



# North Central U.S. Climate Summary and Outlook Webinar July 21, 2016

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# General Information

- Regional climate services for the North Central U.S., including the Great Plains and Midwest, are provided through collaboration among federal, regional, and state partners:
  - National Oceanic and Atmospheric Administration
  - U.S. Department of Agriculture
  - National Drought Mitigation Center
  - High Plains Regional Climate Center
  - Midwestern Regional Climate Center
  - American Association of State Climatologists
  
- Next webinar
  - August 18, 2016 with Jim Angel, Illinois State Climatologist
  
- Archive of past webinars
  - <http://mrcc.isws.illinois.edu/multimedia/webinars.jsp>
  - <http://www.hprcc.unl.edu/webinars.php>

# Agenda

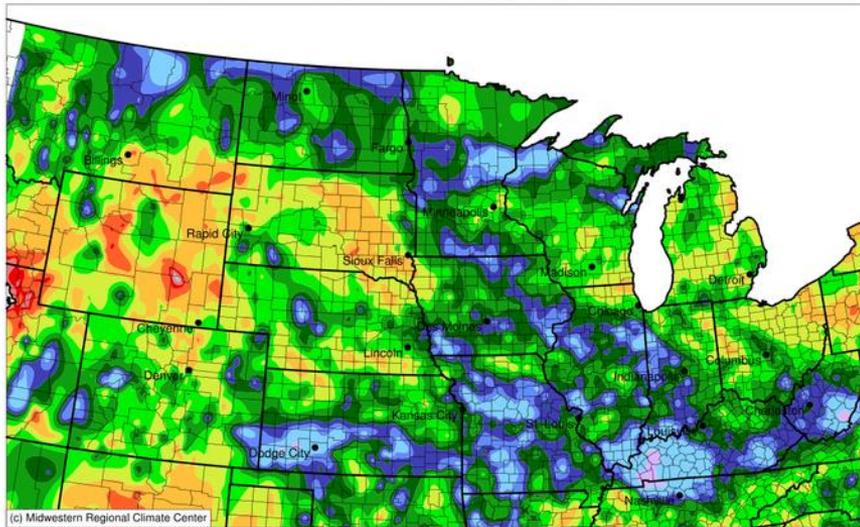


Credit: NWS, Omaha WFO

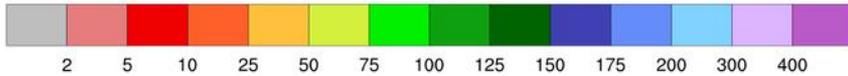
- Current climate conditions in historical context
- Current and prospective climate impacts
- Climate outlooks
- Questions, answers, and further discussion  
Panelists: Doug Kluck (host), Barb Mayes,  
Dennis Todey, Stu Foster

### Accumulated Precipitation (in): Percent of 1981-2010 Normals

June 21, 2016 to July 20, 2016

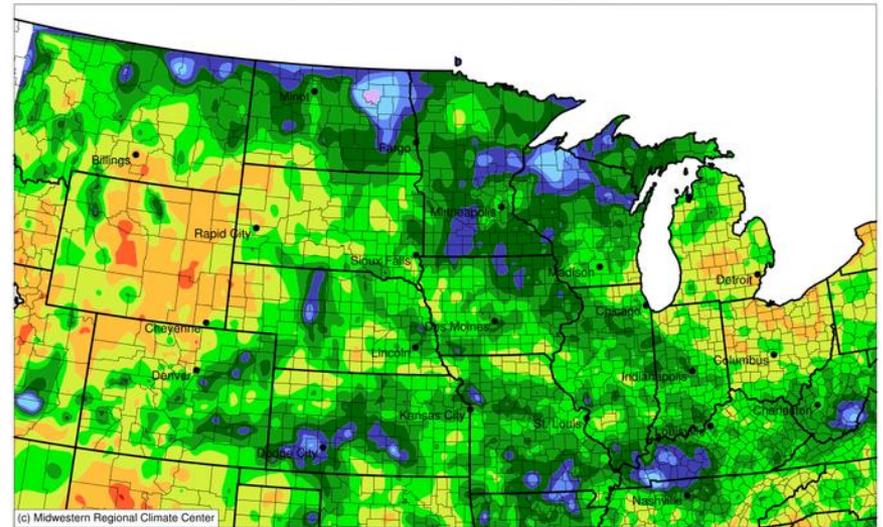


(c) Midwestern Regional Climate Center

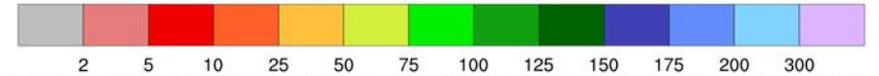


### Accumulated Precipitation (in): Percent of 1981-2010 Normals

May 22, 2016 to July 20, 2016

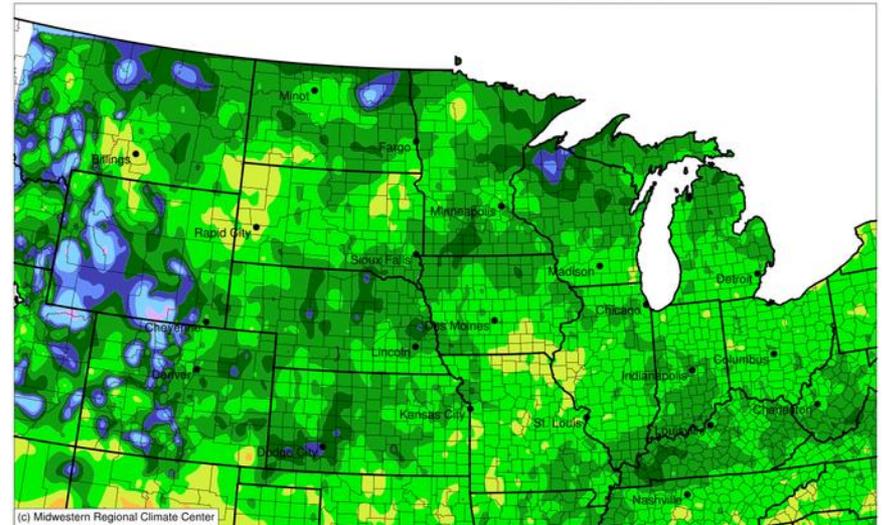


(c) Midwestern Regional Climate Center

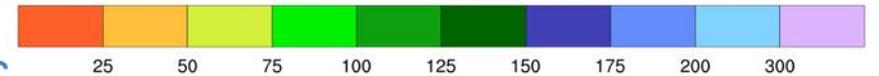


### Accumulated Precipitation (in): Percent of 1981-2010 Normals

January 01, 2016 to July 20, 2016



(c) Midwestern Regional Climate Center

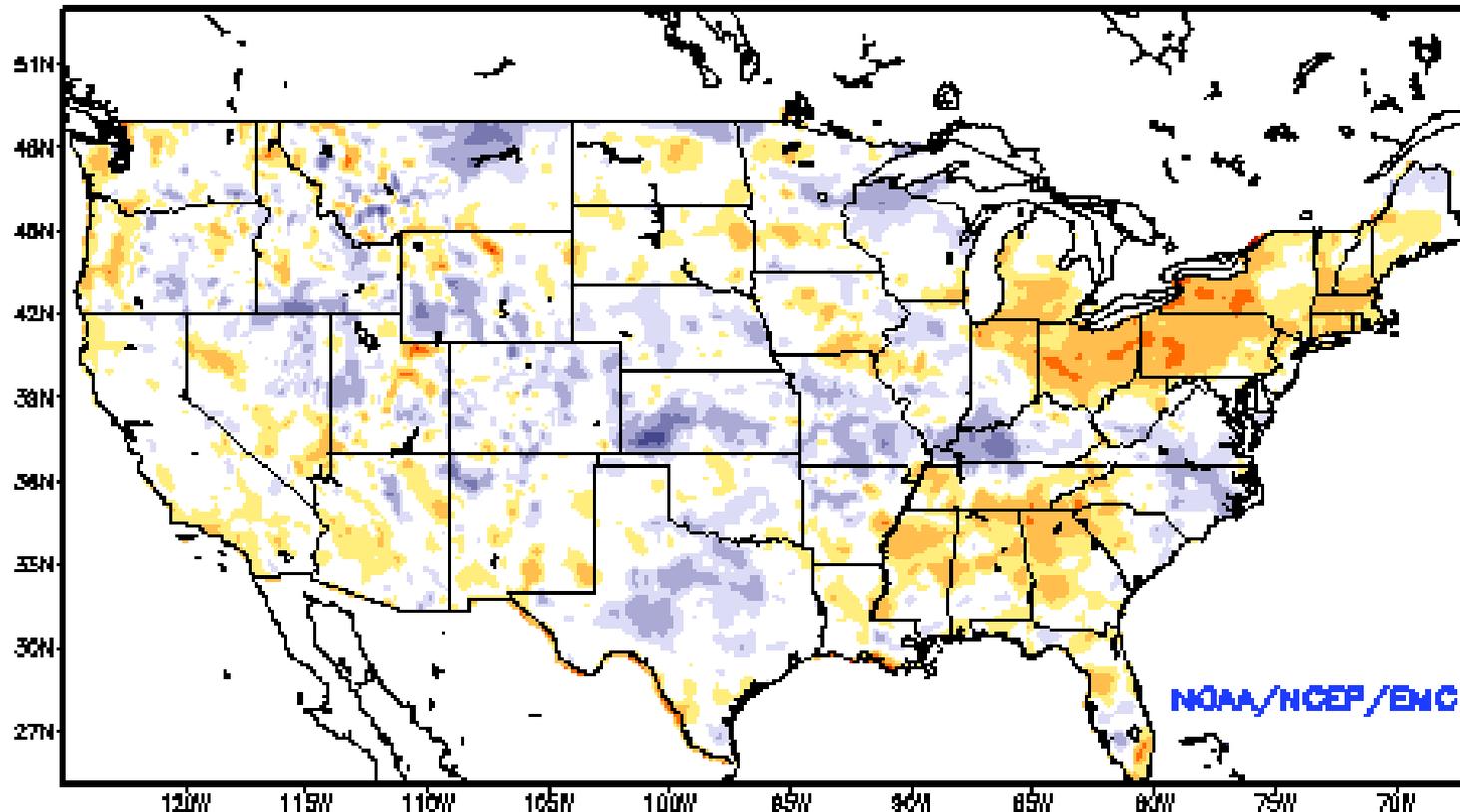


- Precipitation deficits continued to develop in portions of Wyoming and South Dakota and in portions of Michigan and Ohio.
- Abundant precipitation occurred over a large portion of the region, with the heaviest amounts centered on portions of Kentucky.

