

# Great Plains and Midwest Climate Outlook June 16, 2016

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402-472-6775



Pathfinder Dam in Wyoming June 2016. Photo courtesy of Chad McNutt, McNutt Ranch



# General Information

## ▶ Providing climate services to the Central Region

- Collaboration Activity Between:

Dennis Todey (South Dakota State Climatologist), Jim Angel (Illinois State Climatologist), Doug Kluck (NOAA), State Climatologists and the Midwest Regional Climate Center, High Plains Regional Climate Center, NOAAs Climate Prediction Center, Brian Fuchs and Mark Svoboda (National Drought Mitigation Center)

## ▶ Next Climate/Drought Outlook Webinar

- July 21, 2016 with Stuart Foster, Kentucky State Climatologist

## ▶ Access to Future Climate Webinars and Information

- ▶ <http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars>

## ▶ Past recorded presentations and slides can be found here:

- ▶ <http://mrcc.isws.illinois.edu/webinars.htm>

- ▶ <http://www.hprcc.unl.edu/webinars.php>

## ▶ There will be time for questions at the end



# Agenda

- ▶ Current Conditions
- ▶ Regional Climate Updates
- ▶ Outlooks

Corn fields outside Columbia, MO.  
Photos courtesy of Pat Guinan, MO State Climatologist



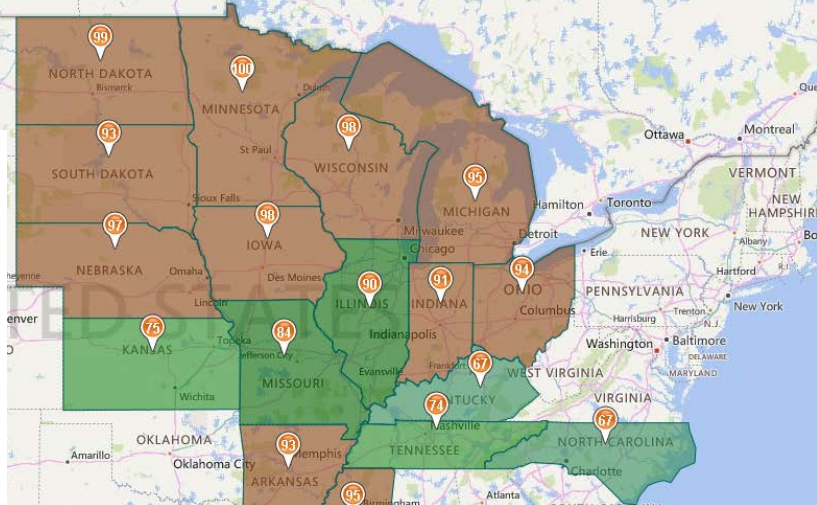
# Current Conditions

Soybean crop 92% planted with 79% emerged

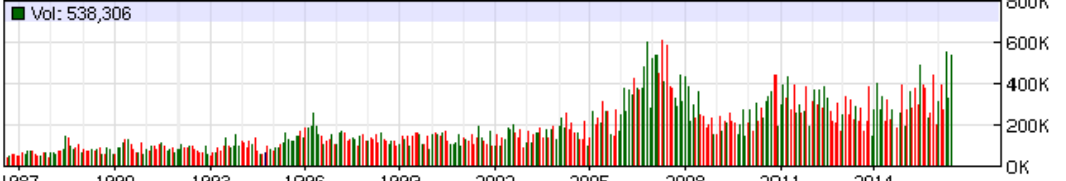
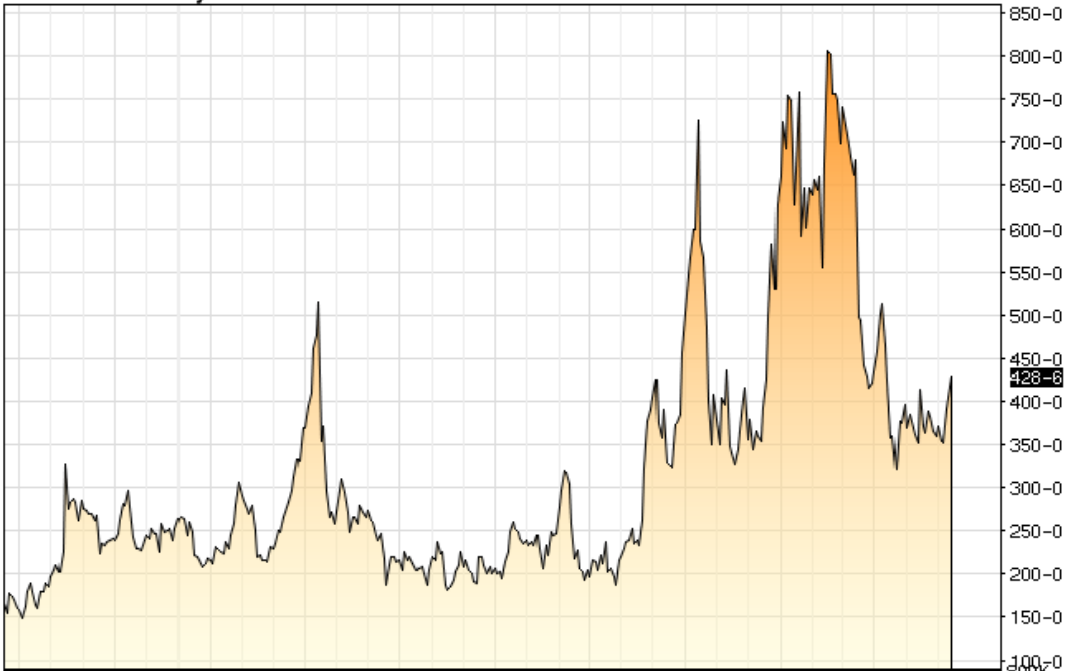
## Soybean Planting Map



