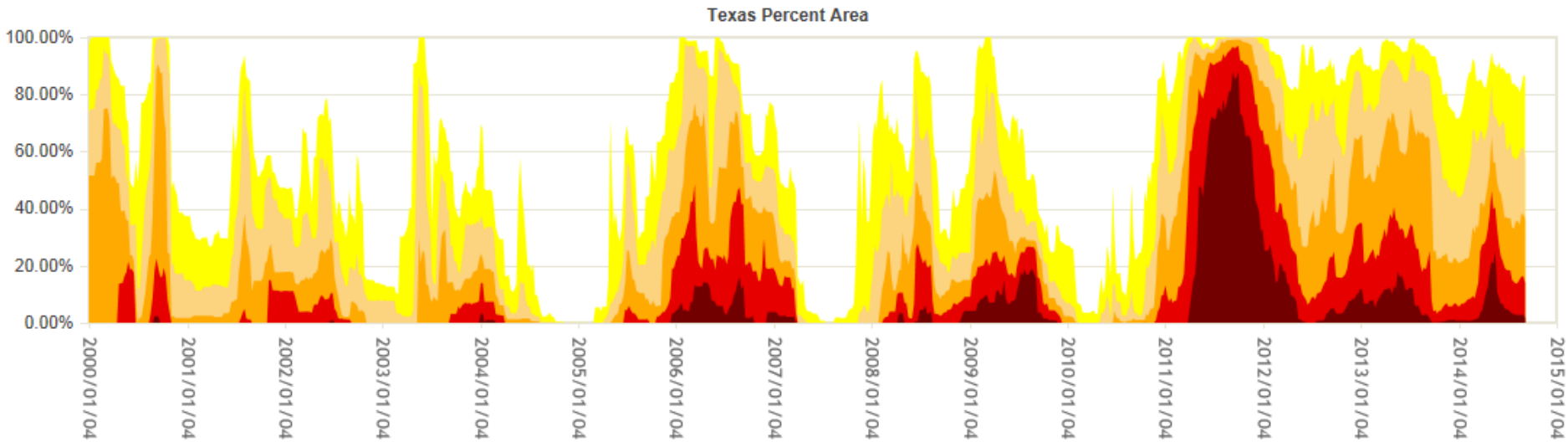
Drought Update; Fall and Winter Weather Outlook

ICI Technical Workshop

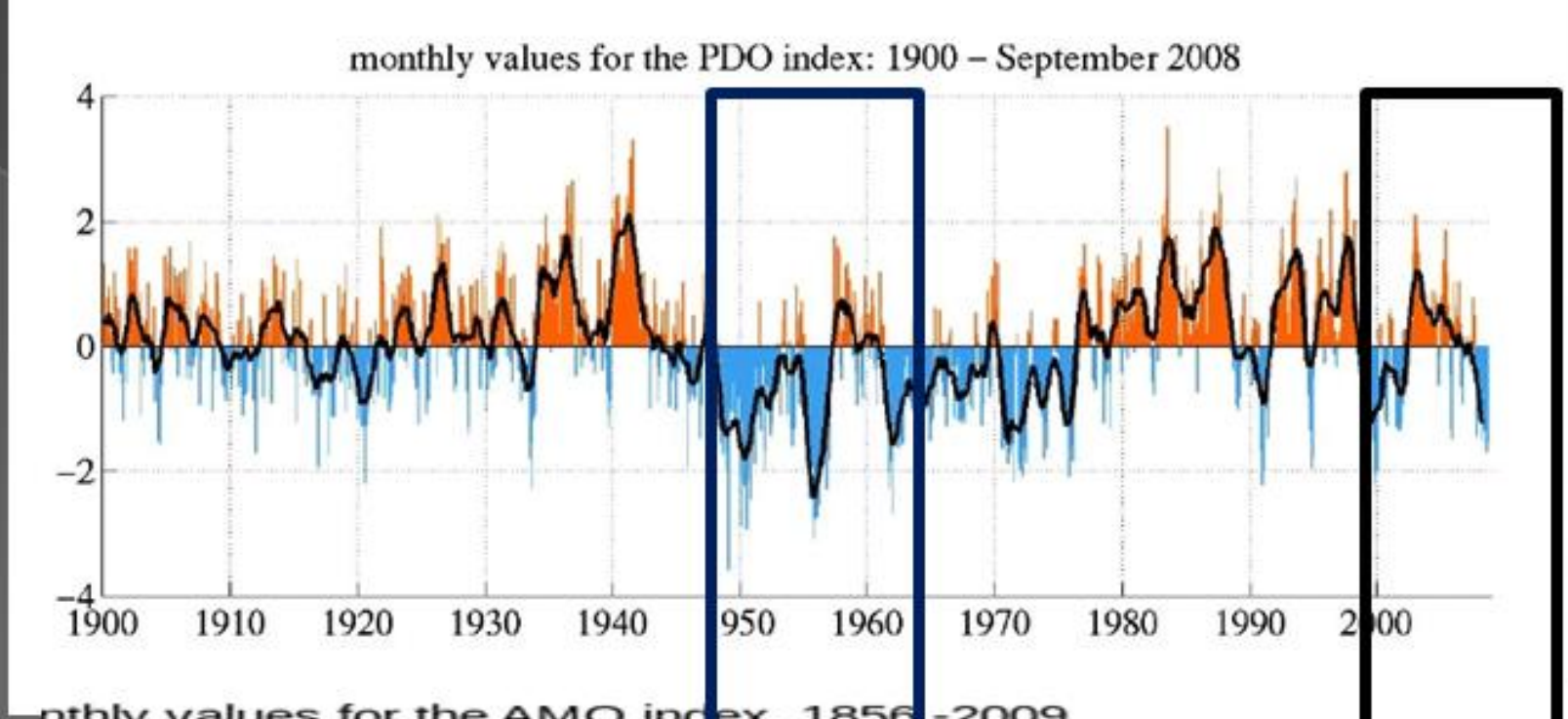
LCRA Chief Meteorologist

September 24, 2014

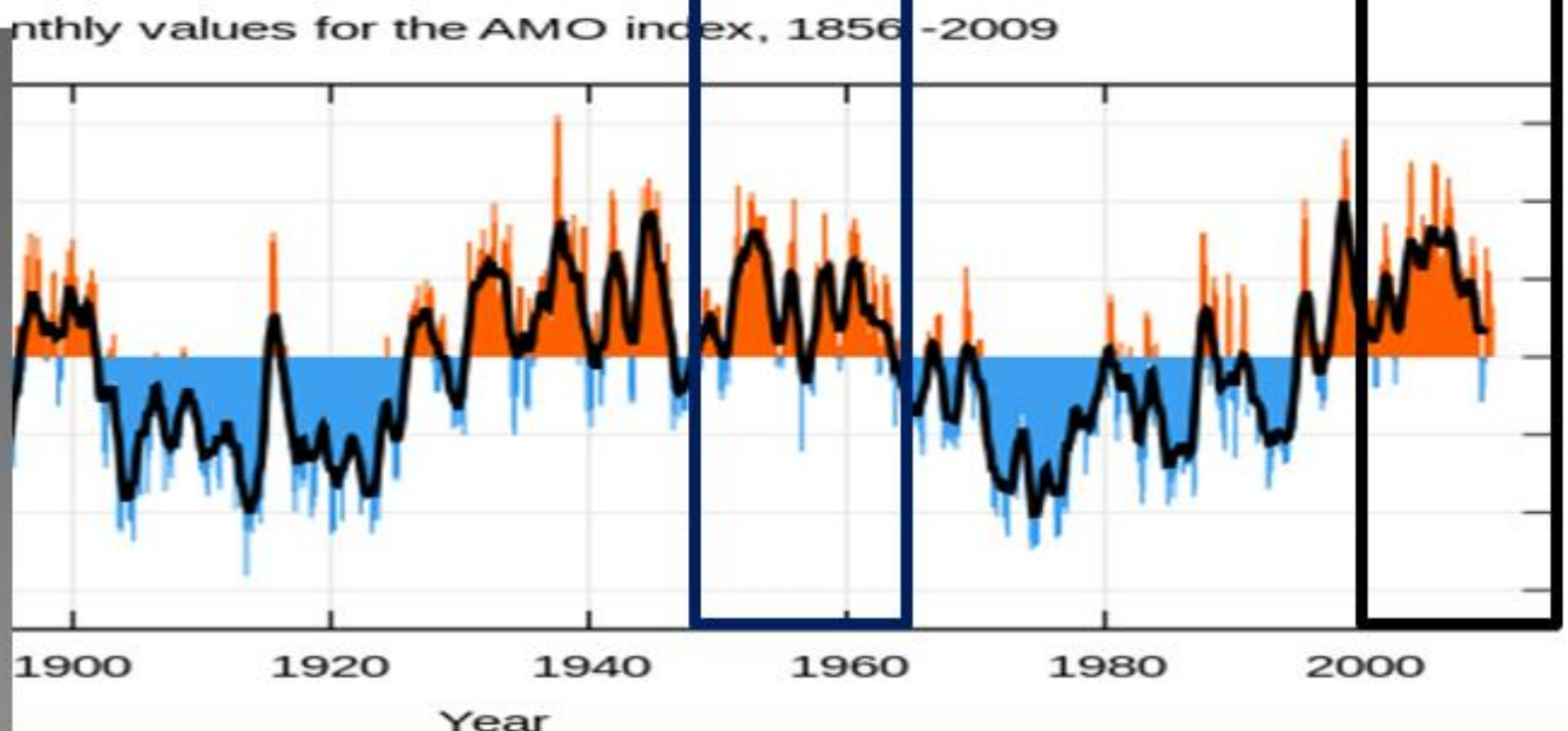
Drought Timeline 2000-2014



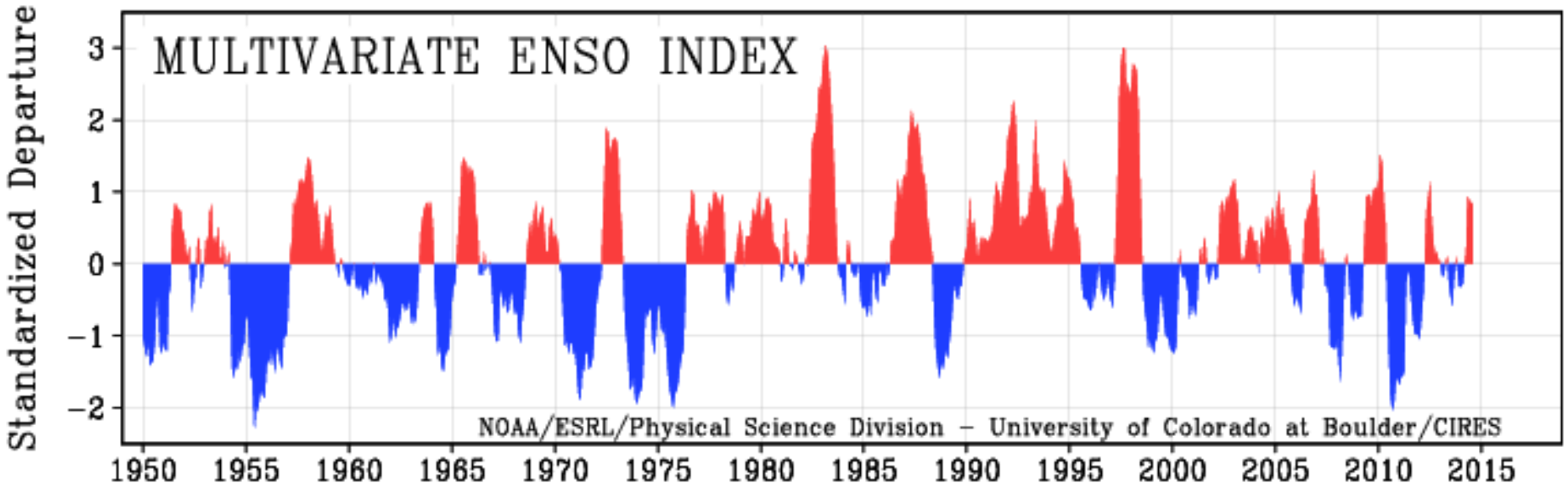
PDO


monthly values for the PDO index: 1900 – September 2008
4
2
0
−2
−4
1900
1910
1920
1930
1940
950
1960
1970
1980
1990
2000