# Soil Moisture Anomaly

North American Land Assimilation Data System

**Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)**  
**NCEP NLDAS Products Valid: JUL 16, 2016**

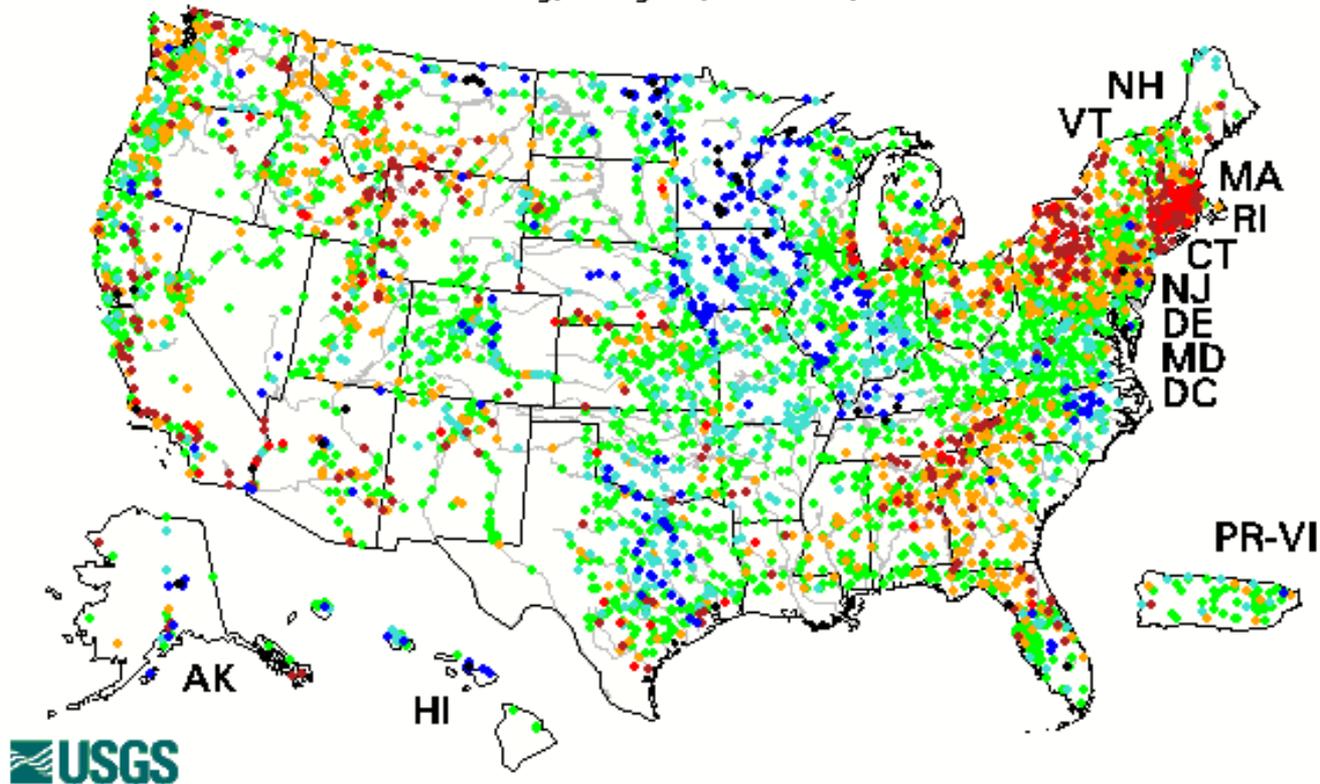


<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>

# USGS Water Watch

## Real-time Streamflow in Historical Context

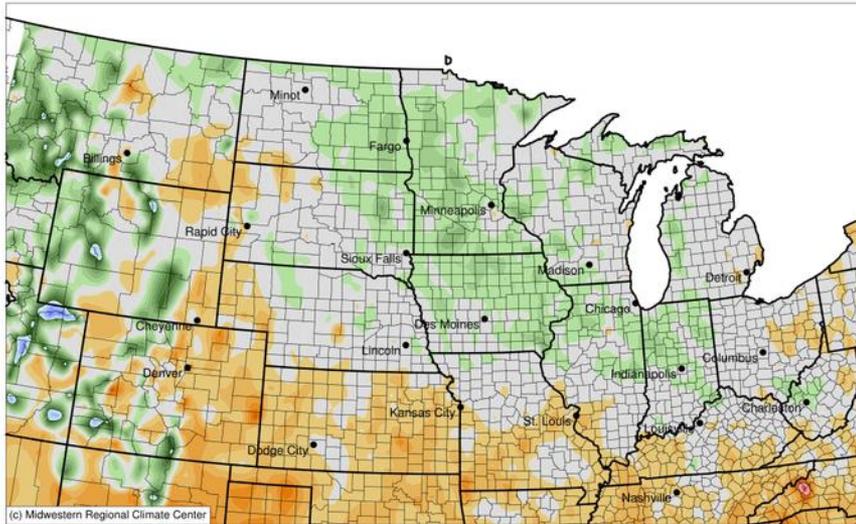
Thursday, July 21, 2016 09:30ET



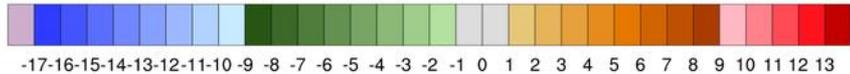
Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

## Average Temperature (°F): Departure from 1981-2010 Normals

June 21, 2016 to July 20, 2016

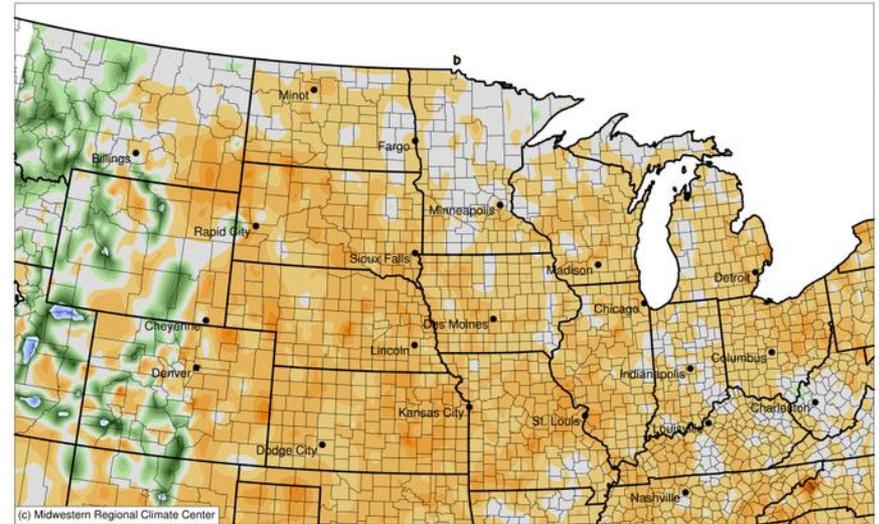


(c) Midwestern Regional Climate Center

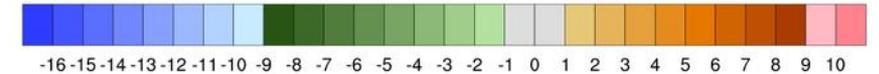


## Average Temperature (°F): Departure from 1981-2010 Normals

May 22, 2016 to July 20, 2016

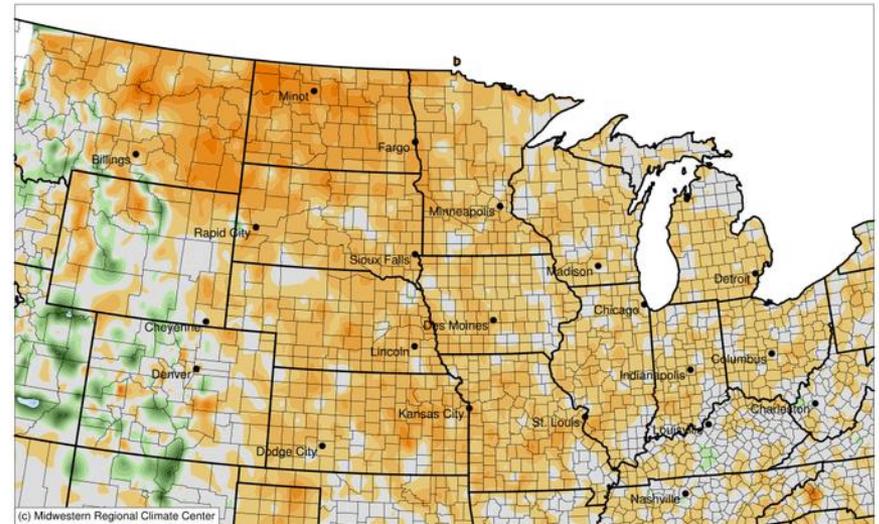


(c) Midwestern Regional Climate Center

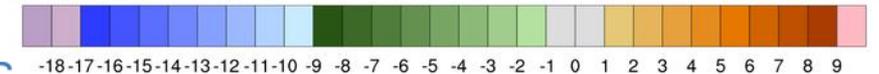


## Average Temperature (°F): Departure from 1981-2010 Normals

January 01, 2016 to July 20, 2016



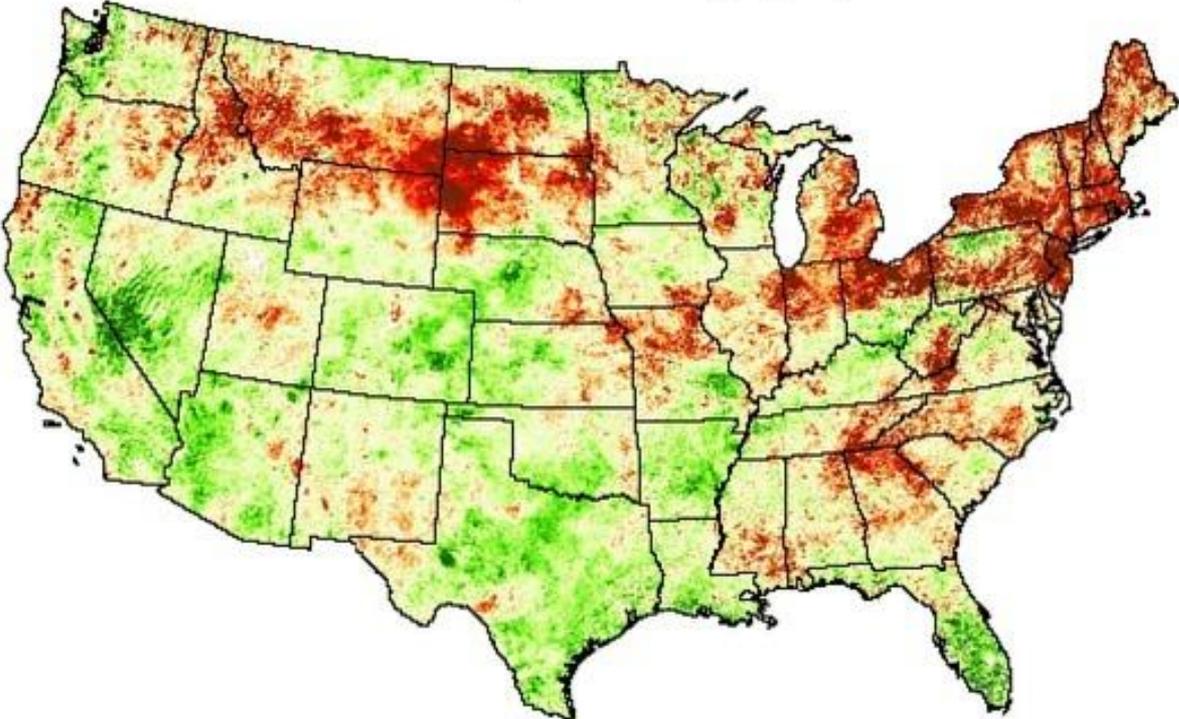
(c) Midwestern Regional Climate Center



- Temperatures transitioned from warmer than normal in the June period to cooler than normal in the July period across the Upper Great Plains and the much of the Midwest.
- Temperatures transitioned from cooler than normal in the June period to warmer than normal in the July period across the southern portions of the Upper Great Plains and Midwest.
- Over the past week, high temperatures and heat stress have been widespread.

