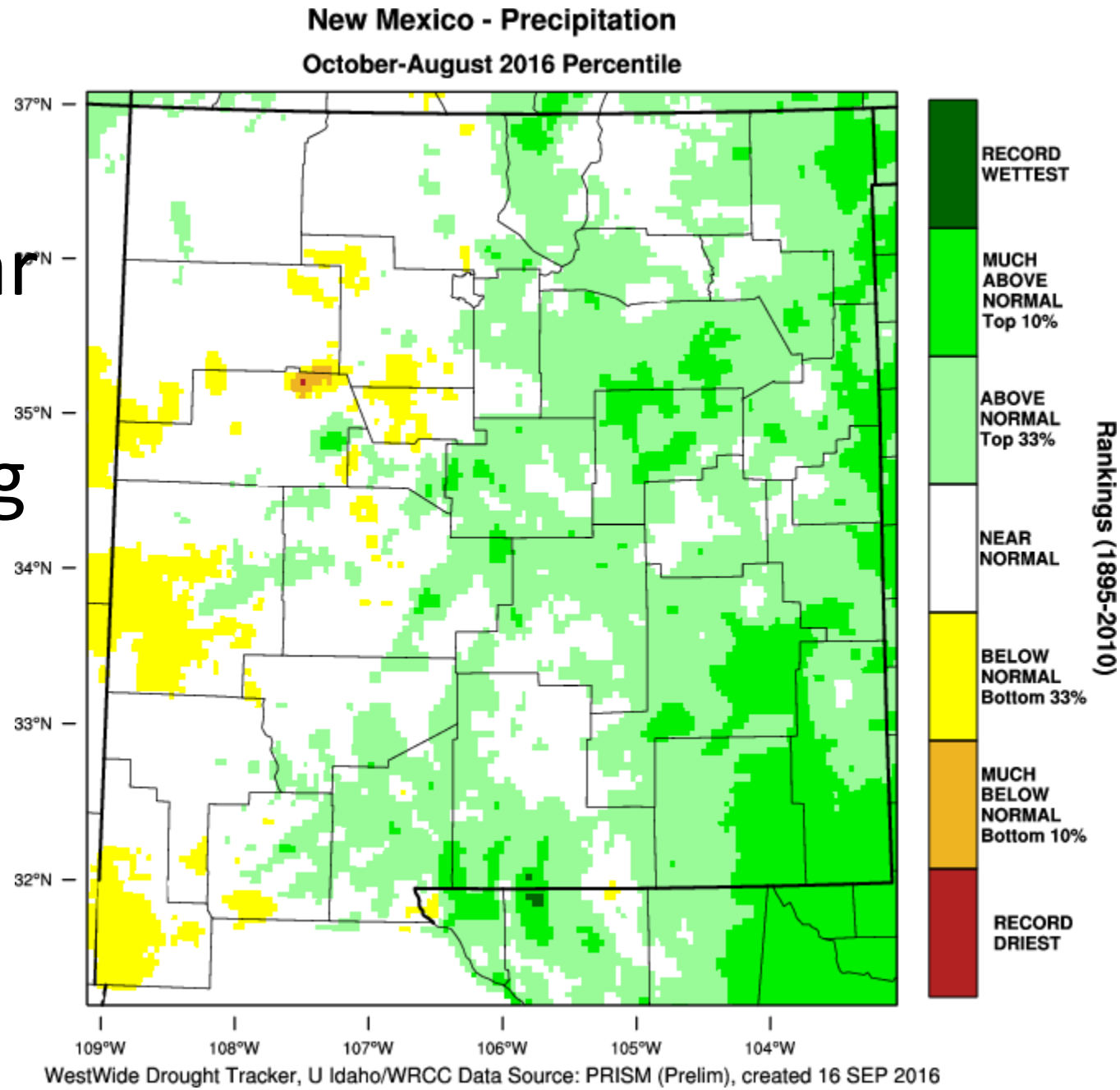
# New Mexico Drought Status and Outlook

**Dr. Dave DuBois**
**State Climatologist**
**New Mexico State University**

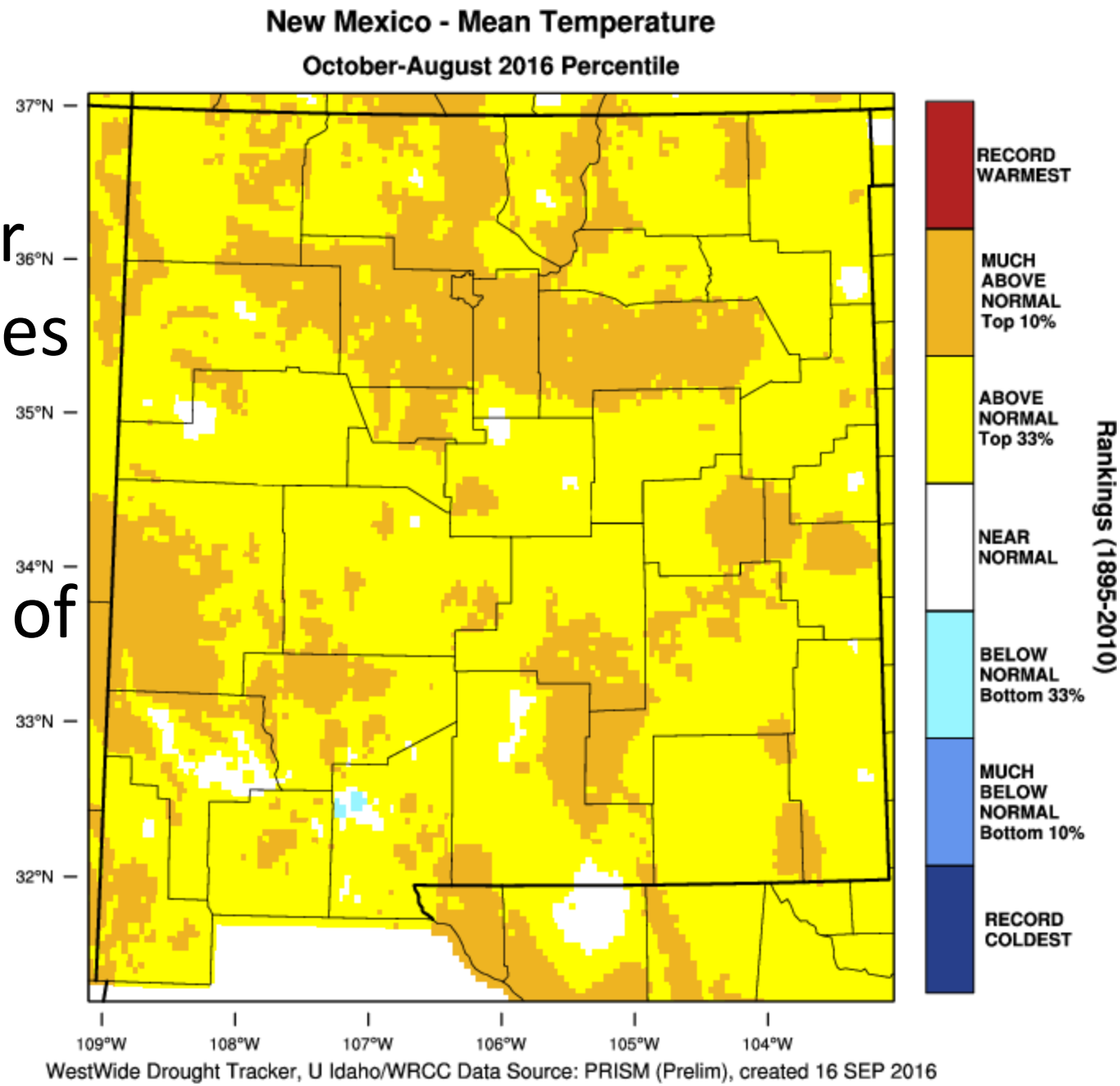
September 20, 2016

# Water Year 2016 Oct to Aug Rainfall



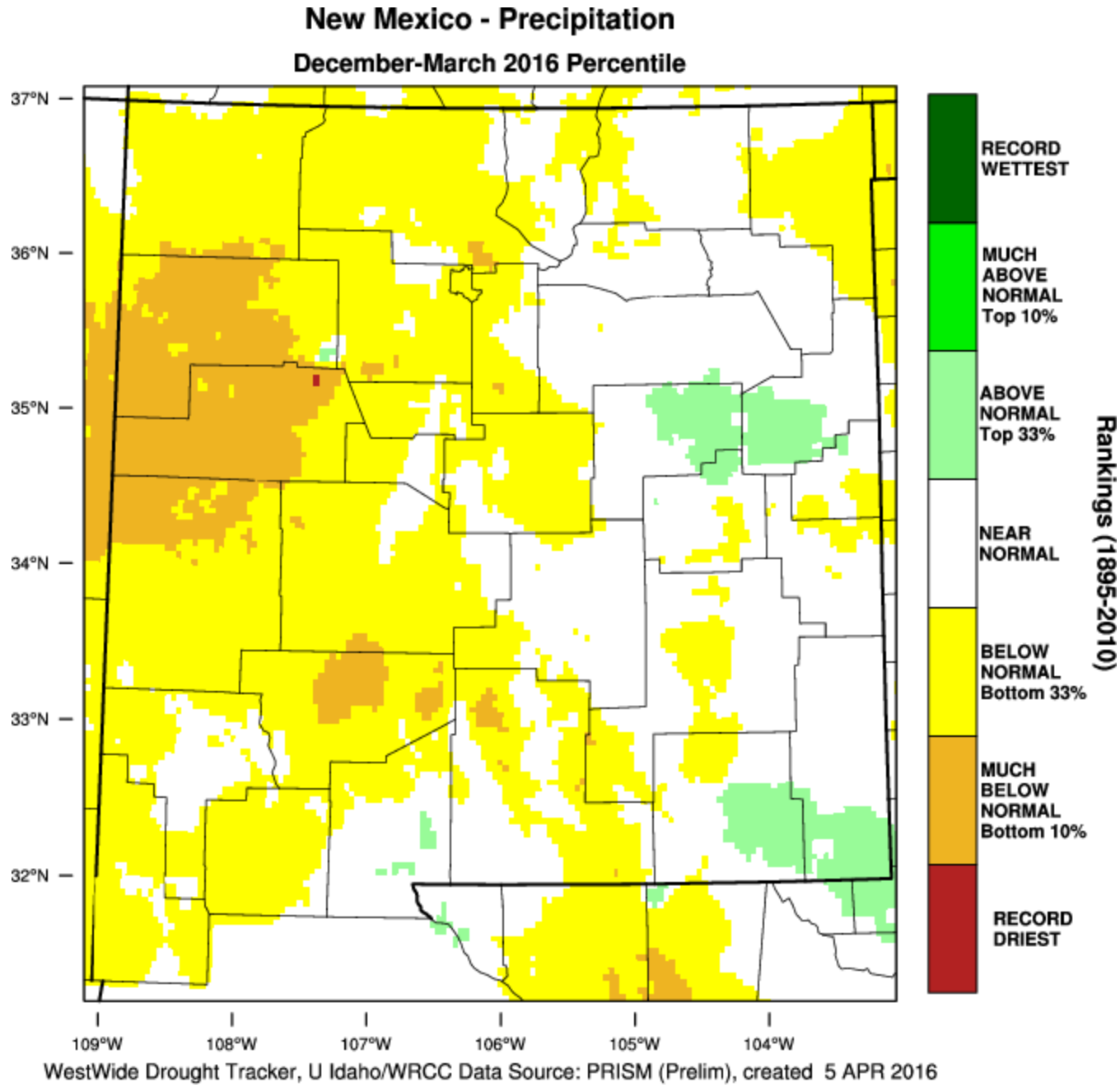

http://www.wrcc.dri.edu/wwdt/

# Water Year Temperatures Above Average across most of state



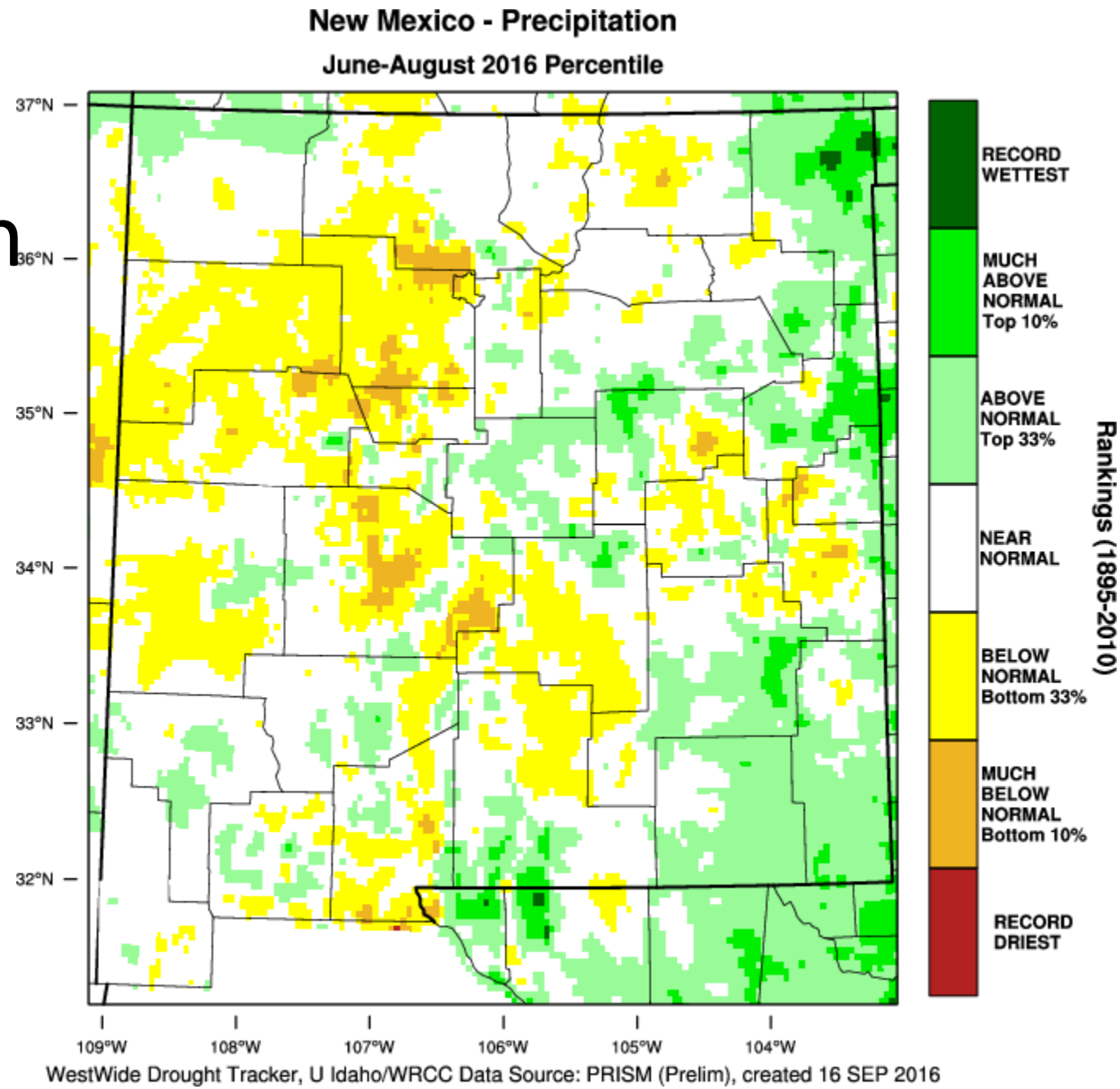