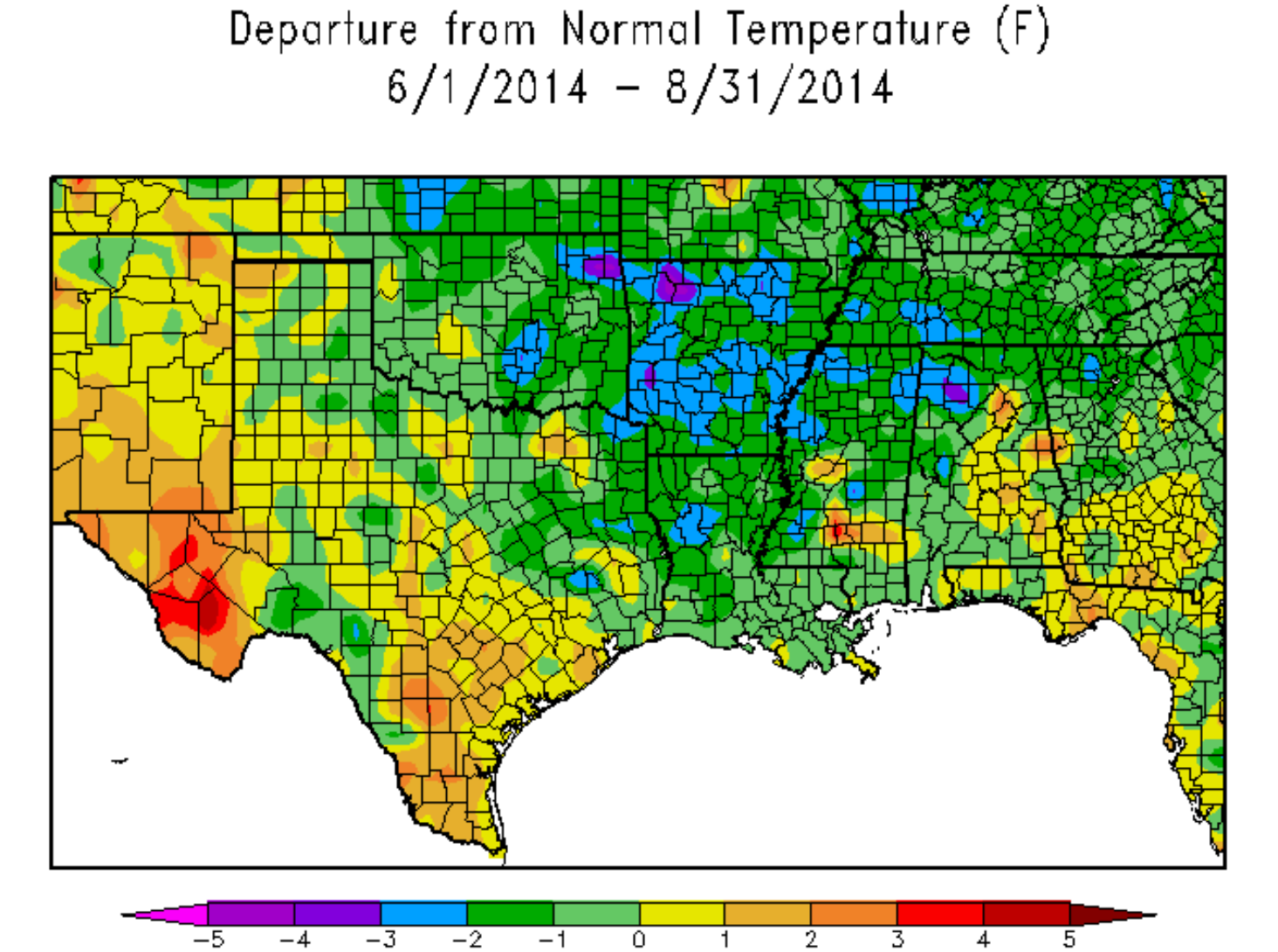
AMO


nthly values for the AMO index, 1856 -2009
1900
1920
1940
1960
1980
2000
Year

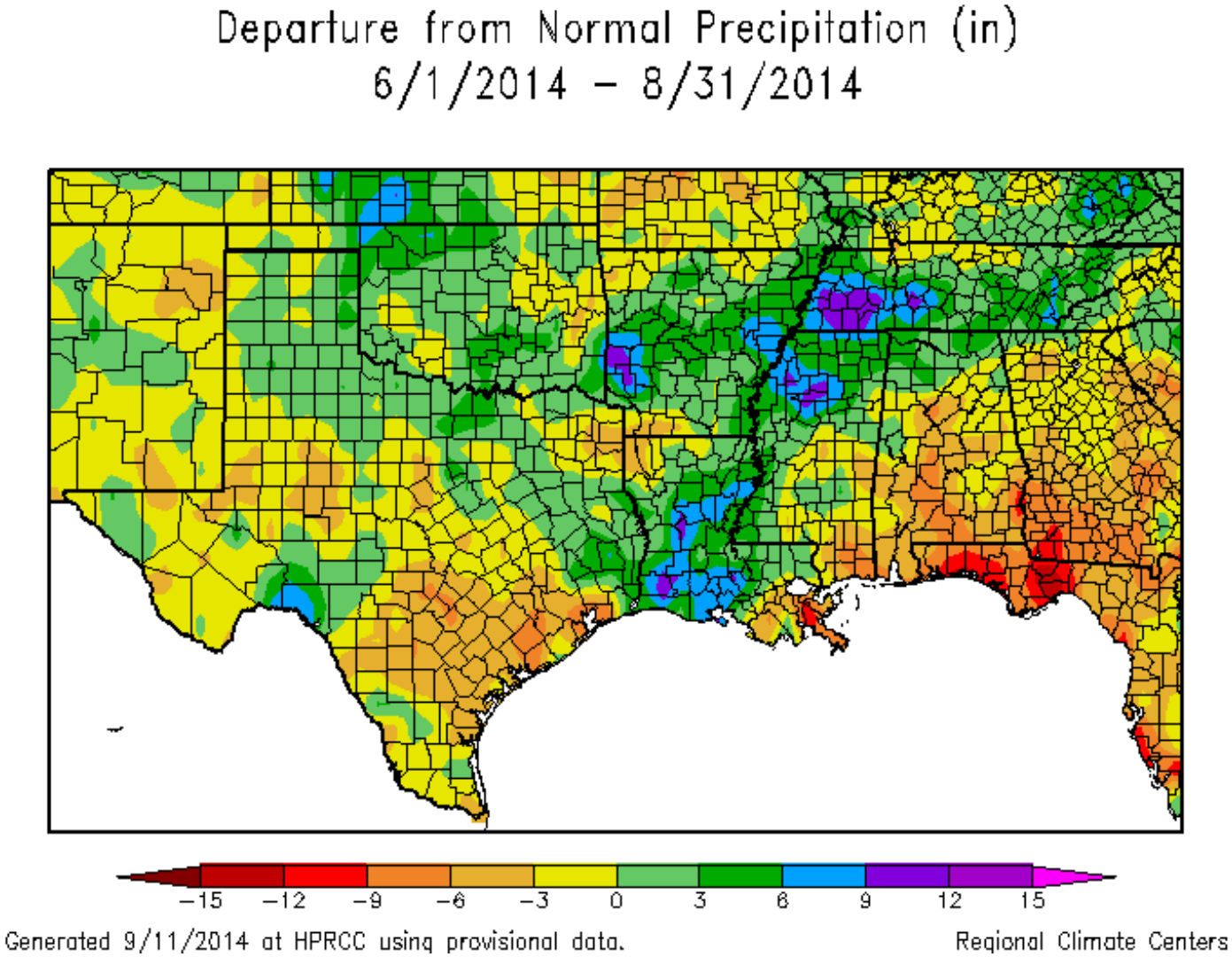
El Niño/La Niña Index



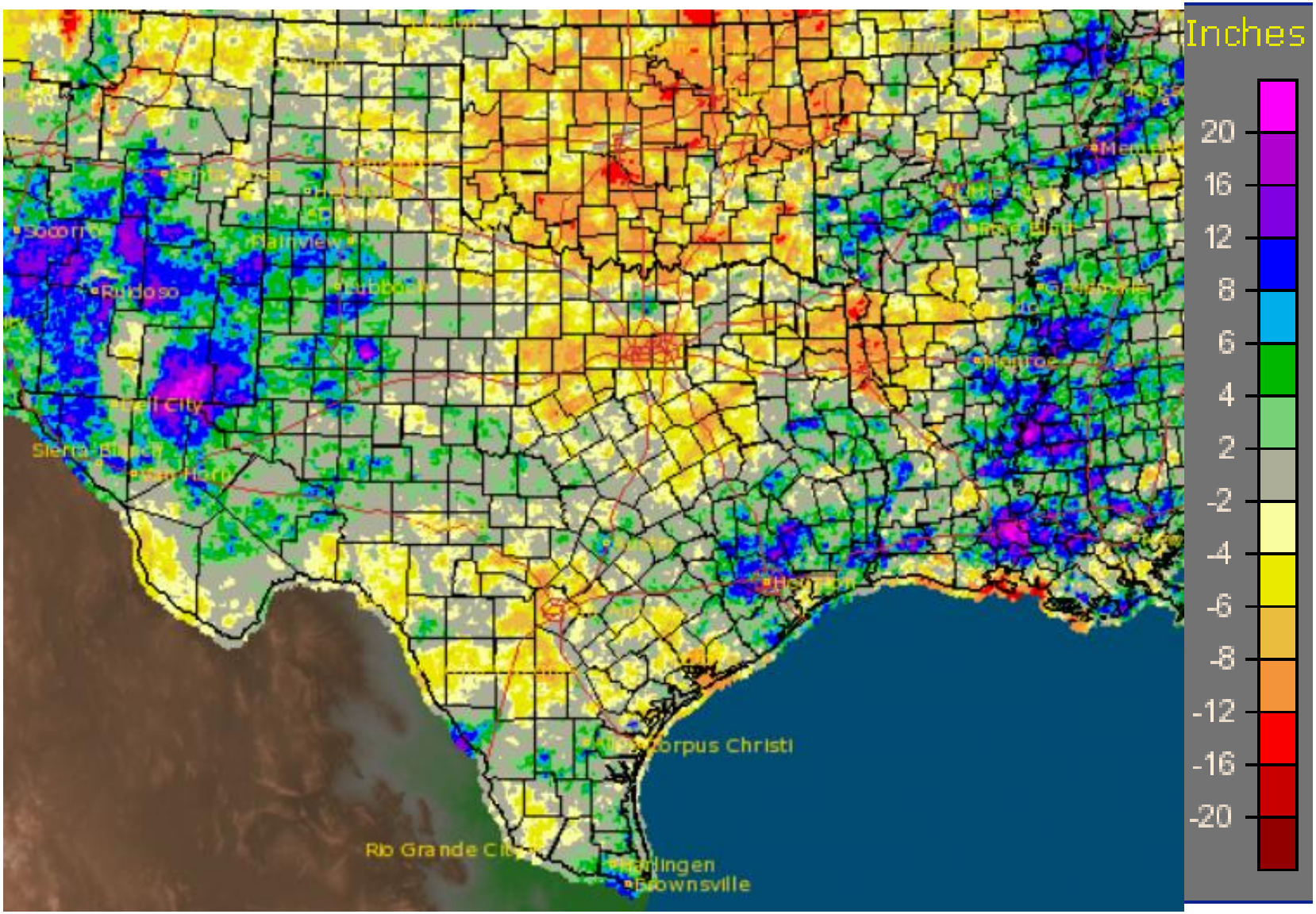
June-August Temperature Departure from Normal



June-August, Rainfall Departure from Normal



Rainfall Departure from Normal Since Jan. 1



Austin's Summer Statistics
(Camp Mabry)

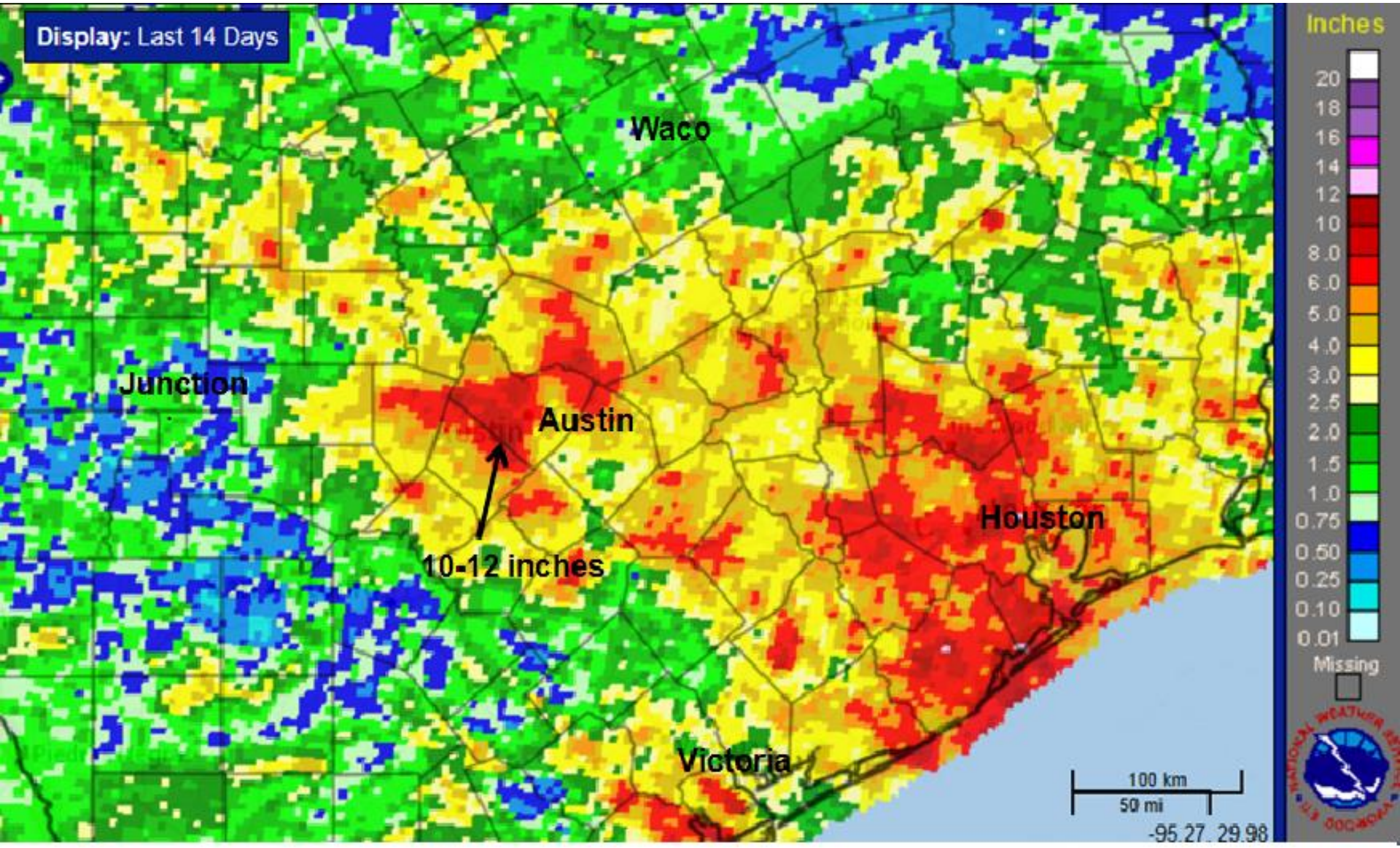
- Average temperature: **84.5 degrees.** 0.2 degrees F above normal.
- Rainfall **8.78 inches**, 0.22 inches above normal.
- 21 100-degree days.
- Highest temperature 104 on 8/16.
- August was the 12th warmest and 13th driest with just 0.07 inches of rain.

Austin's Rainfall Statistics
(Camp Mabry)

- September rainfall: 6.98 inches, 4.62 inches above normal.