# Evaporative Stress Index 4km

1 month composite ending July 19, 2016



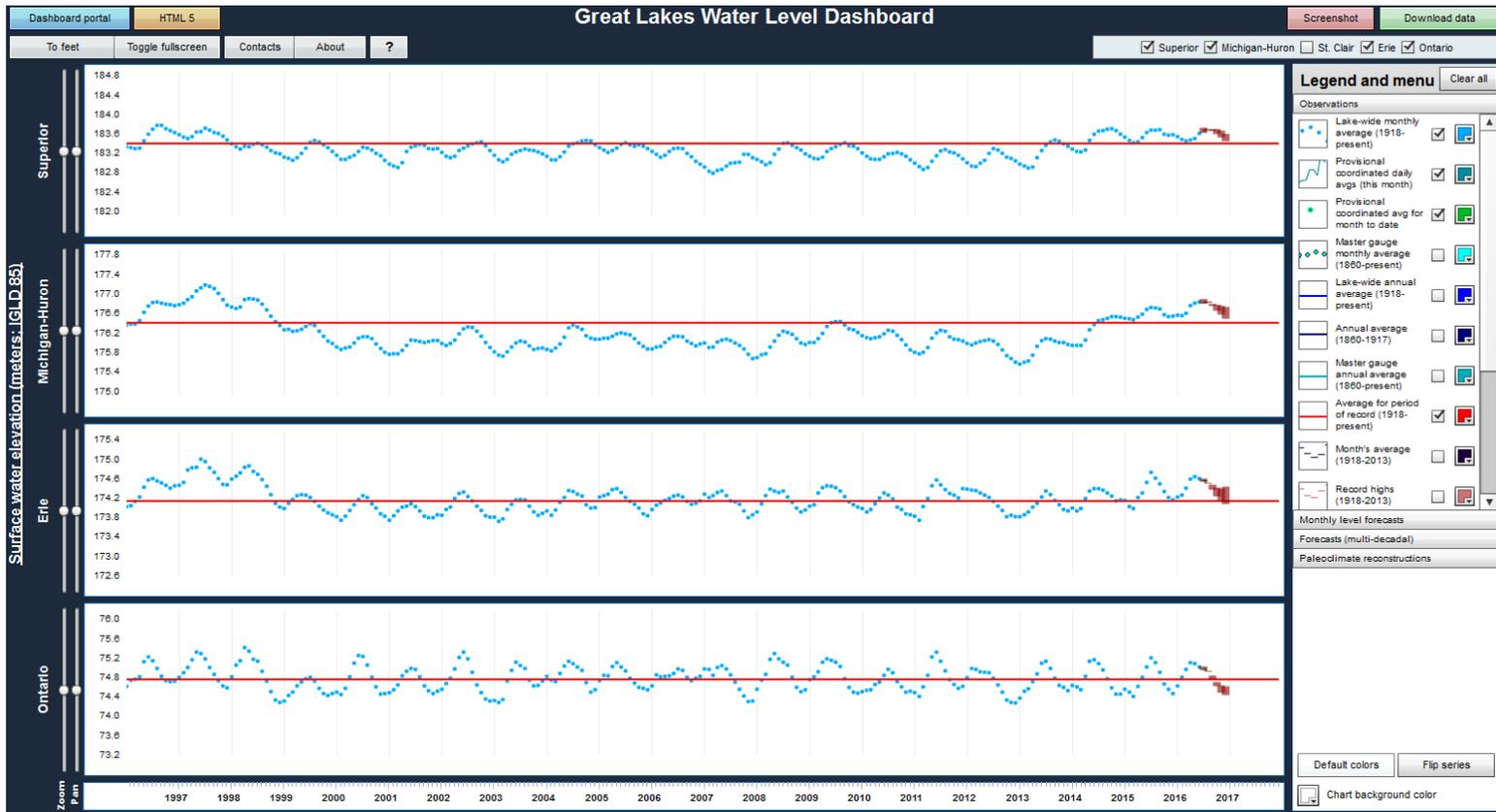
Standardized ET/PET anomalies



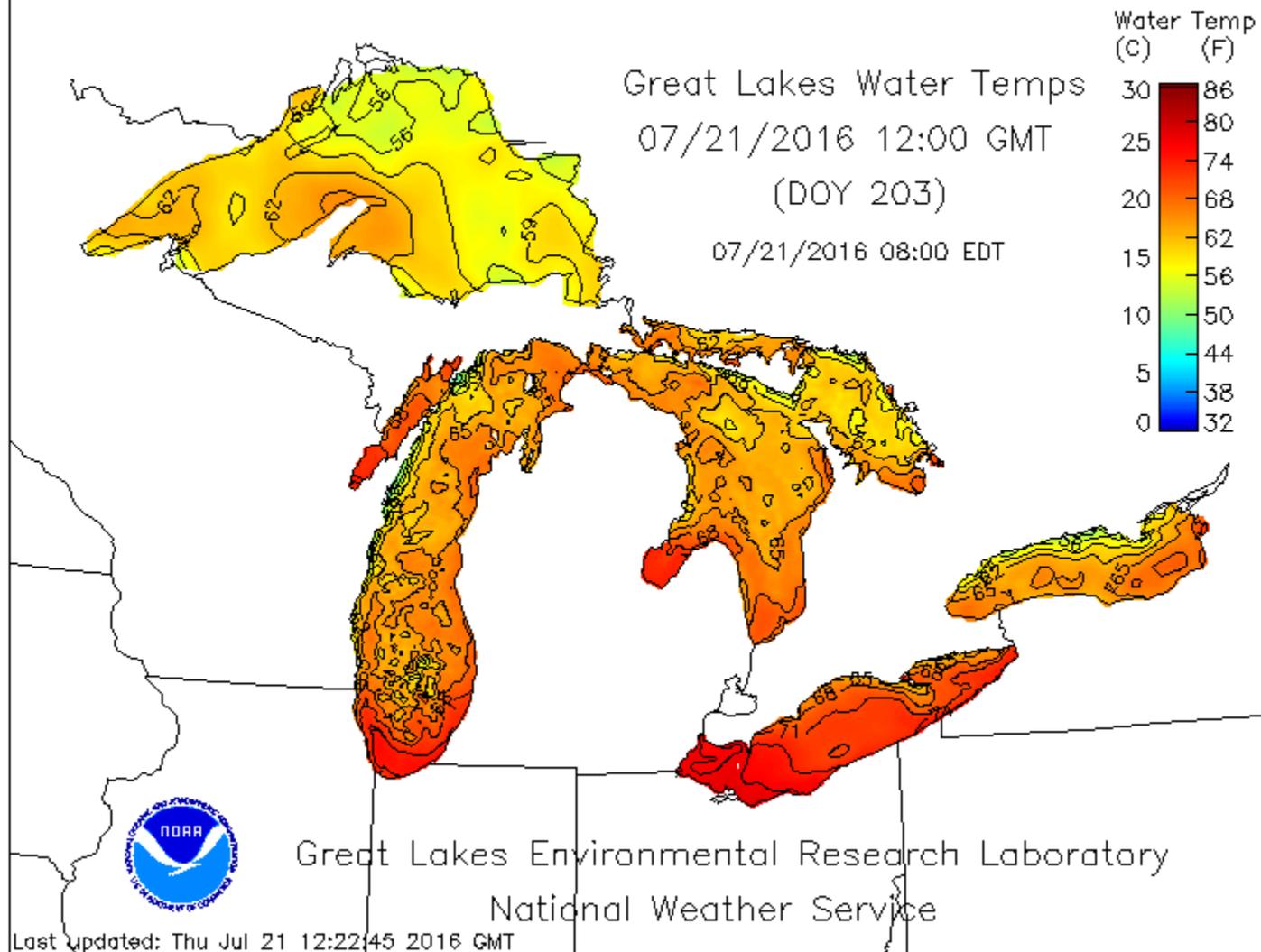
# Great Lakes Water Levels

1997-present

NOAA Great Lakes Environmental Research Laboratory



# NOAA Great Lakes Coastal Forecasting System

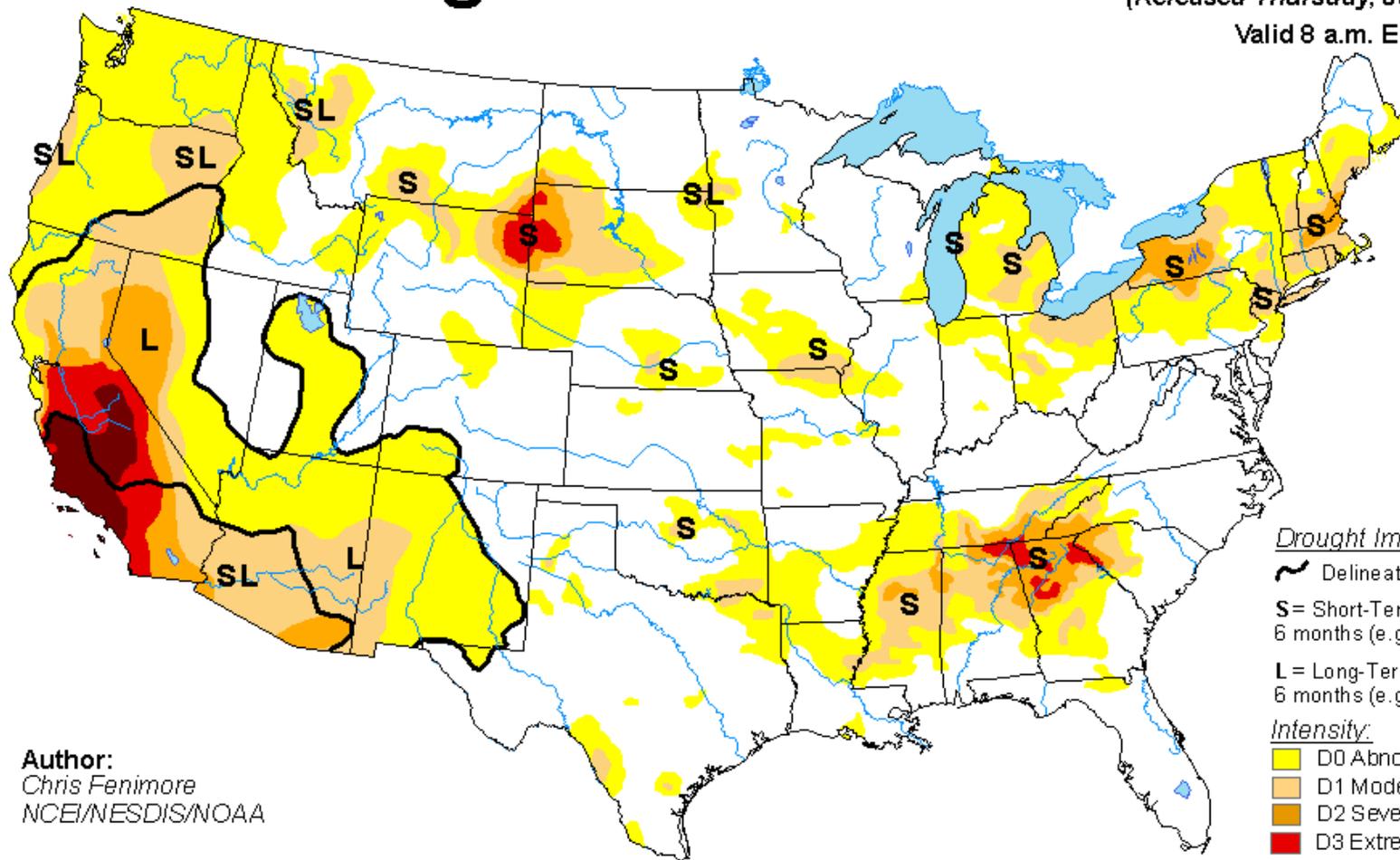


# U.S. Drought Monitor

July 19, 2016

(Released Thursday, Jul. 21, 2016)

Valid 8 a.m. EDT



**Author:**  
Chris Fenimore  
NCEI/NESDIS/NOAA

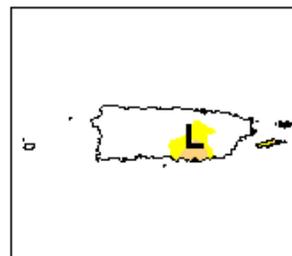
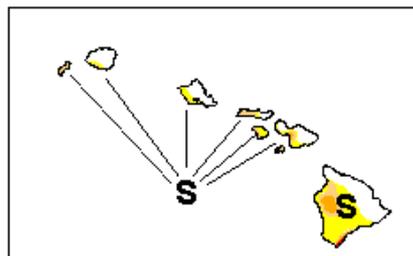
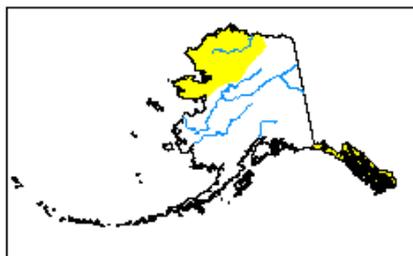
Drought Impact Types:

-  Delineates dominant impacts
- S** = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L** = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

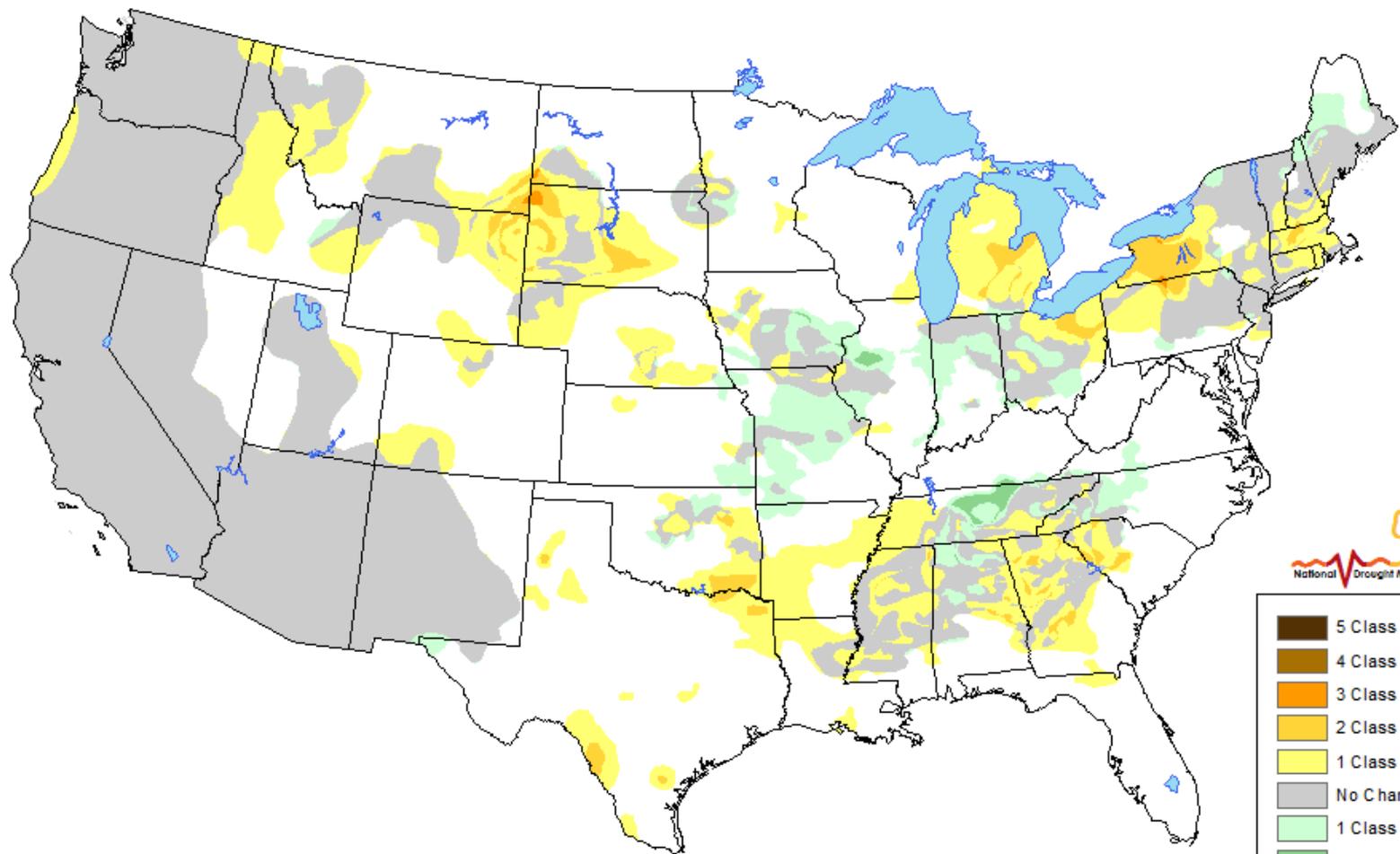
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

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



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

# U.S. Drought Monitor Class Change 1 Month



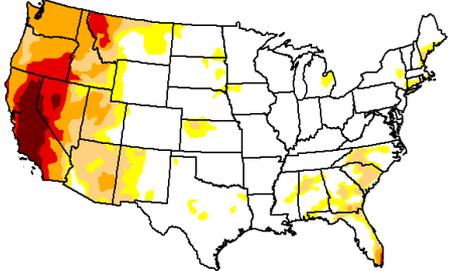
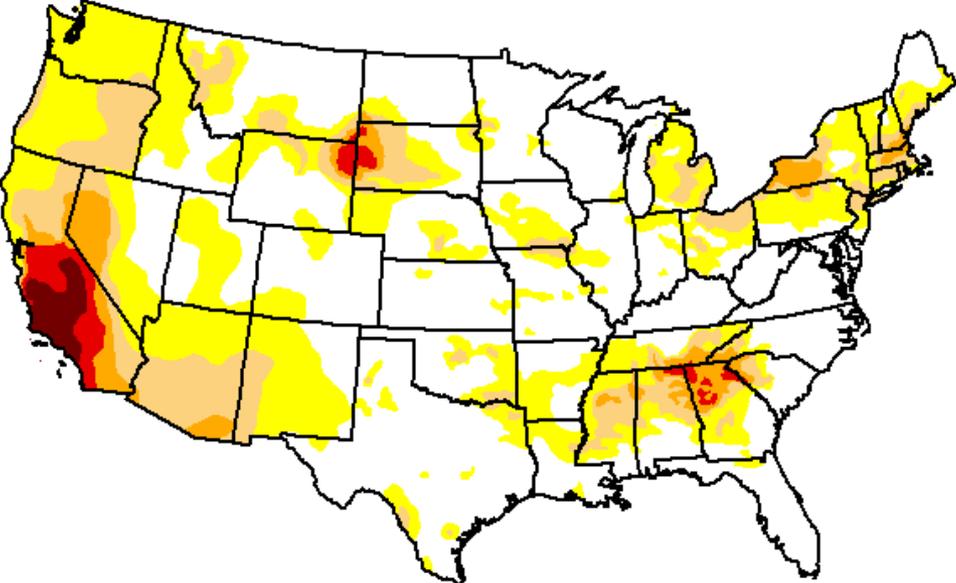
July 19, 2016  
compared to  
June 21, 2016



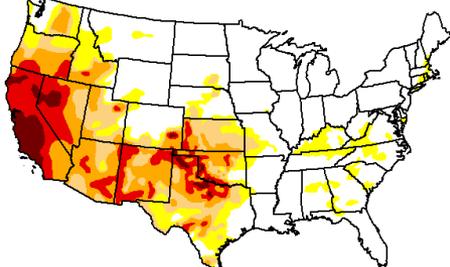
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No C Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

# Year-by-Year Comparisons

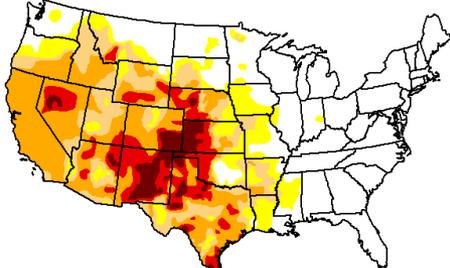
2016 (July 19)



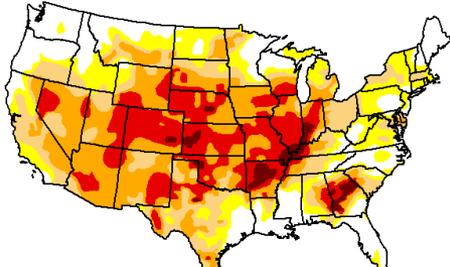
2015 (July 21)



2014 (July 22)



2013 (July 23)



2012 (July 24)

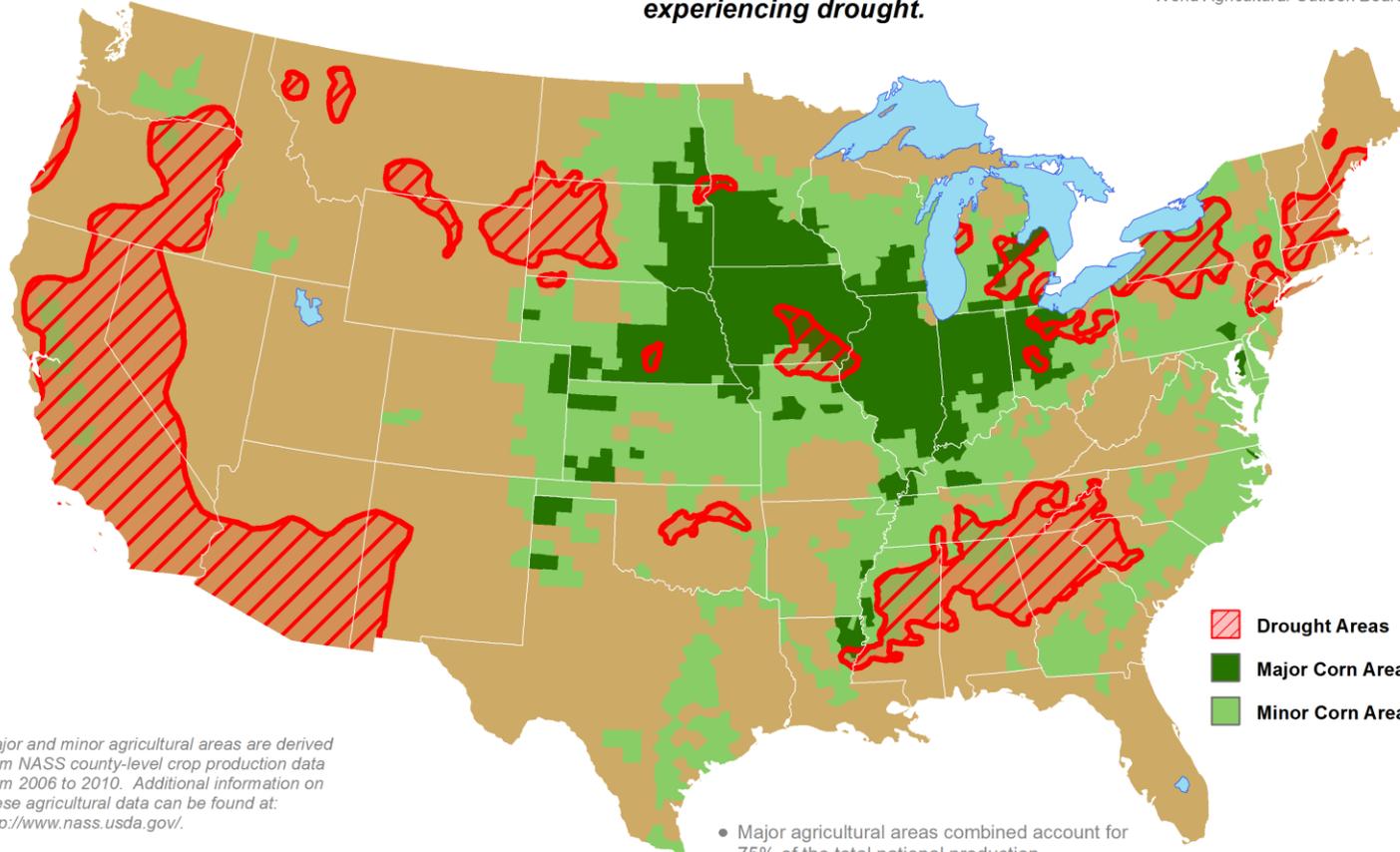
# U.S. Corn Areas Experiencing Drought



Reflects July 12, 2016  
U.S. Drought Monitor data

Approximately 6% of corn  
production is within an area  
experiencing drought.