http://www.wrcc.dri.edu/wwdt/

Below average precip over winter and early 2016 set stage for drought development later



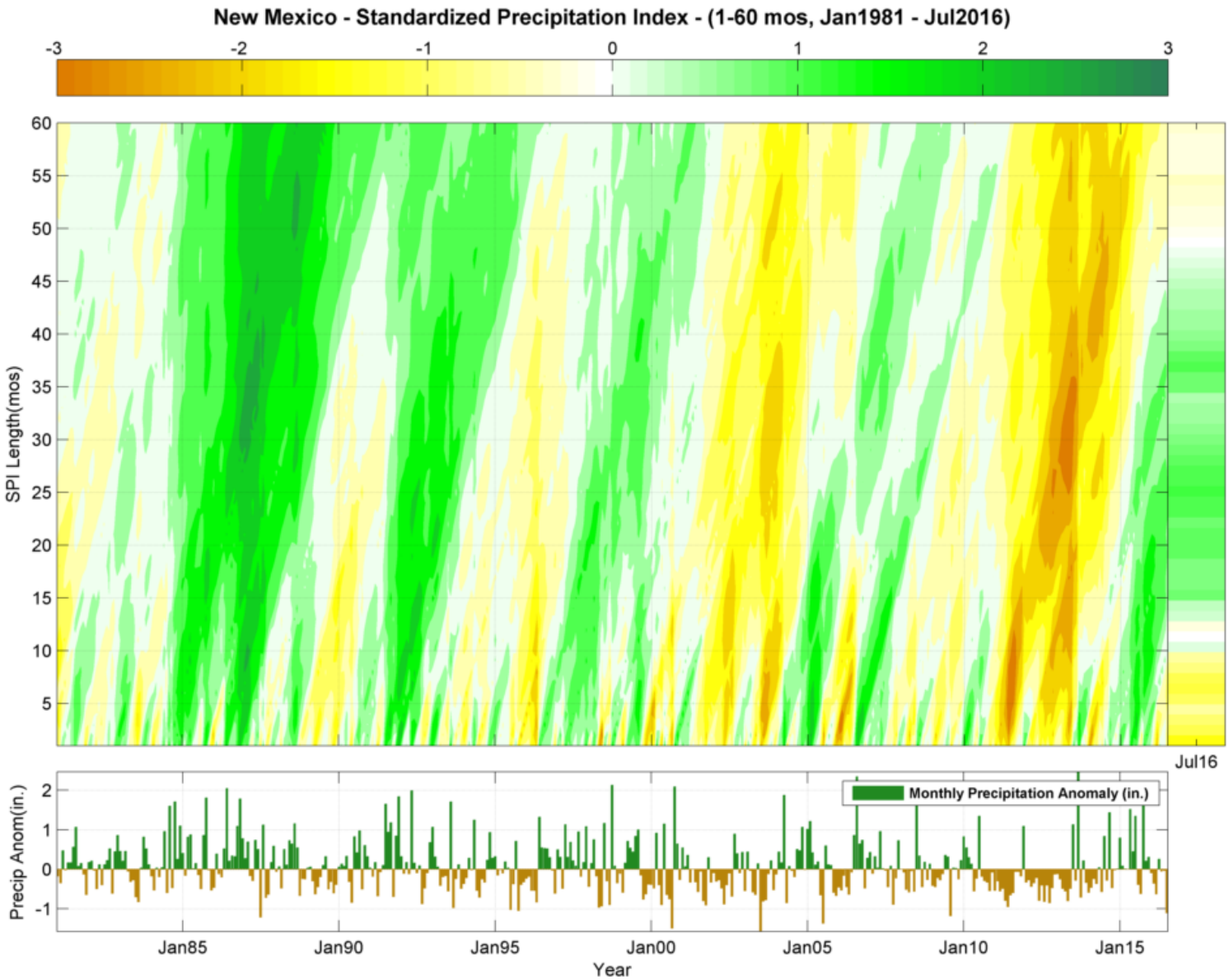

http://www.wrcc.dri.edu/wwdt/

# Monsoon through end of August




http://www.wrcc.dri.edu/wwdt/

# State-wide SPI through July 2016

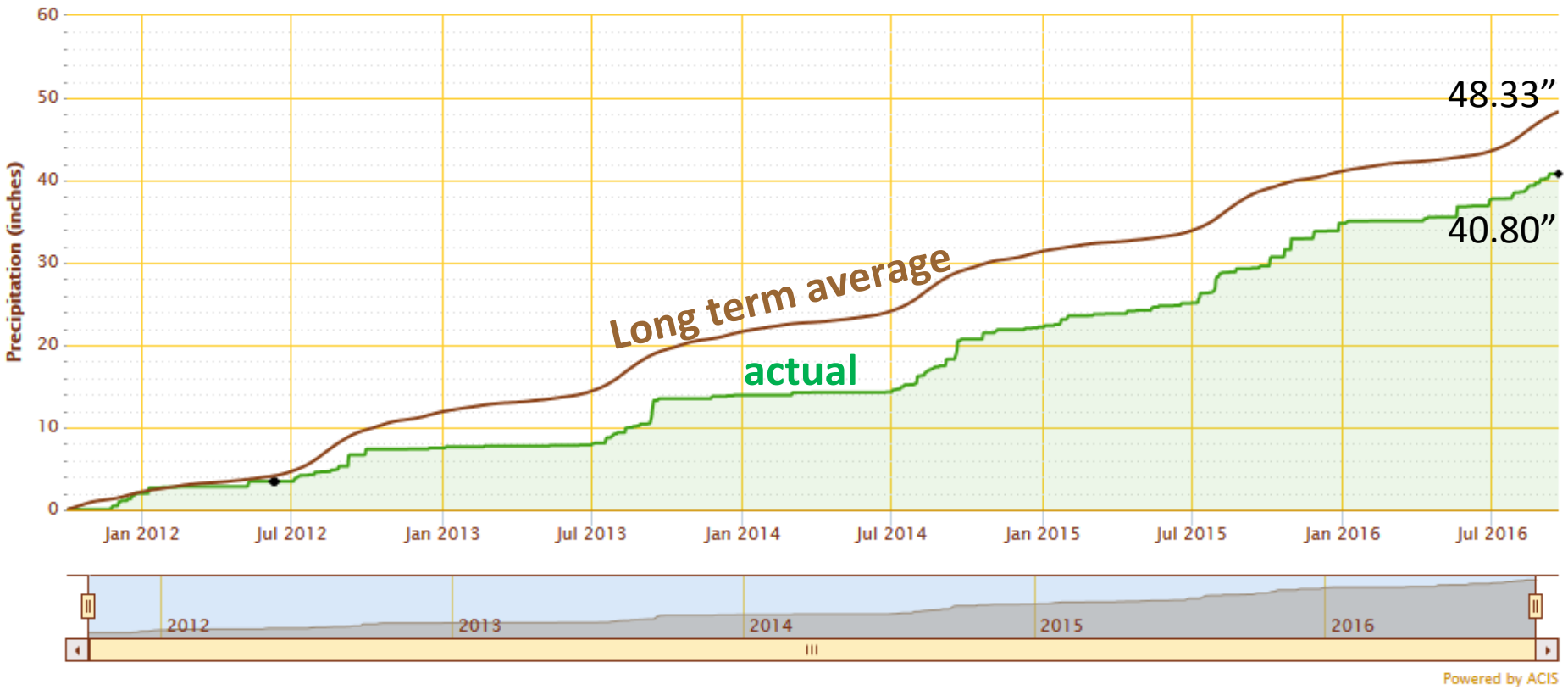



Climate Science Applications Program
University of Arizona Cooperative Extension
http://cals.arizona.edu/climate

