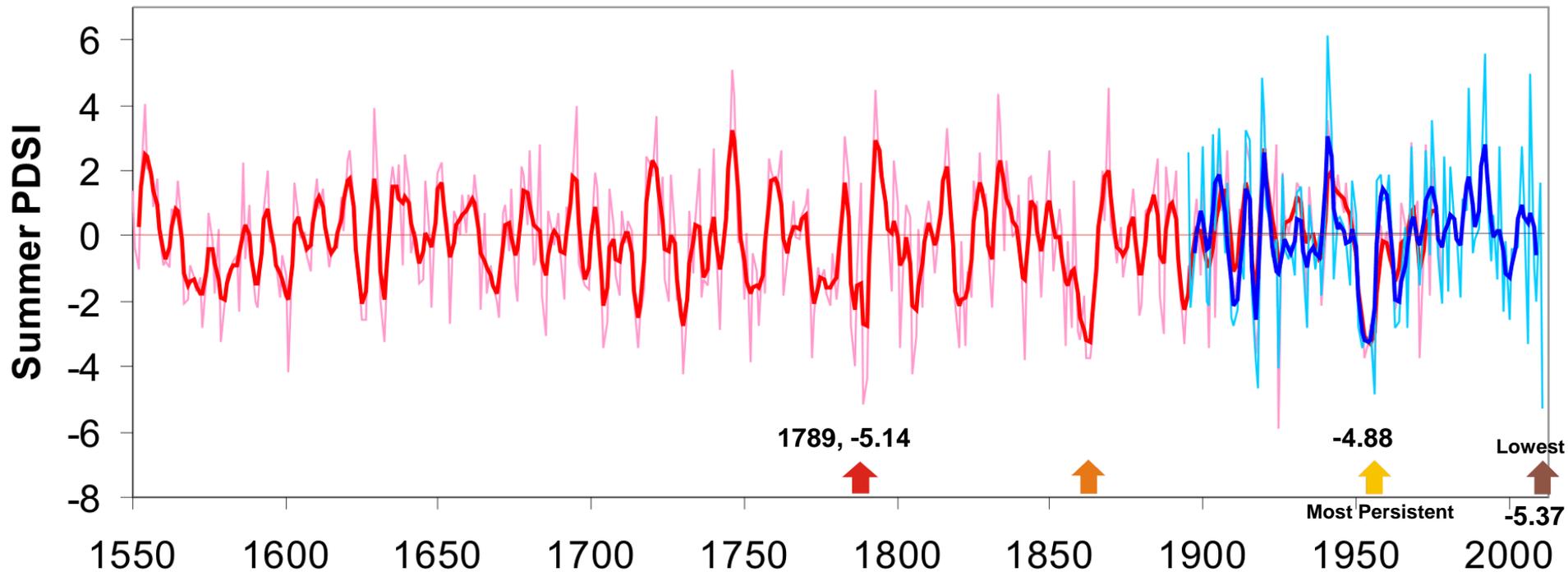
- **Average temperature 72.6 degrees.**
Previous record 71.6 degrees in 2006.
- **Hottest April, July, *August and September on record. Second hottest June.**
- **Hottest summer ever recorded.**
- **90 days at or above 100 degrees.**

The 2011 Drought in Historical Context

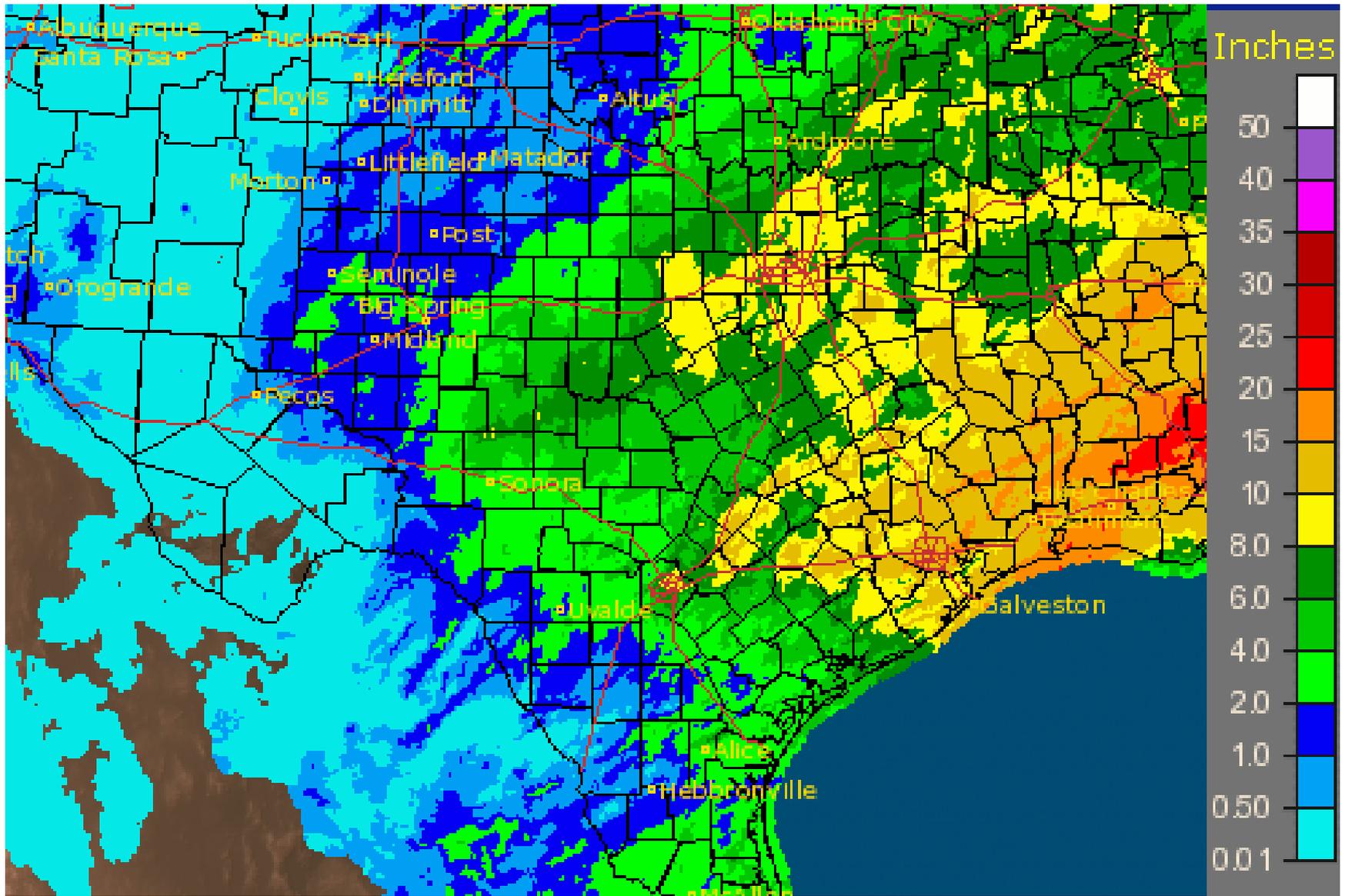
Summer (June-August) PDSI, Texas

Texas Observed Summer PDSI, 1895-2011

Tree-ring reconstruction of Texas Summer PDSI, 1550-1978

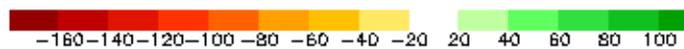
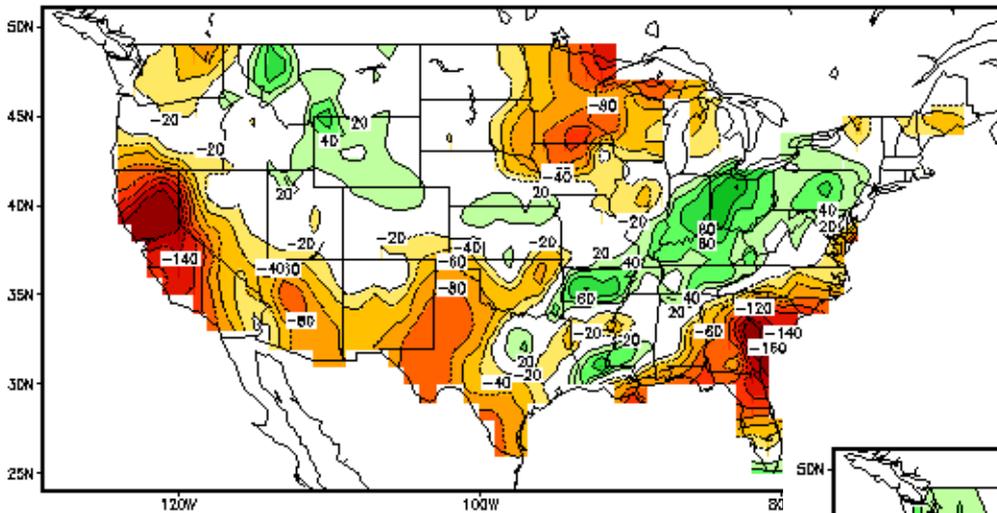