This product was prepared by the  
USDA Office of the Chief Economist  
World Agricultural Outlook Board



-  Drought Areas
-  Major Corn Area
-  Minor Corn Area

Major and minor agricultural areas are derived from NASS county-level crop production data from 2006 to 2010. Additional information on these agricultural data can be found at: <http://www.nass.usda.gov/>.

Mapped drought areas are derived from the U.S. Drought Monitor product and do not depict the intensity of drought in any particular location. More information on the Drought Monitor can be found at: <http://droughtmonitor.unl.edu/>.

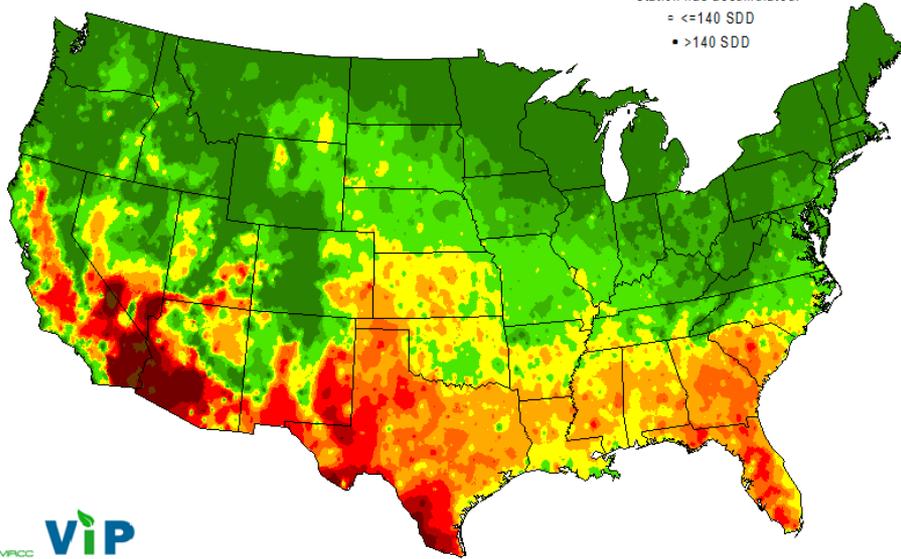
- Major agricultural areas combined account for 75% of the total national production.
- Major and minor agricultural areas combined account for 99% of the total national production.

### Modified Stress Degree Days (base 86°F) for Corn Plants

Accumulated January 1 to 7/19/2016

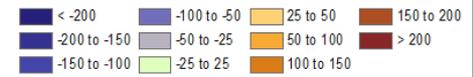


Station has accumulated:  
• ≤140 SDD  
• >140 SDD

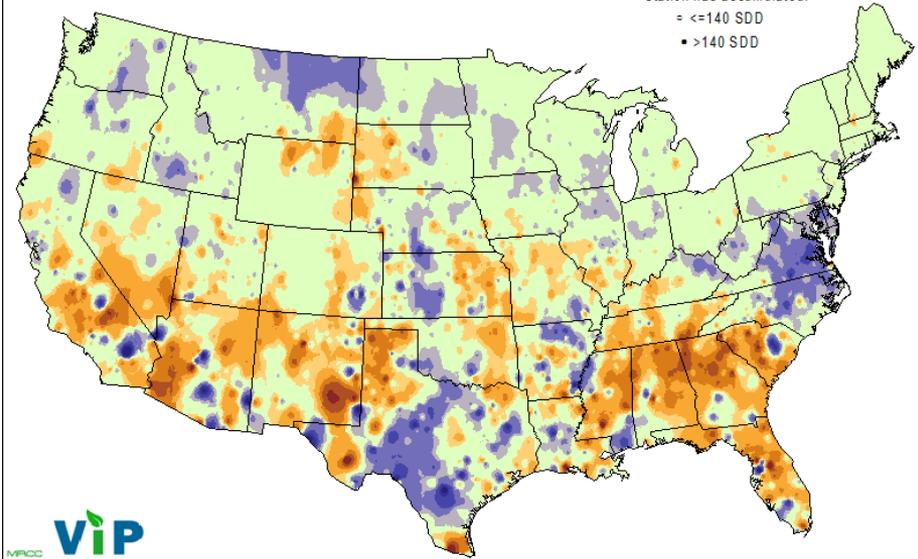


### Modified Stress Degree Days (base 86°F) for Corn Plants, Departure From Normal

Accumulation January 1 to 7/19/2016



Station has accumulated:  
• ≤140 SDD  
• >140 SDD

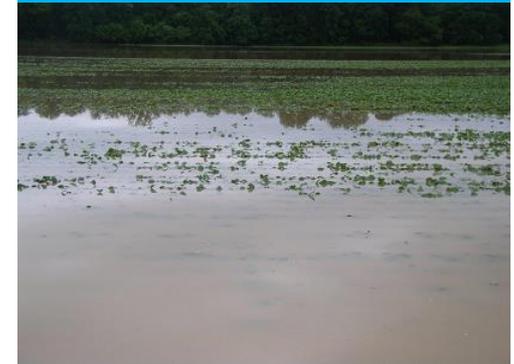


# Climate Impacts: It's too wet!

- Extensive areas in western Kentucky have recorded 10" or more of rain in July. One storm produced more than 8" within 5 hours in Marshall County. Corn and soybean crops have been damaged. Areas of Kentucky, Indiana, Illinois, and Missouri are at elevated risk for fungus.



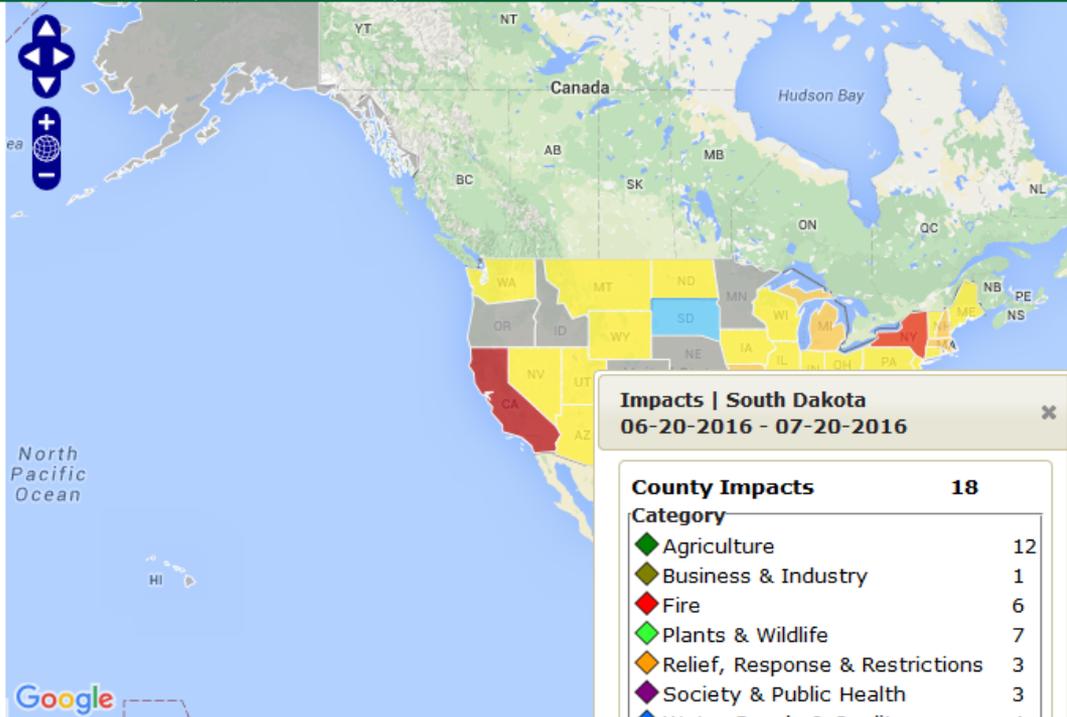
State Climatologist Office for Illinois



# Climate Impacts: It's too dry!

- Drought is intensifying in northeastern Wyoming and western South Dakota. Dryland alfalfa yields are projected to be worst since 1988. Pastures are stressed. Water quantity and quality issues are prevalent. Increased pumping for irrigation or row crops. Fire danger is heightened. Municipal water in Rapid City during June exceeded that experienced in 2012.
- Dryness has persisted in some areas of the Lower Peninsula of Michigan and in northern Ohio, following wet conditions over winter and into spring. Continued dryness is likely to impact corn, hay, Christmas trees, and young/recently transplanted fruit trees. With prospects for rain over the near term, potential impacts could be reduced.





Refresh

Impacts & Reports    Overlays

- Scales
- National
  - Multistate
  - State
  - County
  - City

**Impacts | South Dakota**  
06-20-2016 - 07-20-2016

**County Impacts 18**

Category	Count
Agriculture	12
Business & Industry	1
Fire	6
Plants & Wildlife	7
Relief, Response & Restrictions	3
Society & Public Health	3
Water Supply & Quality	4

Report Source

Media	13
User	5

Impacts List    County View

Fire	26
Relief, Response & Restrictions	38
Tourism & Recreation	6

**Impacts | South Dakota**  
06-20-2016 - 07-20-2016  
Page 1 of 2

**Deteriorating pasture conditions affecting agricultural producers in Harding County, South Dakota**

Duration: 04-01-2016 - 07-20-2016

**Drought leads to dry stock dams, poor hay harvests and pasturage in Harding County, South Dakota**

Duration: 06-01-2015 - 07-19-2016

**Dams drying up, grass and alfalfa hay yields decreased in Harding County, South Dakota**

Duration: 06-15-2016 - 07-19-2016

**Dams dried up, hay and grass gone in Harding County, South Dakota**

Duration: 01-01-2016 - 07-19-2016

All States | 06-20-2016 - 07-20-2016 |

Impact Counts    Impacts List | Page 1/12    Report

**County Impacts | All States**

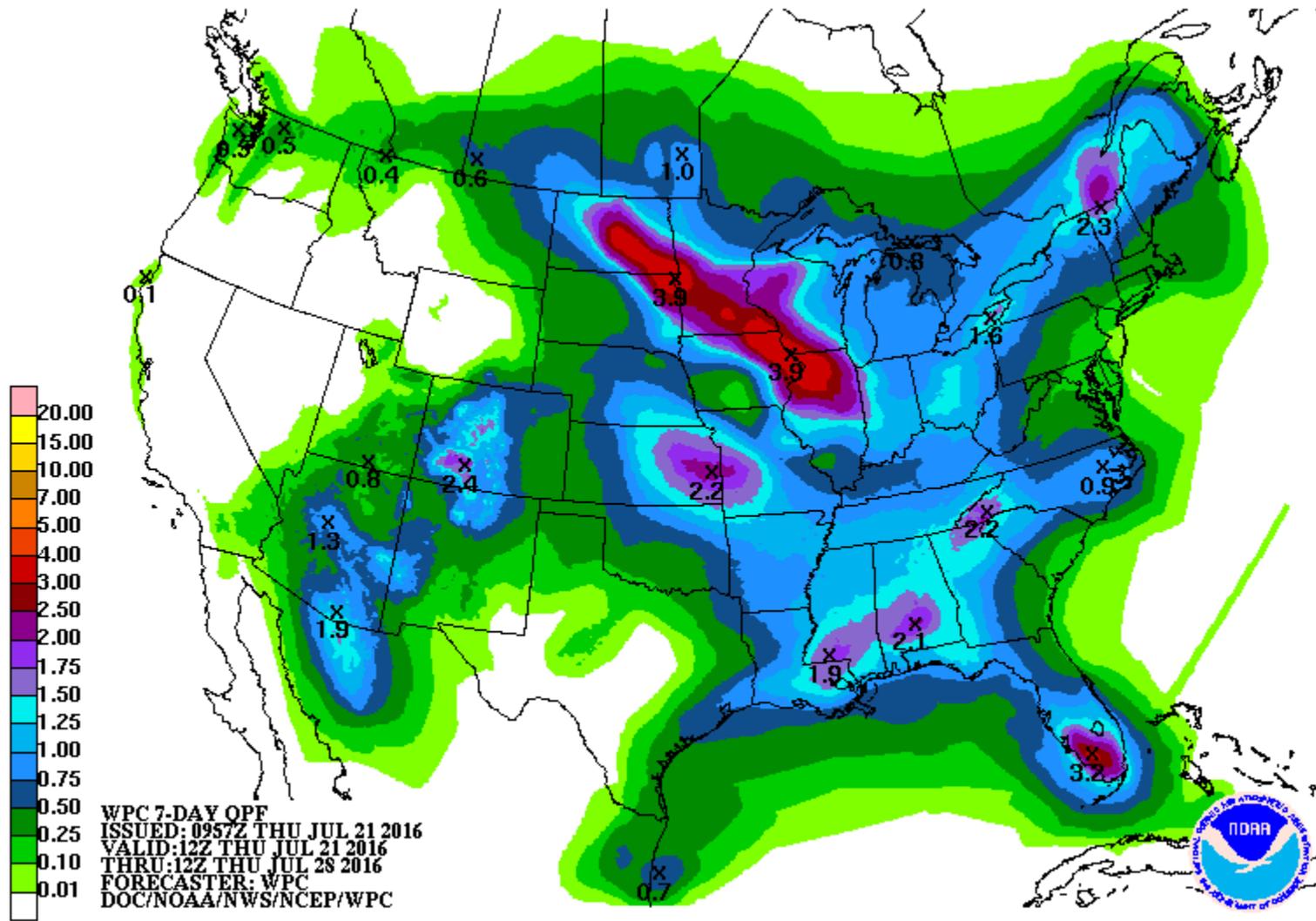
Category	Count
Agriculture	55
Energy	1
Plants & Wildlife	43
Society & Public Health	19
Water Supply & Quality	38