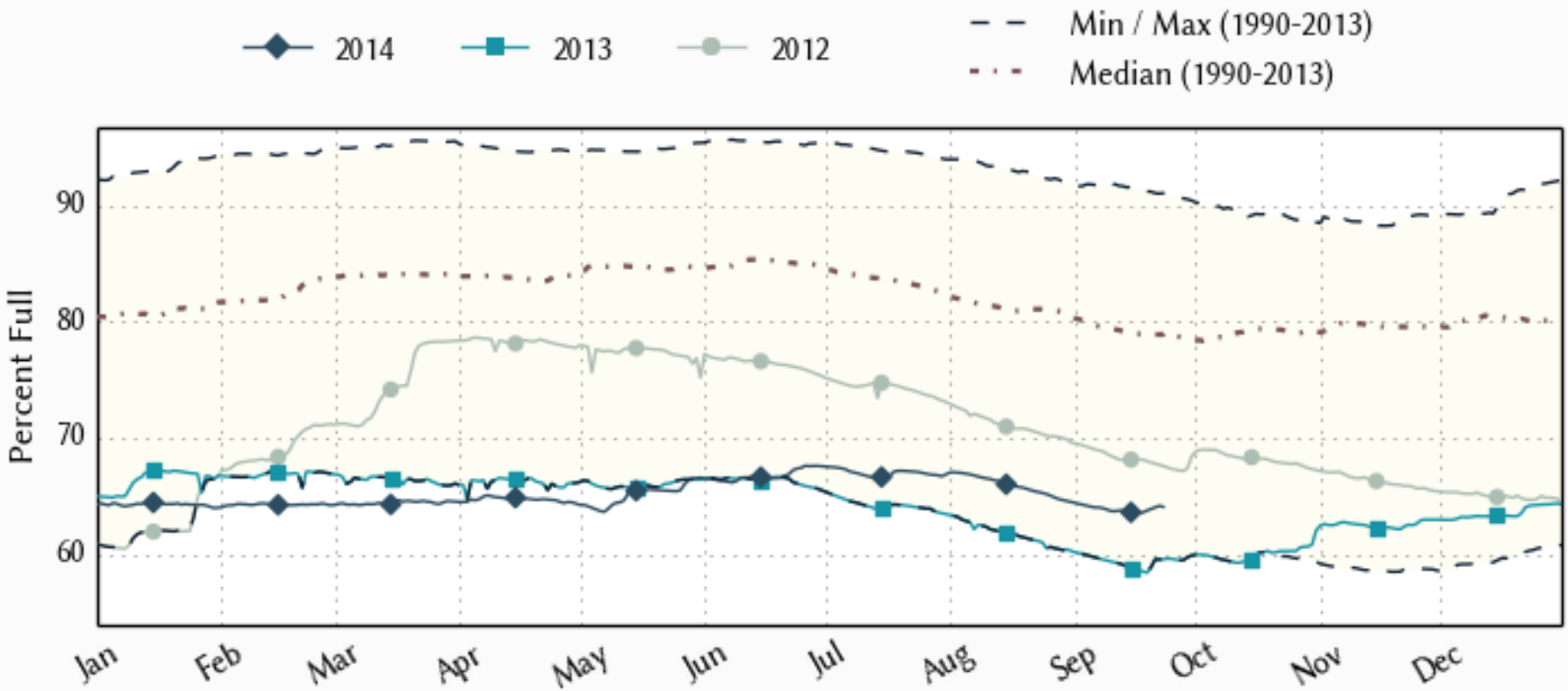
- Year to date total: 26.84 inches, 2.39 inches above normal.

Rainfall 9/8-9/22

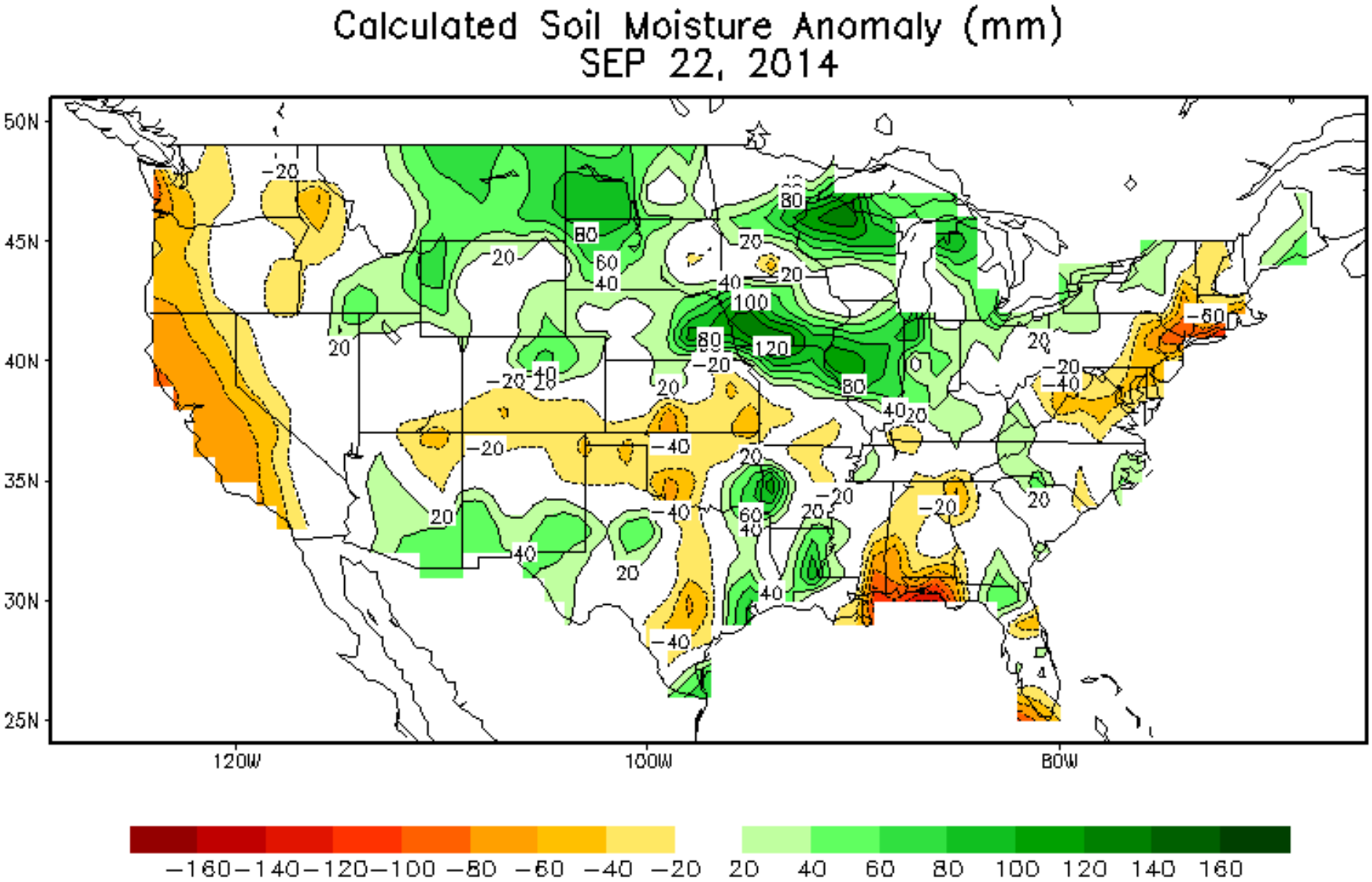


Texas Reservoirs

Monitored Water Supply Reservoirs are 64.1% full on 2014-09-23

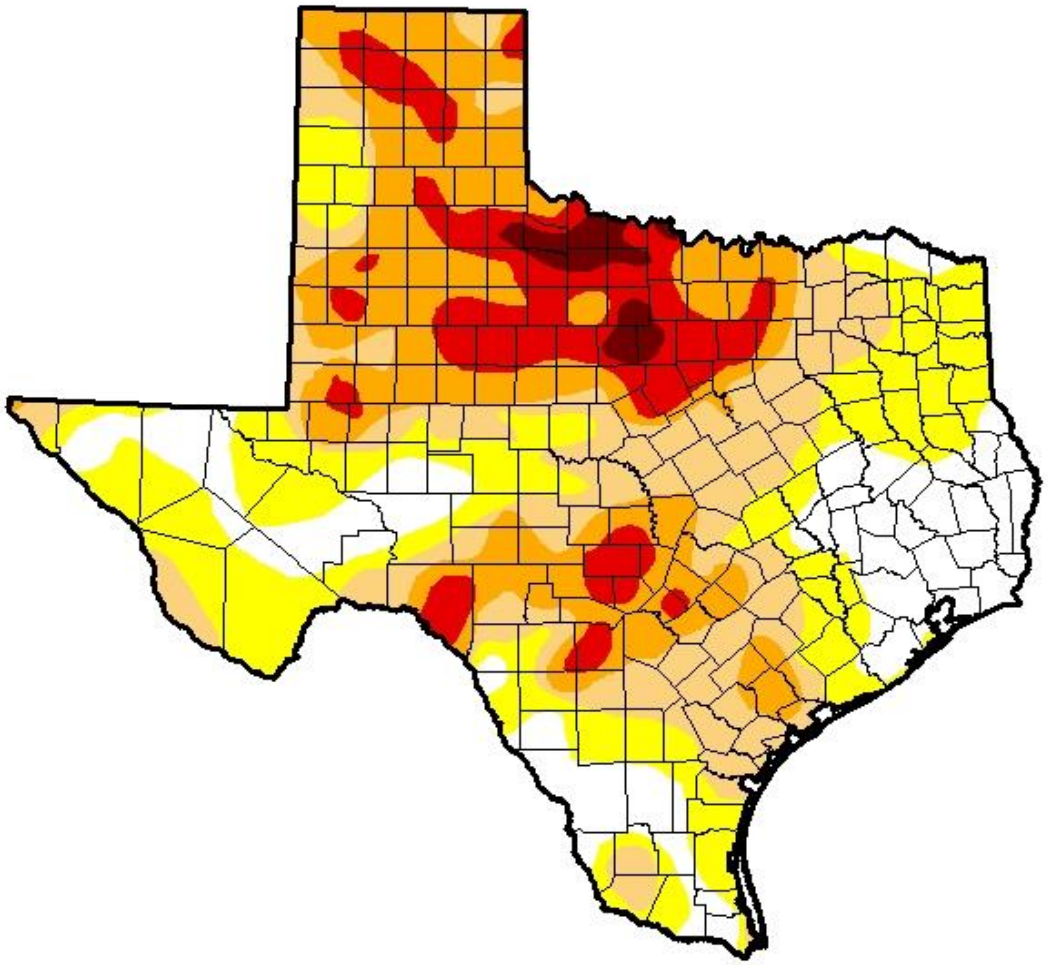


Current Soil Moisture Anomaly



U.S. Drought Monitor

Texas



September 16, 2014

(Released Thursday, Sep. 18, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	17.71	82.29	56.83	35.00	13.05	1.79
Last Week *9/9/2014*	13.77	86.23	57.62	36.26	13.87	1.54
3 Months Ago *6/17/2014*	10.45	89.55	70.95	41.30	21.50	6.56
Start of Calendar Year *12/31/2013*	28.48	71.52	43.84	21.15	5.82	0.79
Start of Water Year *10/1/2013*	6.62	93.38	70.95	25.08	4.01	0.12
One Year Ago *9/17/2013*	5.30	94.70	86.30	64.06	25.08	1.65

Intensity:

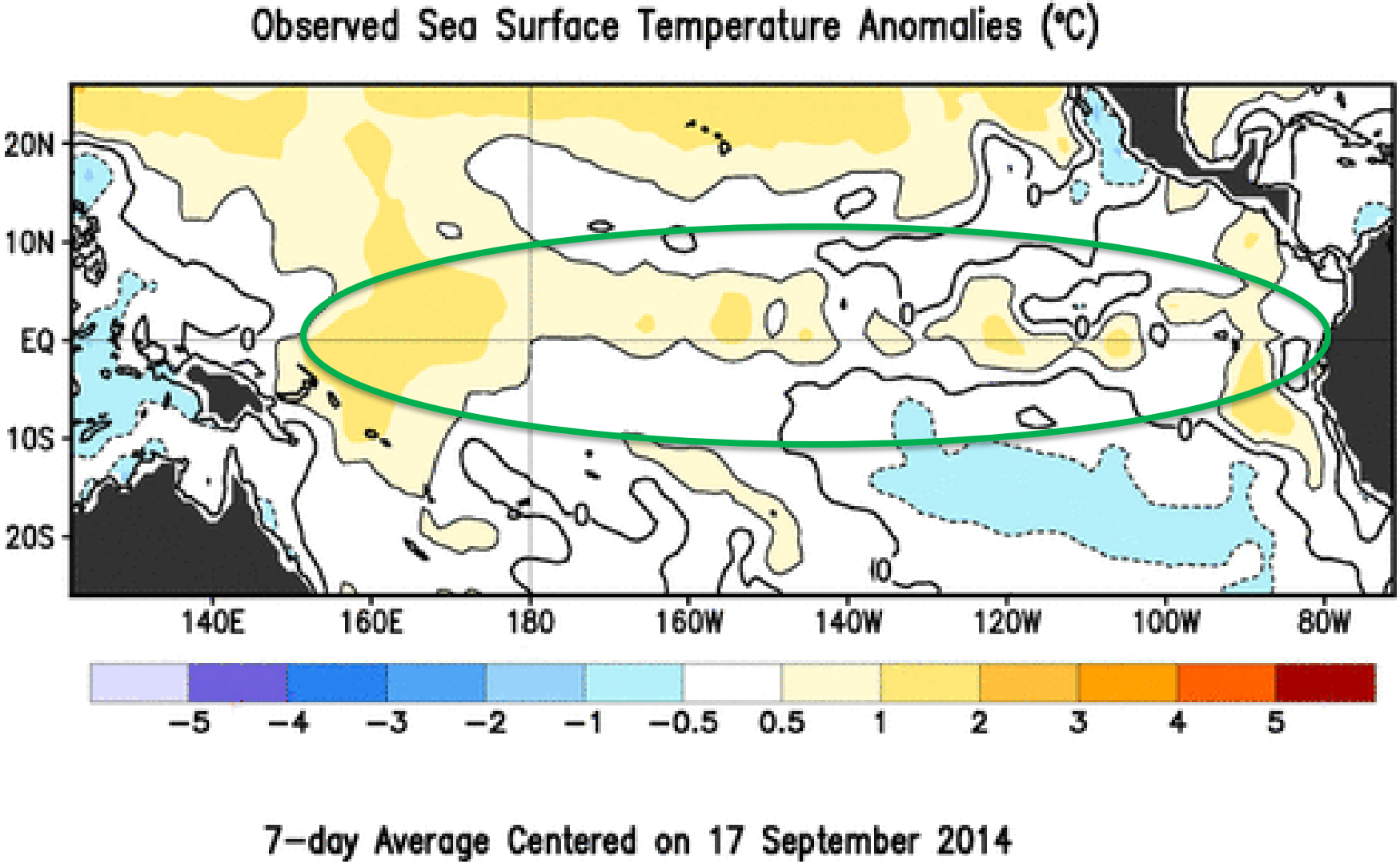
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