Rainfall, Past 60 Days

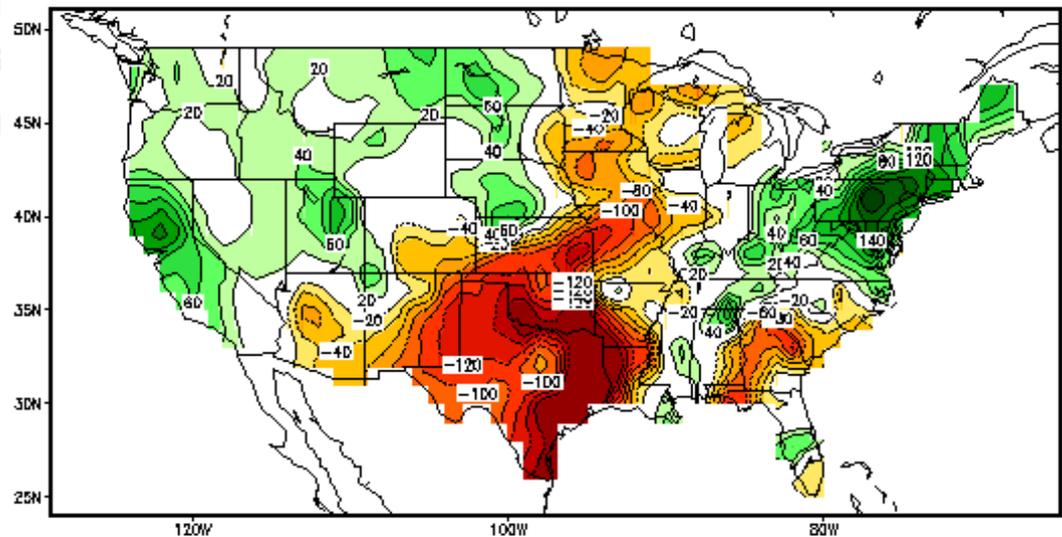


Soil Moisture Improving

Calculated Soil Moisture Anomaly (mm)
FEB 21, 2012

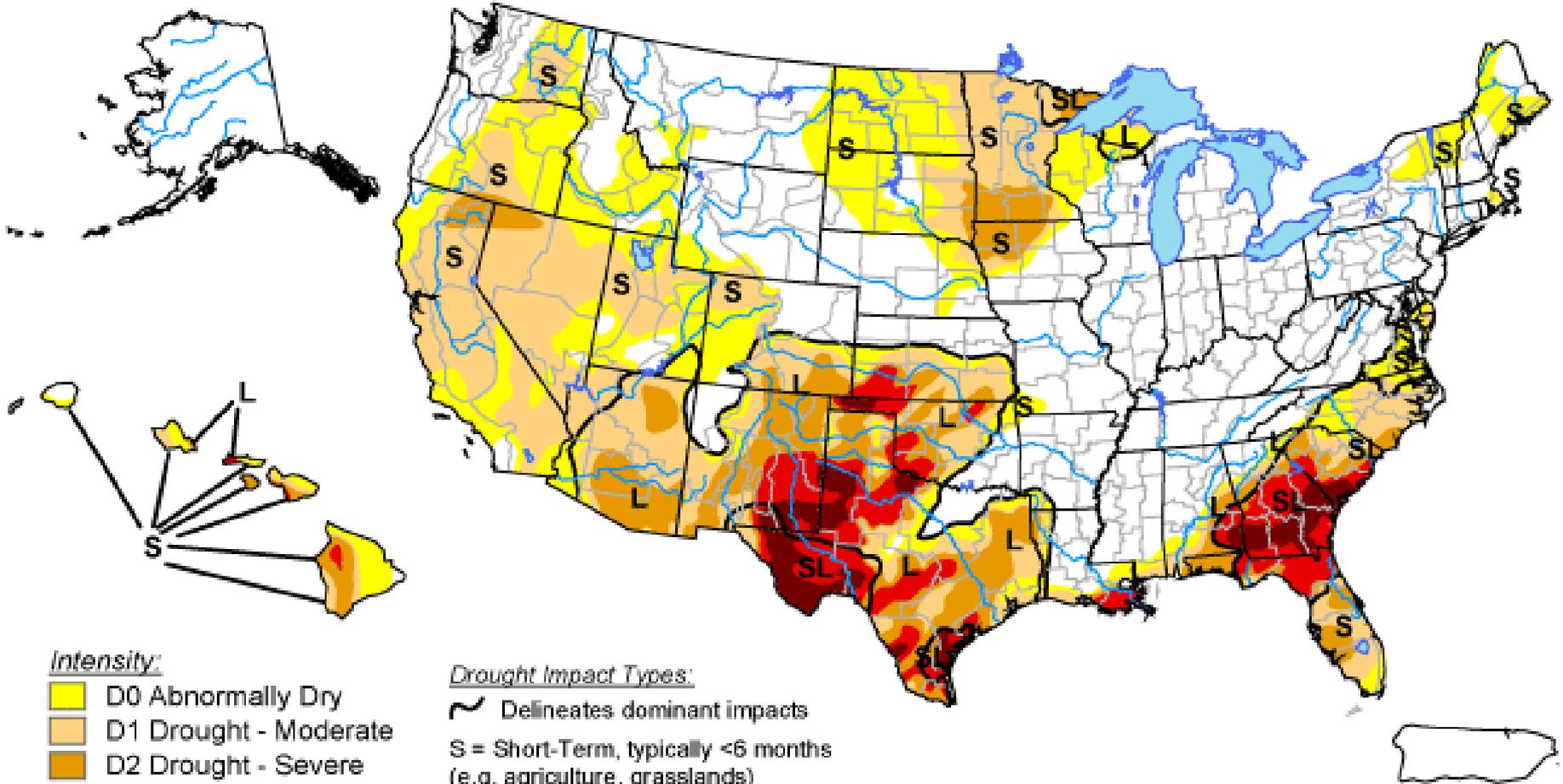


Calculated Soil Moisture Anomaly (mm)
OCT 16, 2011



U.S. Drought Monitor

February 21, 2012
Valid 7 a.m. EST



Intensity:

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

Drought Impact Types:

-  Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

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



Released Thursday, February 23, 2012

Author: Mark Svoboda, National Drought Mitigation Center

<http://droughtmonitor.unl.edu/>

U.S. Drought Monitor

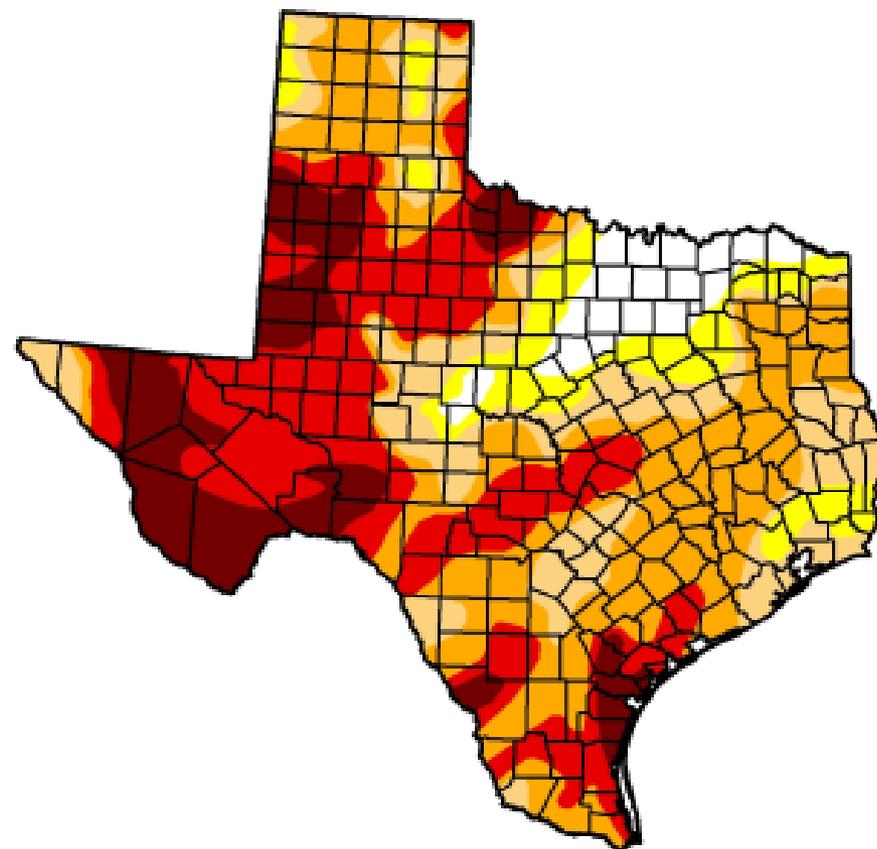
Texas

February 21, 2012

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6.05	93.95	85.21	67.48	38.68	13.93
Last Week (02/14/2012 map)	4.93	95.07	89.08	76.46	53.27	20.41
3 Months Ago (11/22/2011 map)	0.00	100.00	100.00	97.44	86.75	62.97
Start of Calendar Year (12/27/2011 map)	0.01	99.99	97.83	84.81	67.32	32.36
Start of Water Year (09/27/2011 map)	0.00	100.00	100.00	99.16	96.65	85.75
One Year Ago (02/15/2011 map)	12.52	87.48	58.11	37.35	7.78	0.00