Select State



ZC - Corn - Monthly Area Chart

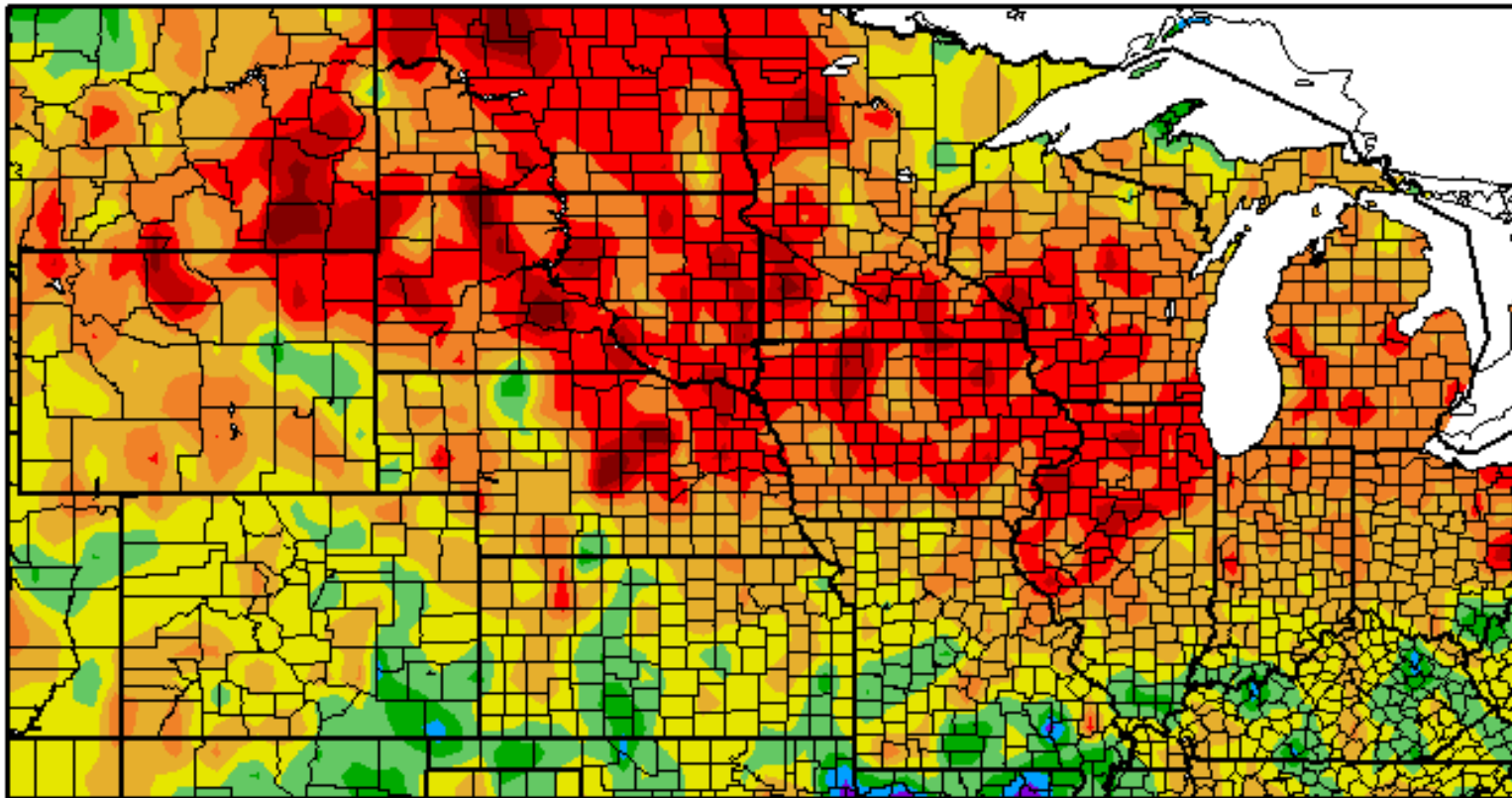


# 30-Day Temperature Departure

Departure from Normal Temperature (F)

5/17/2016 - 6/15/2016

<http://www.hprcc.unl.edu/maps/current/>



Generated 6/16/2016 at HPRCC using provisional data.

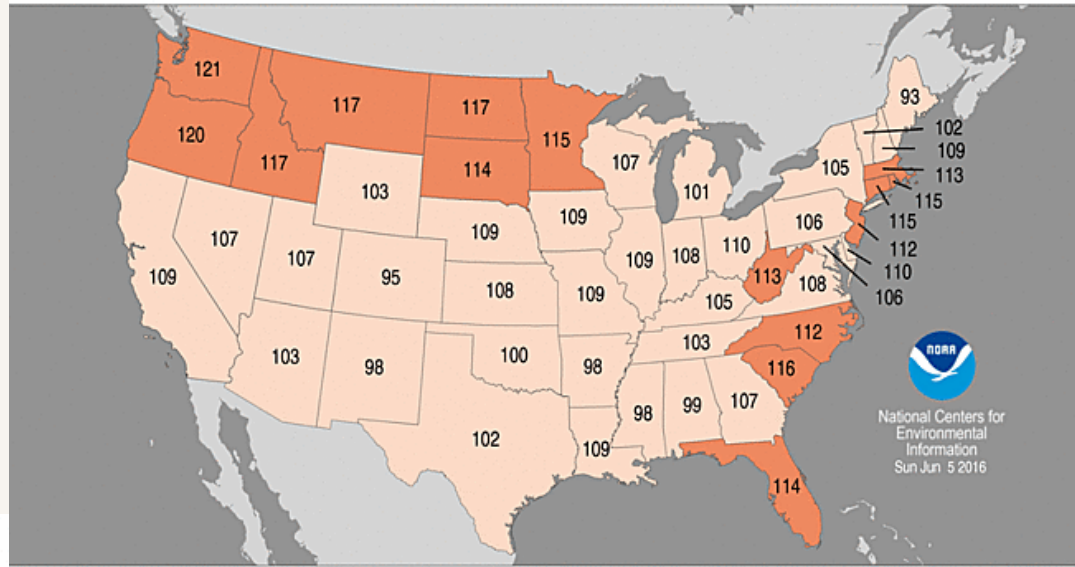
Regional Climate Centers



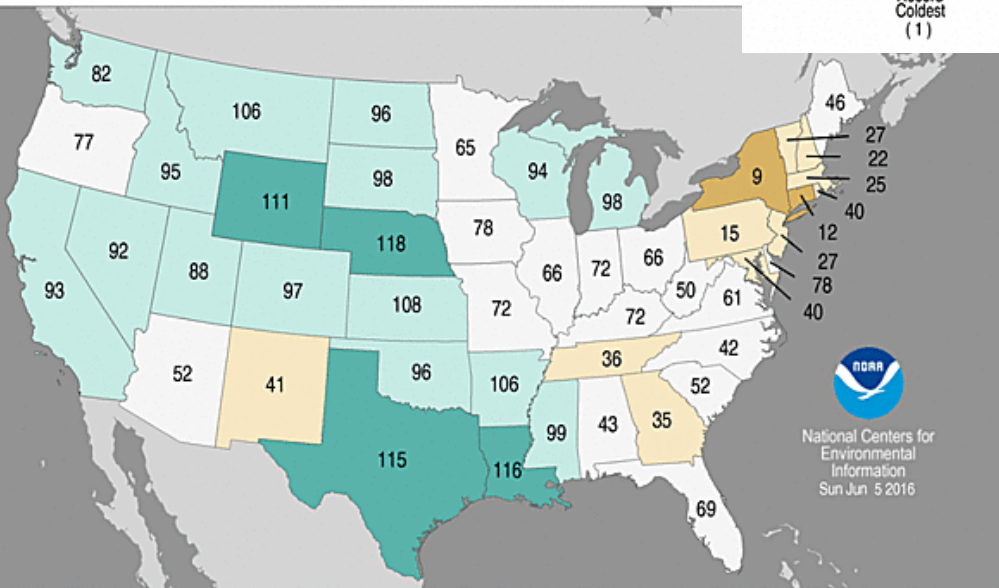
# May 2016 Climate

<https://www.ncdc.noaa.gov/sotc/>

## Statewide Average Temperature Ranks March–May 2016 Period: 1895–2016



## Statewide Precipitation Ranks March–May 2016 Period: 1895–2016



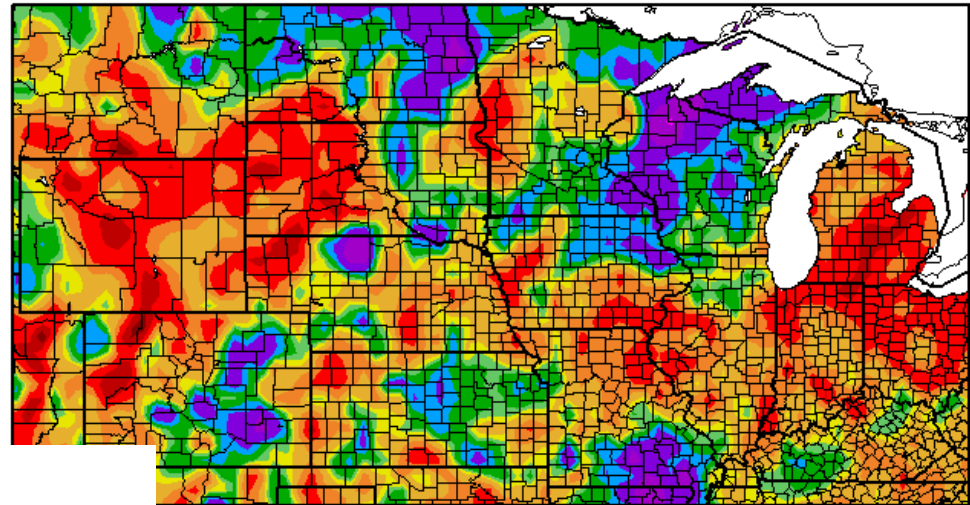
Record Coldest (1)    Much Below Average    Below Average    Near Average    Above Average    Much Above Average    Record Warmest (122)

Record Driest (1)    Much Below Average    Below Average    Near Average    Above Average    Much Above Average    Record Wettest (122)