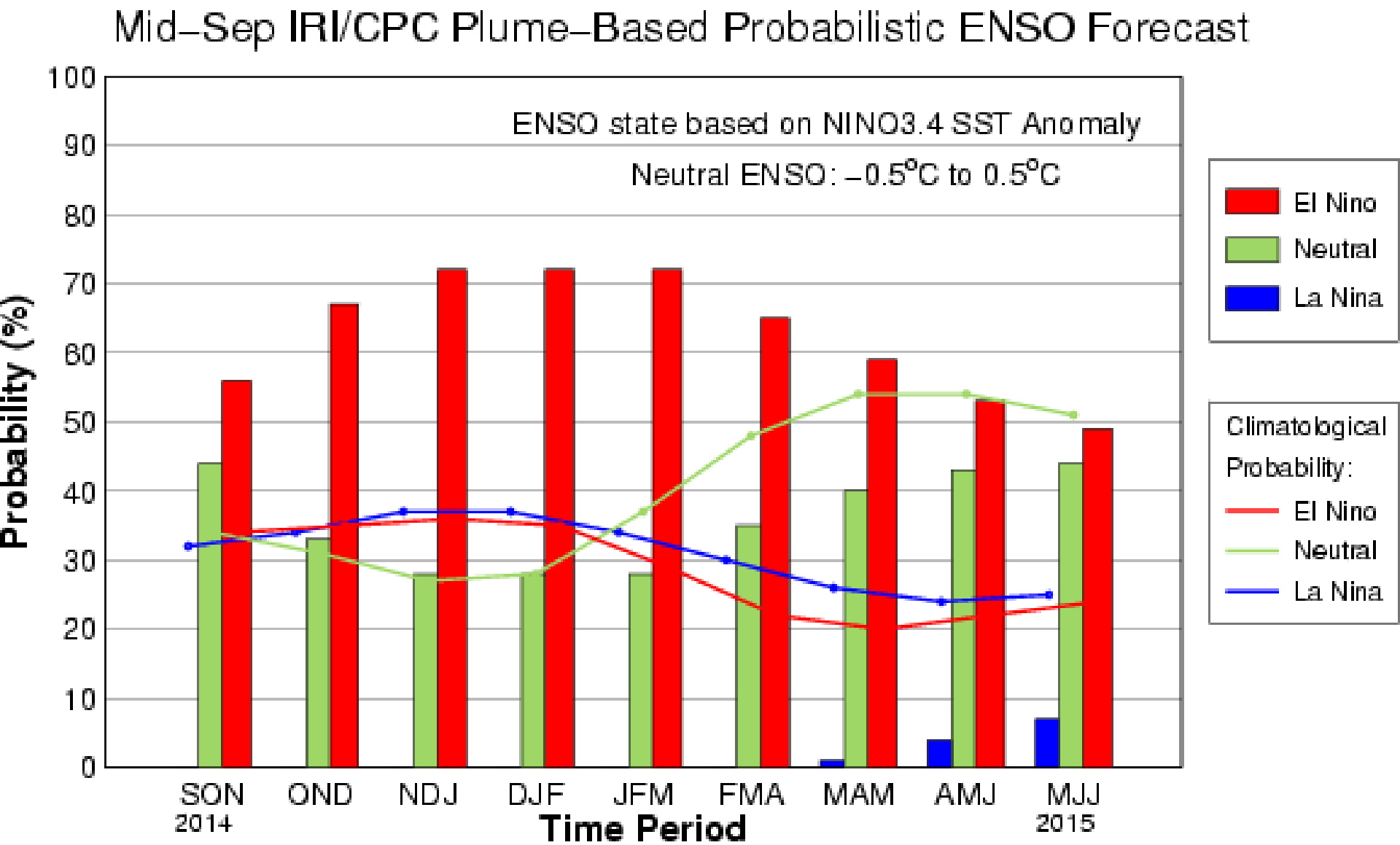
Author:
Michael Brewer
NCDC/NOAA

http://droughtmonitor.unl.edu/

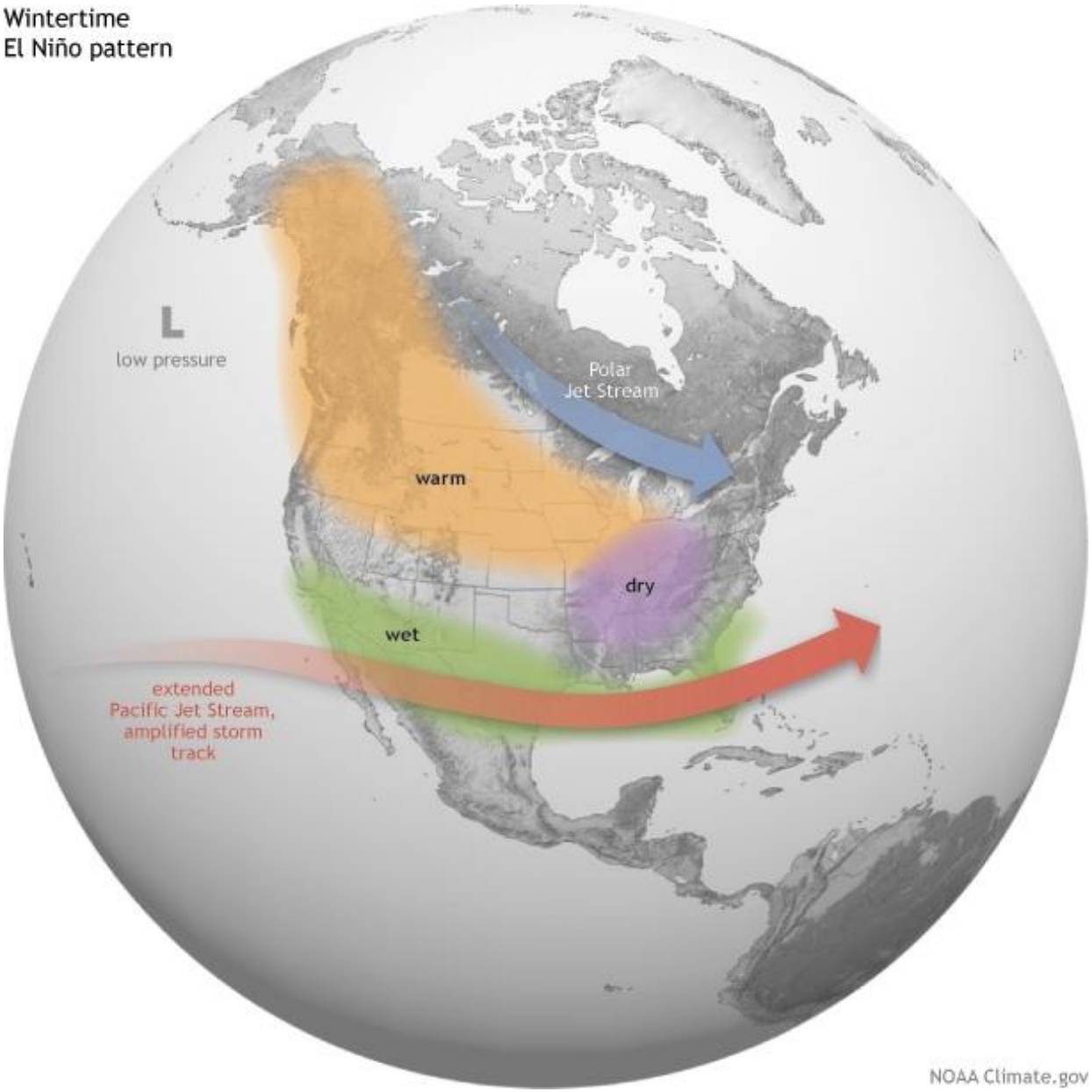
El Niño Developing in the Tropical Pacific

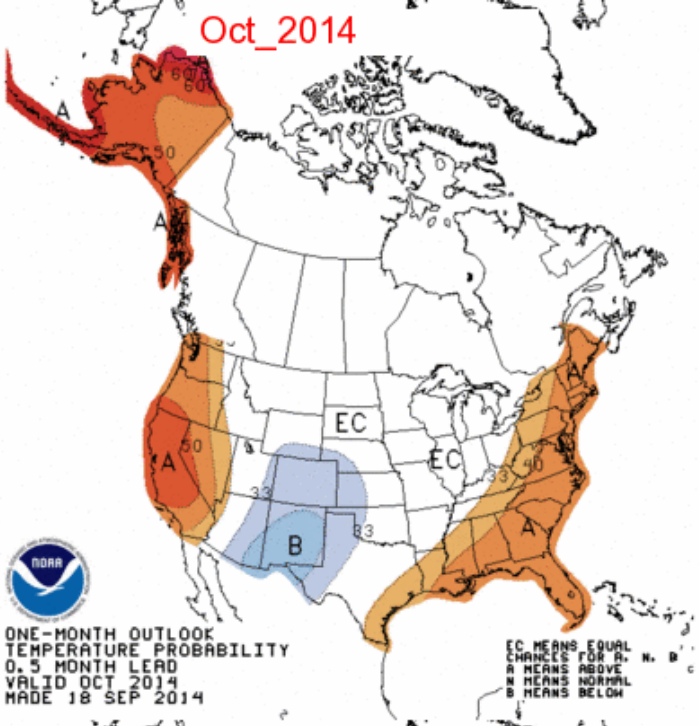


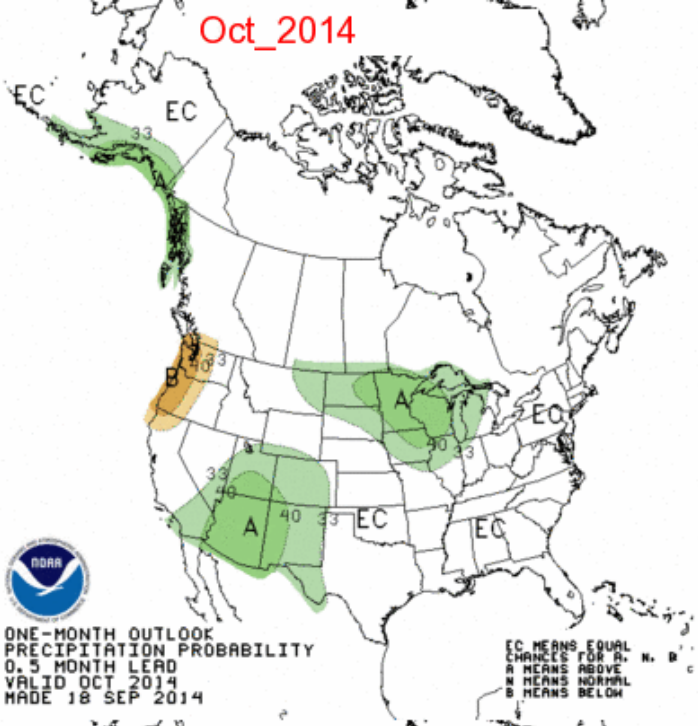
Probability for El Niño



Effects of El Niño




Oct_2014
ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID OCT 2014
MADE 18 SEP 2014
EC MEANS EQUAL CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW


Oct_2014
ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
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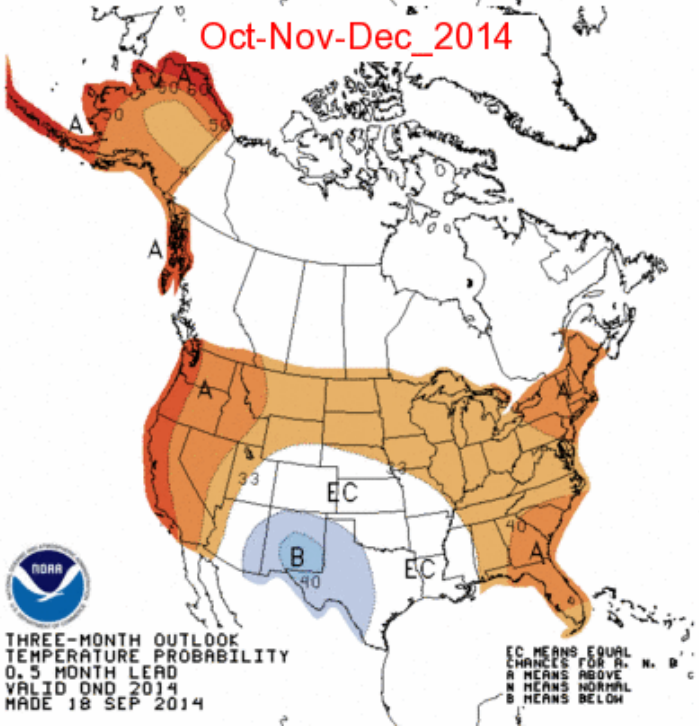
Oct-Nov-Dec_2014
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID OND 2014
MADE 18 SEP 2014
EC MEANS EQUAL CHANCES FOR A, N, B
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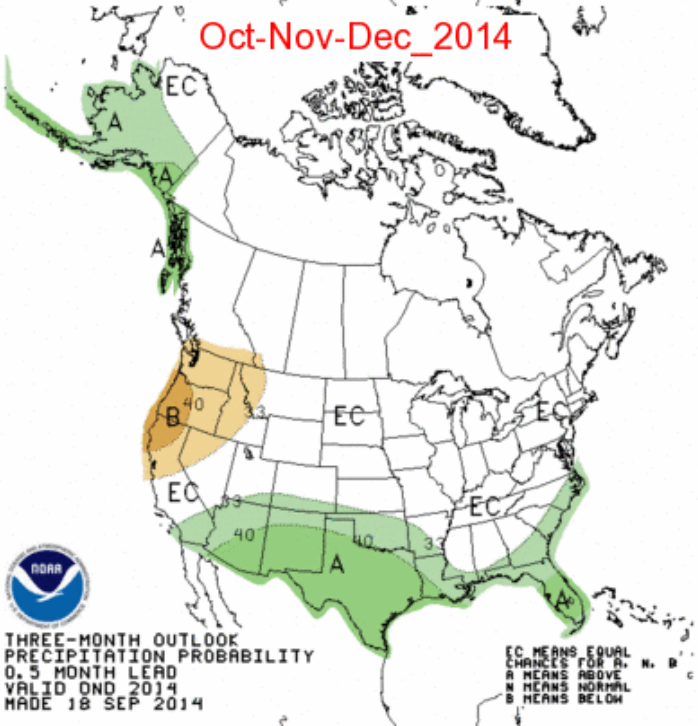
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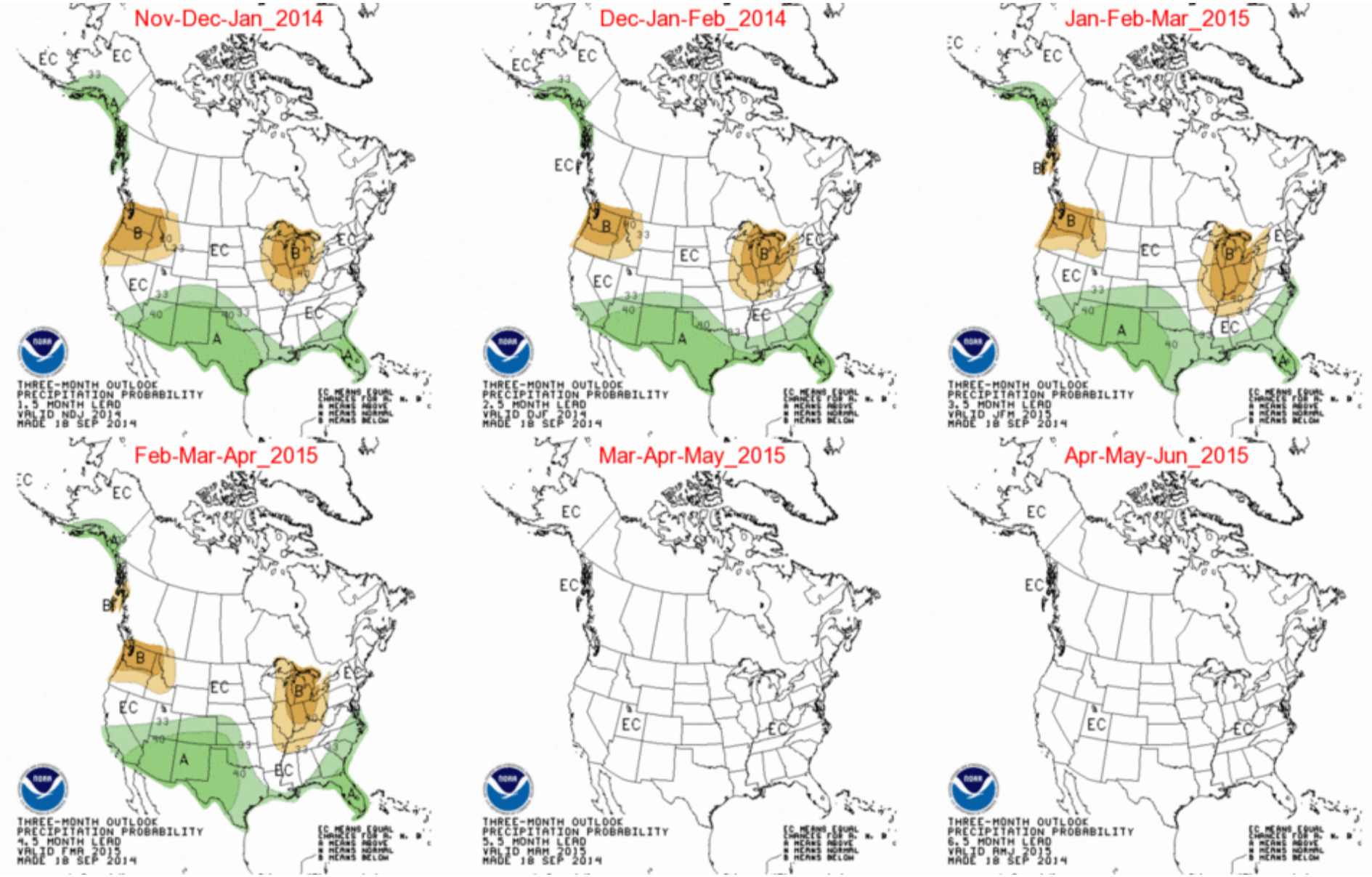
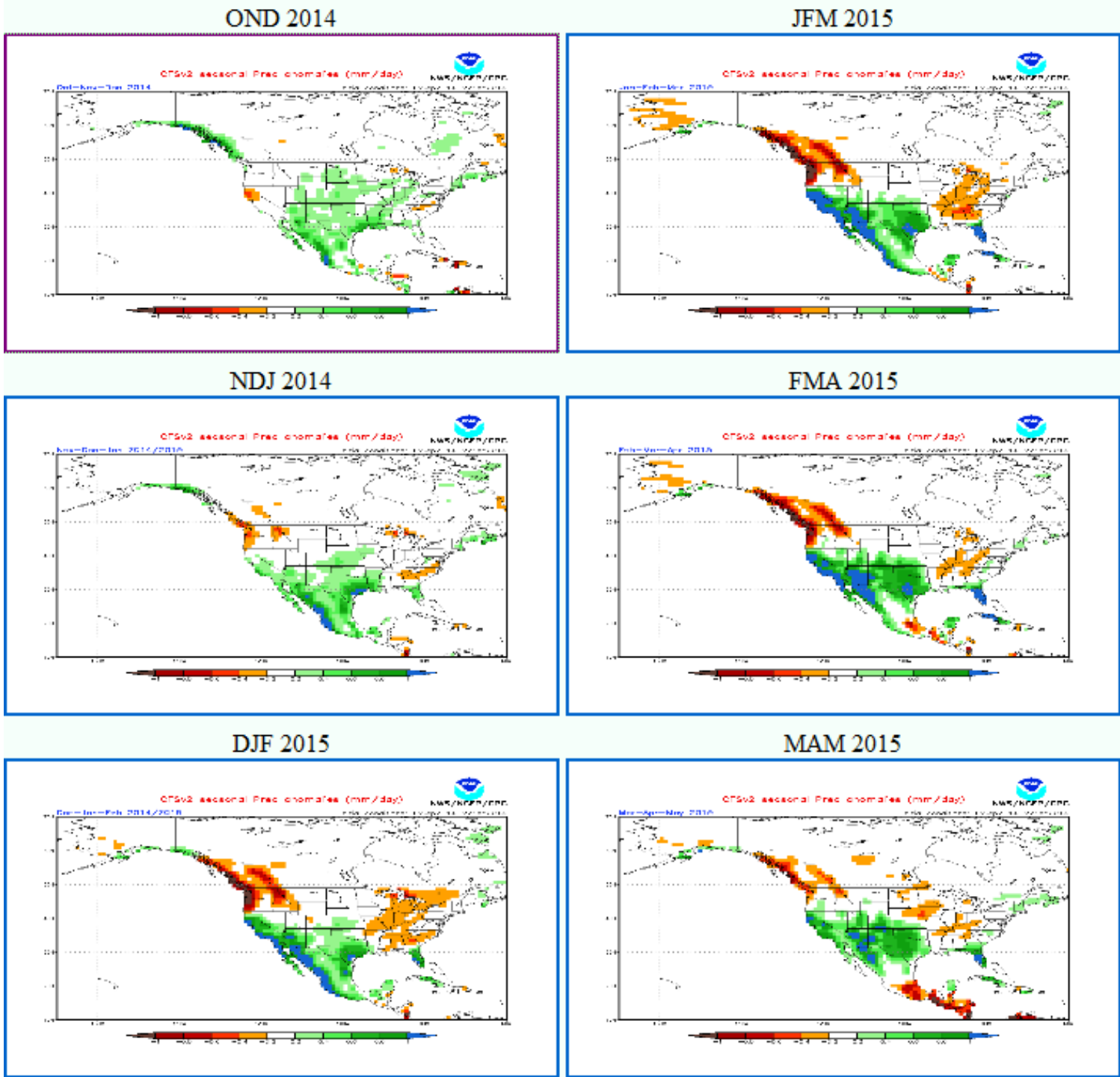
NWS Rainfall Outlook



Climate Forecast System Model, Precipitation Outlook

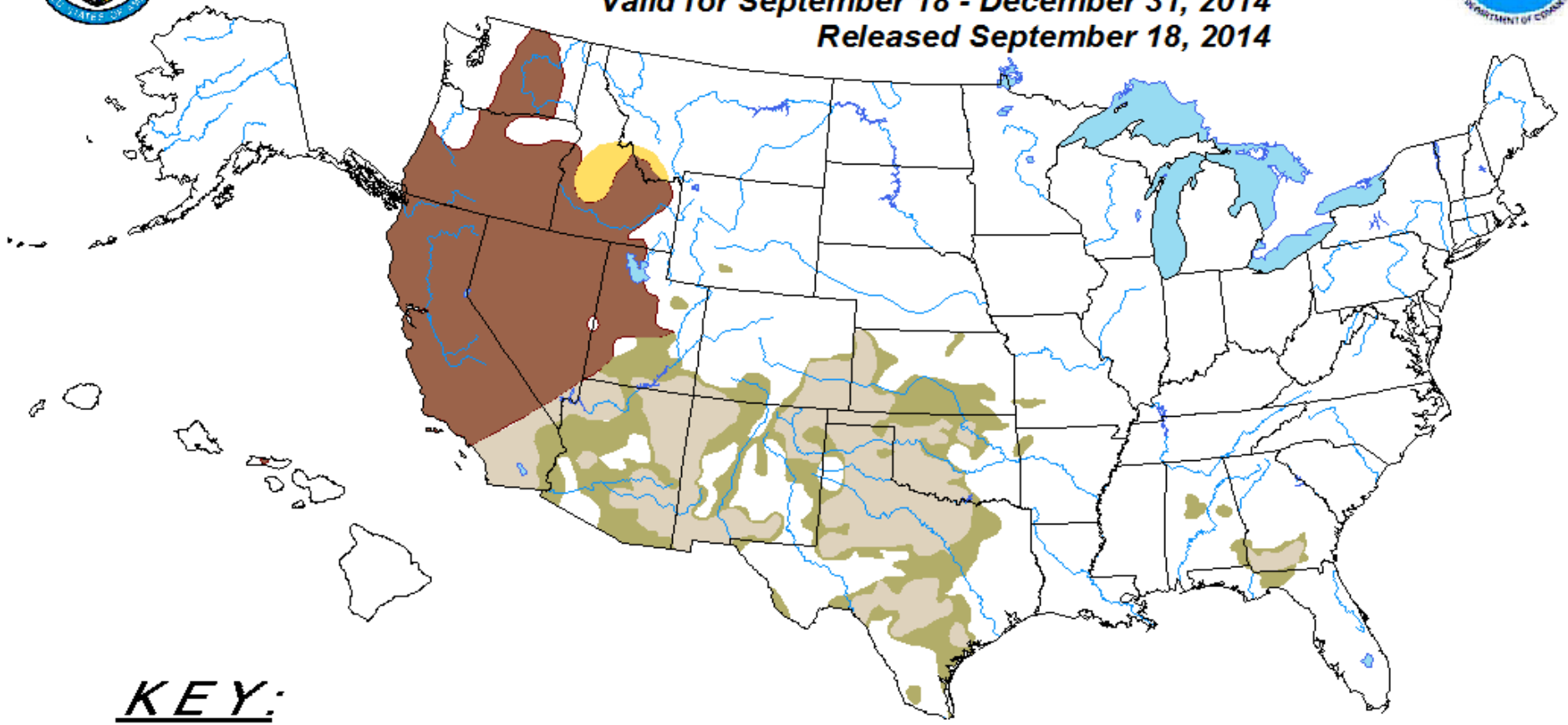


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for September 18 - December 31, 2014

Released September 18, 2014



KEY:

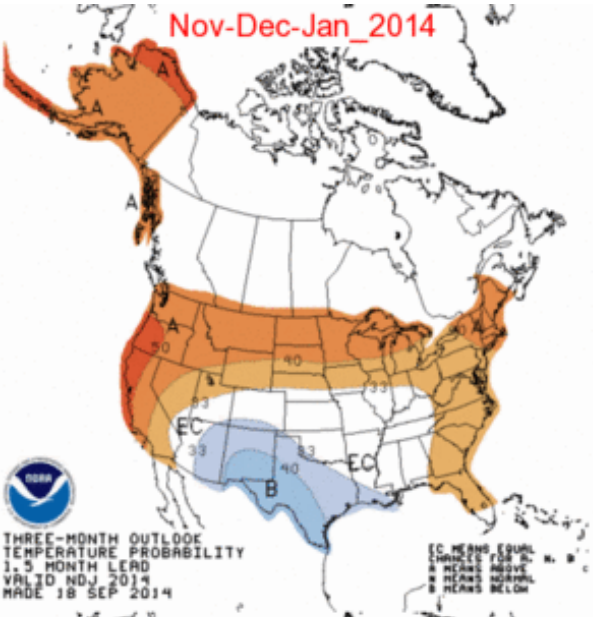
- **Drought persists or intensifies**
- **Drought remains but improves**
- **Drought removal likely**
- **Drought development likely**

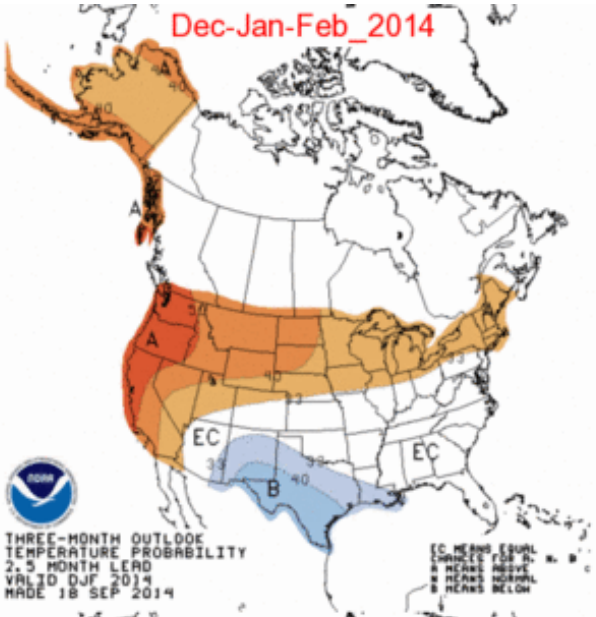
Author: Anthony Artusa, Climate Prediction Center, NOAA