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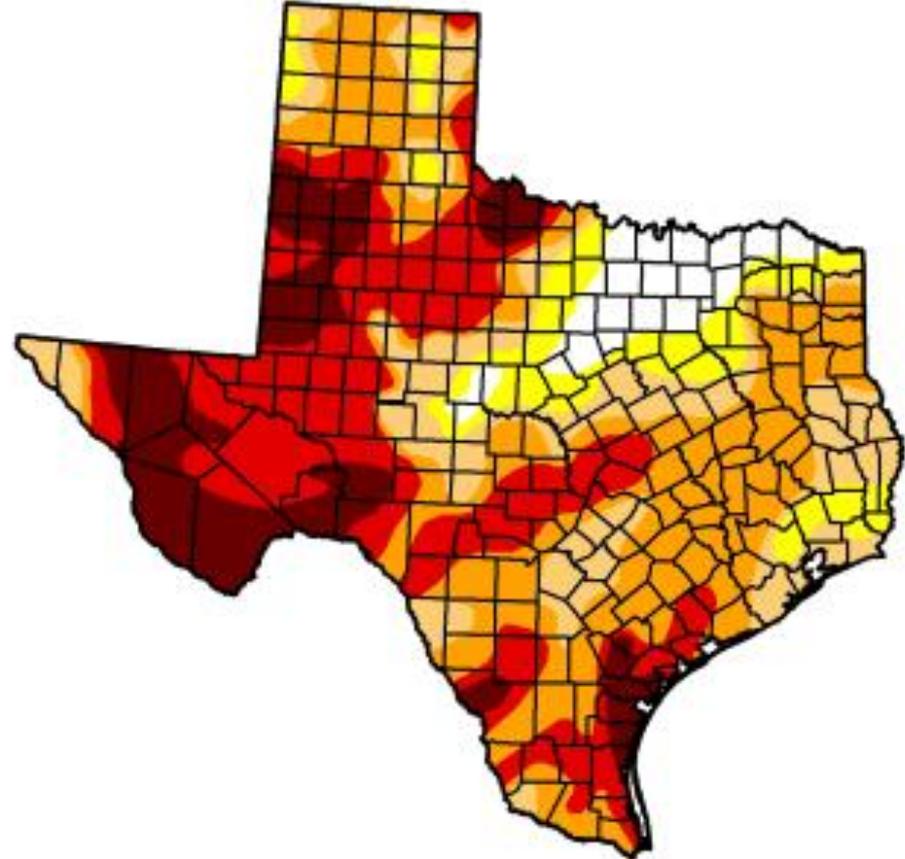
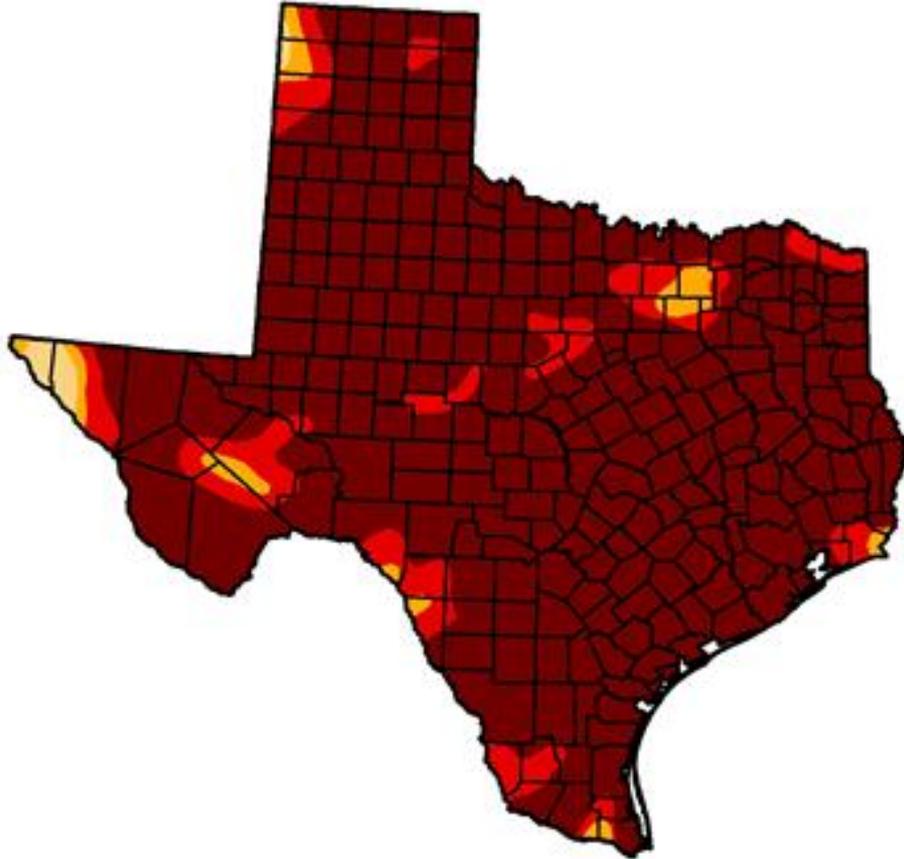
<http://droughtmonitor.unl.edu>



Released Thursday, February 23, 2012
Mark Svoboda, National Drought Mitigation Center