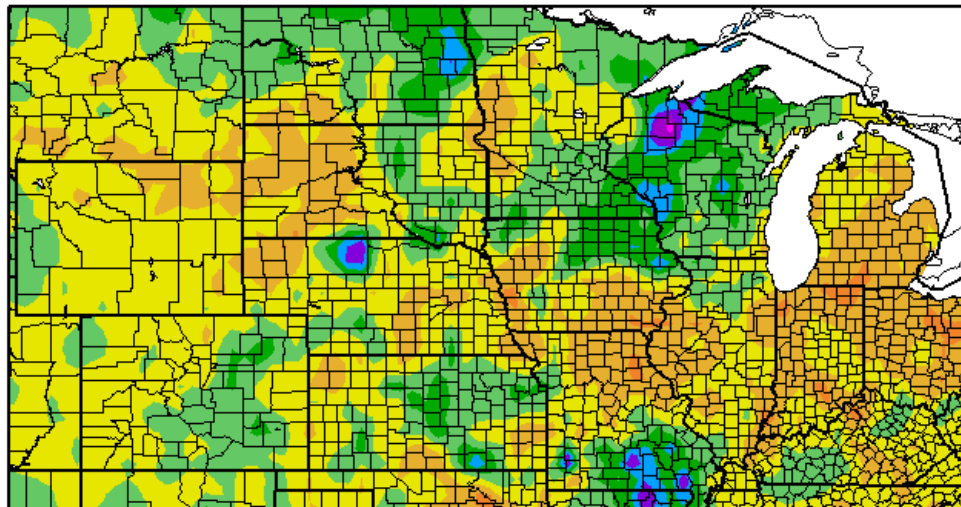


# 30-Day Precipitation

Percent of Normal Precipitation (%)  
5/17/2016 - 6/15/2016



Departure from Normal Precipitation (in)  
5/17/2016 - 6/15/2016



25 50 70 90 100 110 130 150 200 300  
16 at HPRCC using provisional data. Regional Climate Centers

-7.5 -6 -4.5 -3 -1.5 0 1.5 3 4.5 6 7.5  
Generated 6/16/2016 at HPRCC using provisional data. Regional Climate Centers

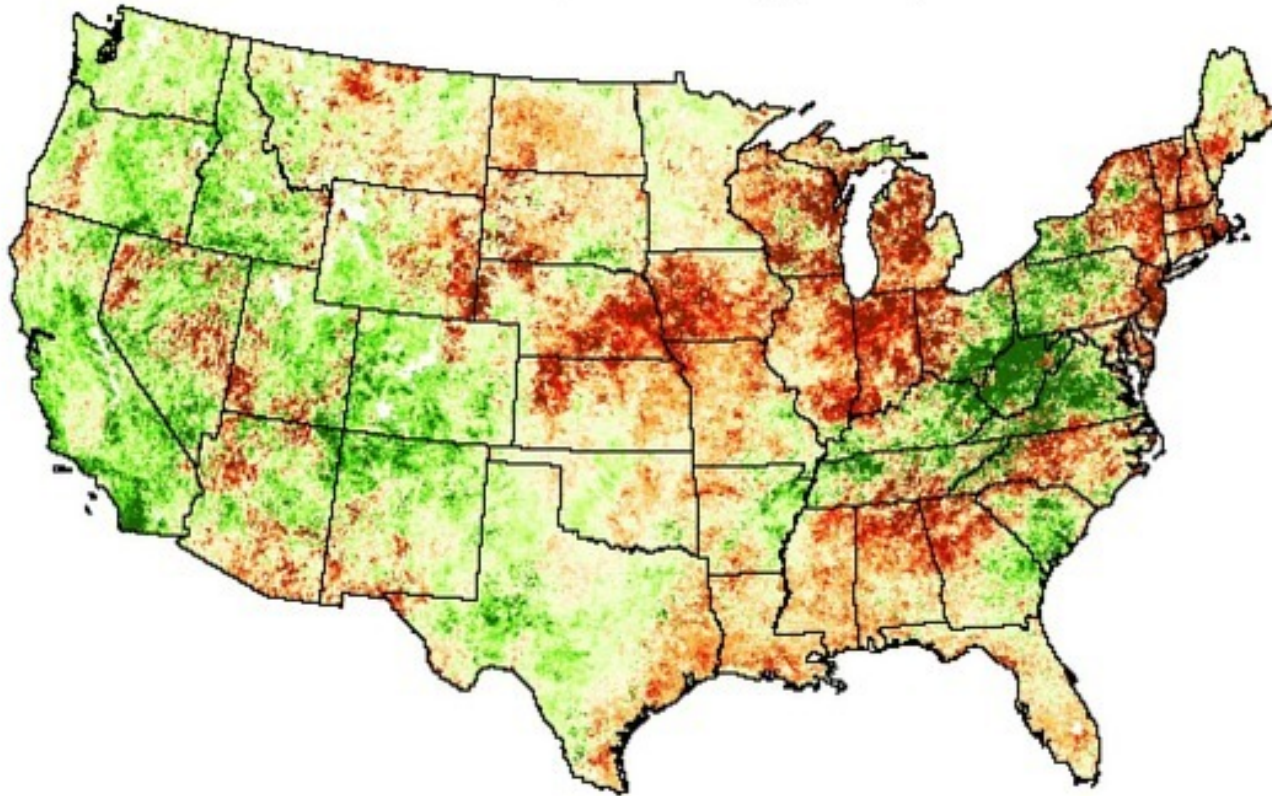


# Evaporative Stress Index (ESI)

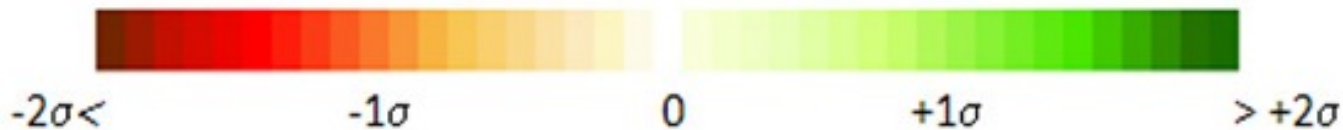
<http://hrsl.arsusda.gov/drought/index.php>

## ESI Change 4km

2 month composite ending June 14, 2016



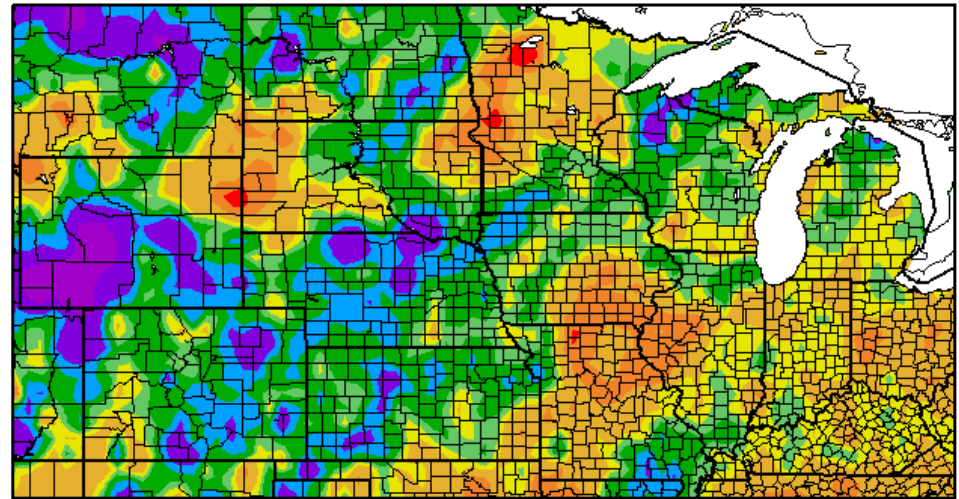
Standardized ESI change anomalies



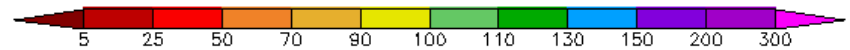


# 90-Day Precipitation

Percent of Normal Precipitation (%)  
3/18/2016 - 6/15/2016

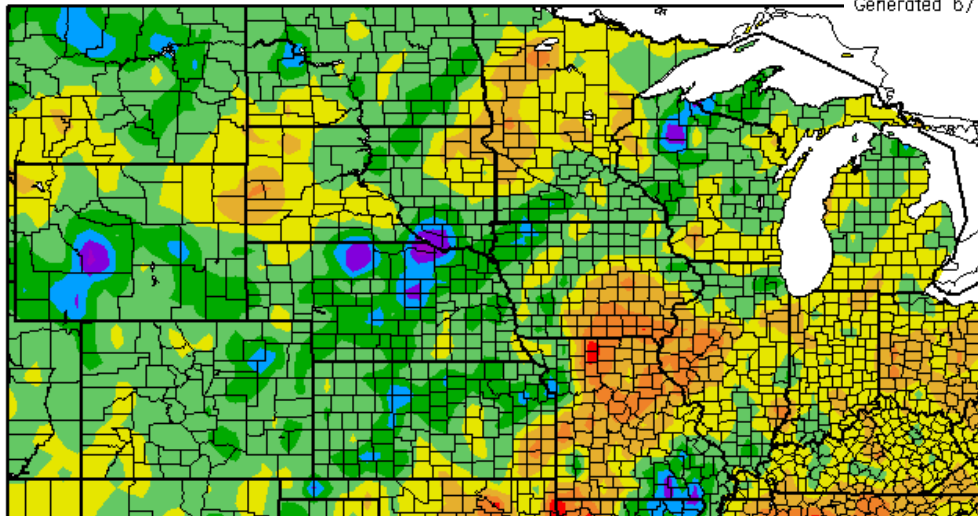


Departure from Normal Precipitation (in)  
3/18/2016 - 6/15/2016



Generated 6/16/2016 at HPRCC using provisional data.