Data source: NOAA National Climatic Data Center
ftp://ftp.ncdc.noaa.gov/pub/data/cirs/climdiv
Base Period= 1900-2016 Date created: 07-Sep-2016

# Las Cruces – Last 5 yrs of Precipitation

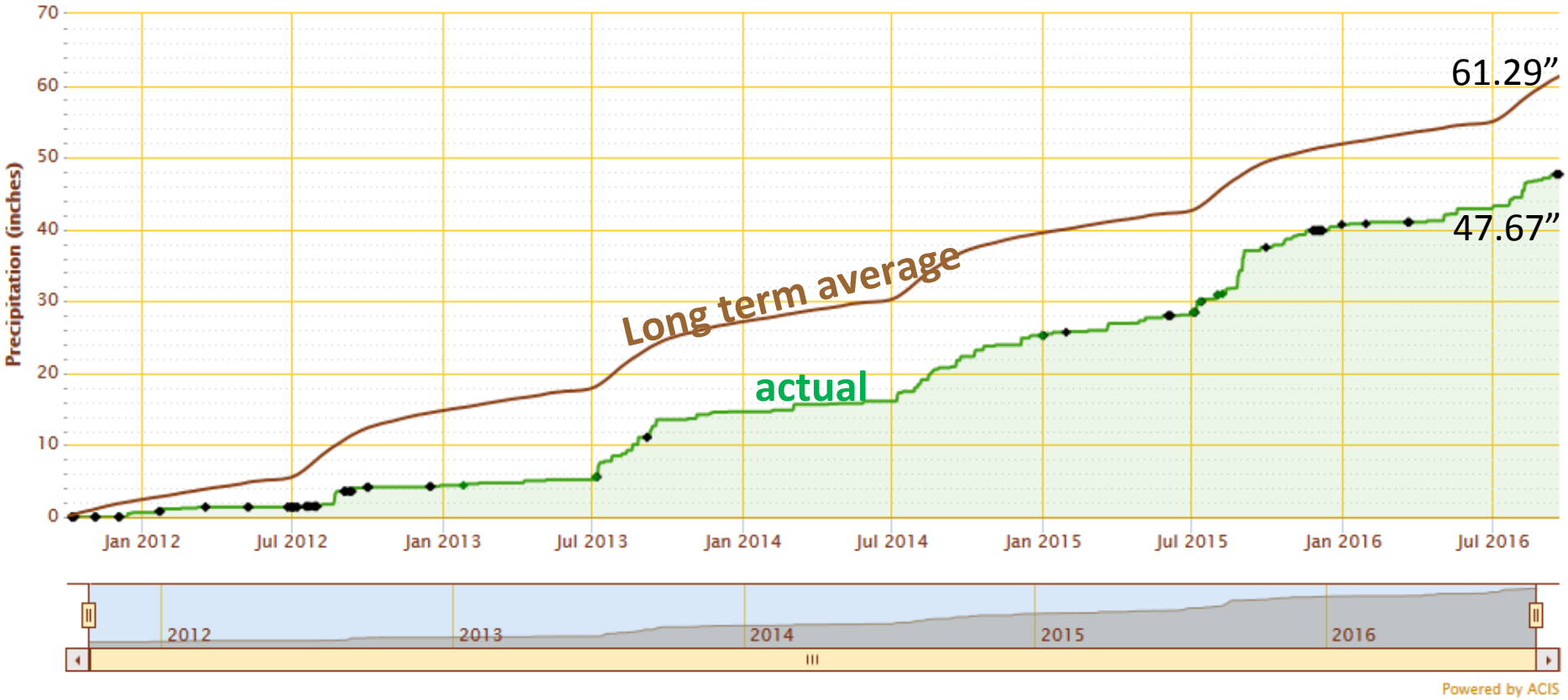
- Oct 2011 to Sept 2016
- 7.53” precipitation <u>deficit</u> over this period




http://scacis.rcc-acis.org/

# Quemado – Last 5 yrs of Precipitation

- Oct 2011 to Sept 2016
- 13.62” precipitation <u>deficit</u> over this period




http://scacis.rcc-acis.org/

*U.S. Drought Monitor*

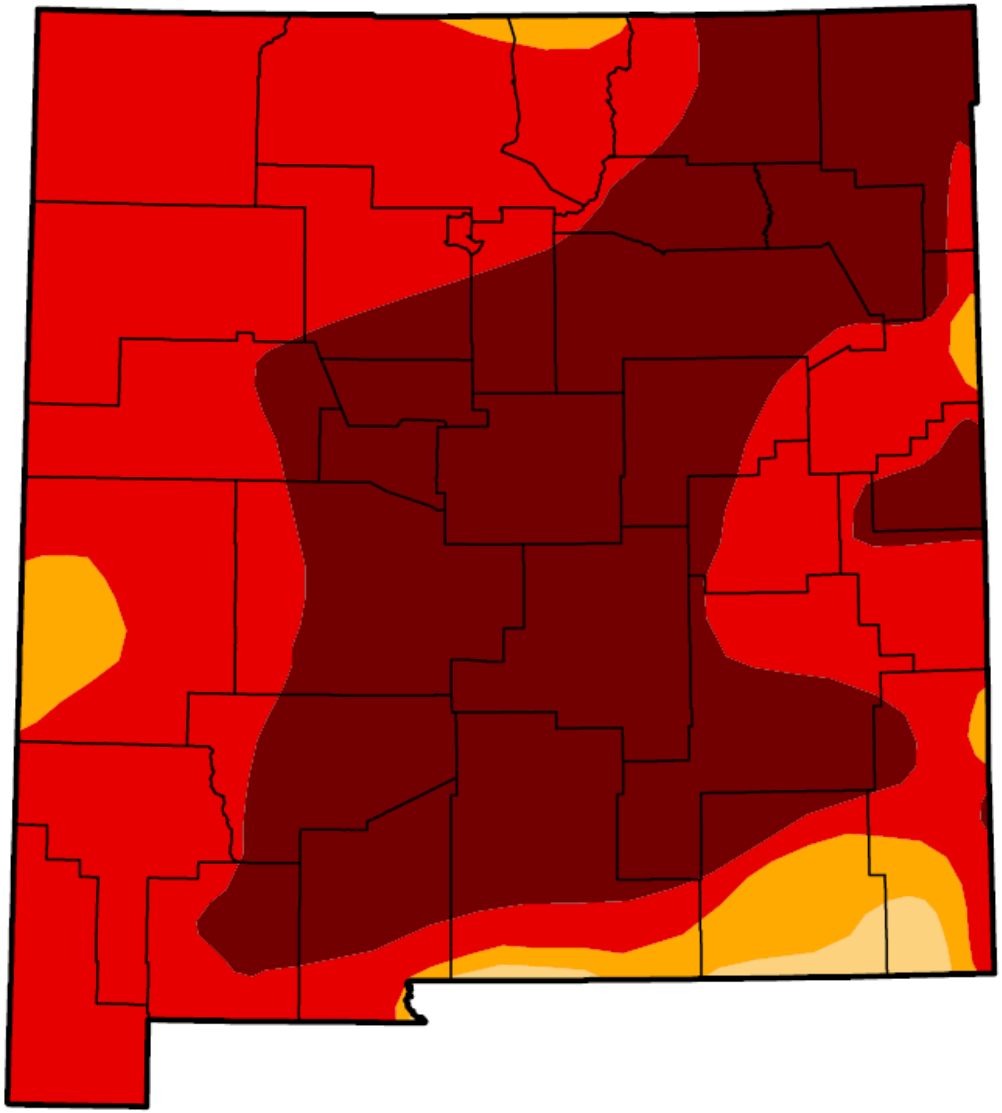
# New Mexico

## June 25, 2013

*(Released Thursday, Jun. 27, 2013)*

Valid 7 a.m. EST

***Drought at its worst!***



*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 0.00 | 100.00 | 100.00 | 98.79 | 93.46 | 44.79 |
| **Last Week** *6/18/2013* | 0.00 | 100.00 | 100.00 | 98.49 | 90.18 | 44.13 |
| **3 Months Ago** *3/26/2013* | 0.23 | 99.77 | 98.47 | 89.85 | 49.97 | 4.36 |
| **Start of Calendar Year** *1/1/2013* | 0.00 | 100.00 | 98.83 | 94.05 | 31.88 | 0.97 |
| **Start of Water Year** *9/25/2012* | 0.00 | 100.00 | 100.00 | 62.56 | 12.25 | 0.66 |
| **One Year Ago** *6/26/2012* | 0.00 | 100.00 | 99.64 | 85.75 | 25.25 | 0.00 |

*Intensity:*

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

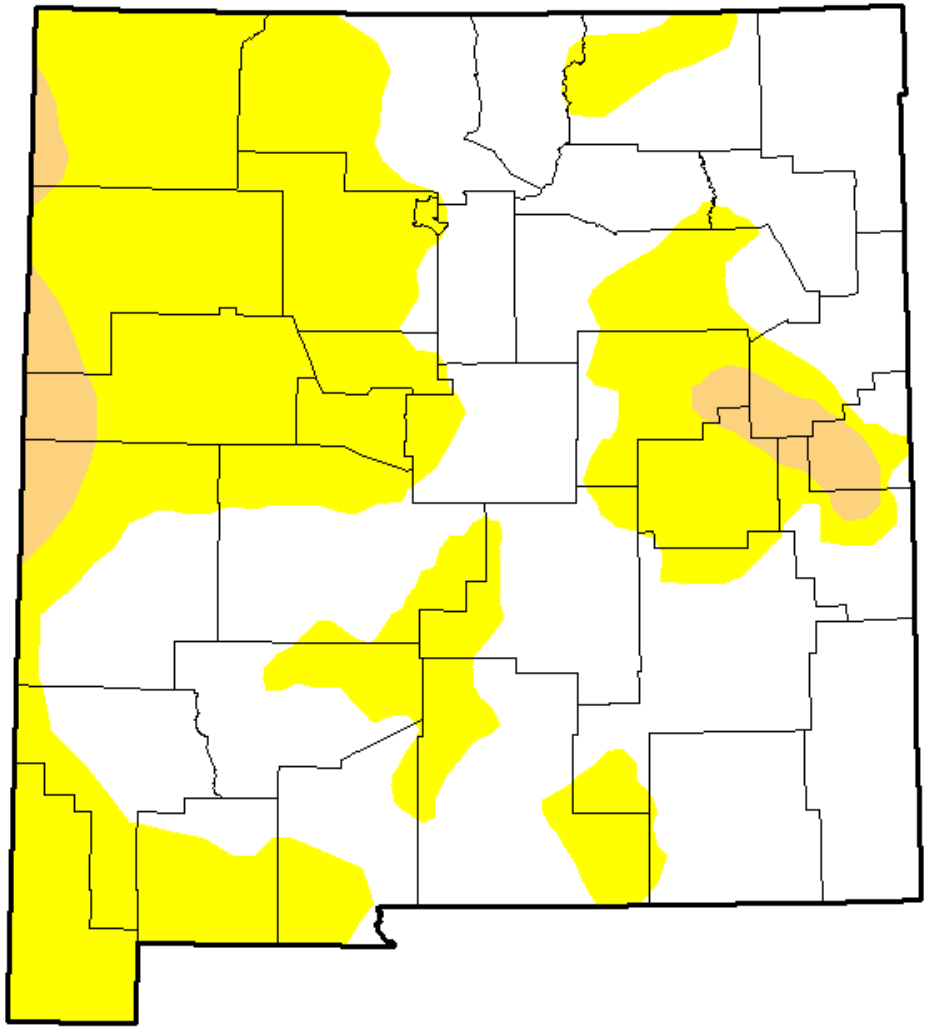
*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