October 4, 2011

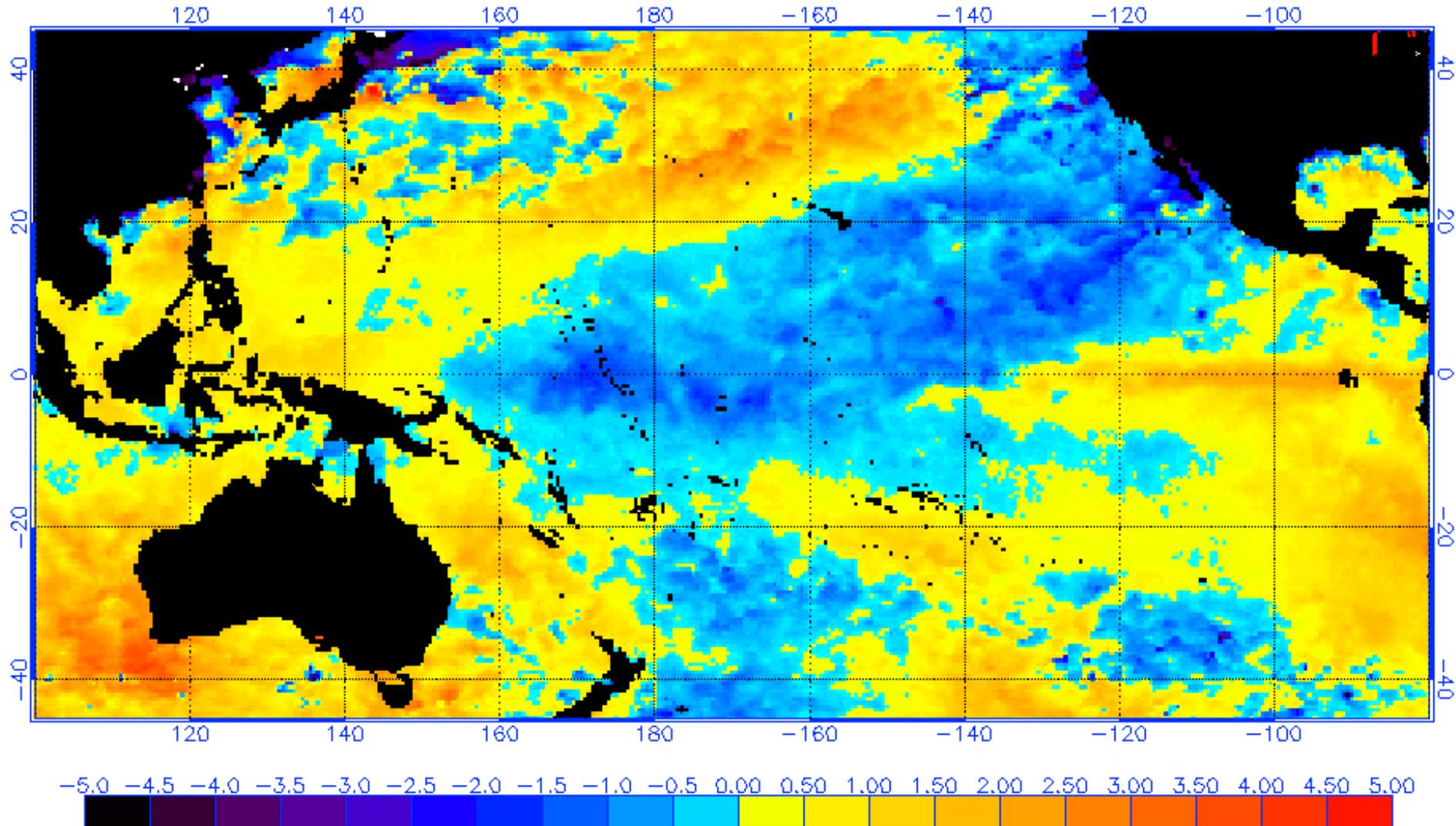
February 21, 2012



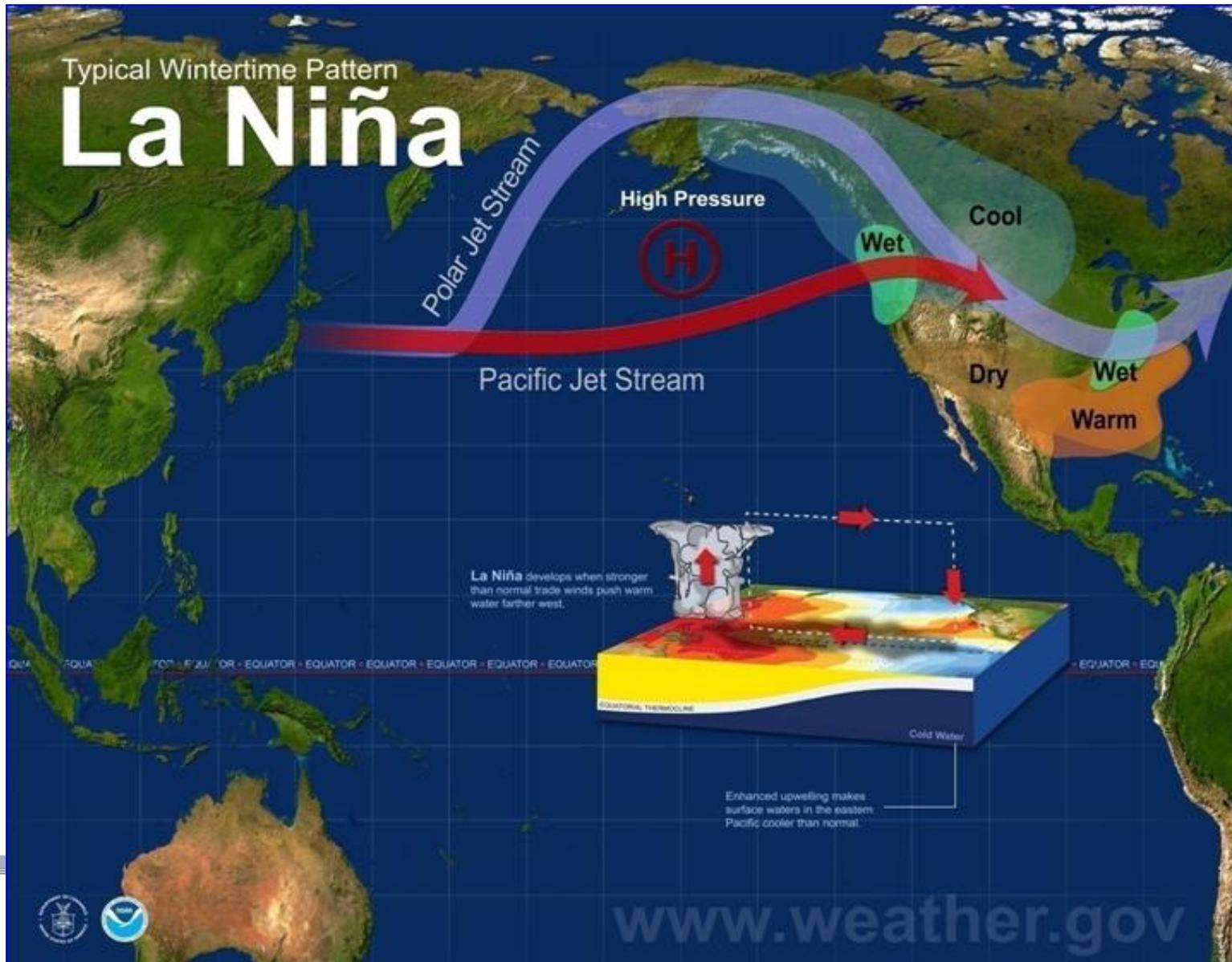
Drought Monitor Comparison

A Weak to Moderate La Niña

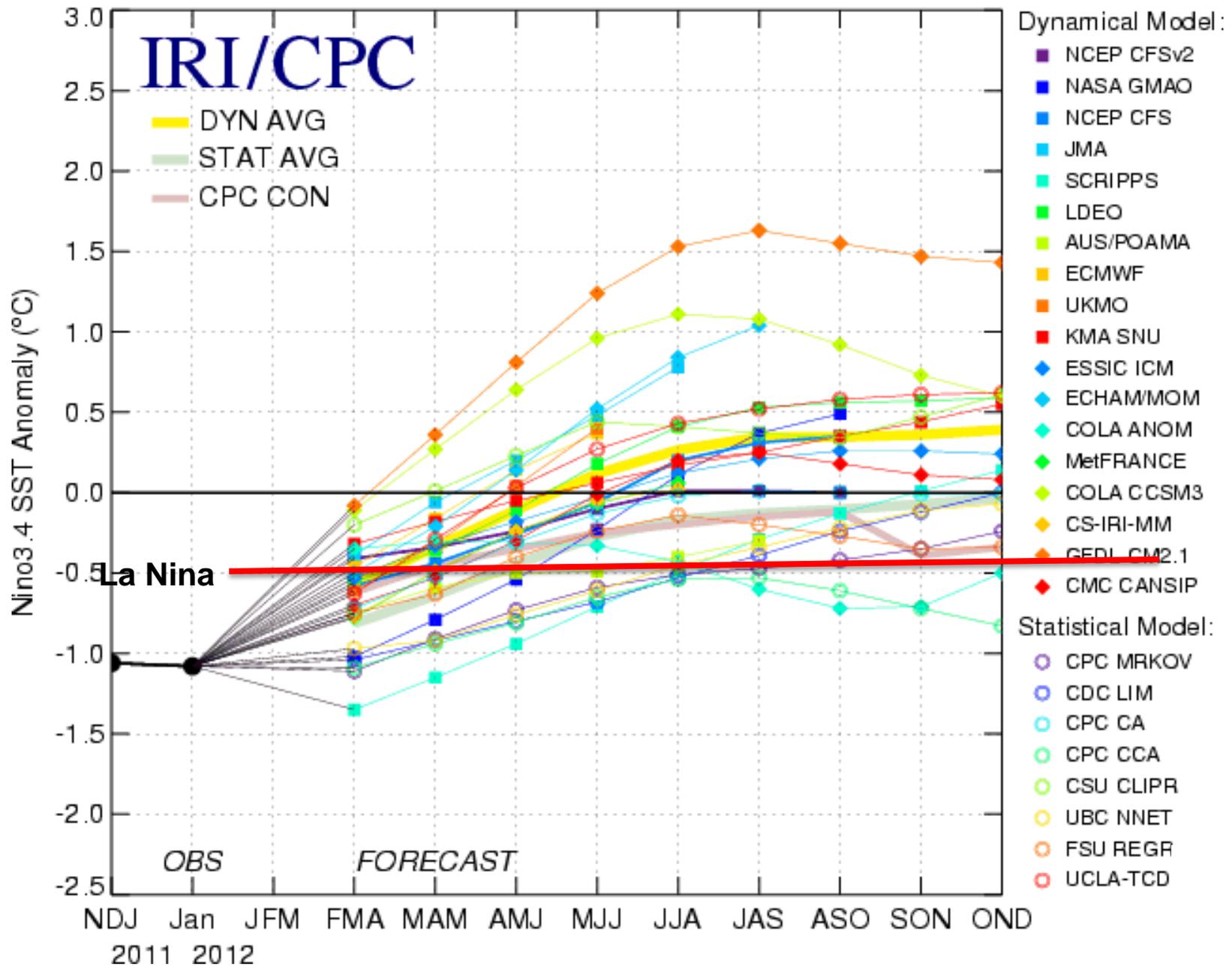
NOAA/NESDIS SST Anomaly (degrees C), 2/23/2012



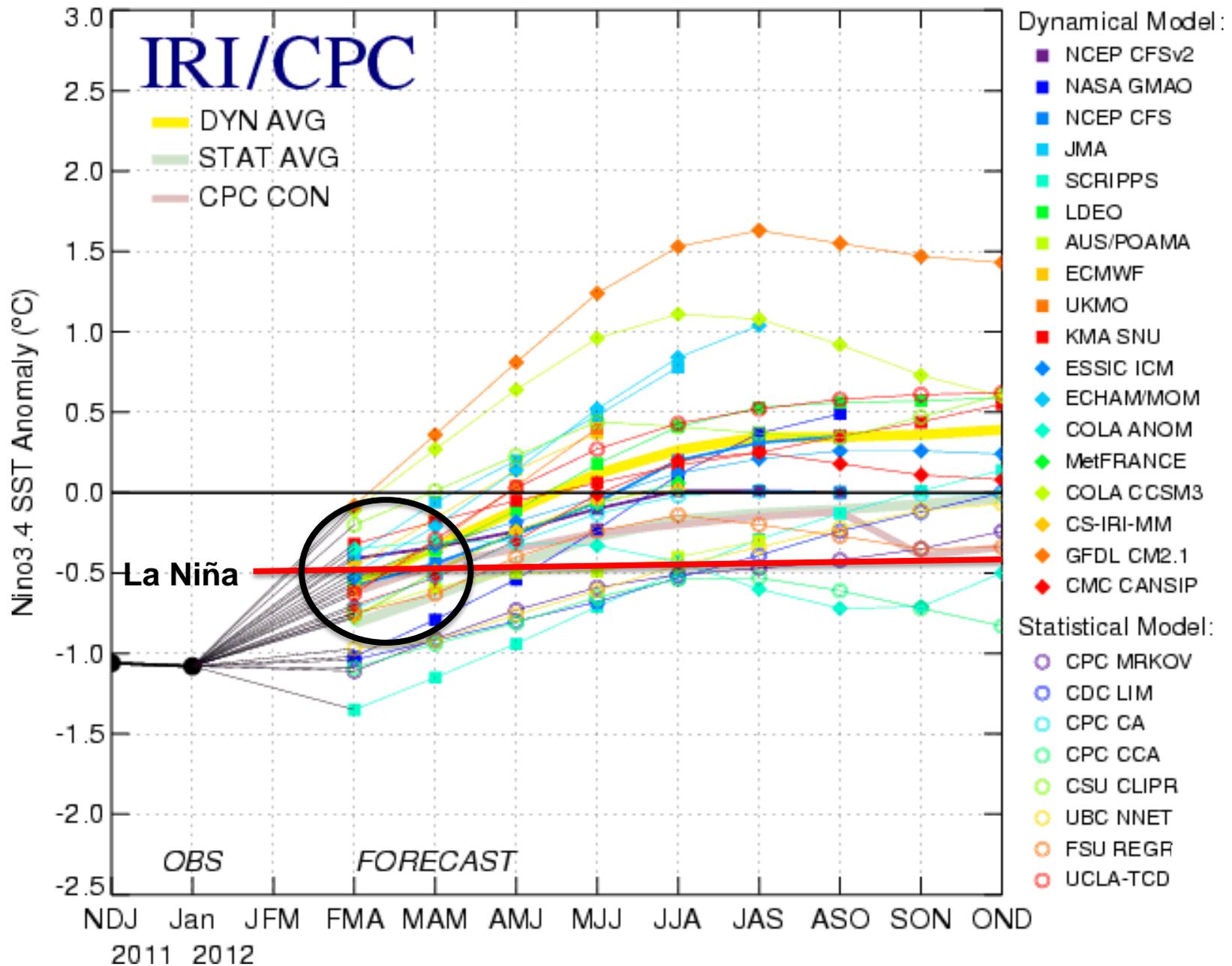
Typical Patterns Associated with La Niña