Regional Climate Centers



Generated 6/16/2016 at HPRCC using provisional data.

Regional Climate Centers

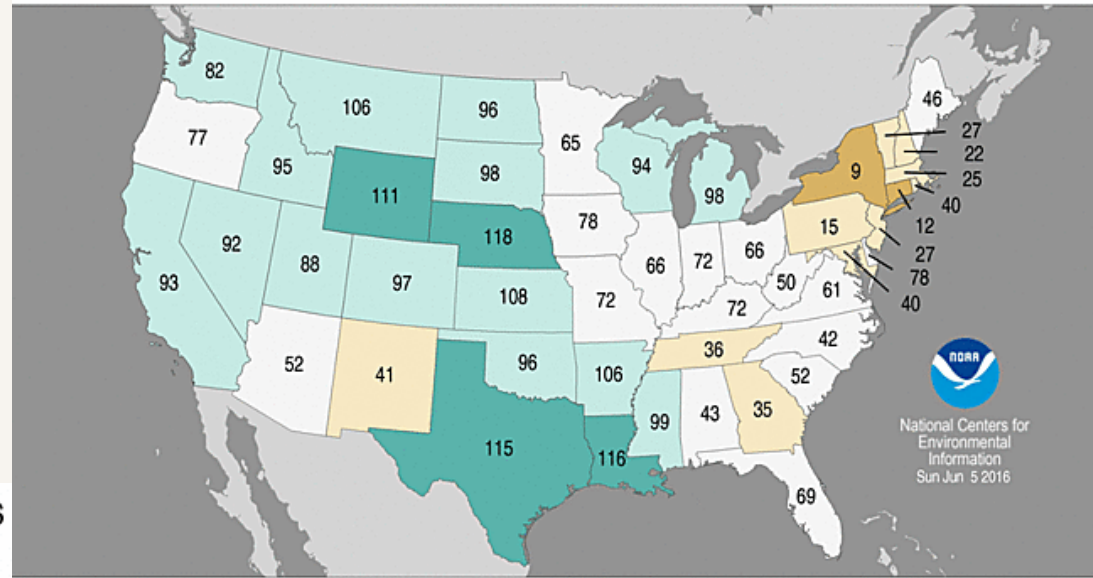


# March-May 2016 Climate

## Statewide Precipitation Ranks

March-May 2016

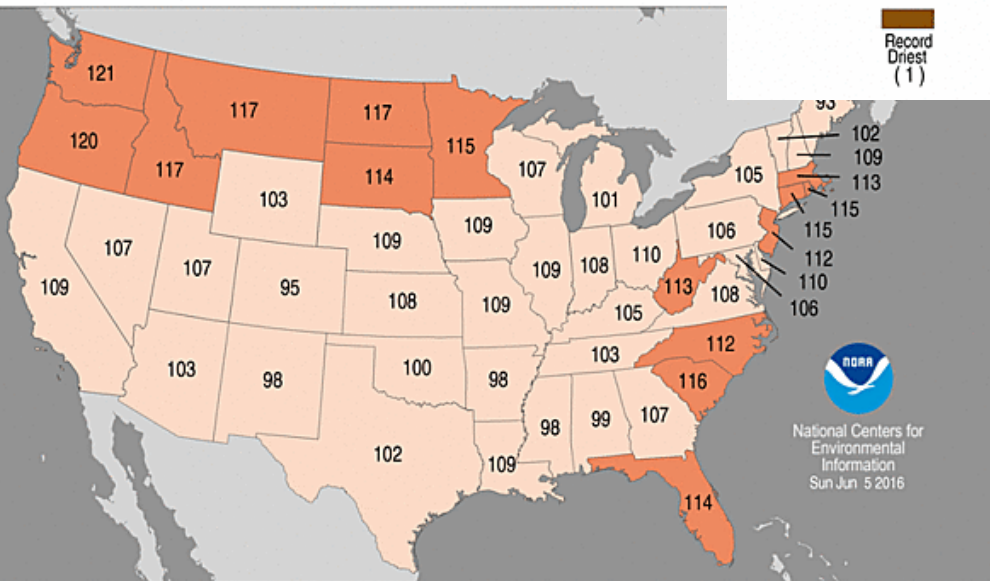
Period: 1895-2016



## Statewide Average Temperature Ranks

March-May 2016

Period: 1895-2016

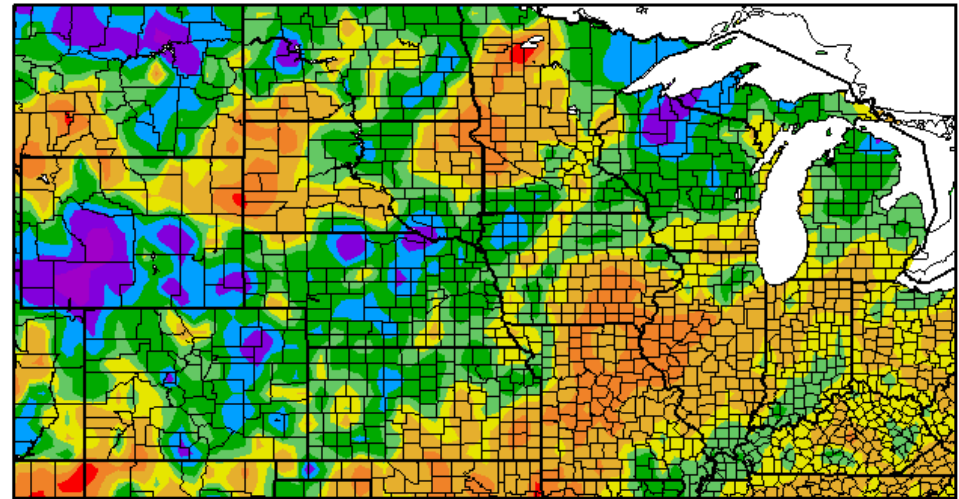


National Centers for Environmental Information  
Sun Jun 5 2016

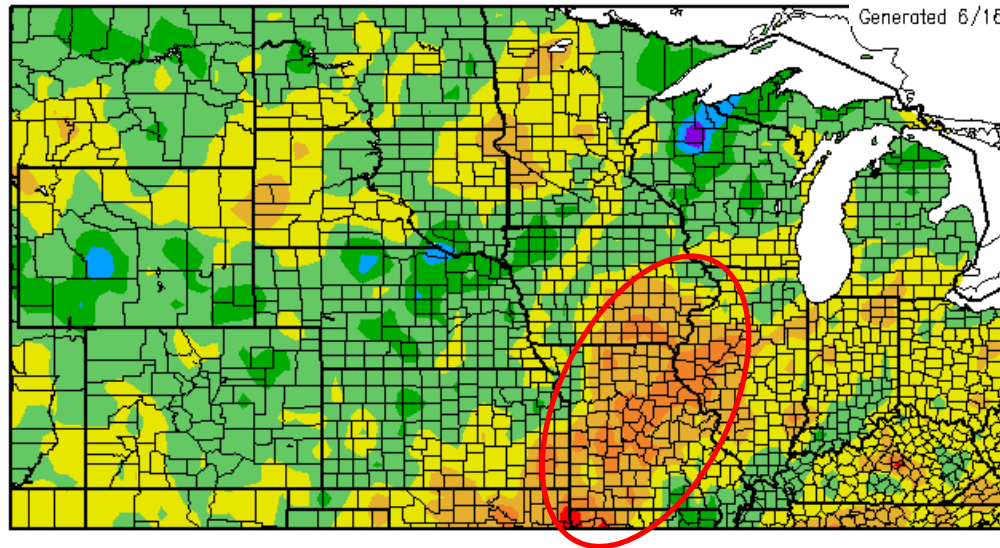


# Year to Date Precipitation

Percent of Normal Precipitation (%)  
1/1/2016 - 6/15/2016



Departure from Normal Precipitation (in  
1/1/2016 - 6/15/2016



Generated 6/16/2016 at HPRCC using provisional data.