**Author:**
*Mark Svoboda*
*National Drought Mitigation Center*

http://droughtmonitor.unl.edu/

*U.S. Drought Monitor*

# New Mexico



## September 13, 2016

***(Released Thursday, Sep. 15, 2016)***

**Valid 8 a.m. EDT**

*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 53.33 | 46.67 | 3.85 | 0.00 | 0.00 | 0.00 |
| **Last Week** *9/6/2016* | 16.43 | 83.57 | 16.78 | 0.00 | 0.00 | 0.00 |
| **3 Months Ago** *6/14/2016* | 22.64 | 77.36 | 15.62 | 0.00 | 0.00 | 0.00 |
| **Start of Calendar Year** *12/29/2015* | 73.76 | 26.24 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Start of Water Year** *9/29/2015* | 56.70 | 43.30 | 7.94 | 0.00 | 0.00 | 0.00 |
| **One Year Ago** *9/15/2015* | 49.44 | 50.56 | 13.04 | 0.00 | 0.00 | 0.00 |

*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.*

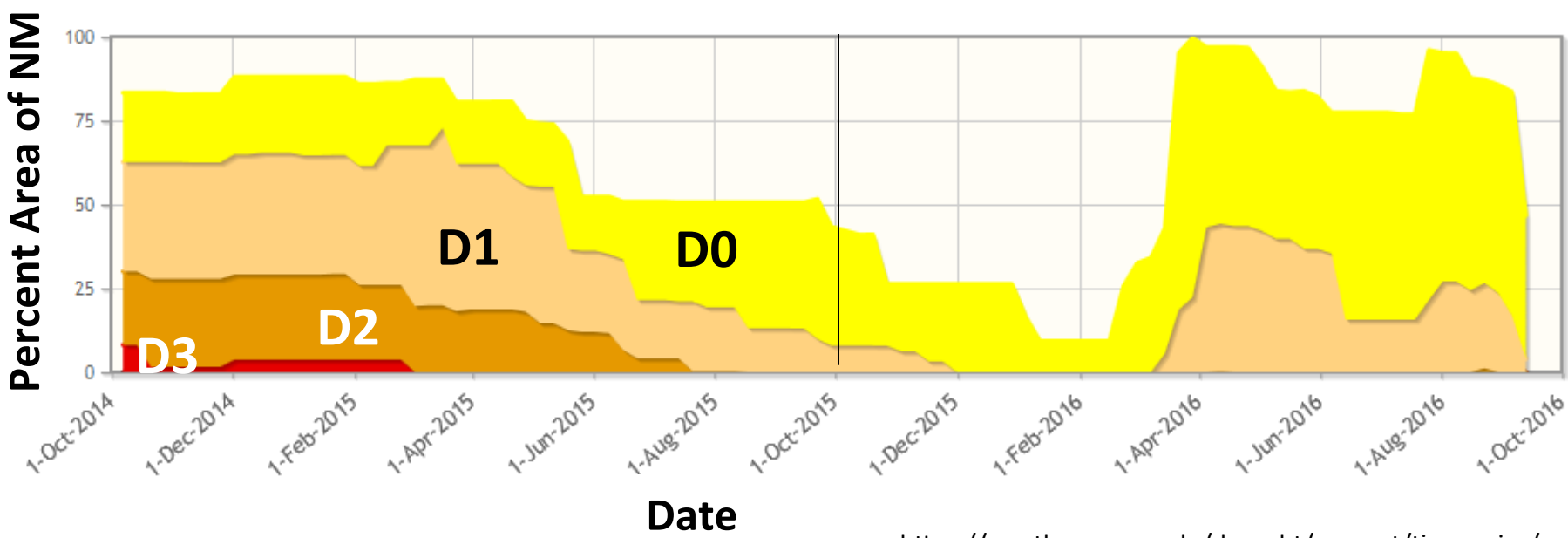
**Author:**
*Eric Luebehusen*
*U.S. Department of Agriculture*

**http://droughtmonitor.unl.edu/**

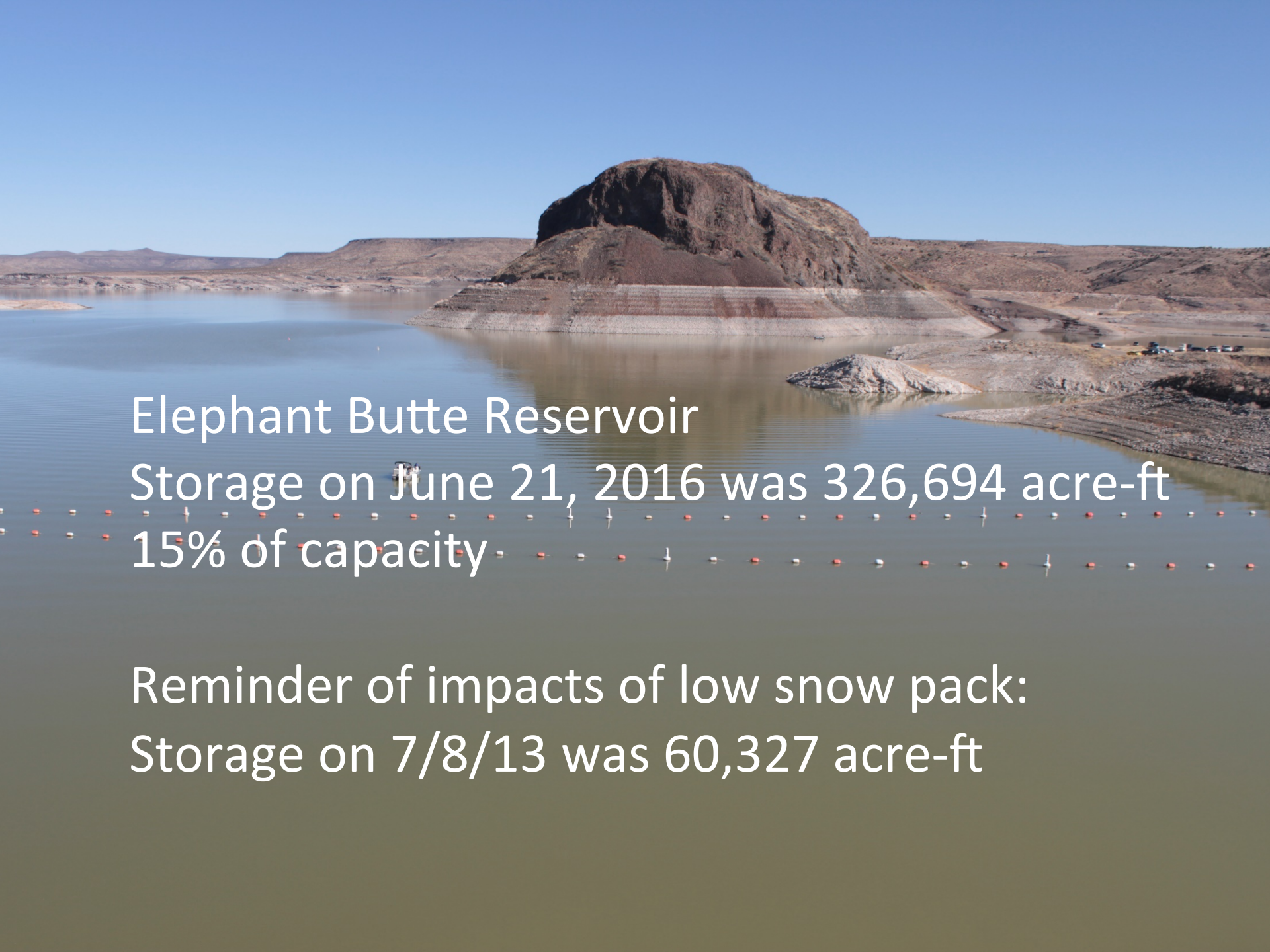
# Drought Monitor over last 2 water years

- Wet start to 2016 water year but early calendar year through spring was dry
  - Decided to bring in D1 in March
- Most recent improvement this Sept.

D4 – Exceptional
D3 – Extreme
D2 – Severe
D1 – Moderate
D0 – Abnormally Dry



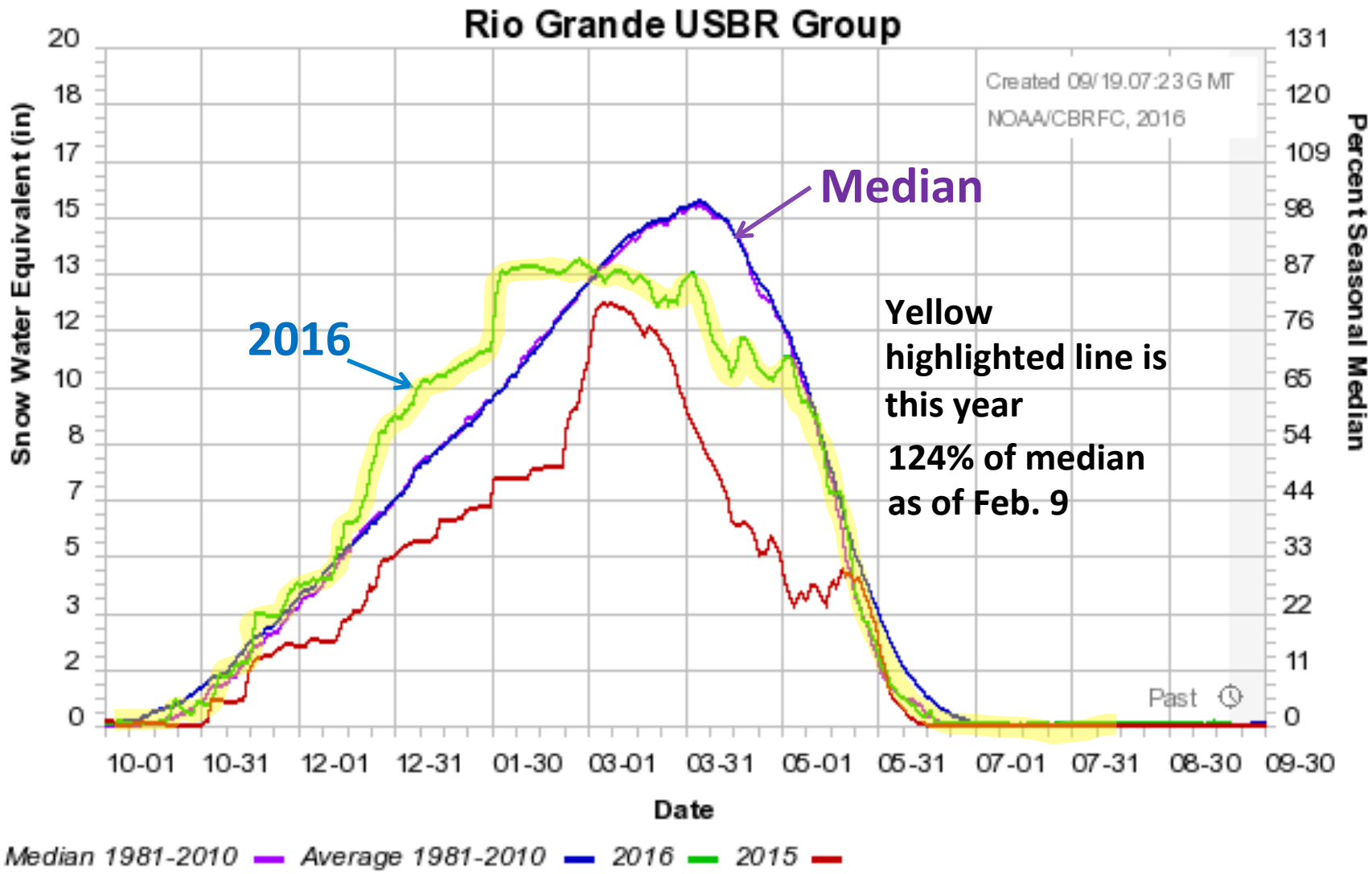

https://weather.nmsu.edu/drought/request/timeseries/



Elephant Butte Reservoir
Storage on June 21, 2016 was 326,694 acre-ft
15% of capacity