Report Source	Count
Media	89
CoCoRaHS	17
User	11

OK

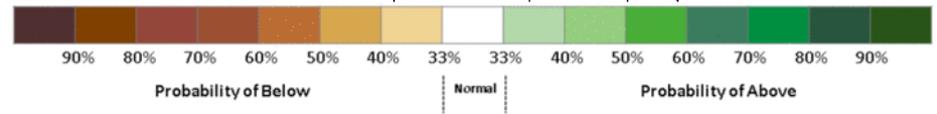
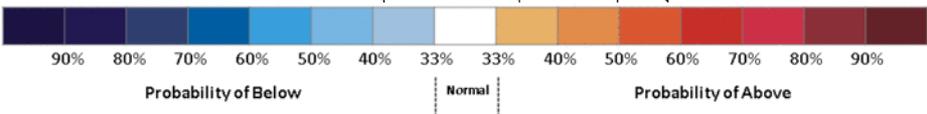
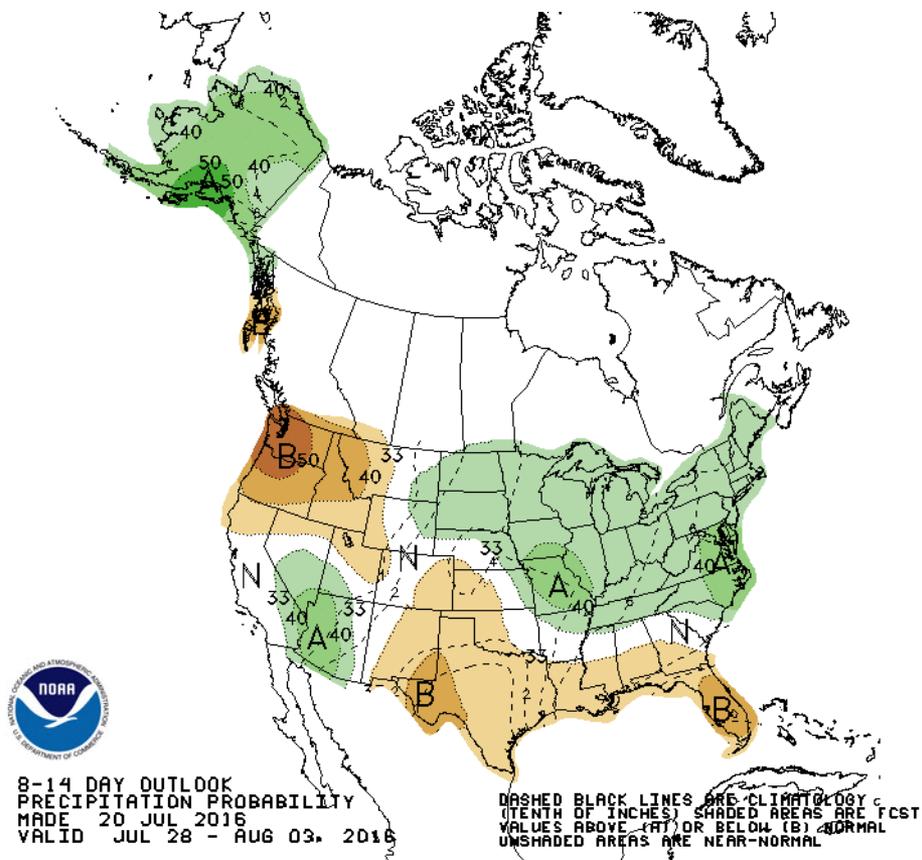
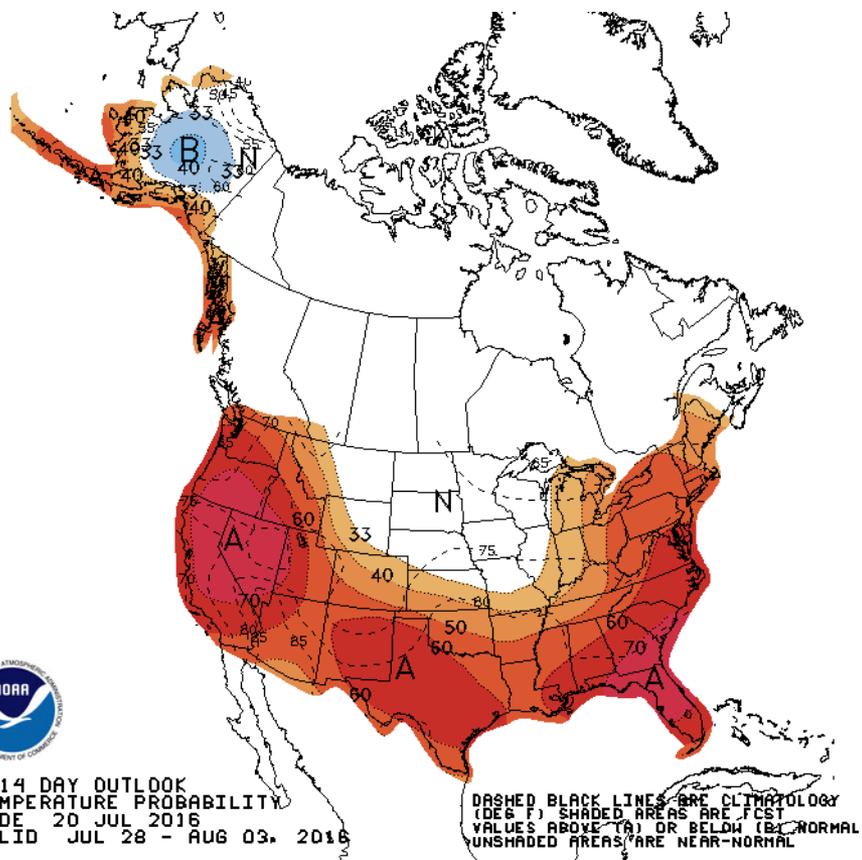
# 7-day Quantitative Precipitation Forecast



# 8-14 Day Outlook

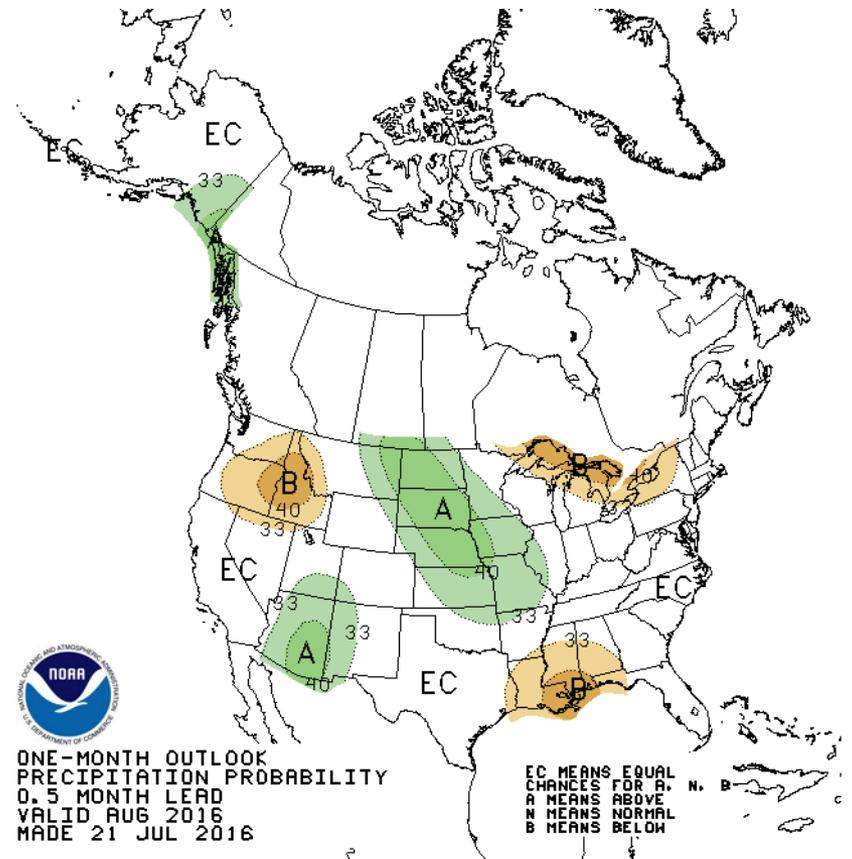
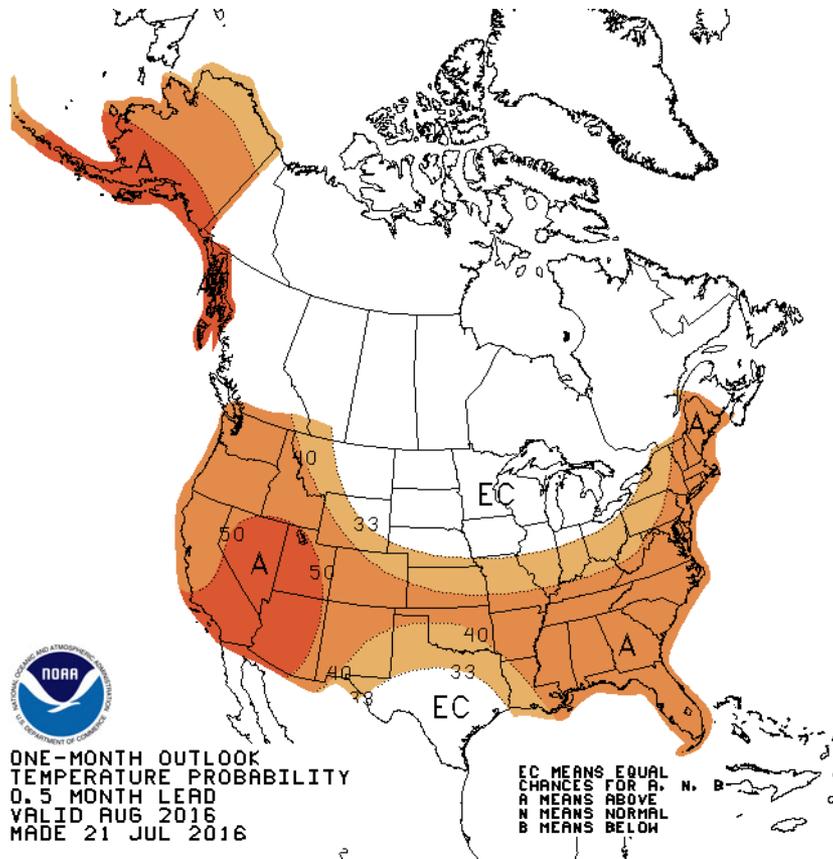
## July 28-Aug 3