Regional Climate Centers



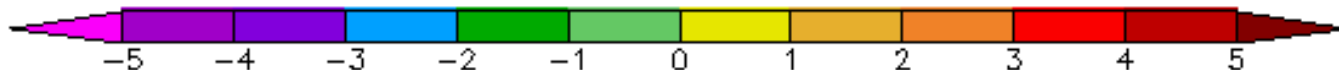
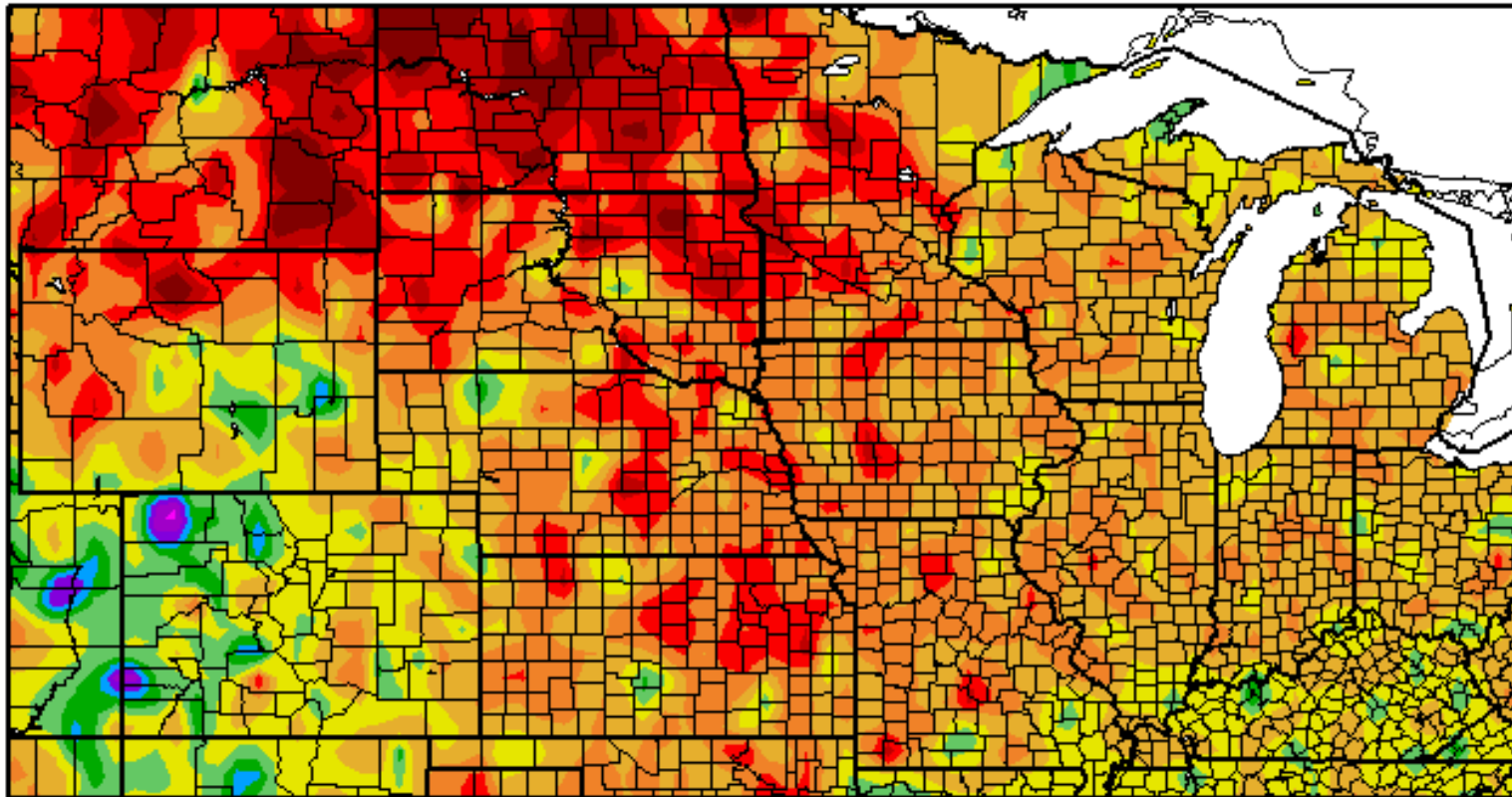
Generated 6/16/2016 at HPRCC using provisional data.