Mid-Feb 2012 Plume of Model ENSO Predictions

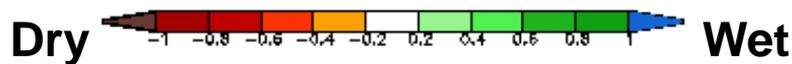
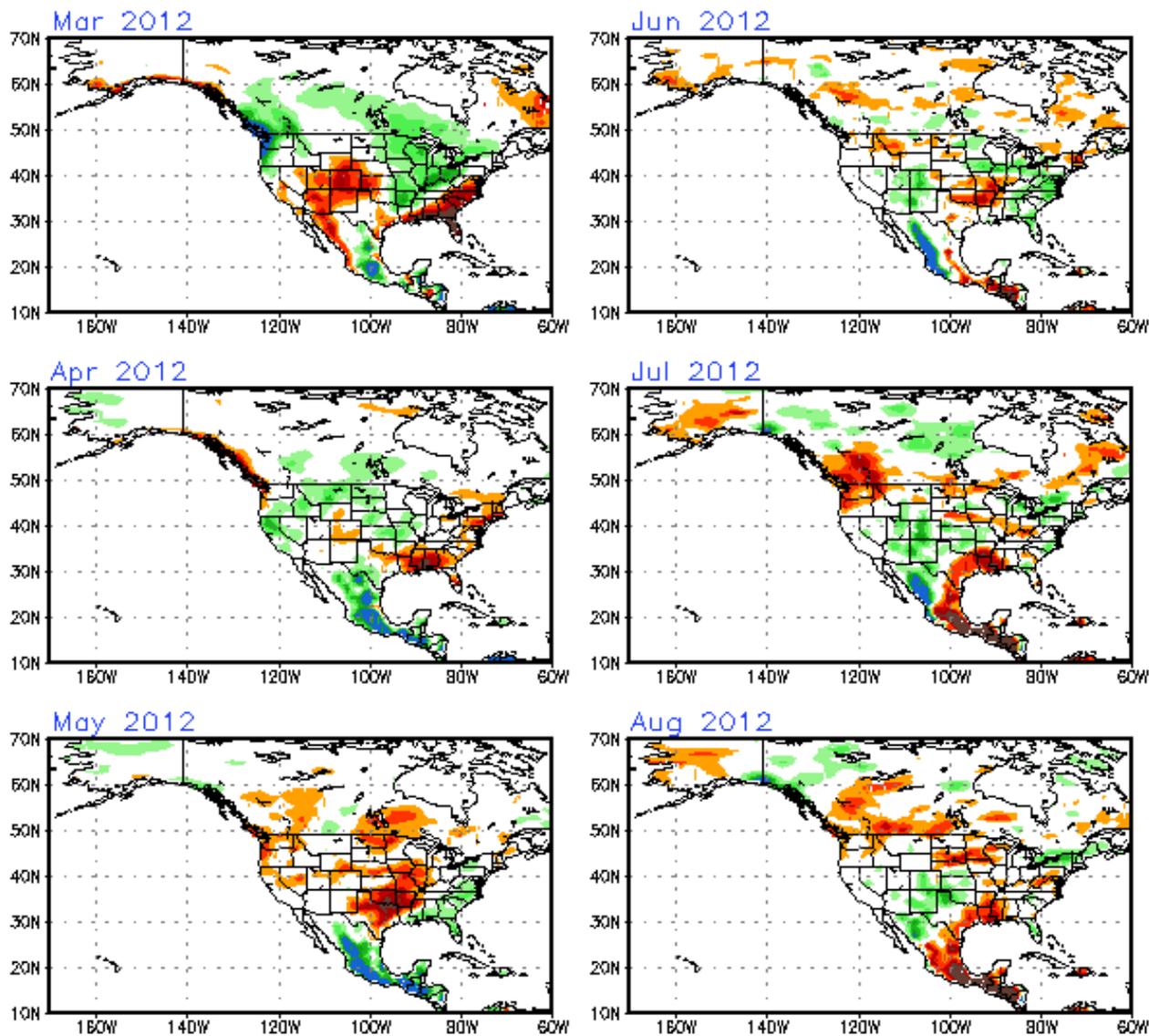


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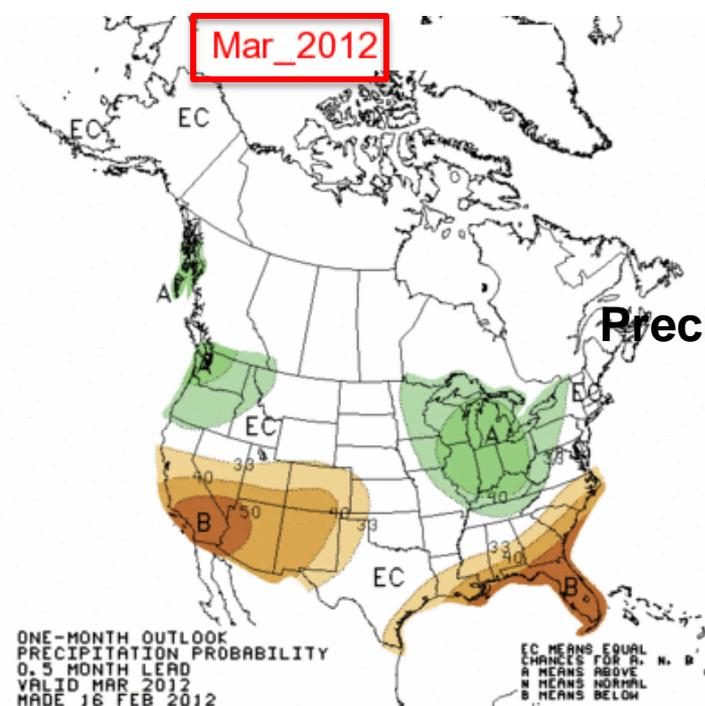
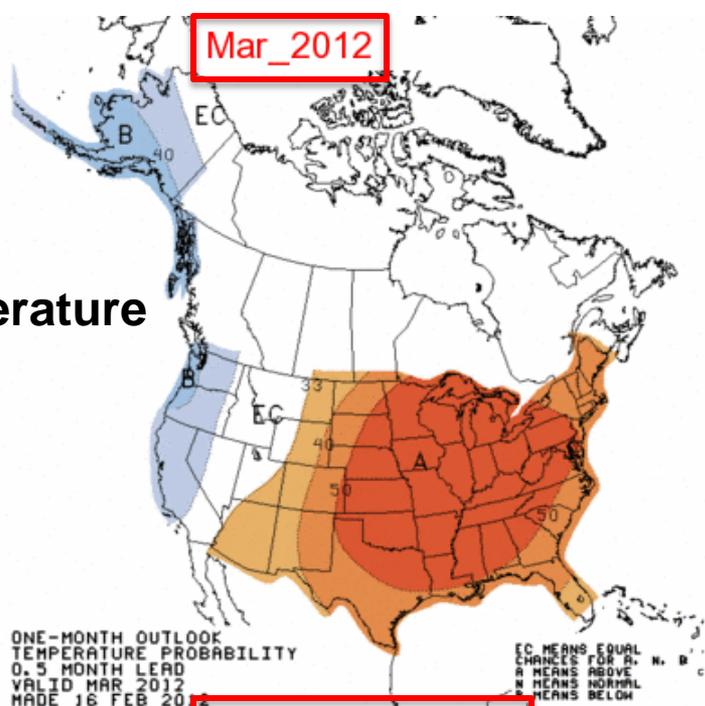




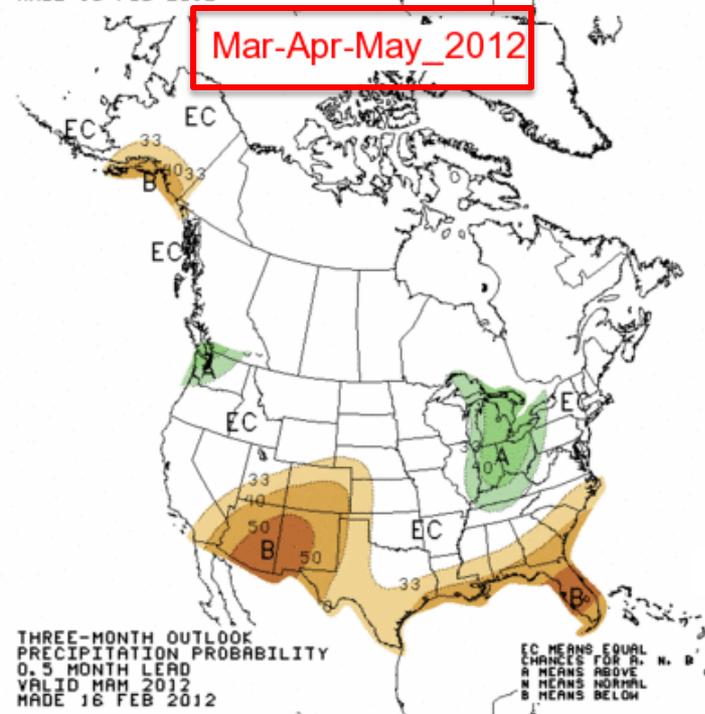
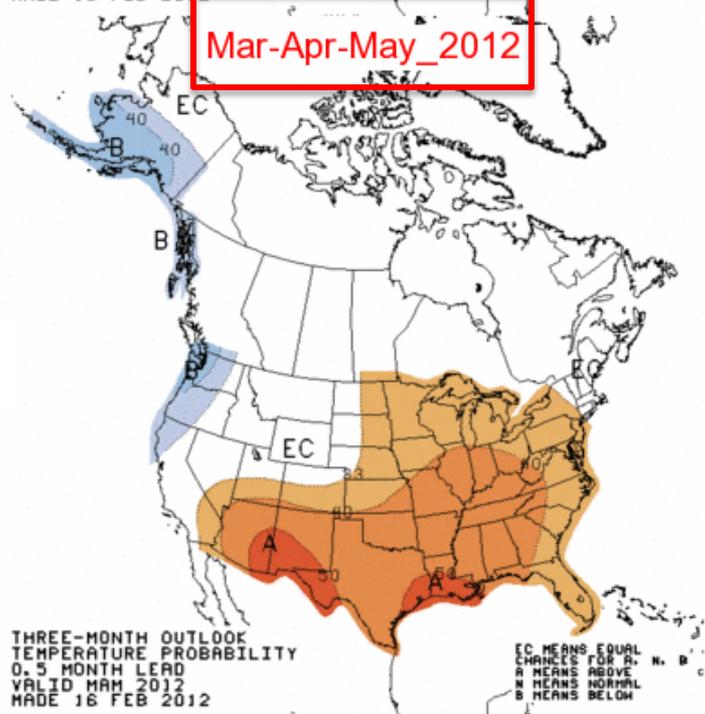
CFSv2 monthly Prec (mm/day)