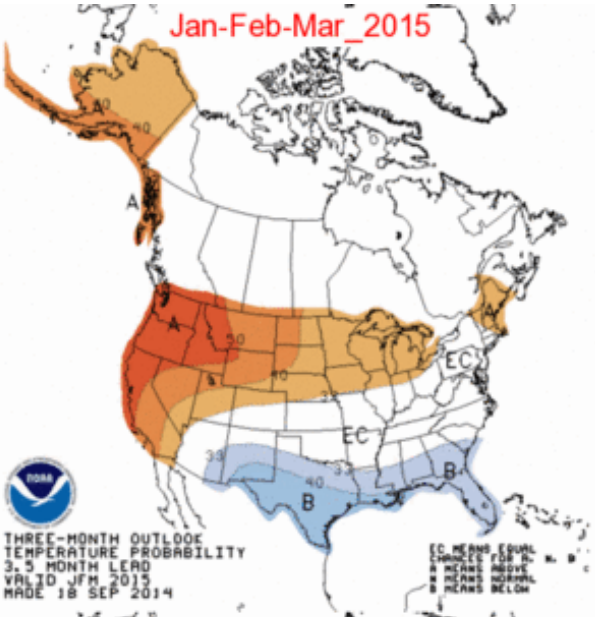
http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.html

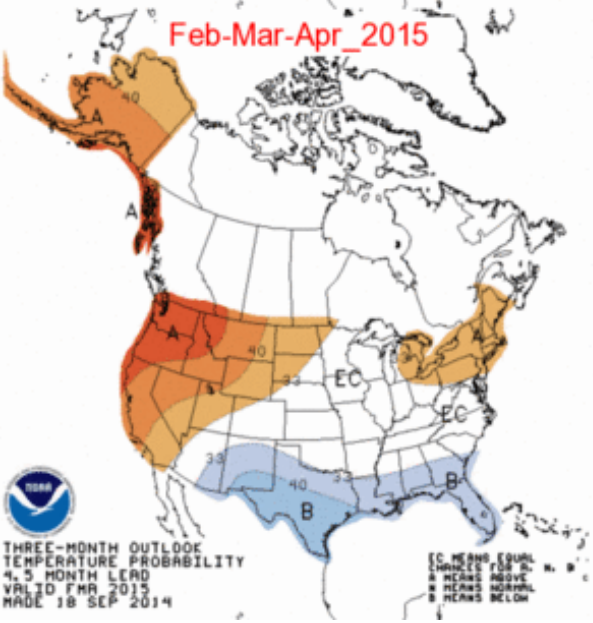
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- 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 tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain.
The Green areas imply drought removal by the end of the period (D0 or none)