Regional Climate Centers



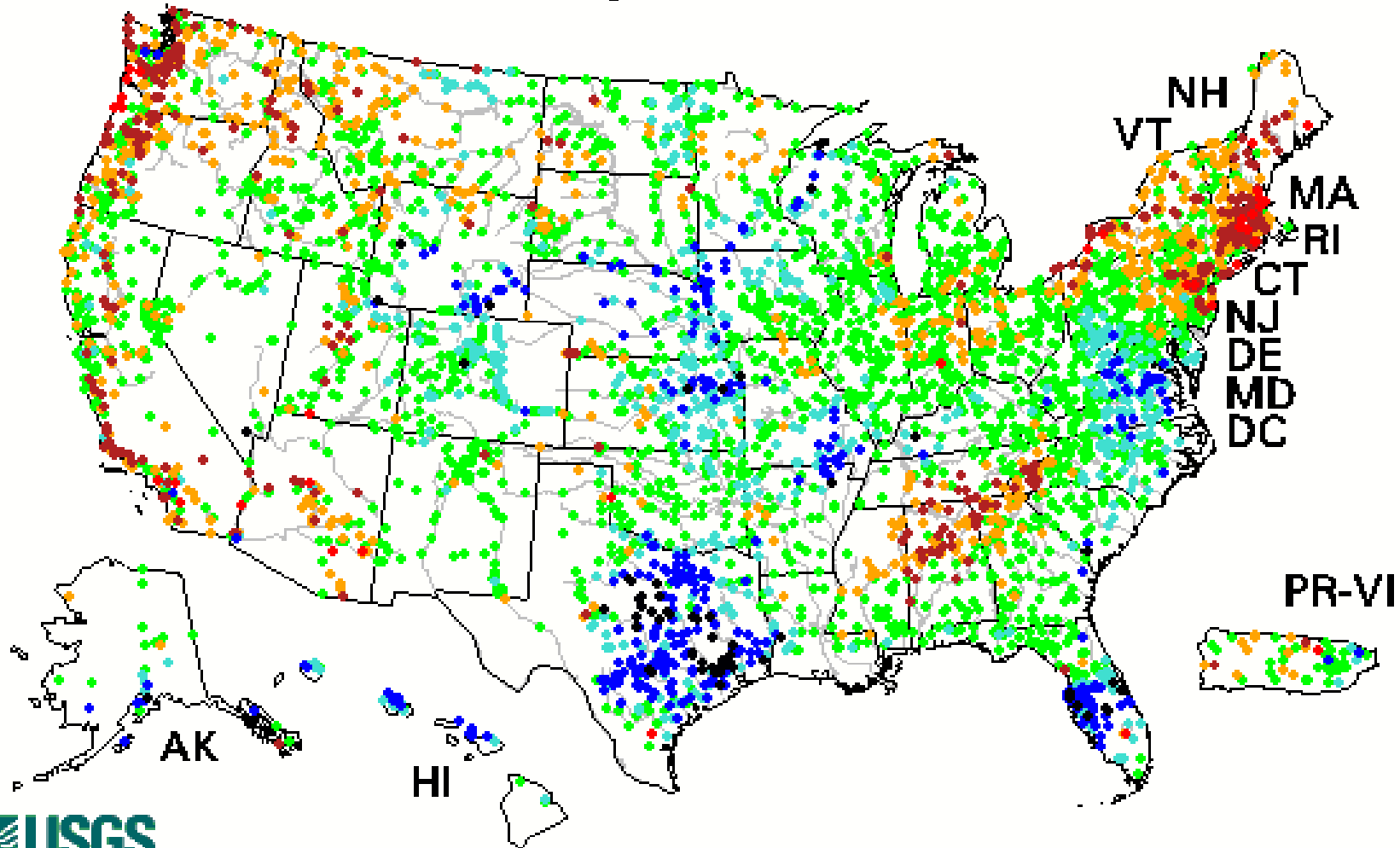
# Year to Date Temperature

Departure from Normal Temperature (F)  
1/1/2016 – 6/15/2016



# 28-Day Average Streamflow

Tuesday, June 14, 2016



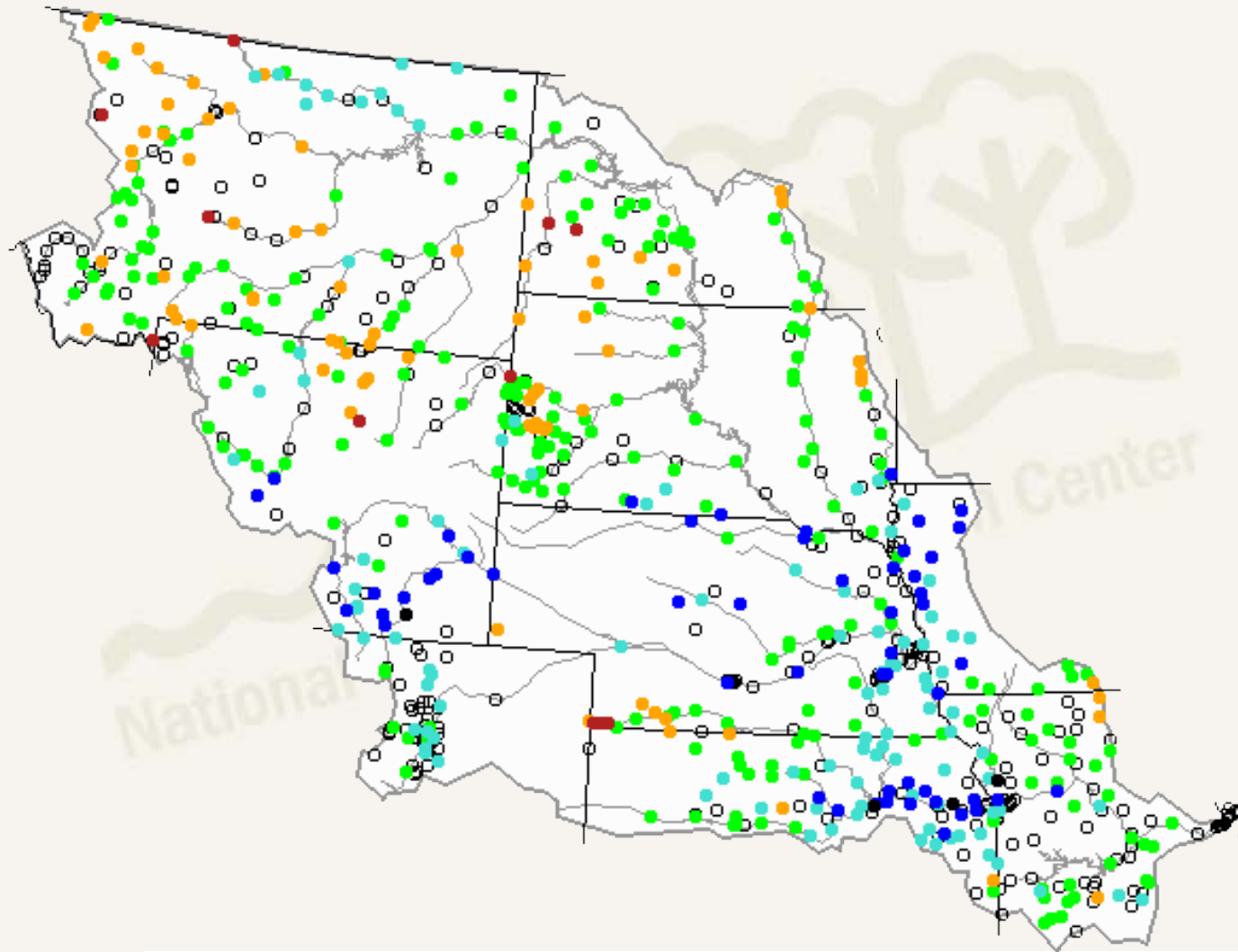
<http://waterwatch.usgs.gov/>

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



# 28-Day Average Streamflow

Tuesday, June 14, 2016



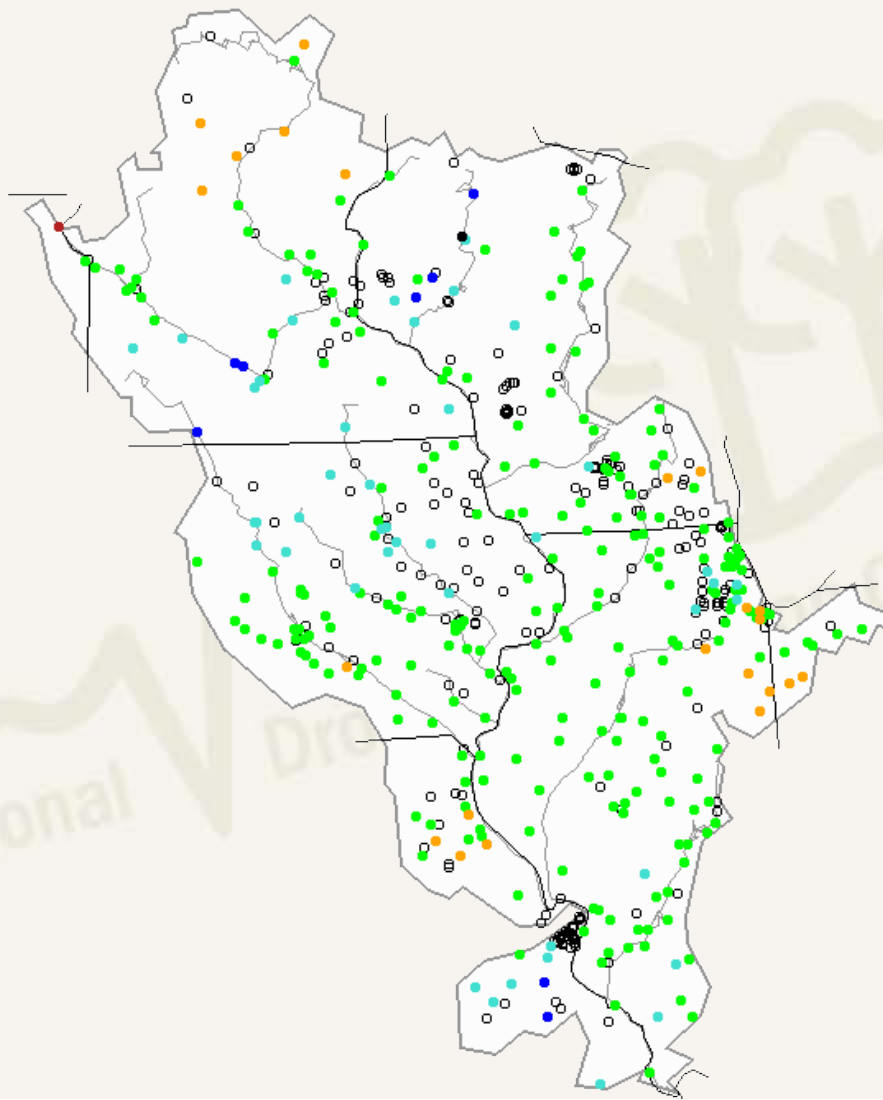
Explanation - Percentile classes

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









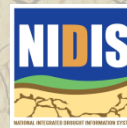
# 28-Day Average Streamflow

Tuesday, June 14, 2016



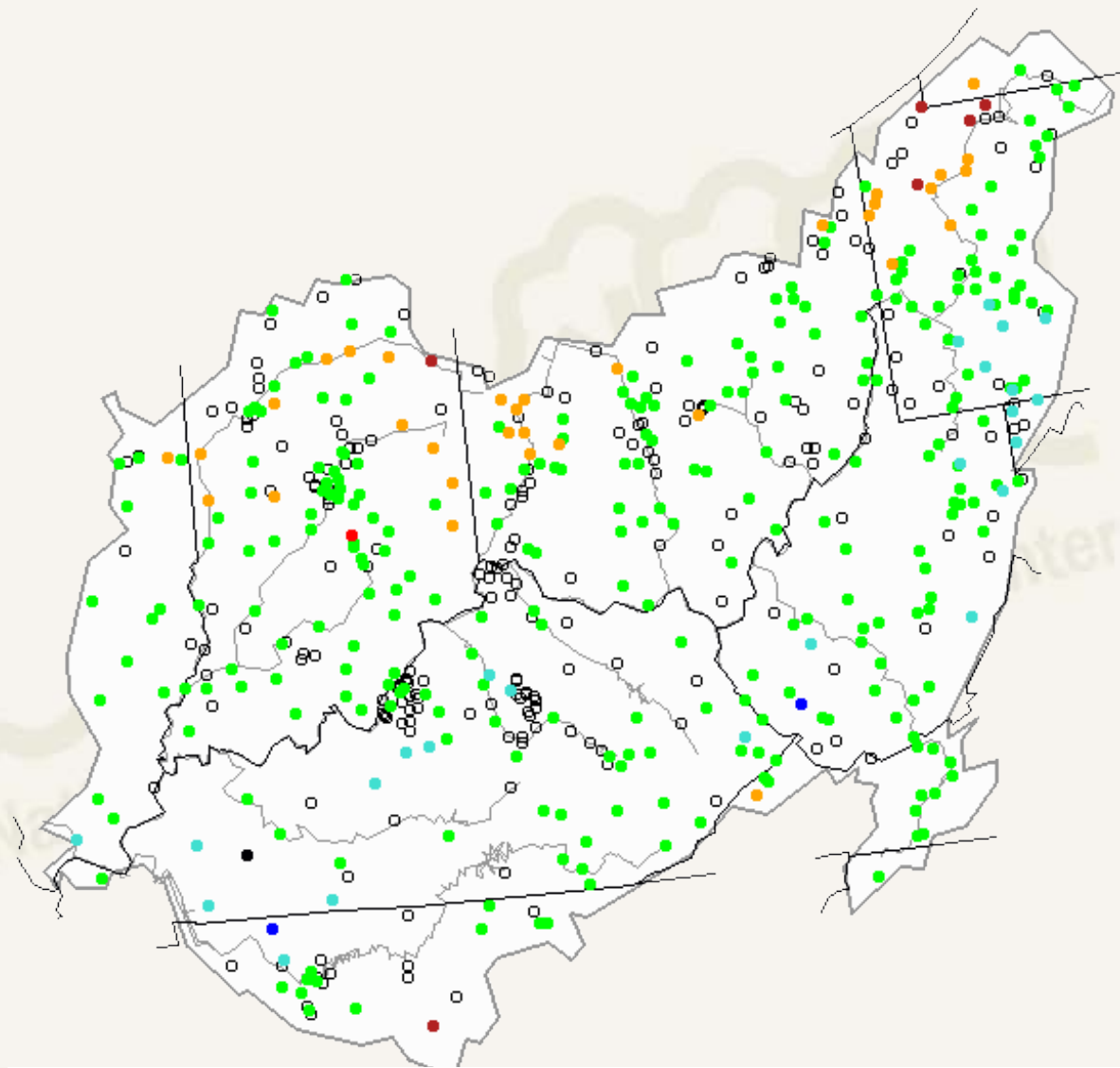
Explanation - Percentile classes







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

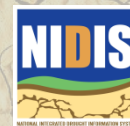


# 28-Day Average Streamflow

Tuesday, June 14, 2016



Explanation - Percentile classes						
						
Low	<10	10-24	25-75	76-90	>90	High