NWS Climate Prediction Center



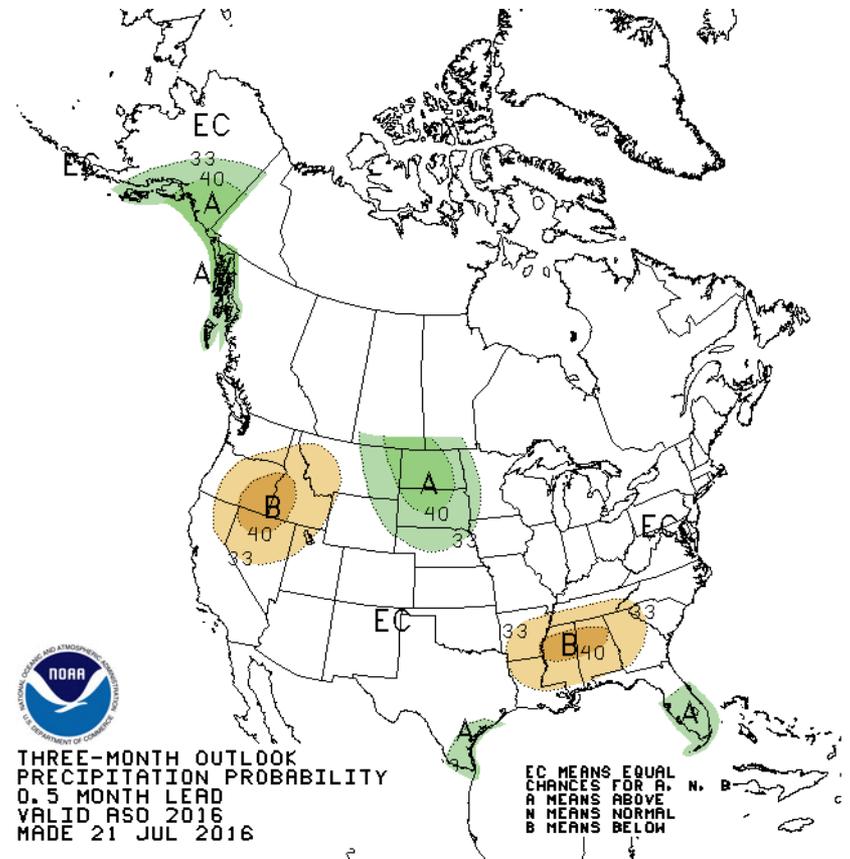
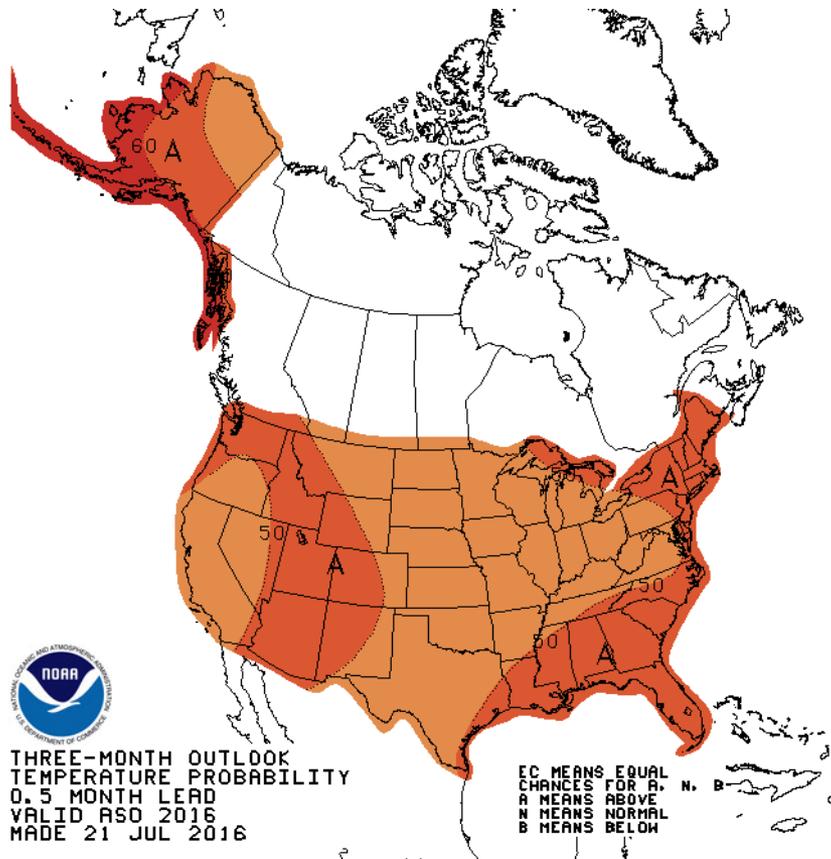
# Monthly Outlook for August

## NWS Climate Prediction Center



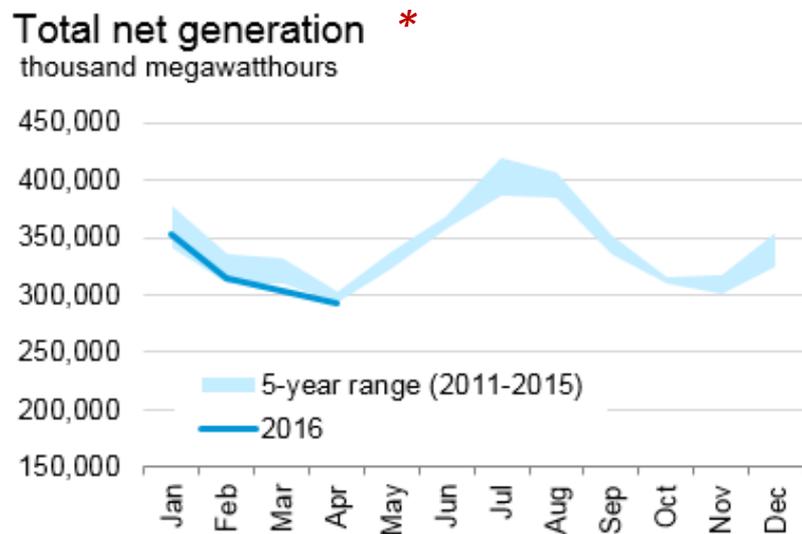
# Seasonal Outlook for Aug-Sep-Oct

## NWS Climate Prediction Center



## Short-Term Energy Outlook

# Electricity Consumption



Source: U.S. Energy Information Administration 

\* National average

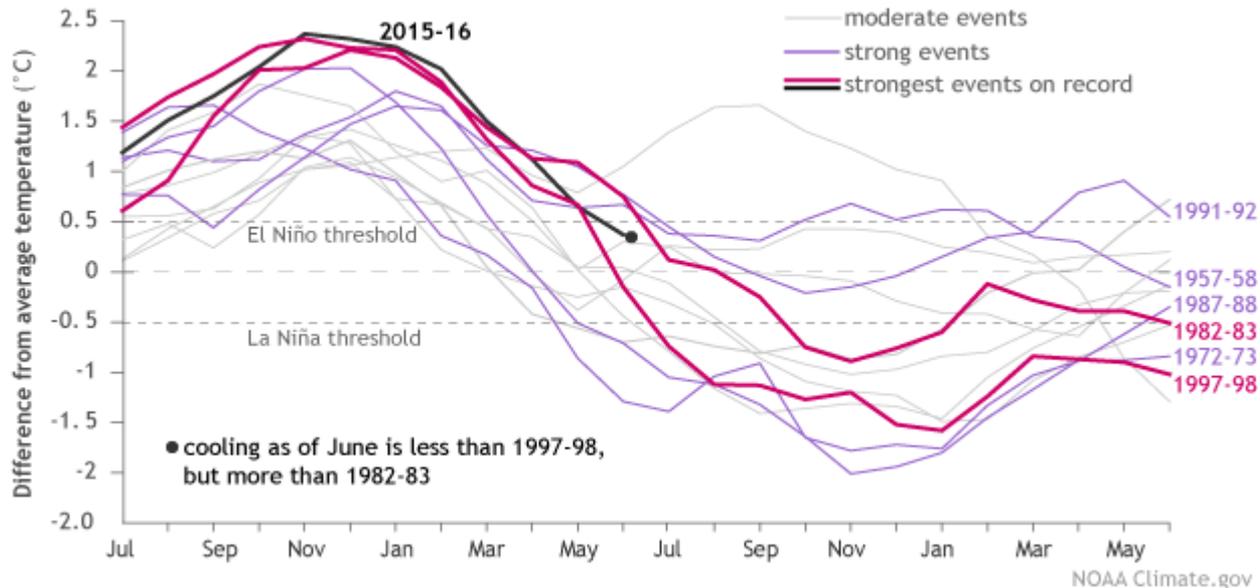
## Nationwide Retail Sales of Electricity *US EIA Estimates*

- Jan-Jun 2016 estimated -5.4% year-over-year, due to mild temperatures
- Jul-Dec 2016 projected +2.9% year-over-year, due to projected above normal temperatures, **especially in the Midwest**

# ENSO Outlook

## La Niña

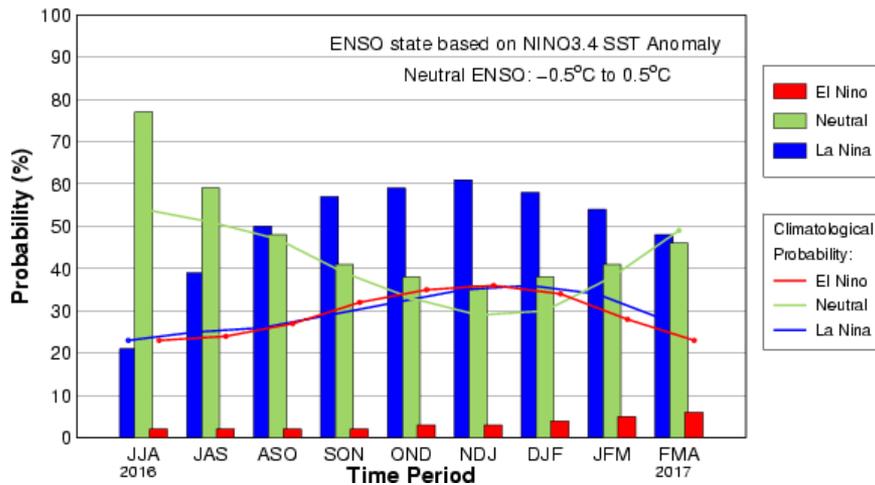
Build up and decay of all El Niño events since 1950