Temperature

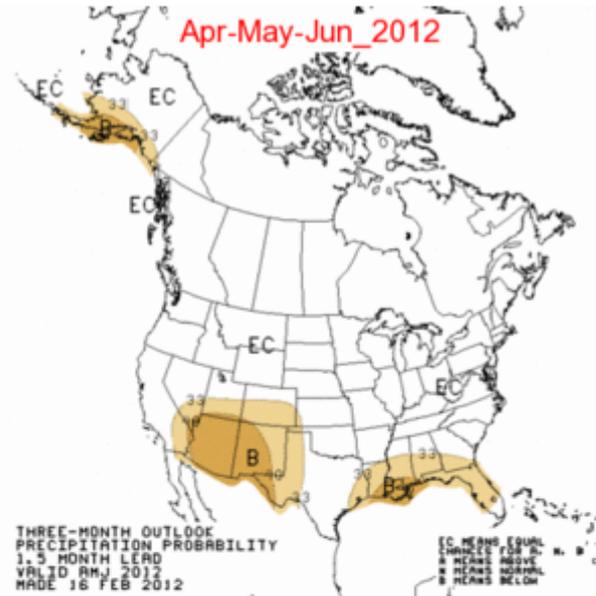


Precipitation

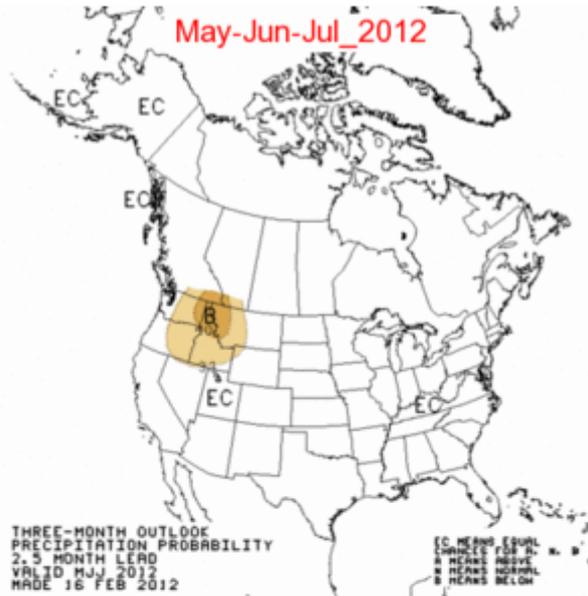


NWS Summer into Fall Rainfall Outlook

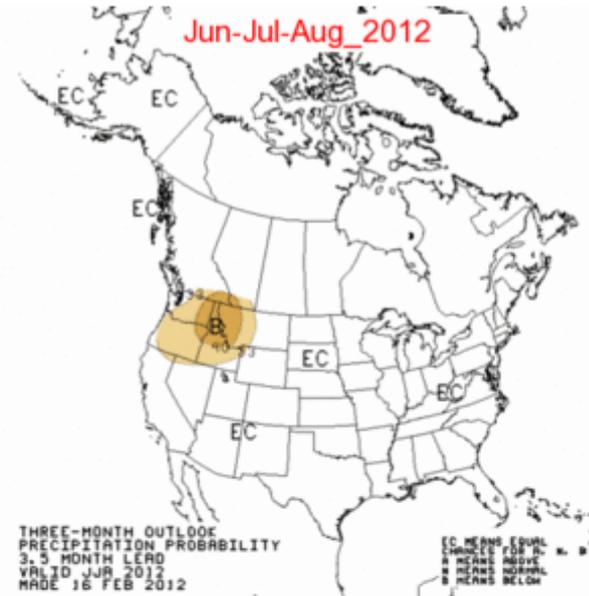
Apr-May-Jun_2012



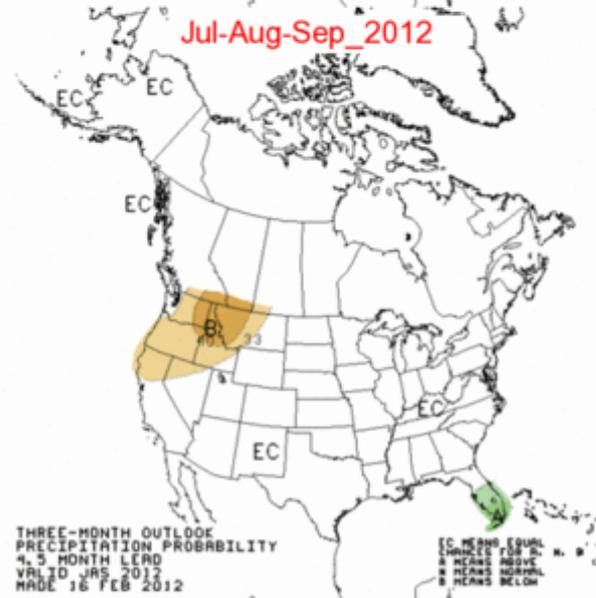
May-Jun-Jul_2012



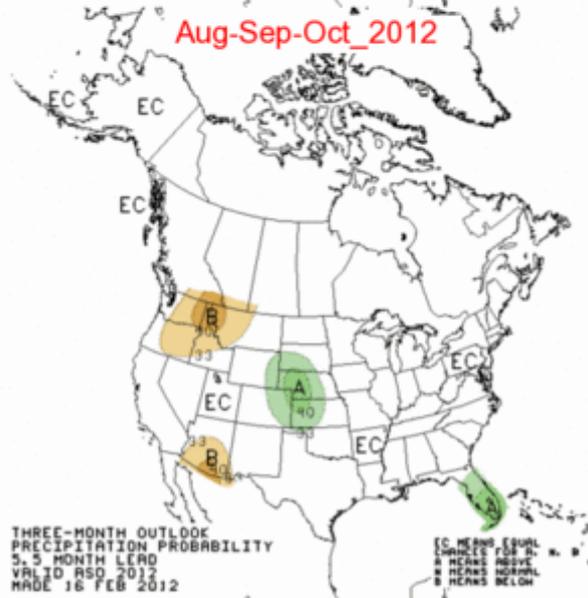
Jun-Jul-Aug_2012



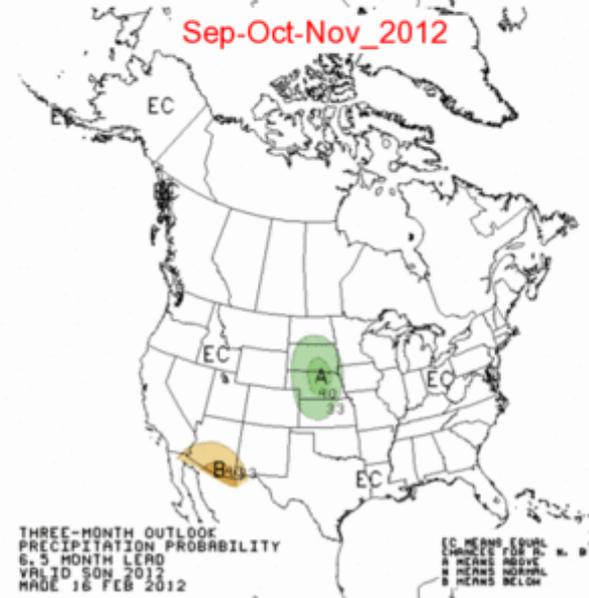
Jul-Aug-Sep_2012



Aug-Sep-Oct_2012



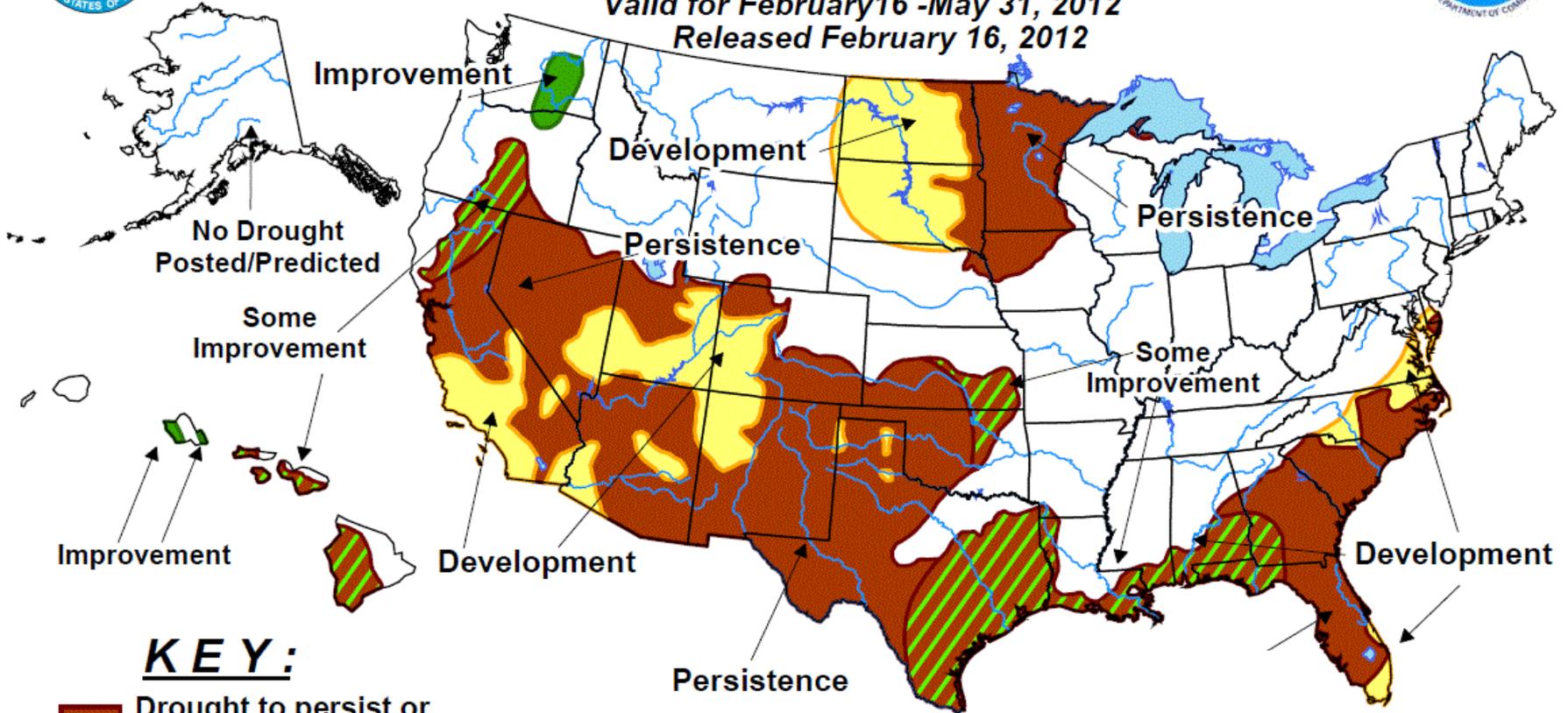
Sep-Oct-Nov_2012



Drought Outlook through May

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for February 16 - May 31, 2012
Released February 16, 2012