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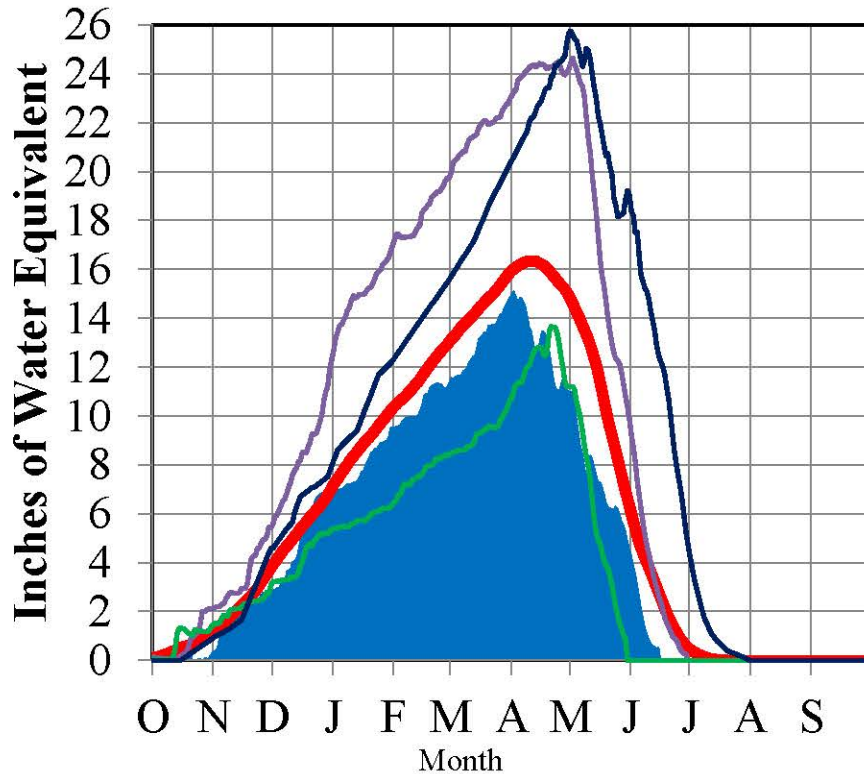




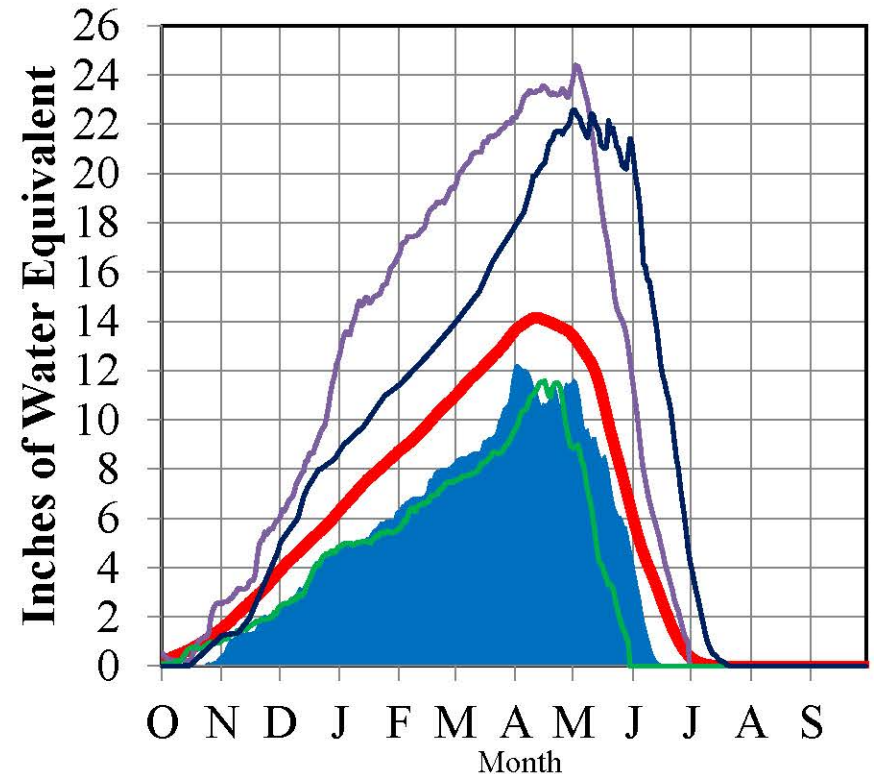
# Missouri River Basin – Mountain Snowpack Water Content 2015-2016 with comparison plots from 1997\*, 2001\*, and 2011

June 15, 2016

## Total above Fort Peck



## Total Fort Peck to Garrison



The Missouri River Basin mountain snowpack normally peaks near April 15. On June 15, 2016 the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach is currently 0.6 inch, 20% of average and 4% of this year’s peak. The mountain SWE in the “Total Fort Peck to Garrison” reach is currently 0.1 inch, 3% of average and less than 1% of this year’s peak. The mountain snowpack has peaked in both reaches -- on April 1 for the “Total above Fort Peck” reach with 15.0” SWE, 95% of average, and on April 2 for the “Total Fort Peck to Garrison” reach with 12.2” SWE, 89% of average. <http://www.nwd-mr.usace.army.mil/rcc/reports/snow.pdf>