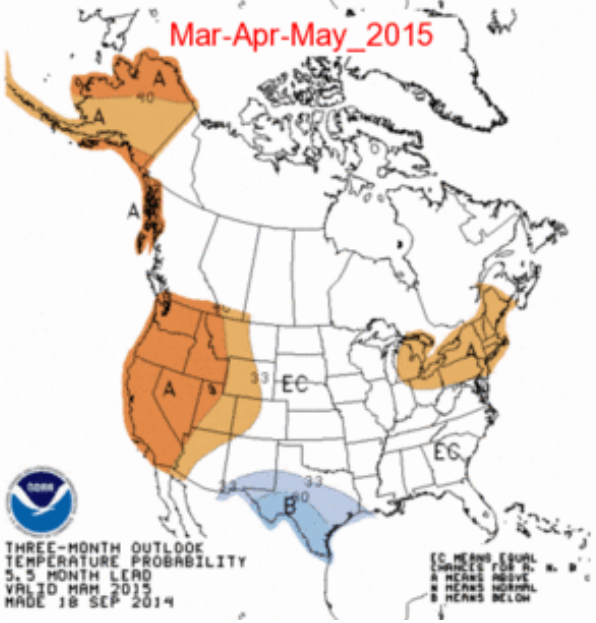
NWS Temperature Outlook

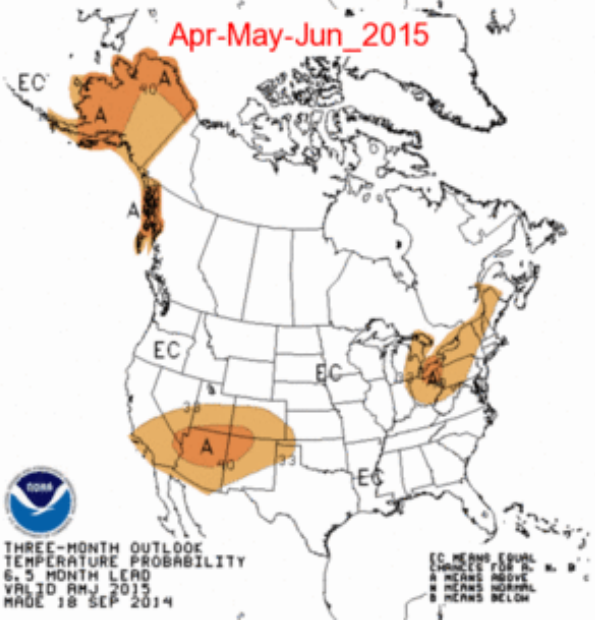




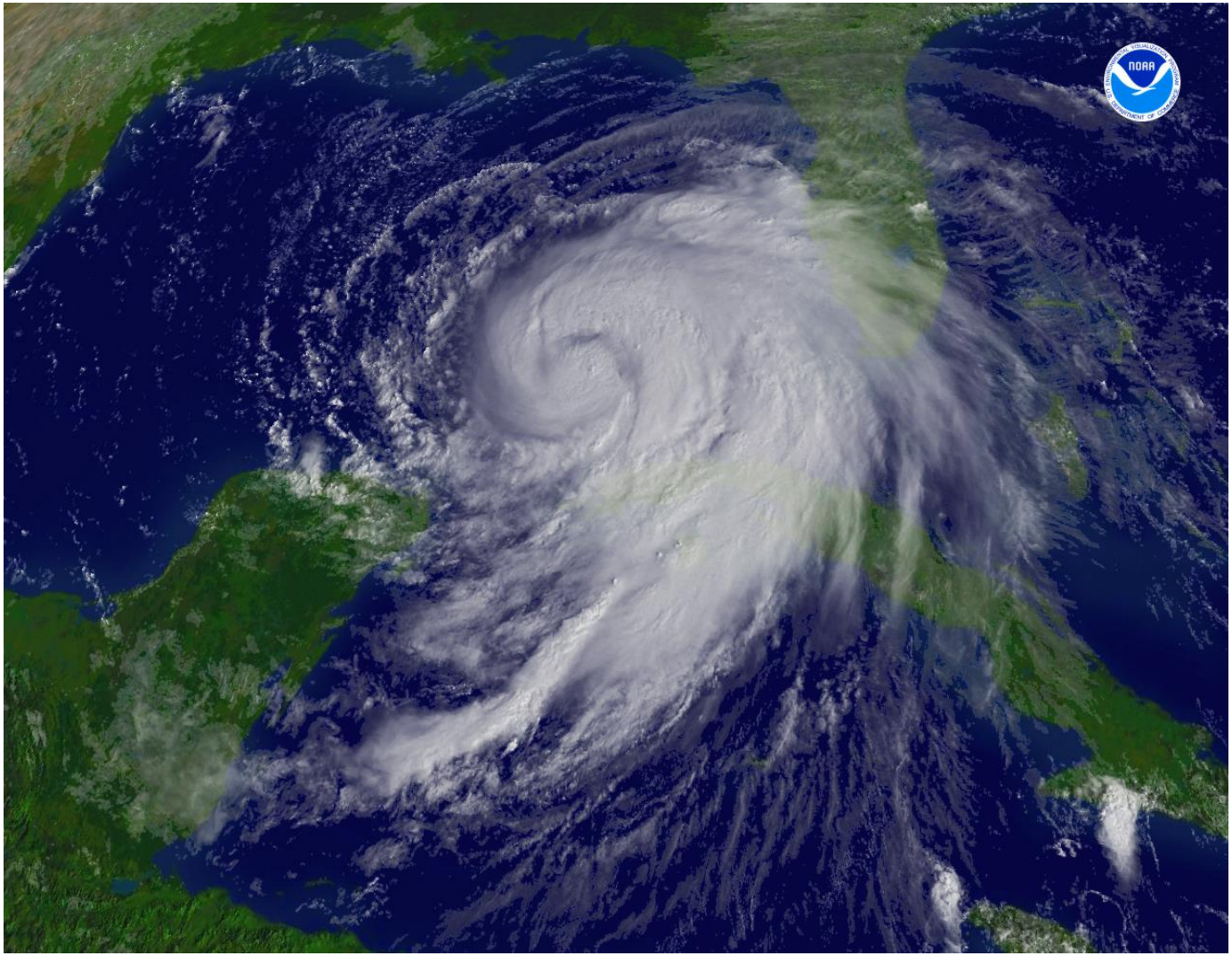




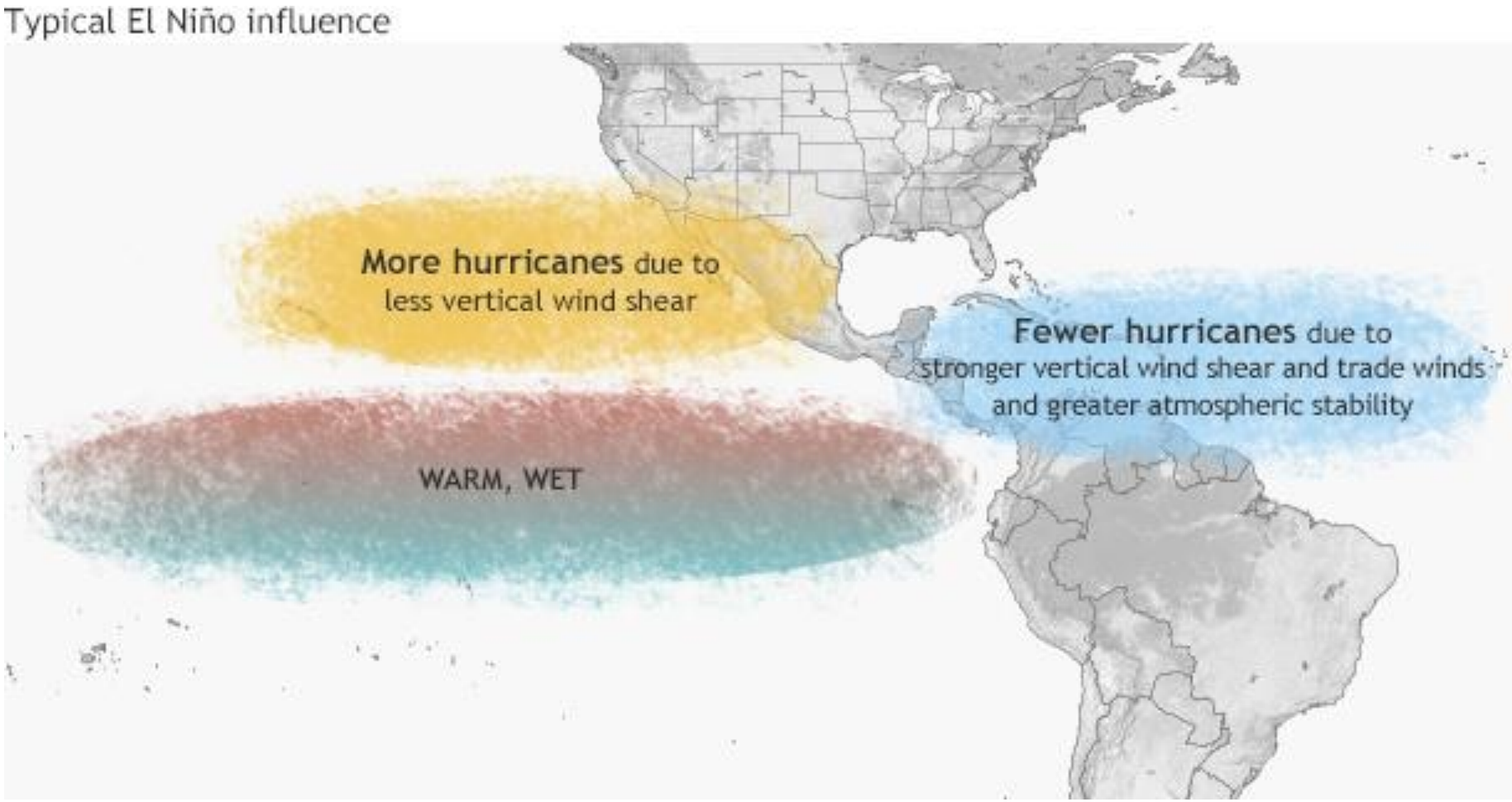




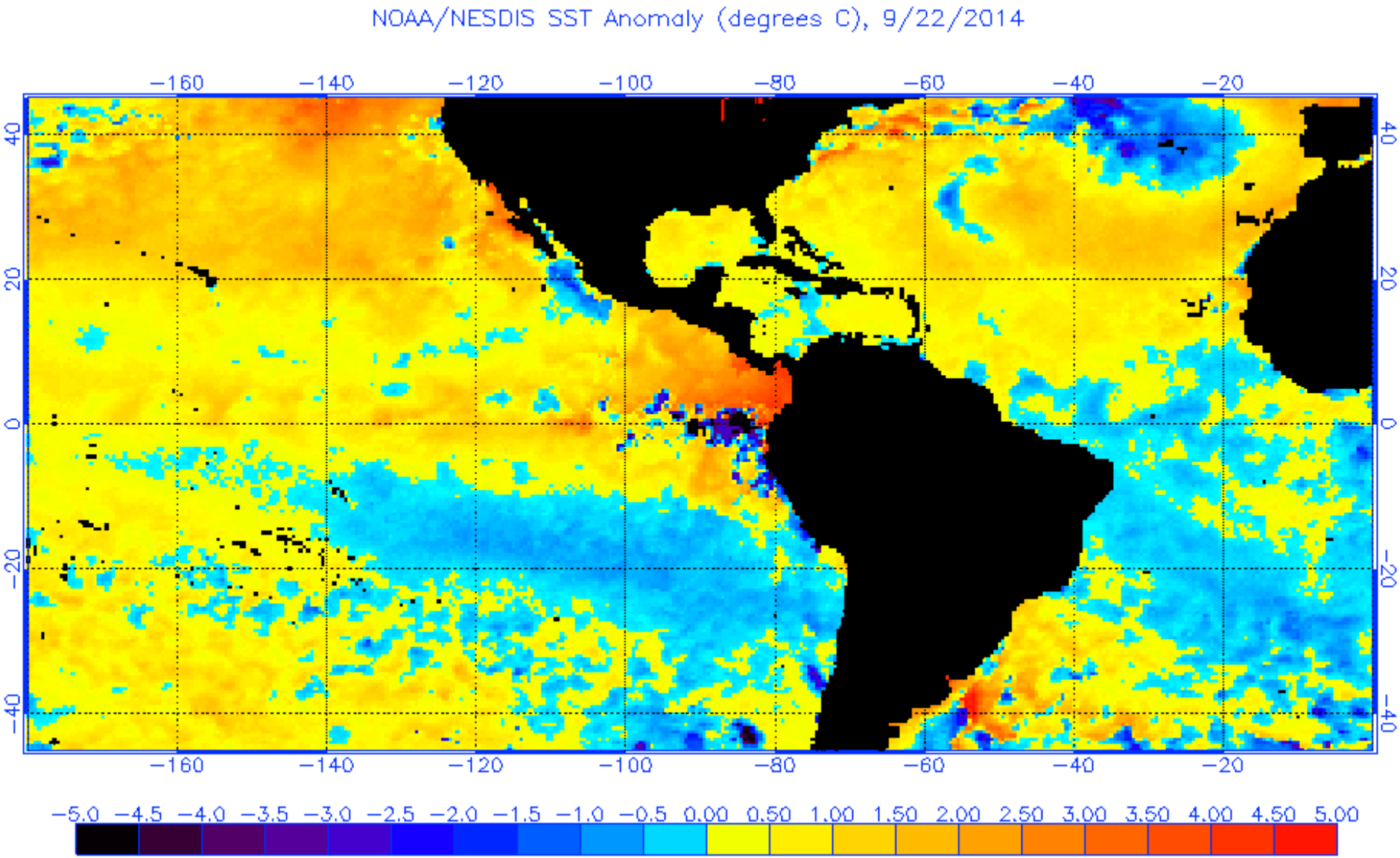
2014 Atlantic Hurricane Season Outlook



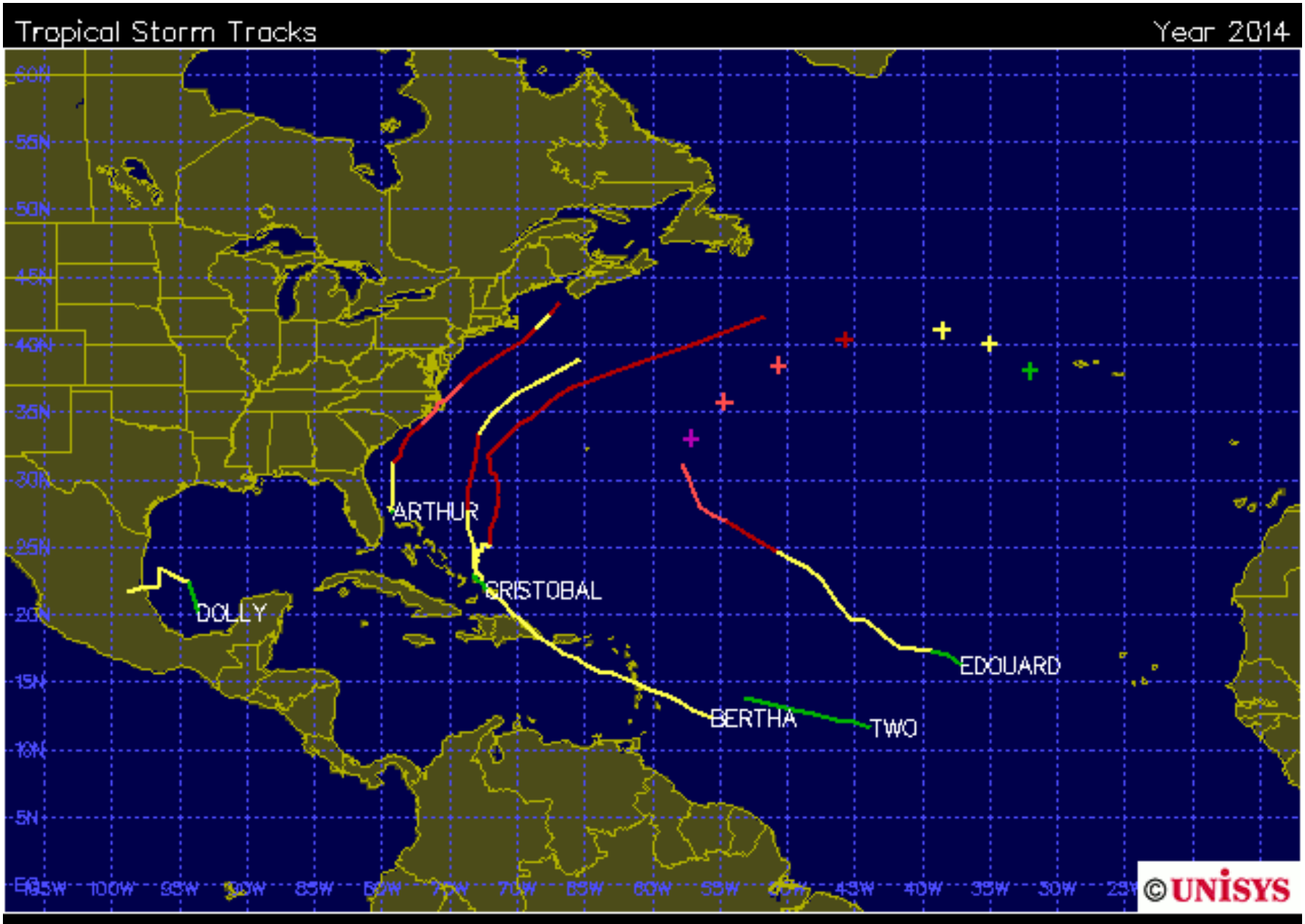
Typical El Niño Tropical Influence



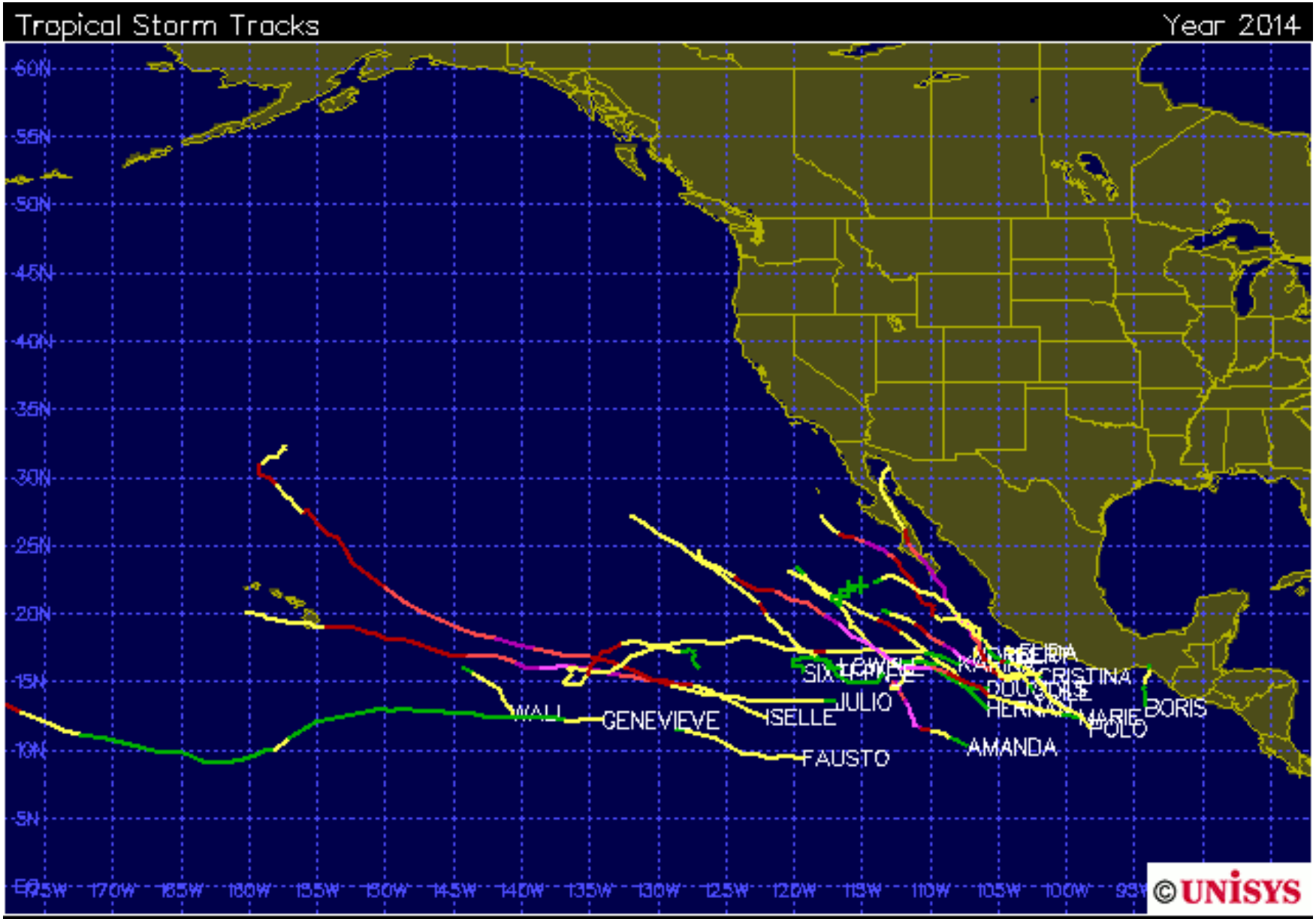
Sea Surface Temp. Anomalies



Atlantic Storm Tracks to Date



E. Pacific Storm Tracks to Date



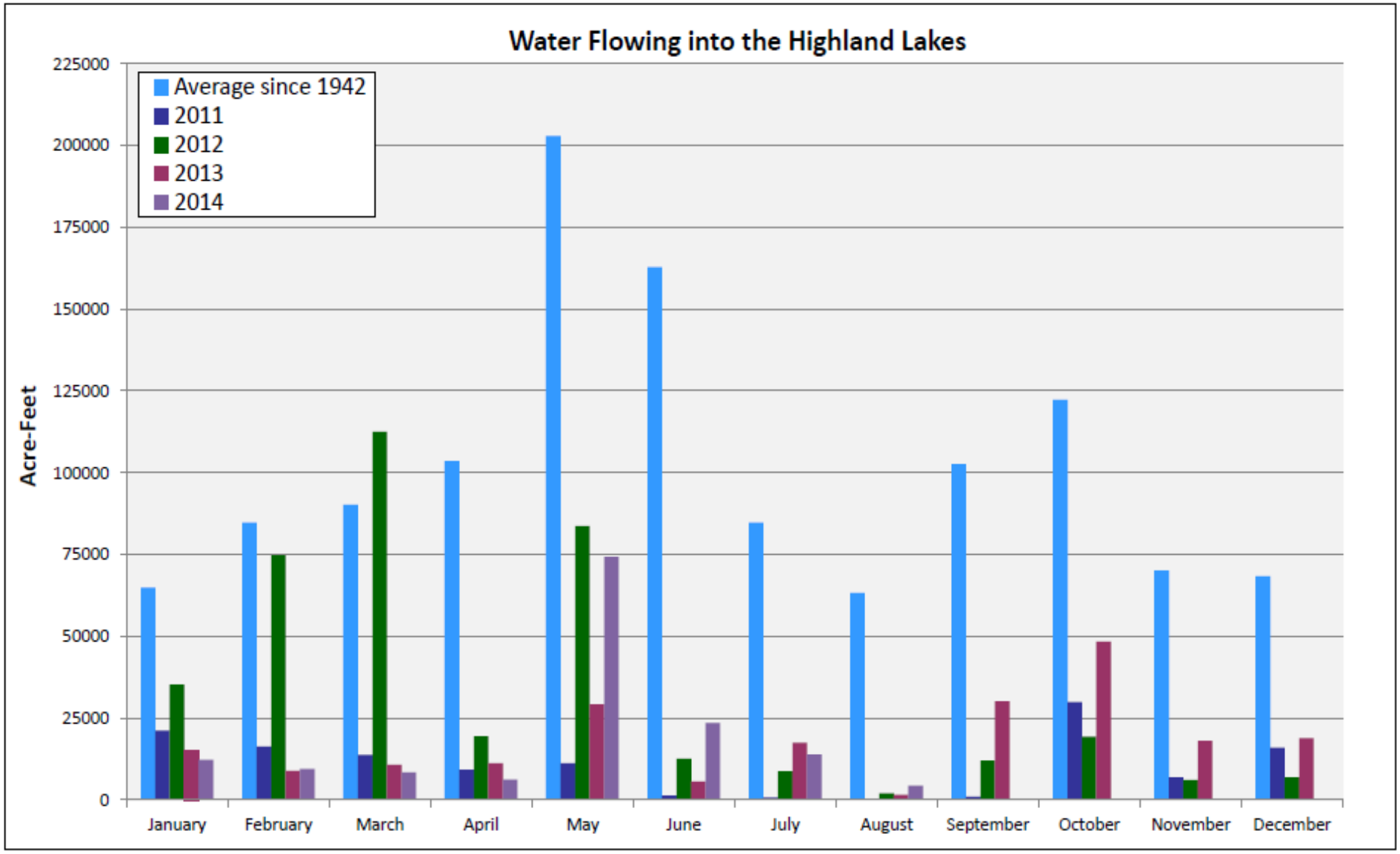
Highland Lakes Update

Lake Levels

- Lake Travis: 625.06 ft. (-38.13)
- 35% full.

- Lake Buchanan: 986.66 ft. (-23.22)
  35% full.

- Combined Storage: 705,690 AF



* Inflows: the estimated amount of water flowing into the Highland Lakes from rivers and streams. Data for 2014 is preliminary and subject to change.