KEY:

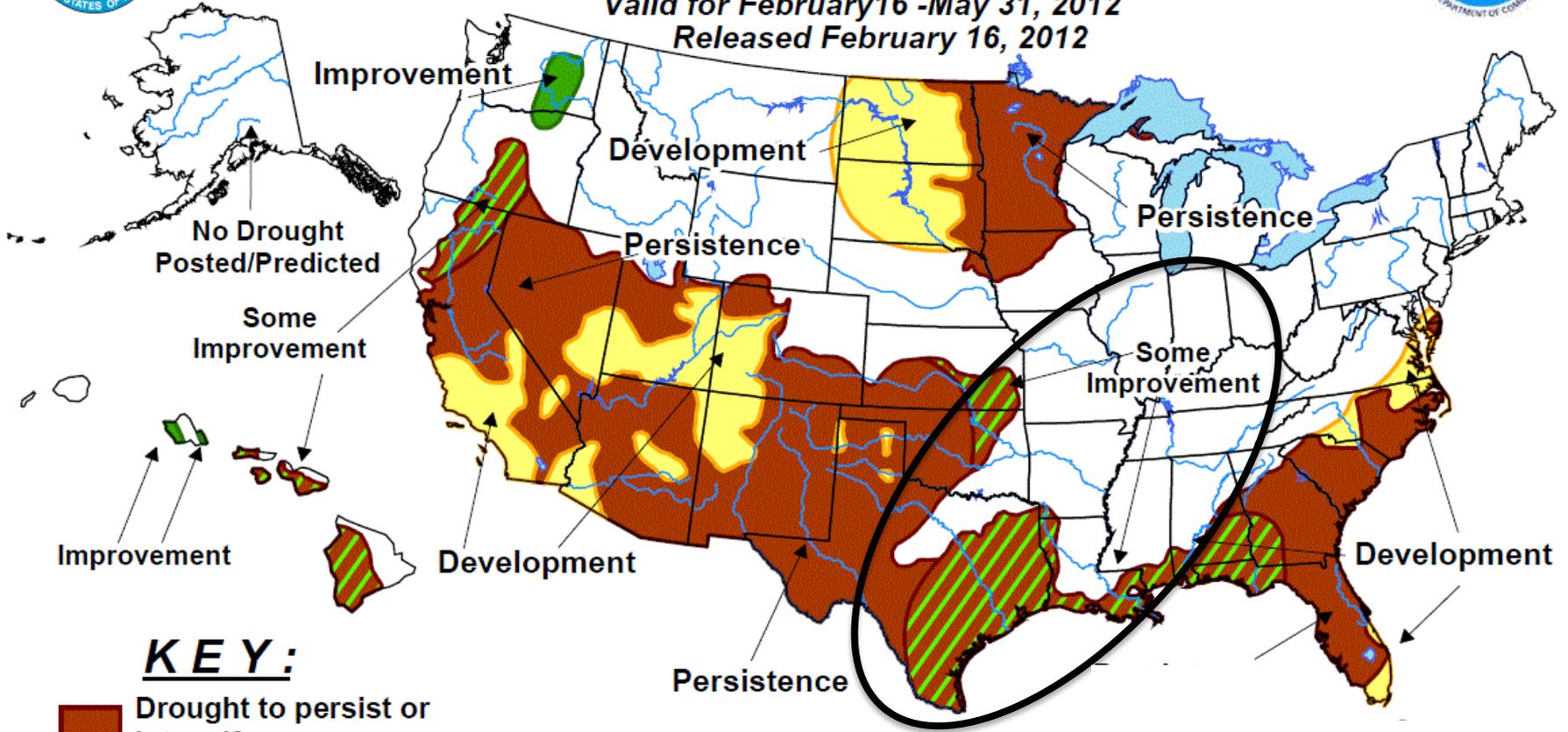
-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Drought Outlook through May

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for February 16 - May 31, 2012
Released February 16, 2012



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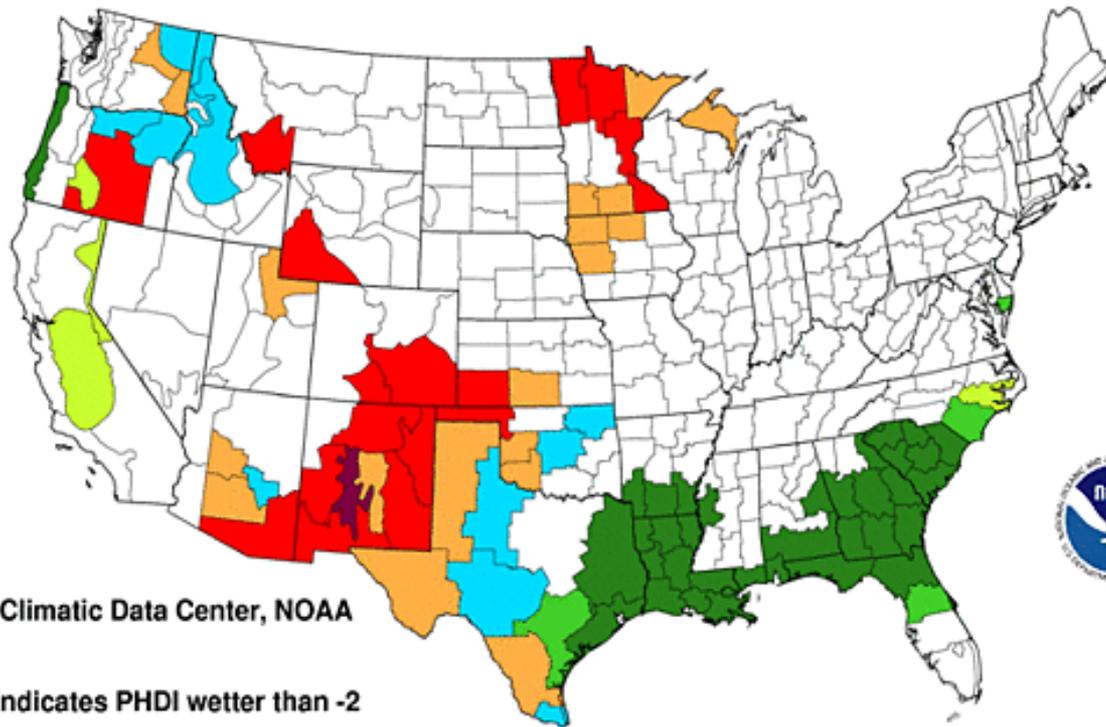
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Rain Needed to End the Drought in 3 Months

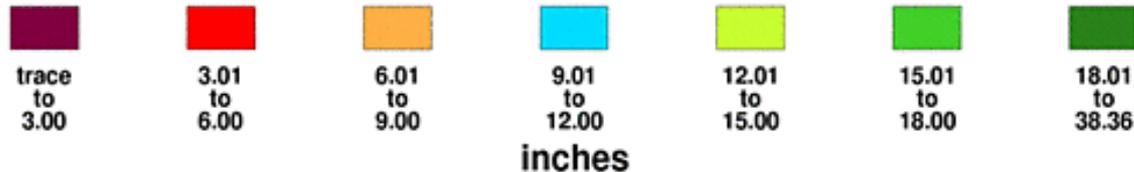
Precipitation Required to End Current Drought Conditions in Three Months