Reminder of impacts of low snow pack:
Storage on 7/8/13 was 60,327 acre-ft

# Rio Grande Basin Snow Observations

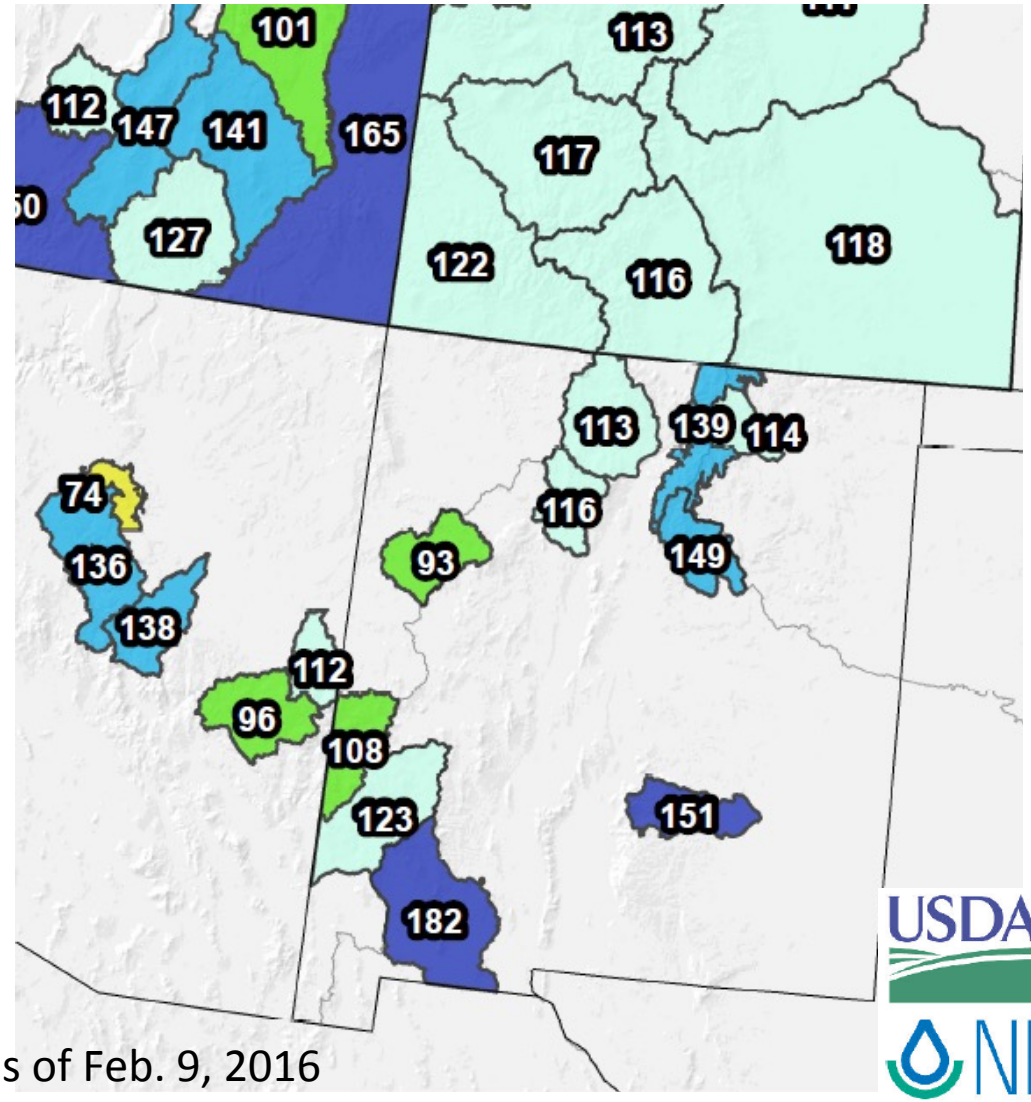



http://www.cbrfc.noaa.gov/

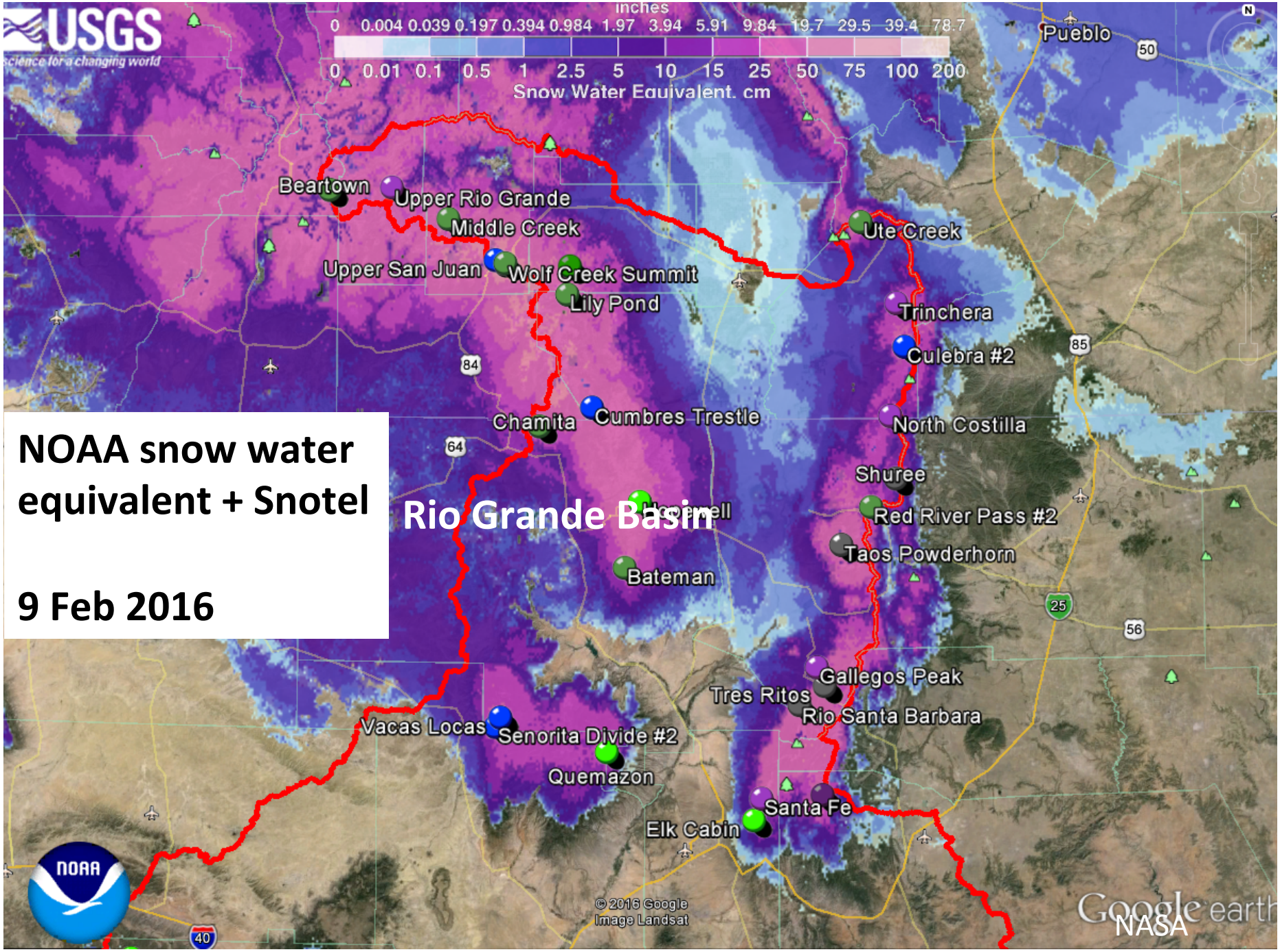
# SWE near the 2016 peak

**Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median**

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >= 150%




water year to date precipitation as of Feb. 9, 2016




**NOAA snow water equivalent + Snotel**

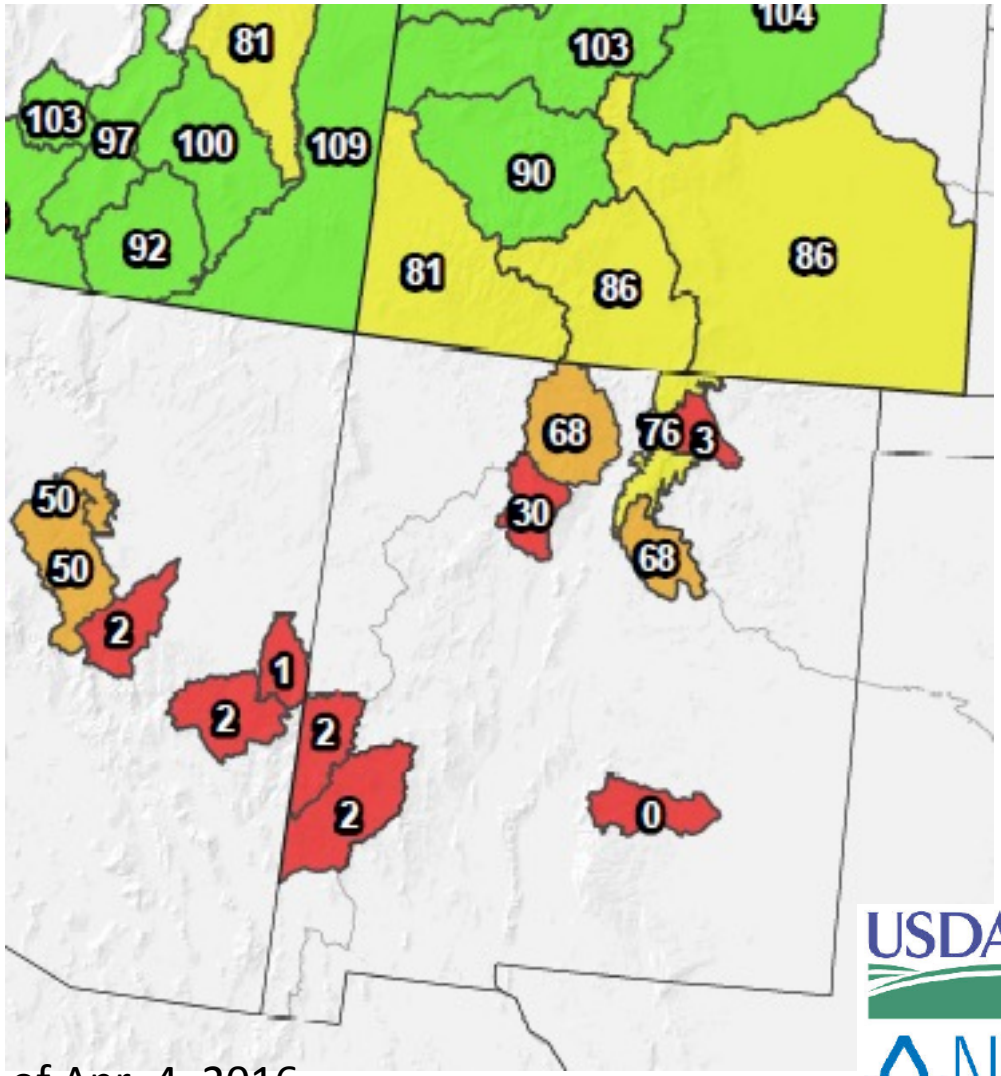
**9 Feb 2016**

**Rio Grande Basin**

# SWE near peak of traditional peak

**Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median**

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >= 150%

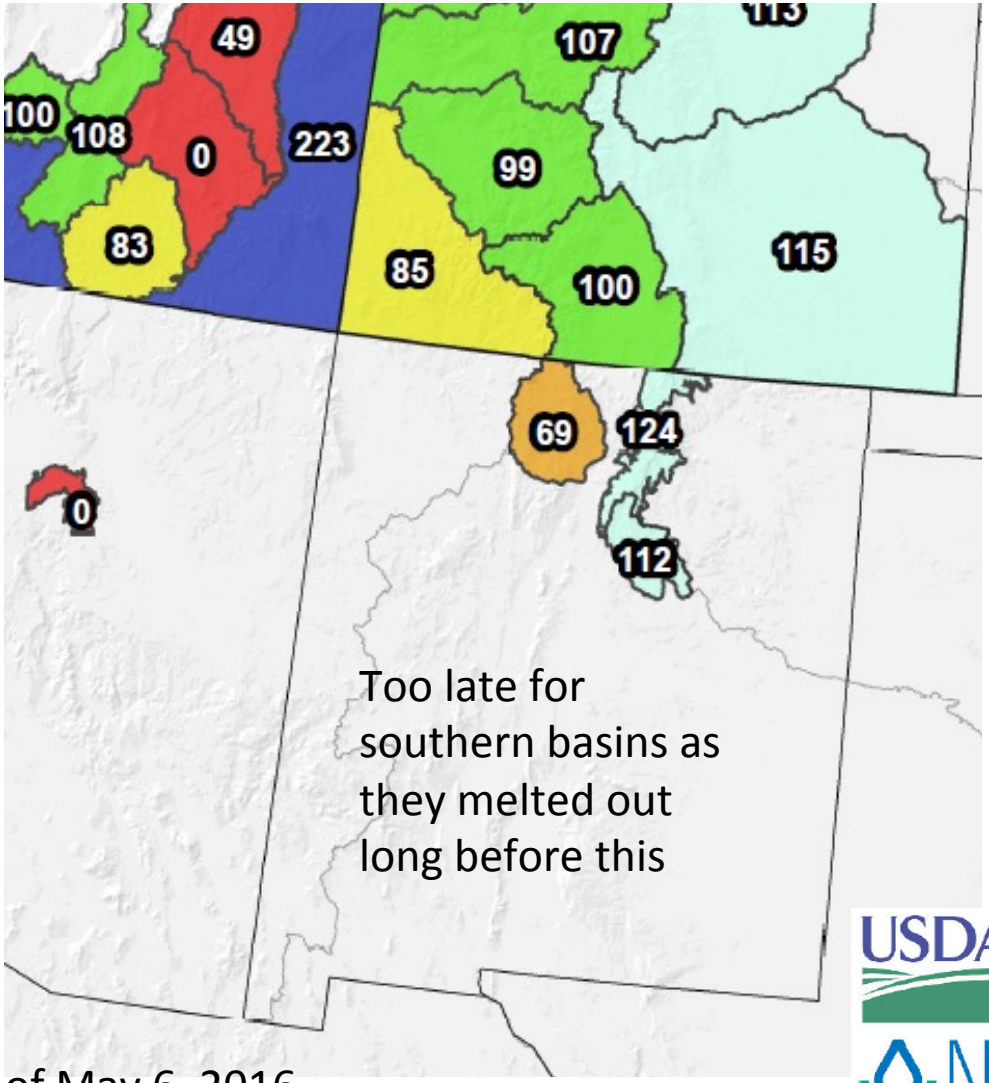



water year to date precipitation as of Apr. 4, 2016

# End of season bonus for RGB

**Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median**

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >= 150%

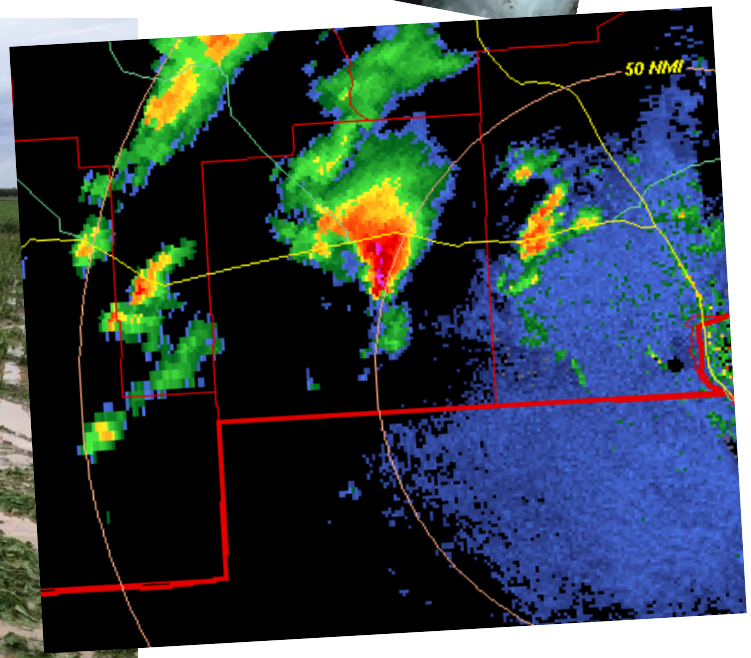



water year to date precipitation as of May 6, 2016

# IMPACTS?

hail, wind, flood damage?

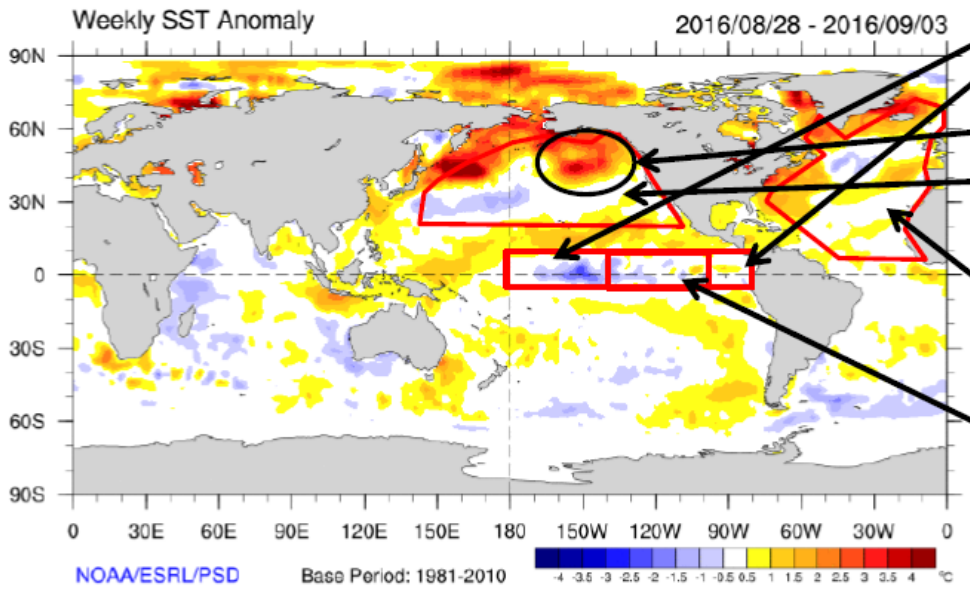
fallow land, groundwater?