Period totals: January-August
(in acre-feet)

Jan-Aug Average:	857,226
Jan-Aug 2011:	74,110
Jan-Aug 2012:	348,924
Jan-Aug 2013:	99,666
Jan-Aug 2014:	152,348

Water Supply Status

September 1, 2014

Lakes Travis and Buchanan Current Storage : 709,070 acre-feet (a-f)

We Are Here

35%

	Good	Fair	Cautious	Severe	Emergency
Water Supply	2 - 1.7 MAF (> 85%)	<1.7 - 1.4 MAF (85% - 70%)	< 1.4 MAF - 900,000 AF (70% - 45%)	< 900,000 - 600,000 AF (45% - 30%)	< 600,000 AF (< 30%) (Drought worse than Drought of Record)
Impacts	None	• Begin environmental reductions**	• Request voluntary firm demand reductions. • Reduce agricultural supply**	• Increase reductions for agriculture* • Increase voluntary reduction for firm demand • Increase reductions for environmental**	• Agricultural supply cutoff • Mandatory firm demand reductions.
Actions		• January 1, 2011, reduced supply for environmental flows when storage was 1.55 MAF	• May 2, 2011, requested voluntary firm demand reductions, when storage was less than 1.4 MAF. • April 18, 2012, requested continuation of mandatory firm demand reductions until storage exceeds 1.1 MAF	• August 23, 2011, requested firm water customers implement mandatory water use restrictions • Jan. 1, 2012, further reduced supply for environmental flows when storage was 0.74 MAF • March 1, 2012, reduced supply for agriculture when storage was 847,324 AF • March 1, 2013, reduced supply for agriculture when storage was 822,782 AF • March 1, 2014, reduced supply for agriculture when storage was 761,270 AF	
Forecast				Storage could fall below 600,000 AF during December 2014 if very dry conditions persist	

Last Three Months

June 1	July 1	Aug. 1
39%	40%	38%

Average Outlook

Oct. 1	Nov. 1	Dec. 1
37%-34%	39%-35%	43%-36%

Very Dry Outlook

Oct. 1	Nov. 1	Dec. 1
34%-33%	33%-31%	33%-30%

1 Year Ago

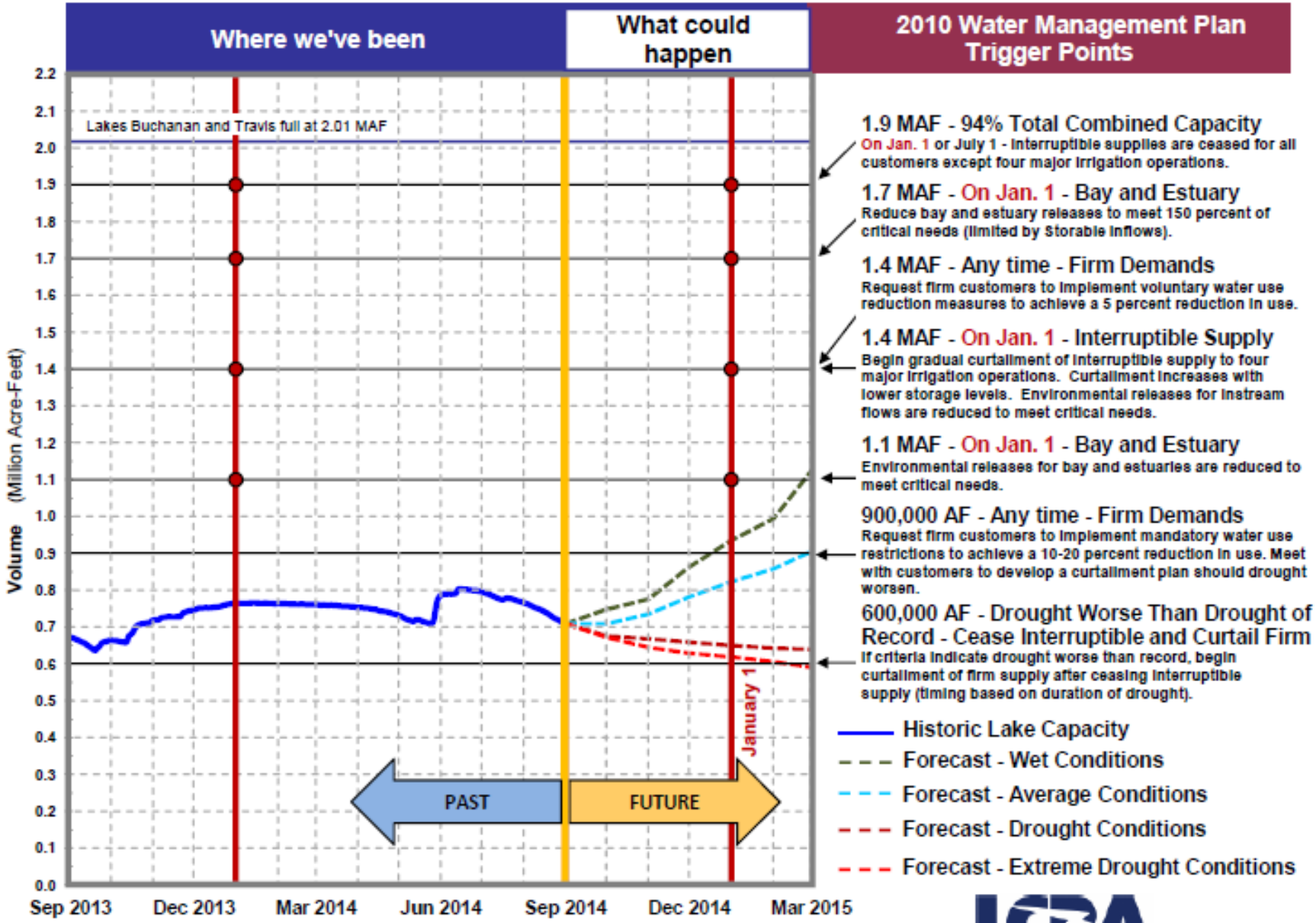
33%

* Based on March 1 storage in lakes

** Based on Jan. 1 storage in lakes

Note: One acre-foot (AF) equals 325, 851 gallons.

Highland Lakes Storage *



Note: MAF equals 1 Million Acre-Feet
One Acre-Foot (a-f) equals 325,851 gallons.

Date: September 2, 2014

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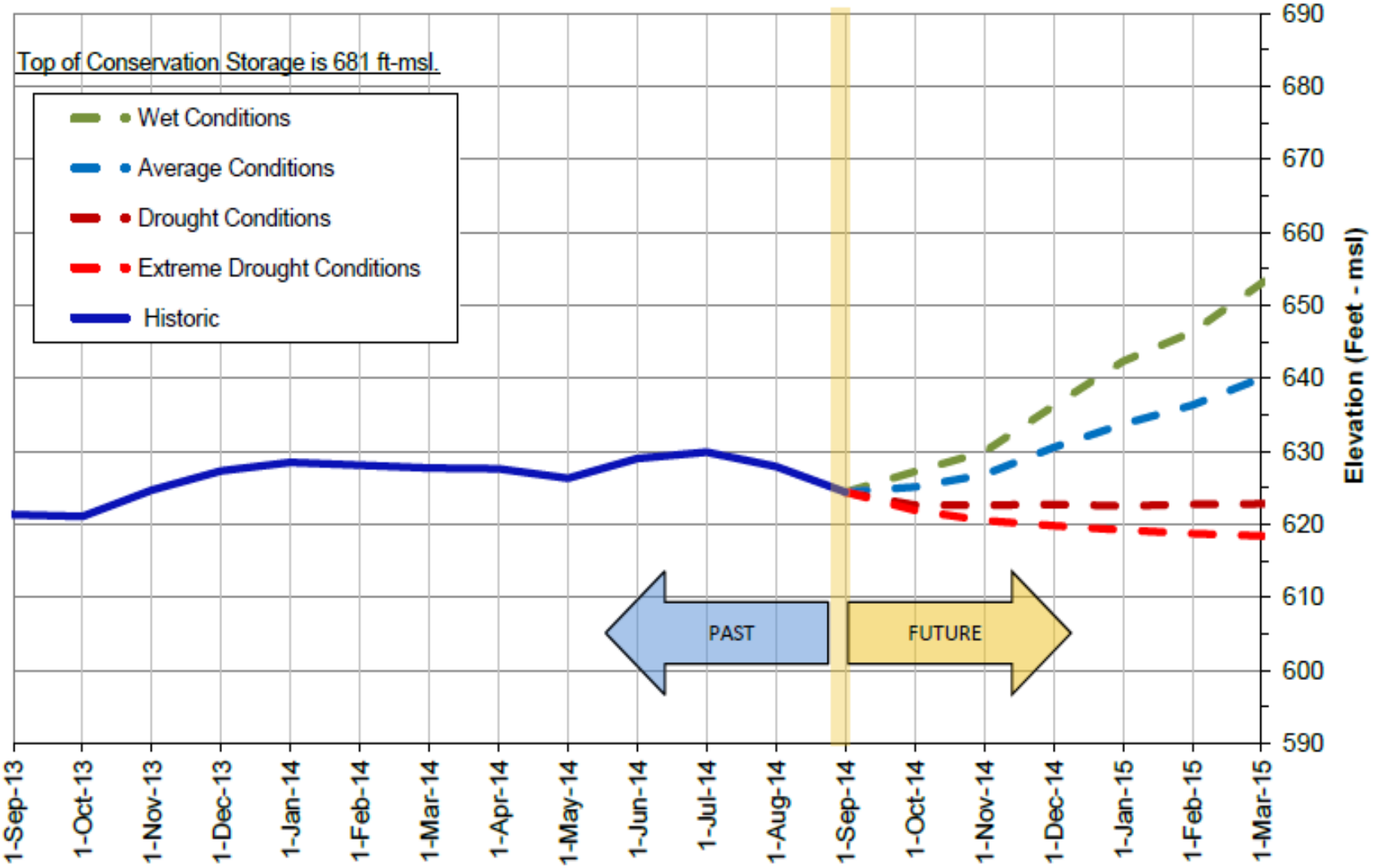
* Based on emergency drought relief measures affirmed by TCEQ on Feb. 26 , April 30, June 4, and August 6, 2014 suspending releases of interruptible stored water for customers in the Gulf Coast, Lakeside and Pierce Ranch irrigation operations through the end of the irrigation season.

Lake Travis Level Forecast
With Emergency Action in 2014



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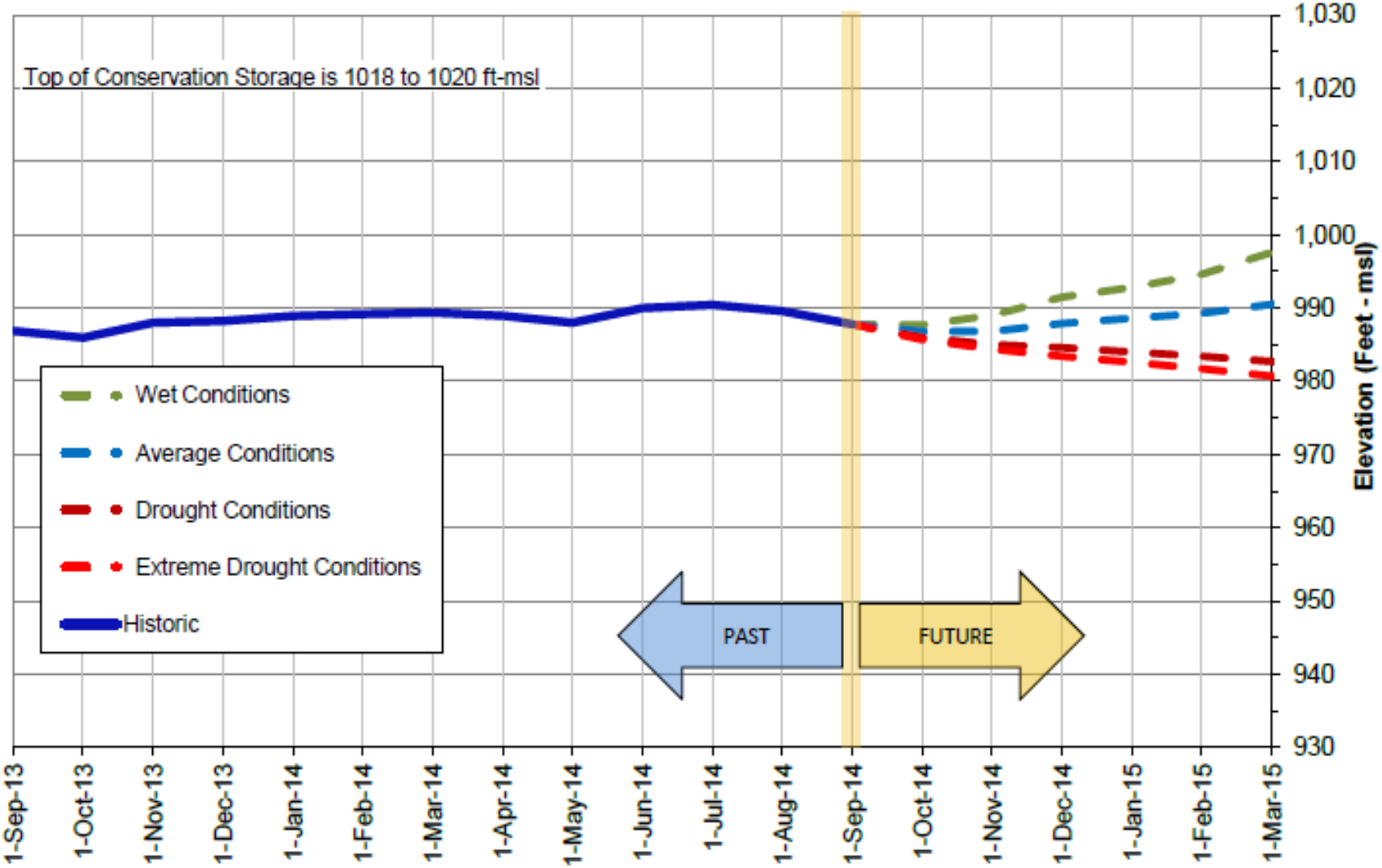
9/2/2014
Subject to Revision
REA

Lake Buchanan Level Forecast
With Emergency Action in 2014



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9/2/2014
Subject to Revision
REA

Questions?

Bob Rose

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512-578-3350