January 2012



National Climatic Data Center, NOAA

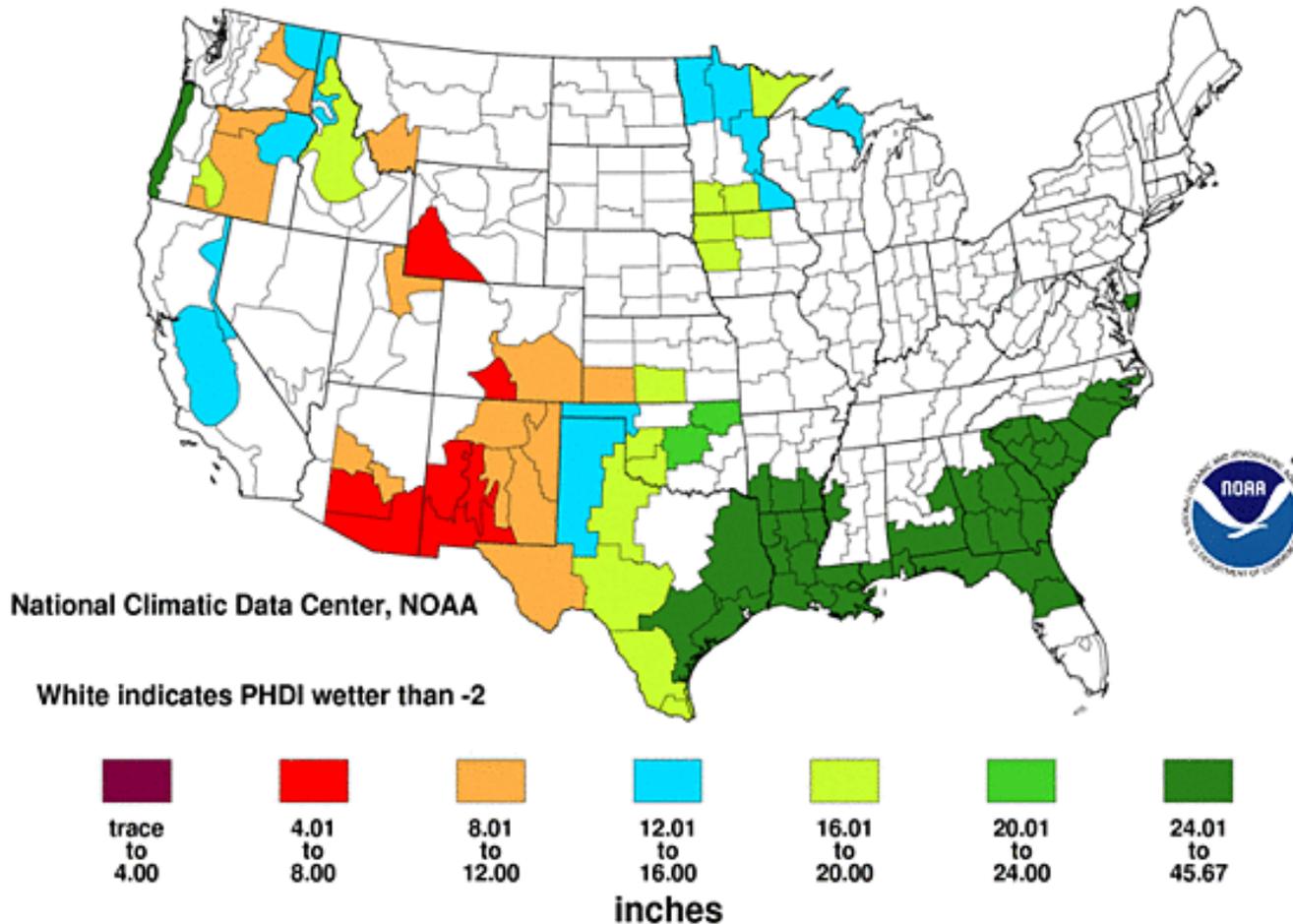
White indicates PHDI wetter than -2



Rain Needed to End the Drought in 6 Months

Precipitation Required to End Current Drought Conditions in Six Months

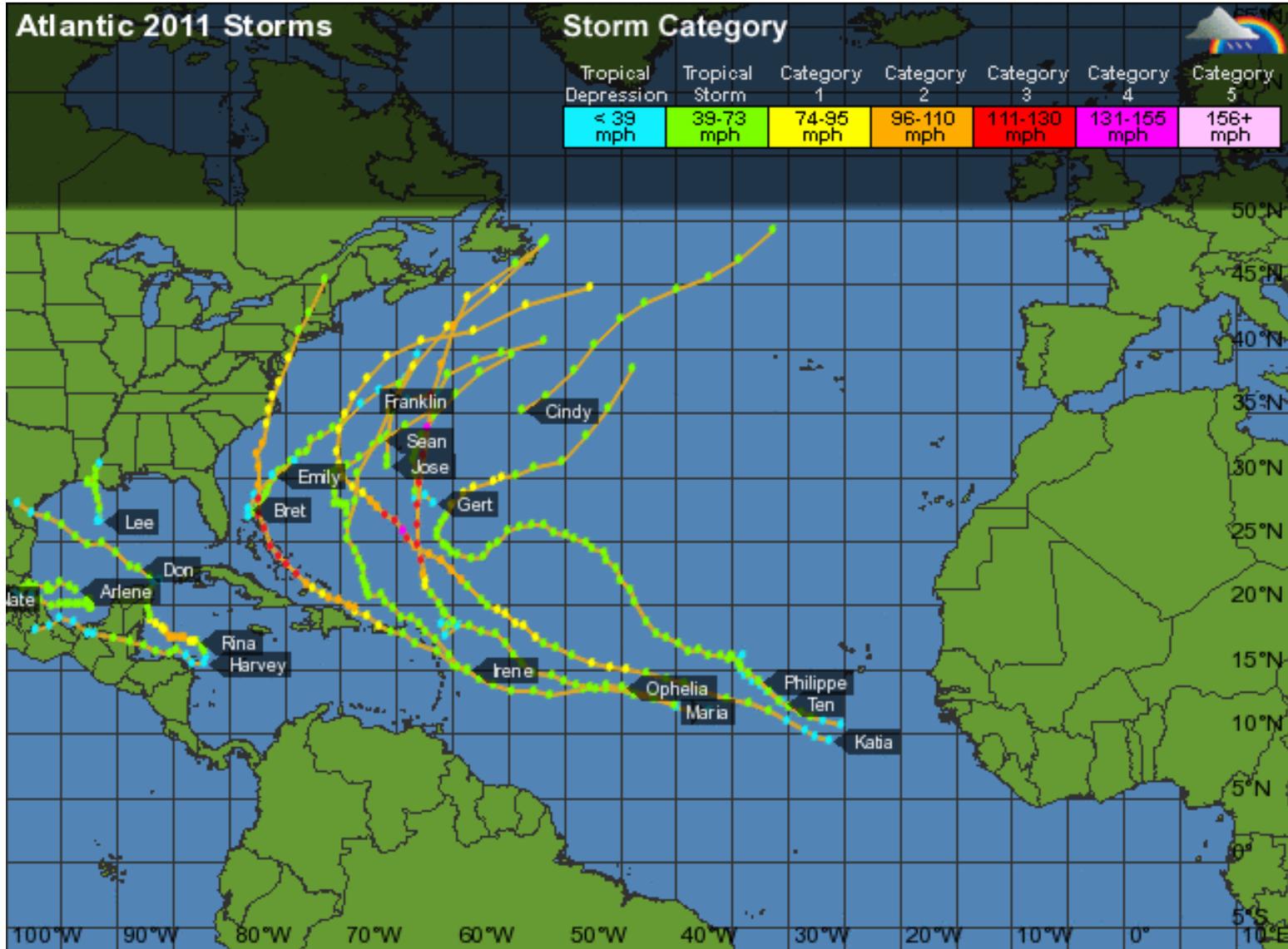
January 2012



The 2012 Atlantic Hurricane Season



2011; An Active Season, but Not for Texas



Colorado Tropical Storm State Outlook for 2012

THC circulation becomes unusually strong in 2012 and no El Niño event occurs (resulting in a seasonal average net tropical cyclone (NTC) activity of ~ 180) – **15% chance. (14-17 Storms)**

THC continues in the above-average condition it has been in since 1995 and no El Niño develops (NTC ~ 140) – **45% chance. (12-15 Storms)**

Colorado State Tropical Storm Outlook for 2012

THC continues in above-average condition it has been in since 1995 with the development of a significant El Niño (NTC ~ 75) – **30% chance. (8-11 Storms)**

THC becomes weaker and there is the development of a significant El Niño (NTC ~ 40) – **10% chance. (5-7 Storms)**

“We anticipate that the 2012 Atlantic basin hurricane season will be primarily determined by the strength of the THC/AMO and by the state of ENSO.”

Take Home Points

- *Still no clear end in sight to the ongoing drought. However, conditions have improved some since last summer.*
- *Pattern of frequent rains shows no signs of breaking down. More drought improvement expected.*
- *A potential for heavier rains May into June.*
- *Summer not as hot or as dry as last year.*
- *Pacific trending toward El Niño this fall; wetter next fall and winter.*

The Old Farmer's ALMANAC

"Useful, with a pleasant degree of humor"

Annual Weather Summary: November 2010 to October 2011

Winter temperatures will be slightly milder than normal, on average, with the coldest periods in late December, mid-January, and early and mid-February. Precipitation will be above normal in Texas and below normal in Oklahoma. Snowfall will be near to above normal, with the most significant snow and ice occurring in mid-January and mid-February.

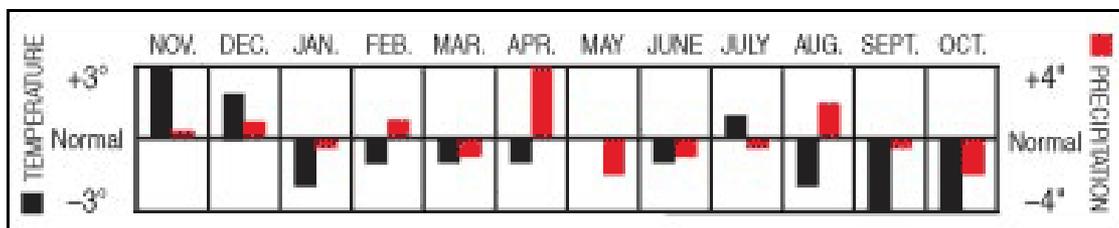
April and May will be rainier than normal, with temperatures above normal in Oklahoma and below normal in Texas.

Summer will be a bit cooler and rainier than normal, with the hottest periods from late June through the first half of July and in mid-August. The hurricane risk is slightly below normal.

September and October will be much cooler and drier than normal.



Temperature and Precipitation November 2010 to October 2011



The Old Farmer's ALMANAC

"Useful, with a pleasant degree of humor"

Annual Weather Summary: November 2011 to October 2012

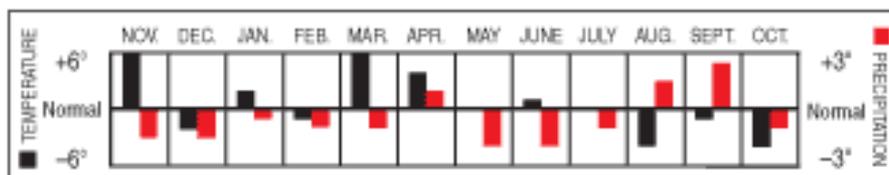
Winter temperatures will be milder than normal, on average, with much-below-normal rainfall. The coldest periods will occur in early and mid-December, early January, and early February. Snowfall will be below normal and limited to the north, with the snowiest periods in mid-December and early January.

April and May will continue warmer than normal, with rainfall above normal in the north and below normal in central and southern areas.

Summer will be a bit cooler than normal, on average, with the hottest periods in mid-June and early and late July. Rainfall will be slightly above normal in The Valley, but below normal elsewhere, with drought a threat.

September and October will be much cooler than normal, with rainfall below normal in the north and above in the south. Expect hurricanes in mid-September and early October, especially in The Valley.

Temperature and Precipitation November 2011 to October 2012





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