# Dust hazards remain on I-10 through 2015 & 2016

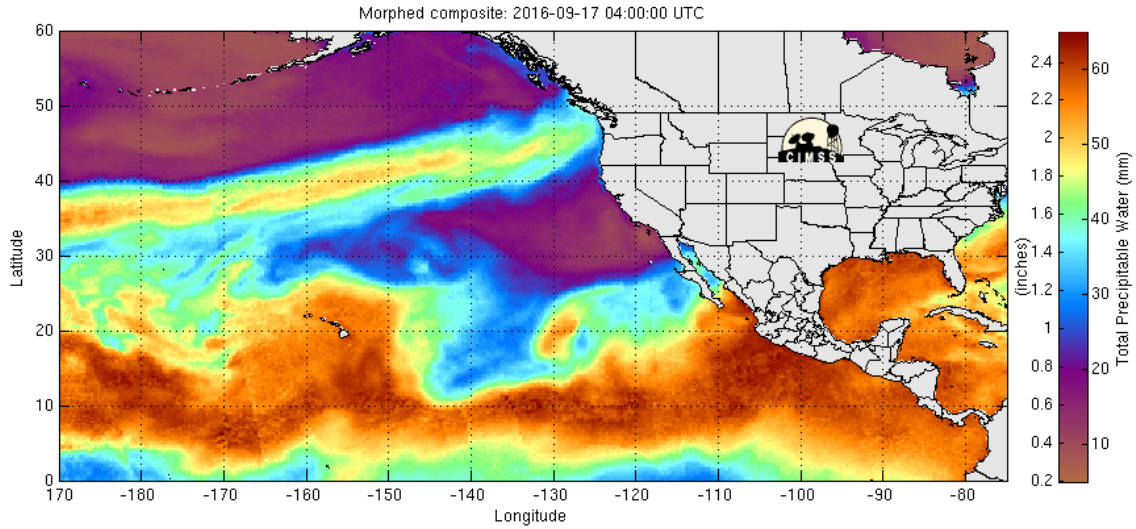
# Oceanic players at this game

Albuquerque NWS fall briefing

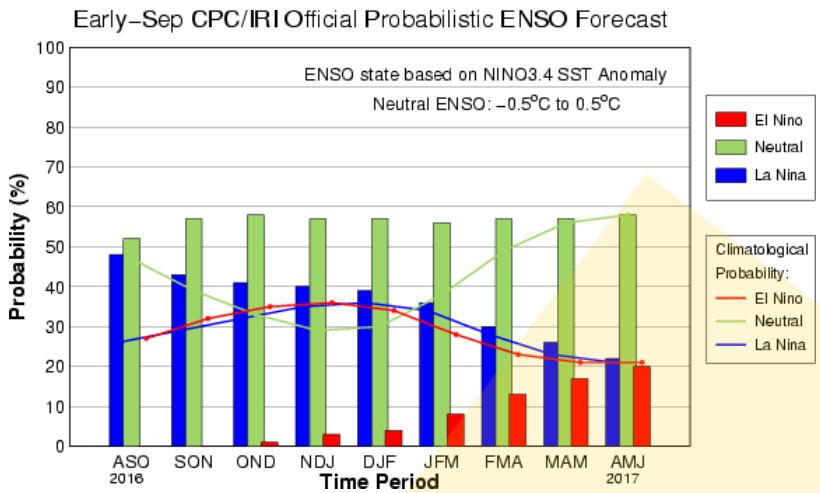


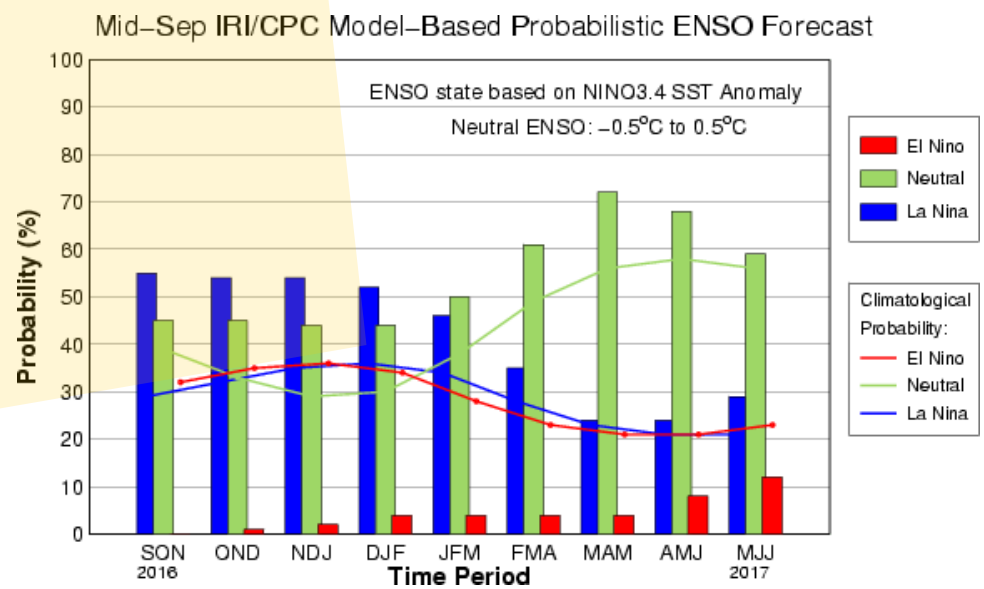

- Multivariate ENSO Index (MEI) for JUL-AUG 2016: +0.175↓
- Pacific Decadal Oscillation (PDO) for AUG 2016: +0.52↓
- Atlantic Multidecadal Oscillation (AMO) for AUG 2016: +0.15↑
- Oceanic Niño Index (ONI) (uses Niño 3.4 region) for JJA 2016: -0.3↓

Warm "blob"