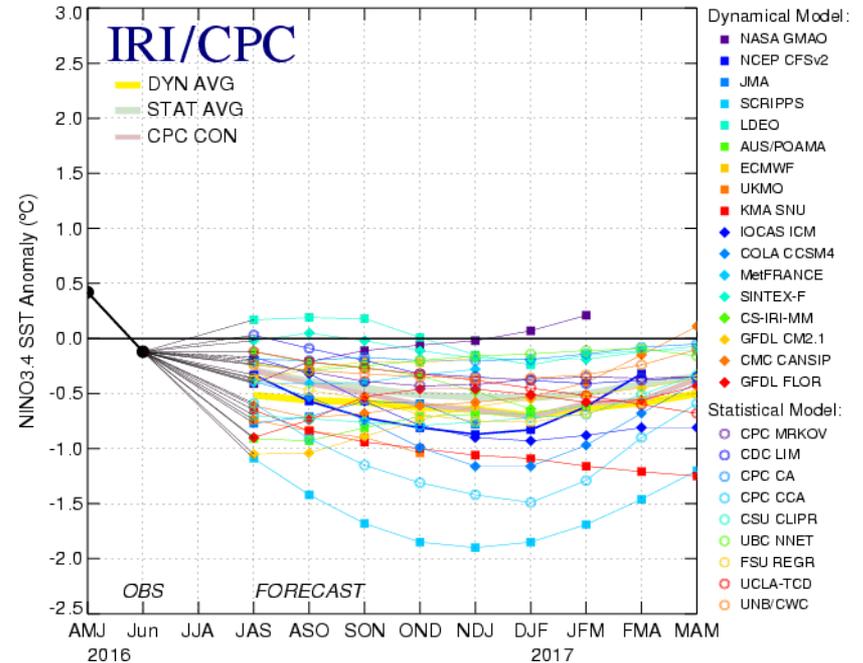
*To get a La Niña started, someone—the ocean or the atmosphere—has to make the first move. The ocean has done that—the ocean surface has cooled somewhat, and appears to be “waiting” for some stronger surface winds to upwell still colder water. **To get the La Niña to grow, we need more upwelling.** It is the atmosphere’s turn to play ball. Is it going to kick in or isn’t it?*

# Probabilistic ENSO Forecast and Model Predictions

Early-Jul CPC/IRI Official Probabilistic ENSO Forecast

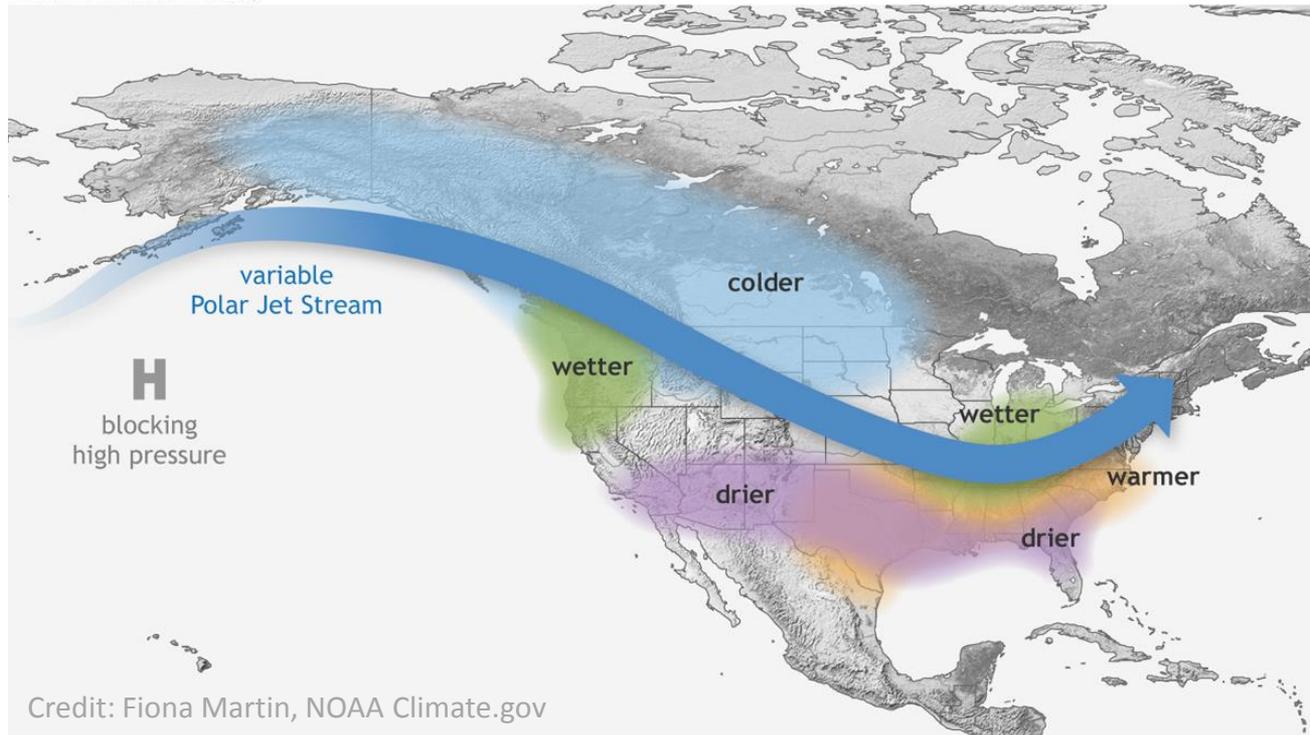


Mid-Jul 2016 Plume of Model ENSO Predictions



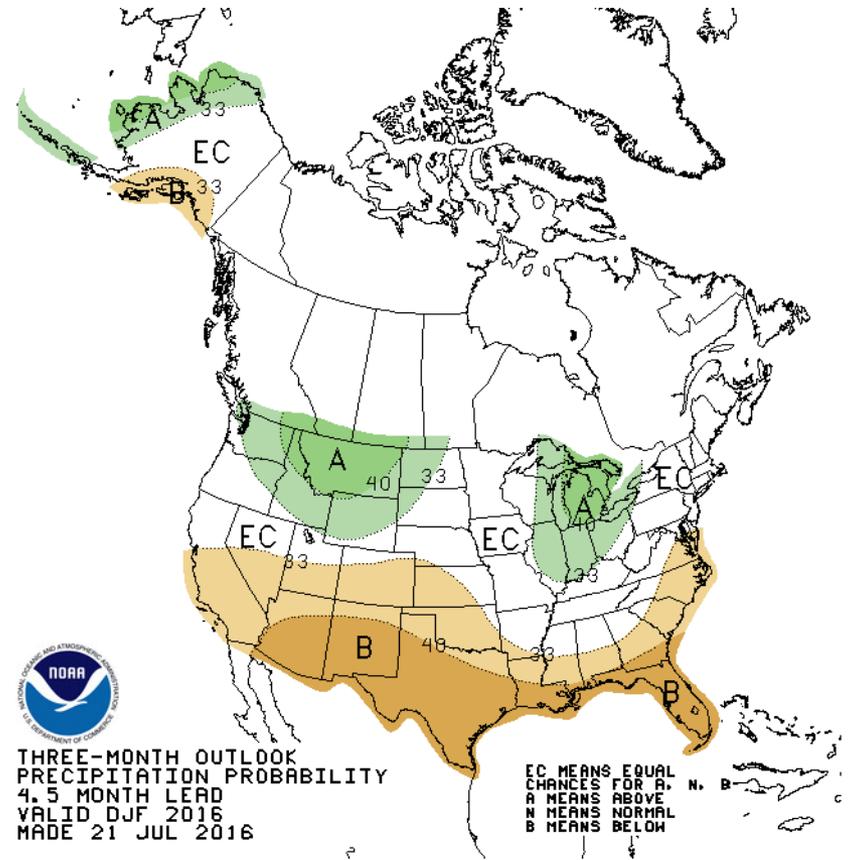
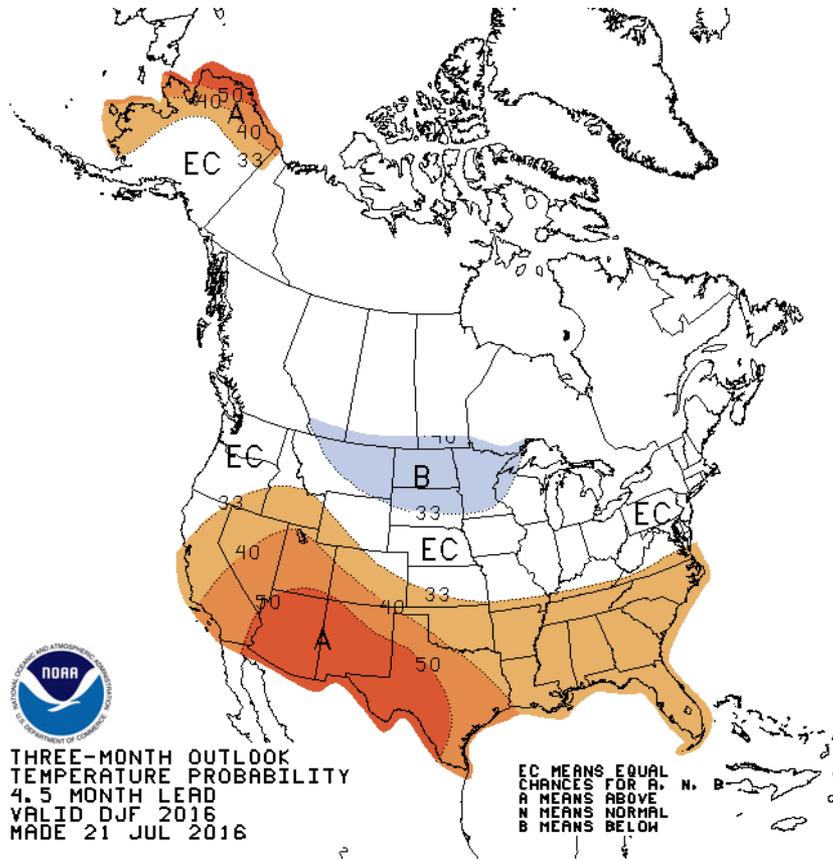
# Generalized Influence of La Niña on North American Winter Climate

TYPICAL LA NIÑA WINTERS



# Seasonal Outlook for Dec-Jan-Feb

## NWS Climate Prediction Center



# Summary

- Precipitation was above normal for much of the region over the past month, including extreme events in portions of Kentucky. Dryness eased over portions of Iowa. Meanwhile, areas of emerging drought expanded and intensified in portions of South Dakota and Wyoming, while dryness persisted in areas of Michigan and Ohio.
- Temperatures moderated over much of the region during the past month before a heat wave accompanied by high humidity developed and created stress during the past week.
- Though extreme conditions affect some areas, conditions over the region have been generally favorable for agriculture.
- La Niña conditions are likely to develop into the fall or winter, though the probability has decreased over the past month.

# Additional Information

- Today's and Past Recorded Presentations and  
<http://mrcc.isws.illinois.edu/multimedia/webinars.jsp>  
<http://www.hprcc.unl.edu/webinars.php>
- NOAA's National Centers for Environmental Information:  
<https://www.ncei.noaa.gov/>
- Monthly climate reports (U.S. & Global): [www.ncdc.noaa.gov/sotc/](http://www.ncdc.noaa.gov/sotc/)
- NOAA's Climate Prediction Center: [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)
- Climate Portal: [www.climate.gov](http://www.climate.gov)
- U.S. Drought Portal: [www.drought.gov](http://www.drought.gov)
- National Drought Mitigation Center: <http://drought.unl.edu/>
- American Association of State Climatologists  
<http://www.stateclimate.org>
- Regional Climate Centers serving the Central Region
  - Midwestern RCC <http://mrcc.isws.illinois.edu>
  - High Plains RCC <http://www.hprcc.unl.edu>

# Questions?

## Climate

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- Brian Fuchs: [bfuchs2@unl.edu](mailto:bfuchs2@unl.edu), 402-472-6775
- Jim Angel: [jimangel@illinois.edu](mailto:jimangel@illinois.edu), 217-333-0729
- Dennis Todey: [dennis.todey@ars.usda.gov](mailto:dennis.todey@ars.usda.gov), 515-294-2013
- Doug Kluck: [doug.kluck@noaa.gov](mailto:doug.kluck@noaa.gov), 816-994-3008
- Mike Timlin: [mtimlin@illinois.edu](mailto:mtimlin@illinois.edu), 217-333-8506
- Natalie Umphlett: [numphlett2@unl.edu](mailto:numphlett2@unl.edu), 402 472-6764
- Barb Mayes Boustead: [barbara.mayes@noaa.gov](mailto:barbara.mayes@noaa.gov), 402-359-4381

## Weather

- [crhroc@noaa.gov](mailto:crhroc@noaa.gov)

Thank you for your participation!