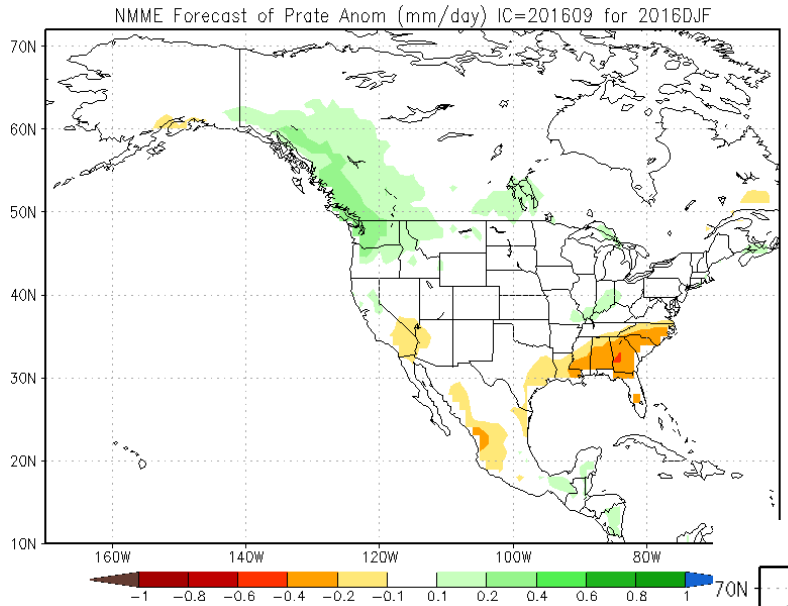


# Seasonal Forecast

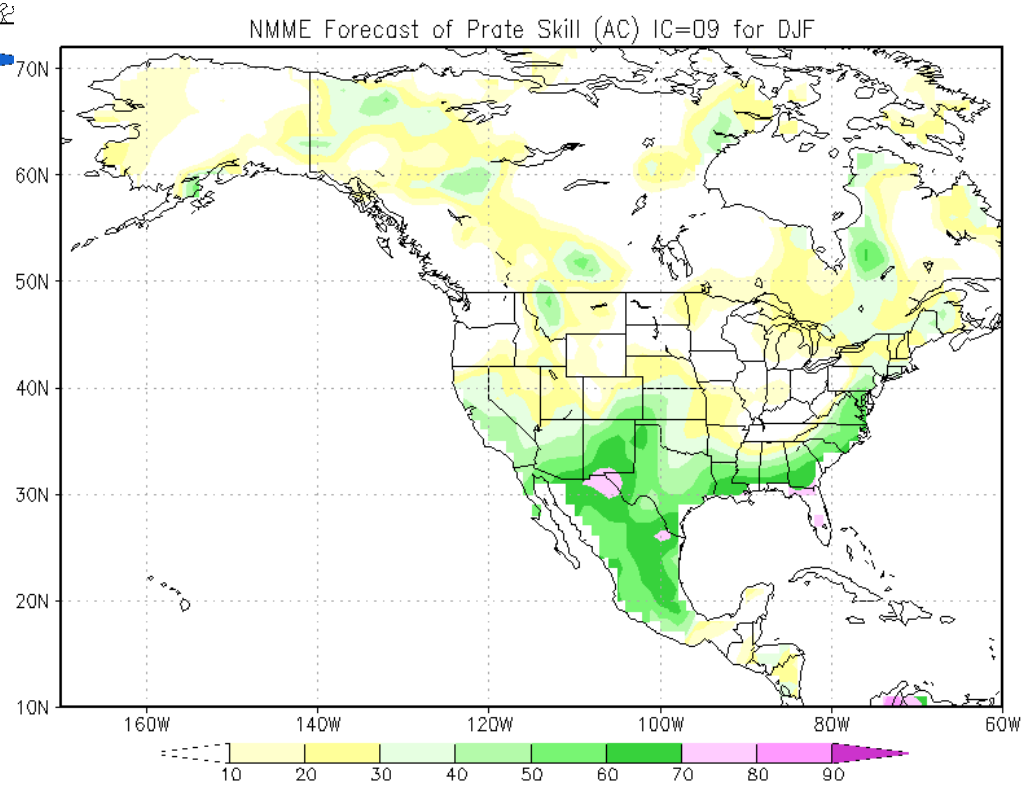



http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/



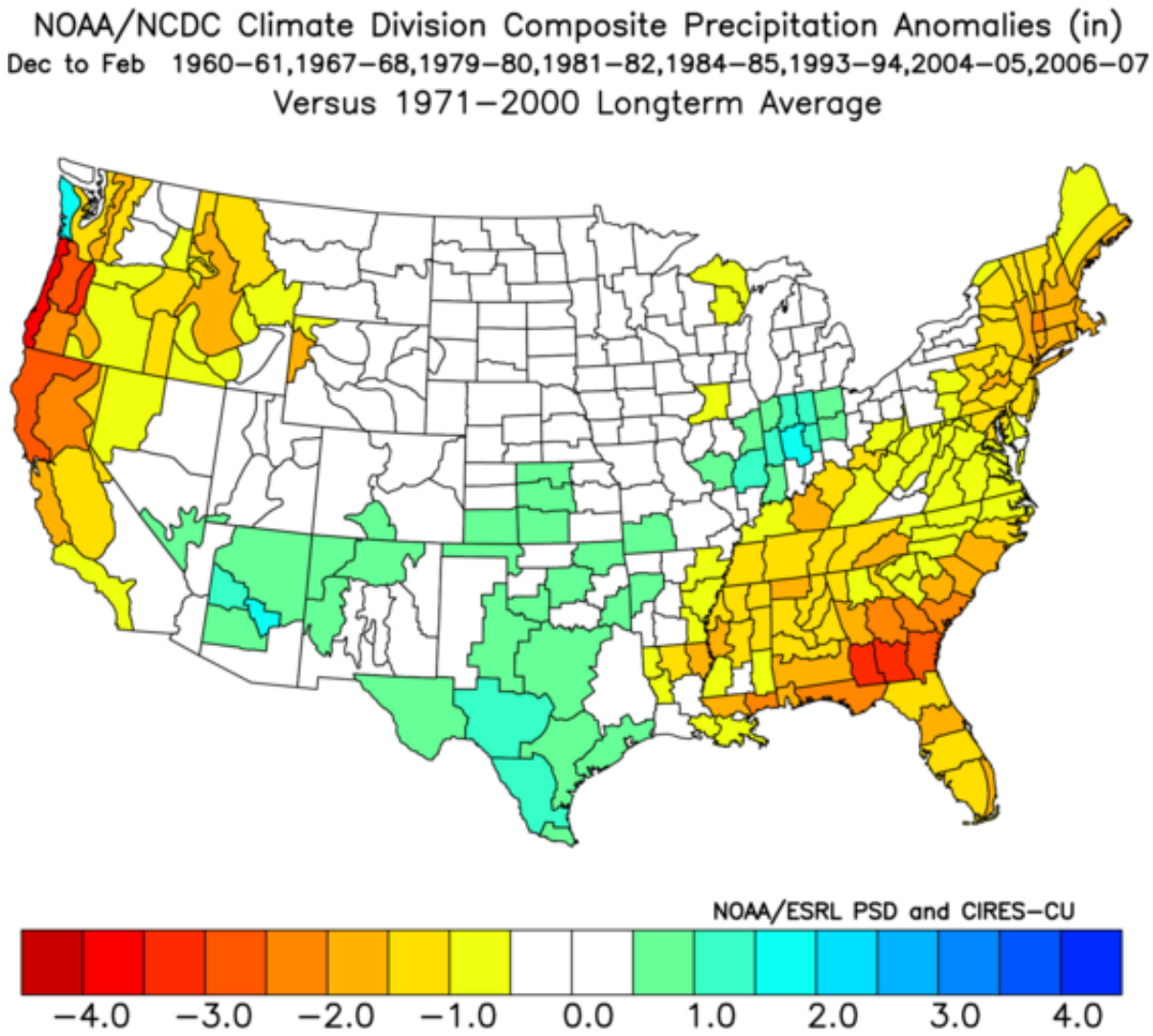

NMME
DJF precipitation
Season 3




NMME
DJF skill map
Season 3

# Neutral winters following an El Niño

Using ONI of ERSST v4

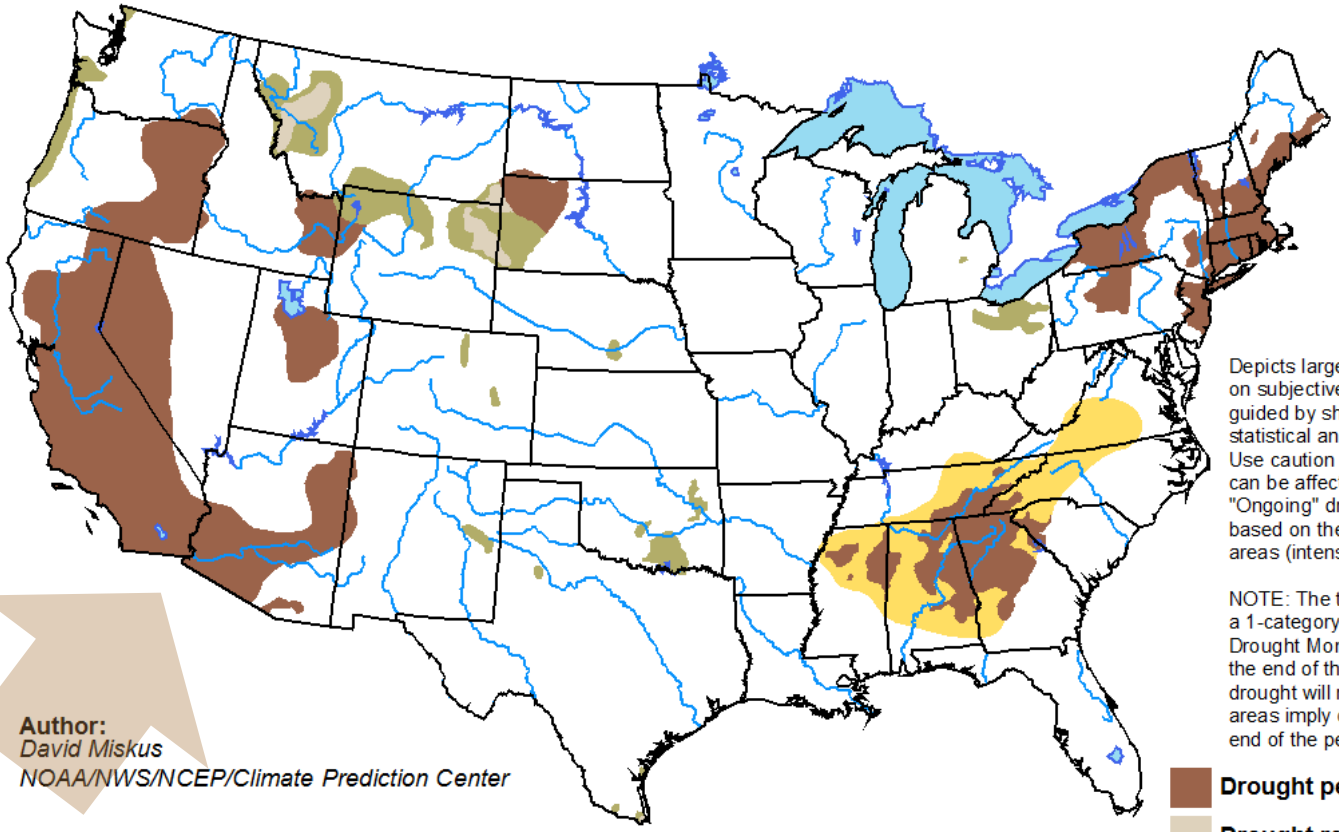


# U.S. Seasonal Drought Outlook

*Valid for September 15 - December 31, 2016*

## Drought Tendency During the Valid Period

*Released September 15, 2016*

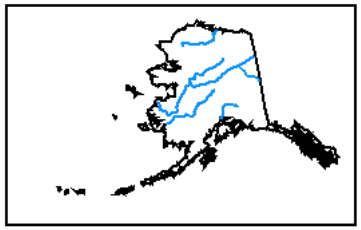


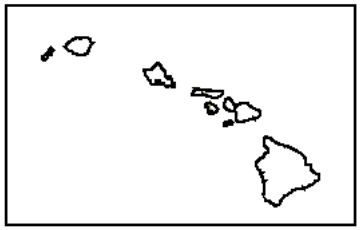

**Author:**
*David Miskus*
*NOAA/NWS/NCEP/Climate Prediction Center*

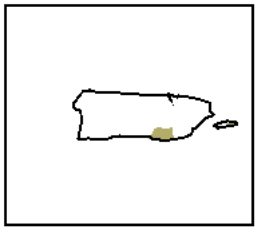

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan 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).

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



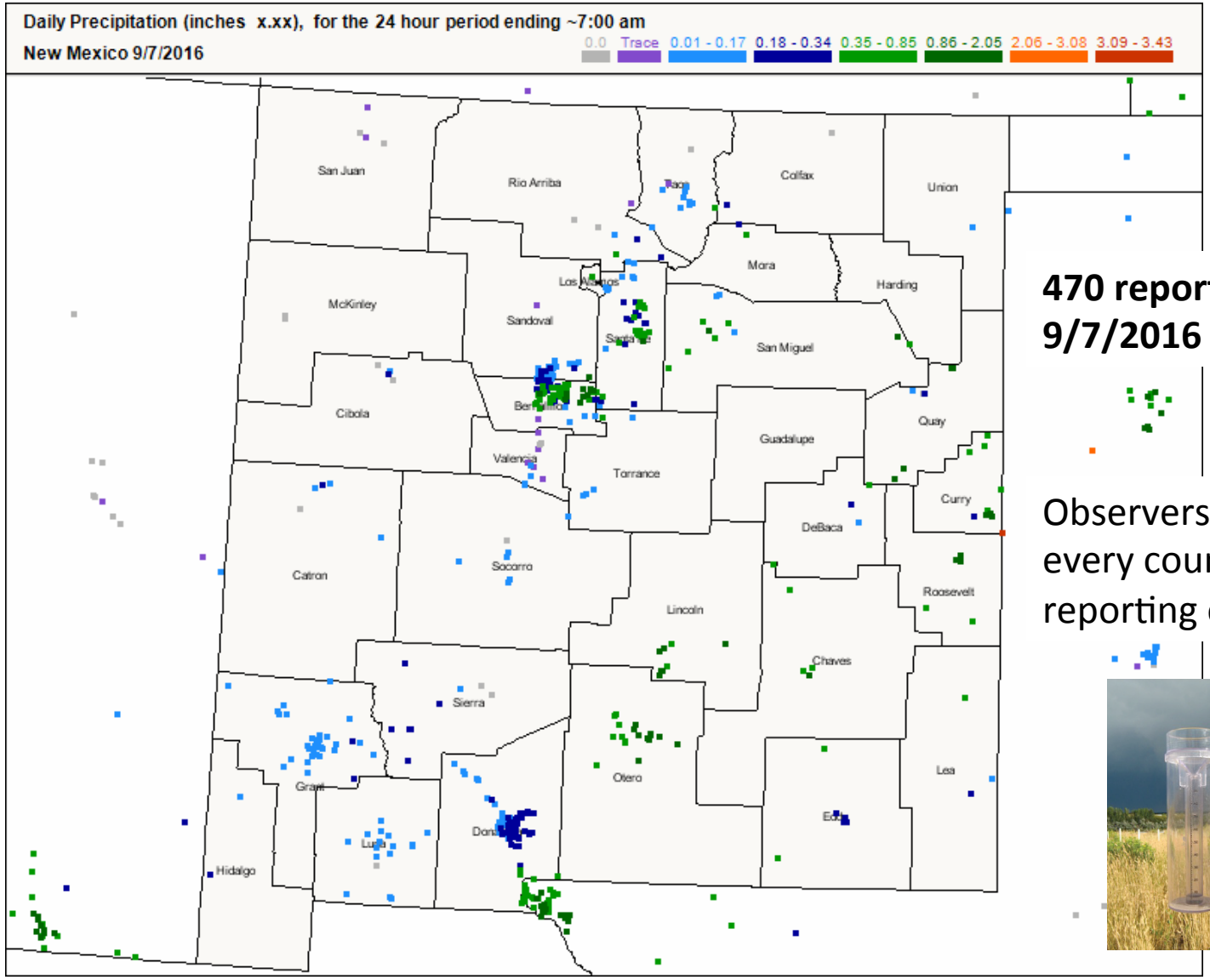




**http://go.usa.gov/3eZ73**

http://www.cpc.ncep.noaa.gov/

# CoCoRaHS




**470 reports on 9/7/2016**

Observers registered in every county but not reporting every day

Dr. Dave DuBois
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NMSU

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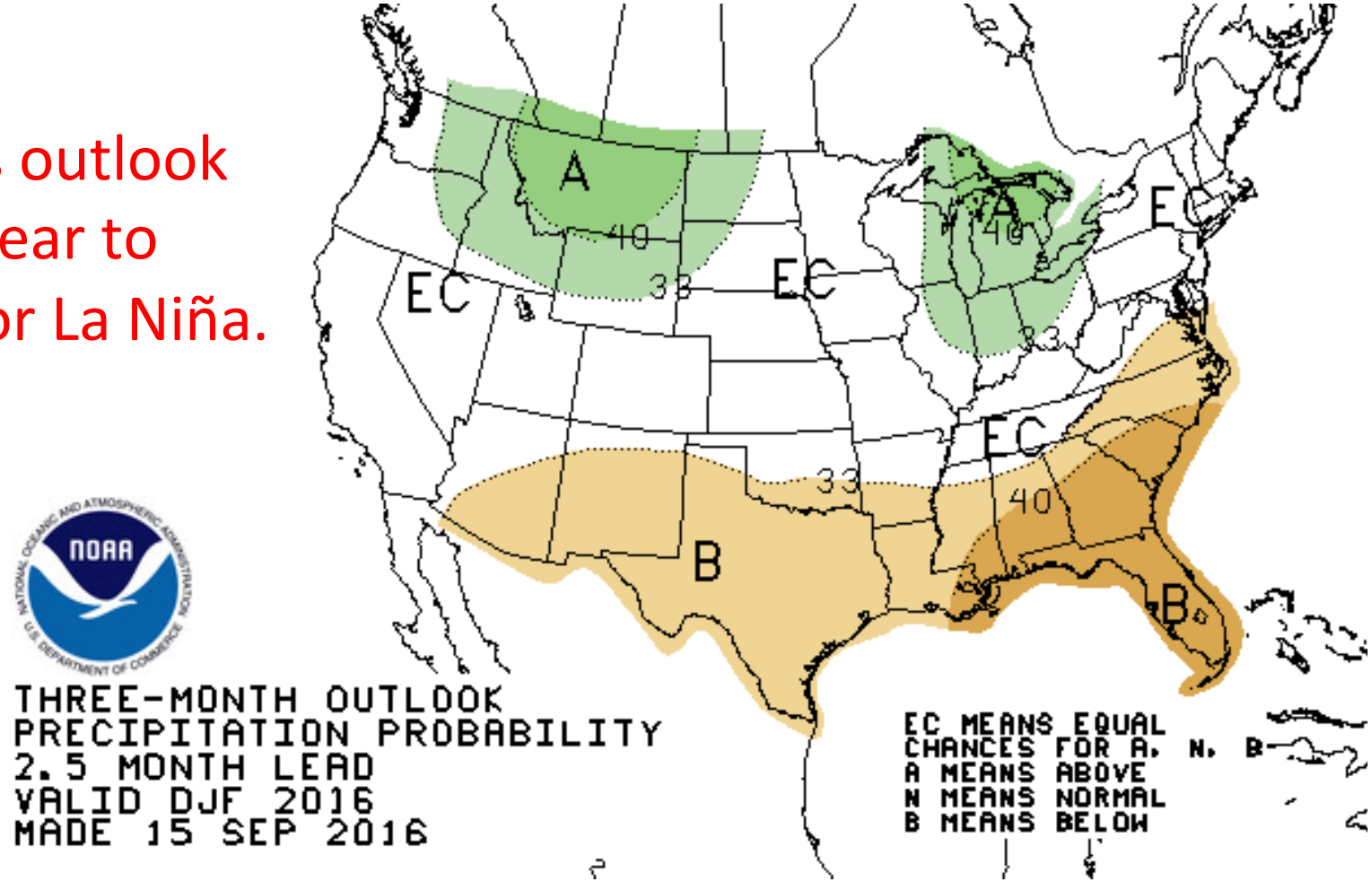
YouTube.com/nmclimate

# Dec-Jan precipitation outlook

This outlook appear to favor La Niña.