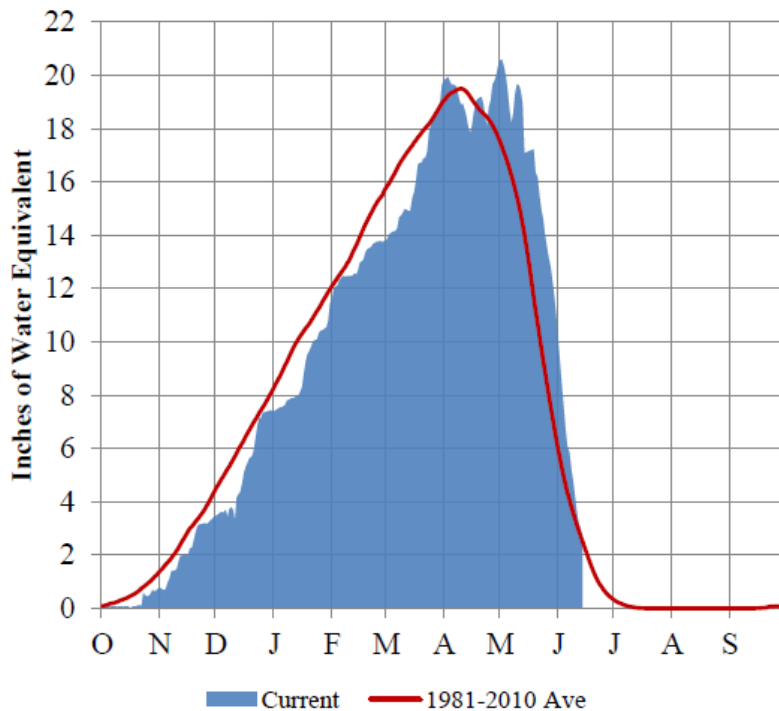
\*Generally considered the high and low year of the last 20-year period.

Provisional data. Subject to revision.

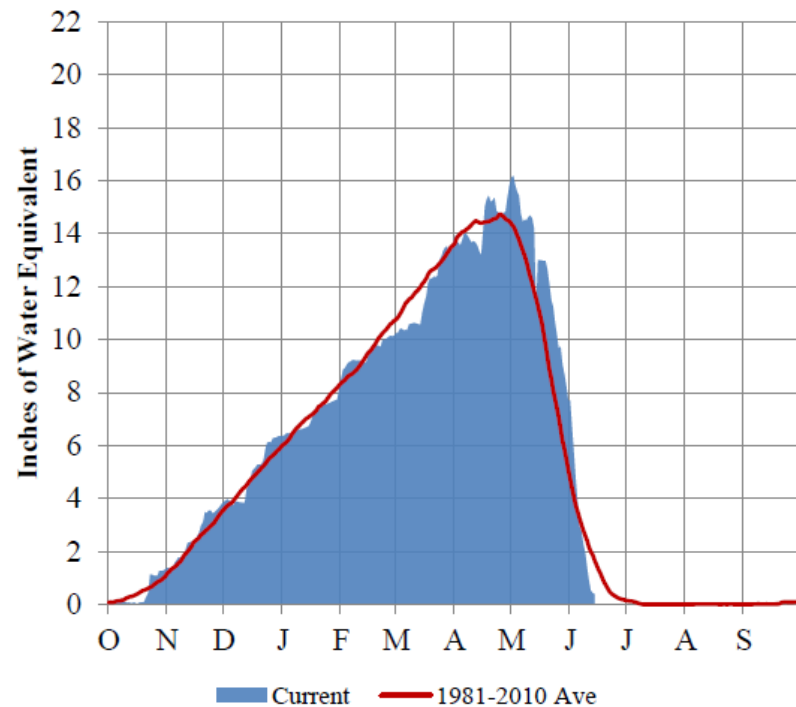
# Platte River Basin - Mountain Snowpack Water Content Water Year 2015-2016

6/15/2016

## Total North Platte



## Total South Platte

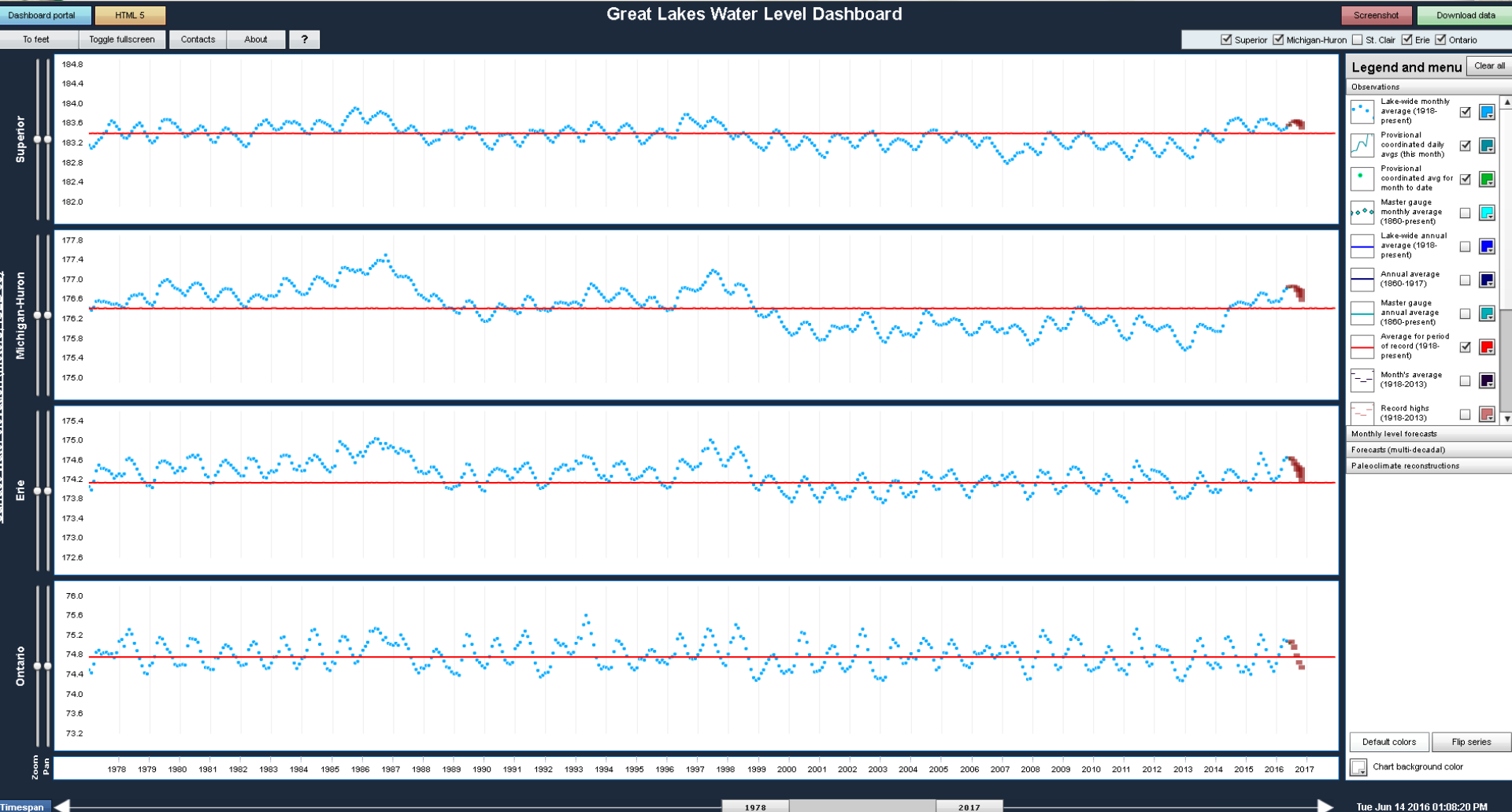


The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of June 14, 2016, the mountain snowpack SWE in the "Total North Platte" reach is currently 2.6", 103% of average. The mountain snowpack SWE in the "Total South Platte" reach is currently 0.4", 24% of average.



# Great Lakes

<http://www.glerl.noaa.gov/>



# GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)

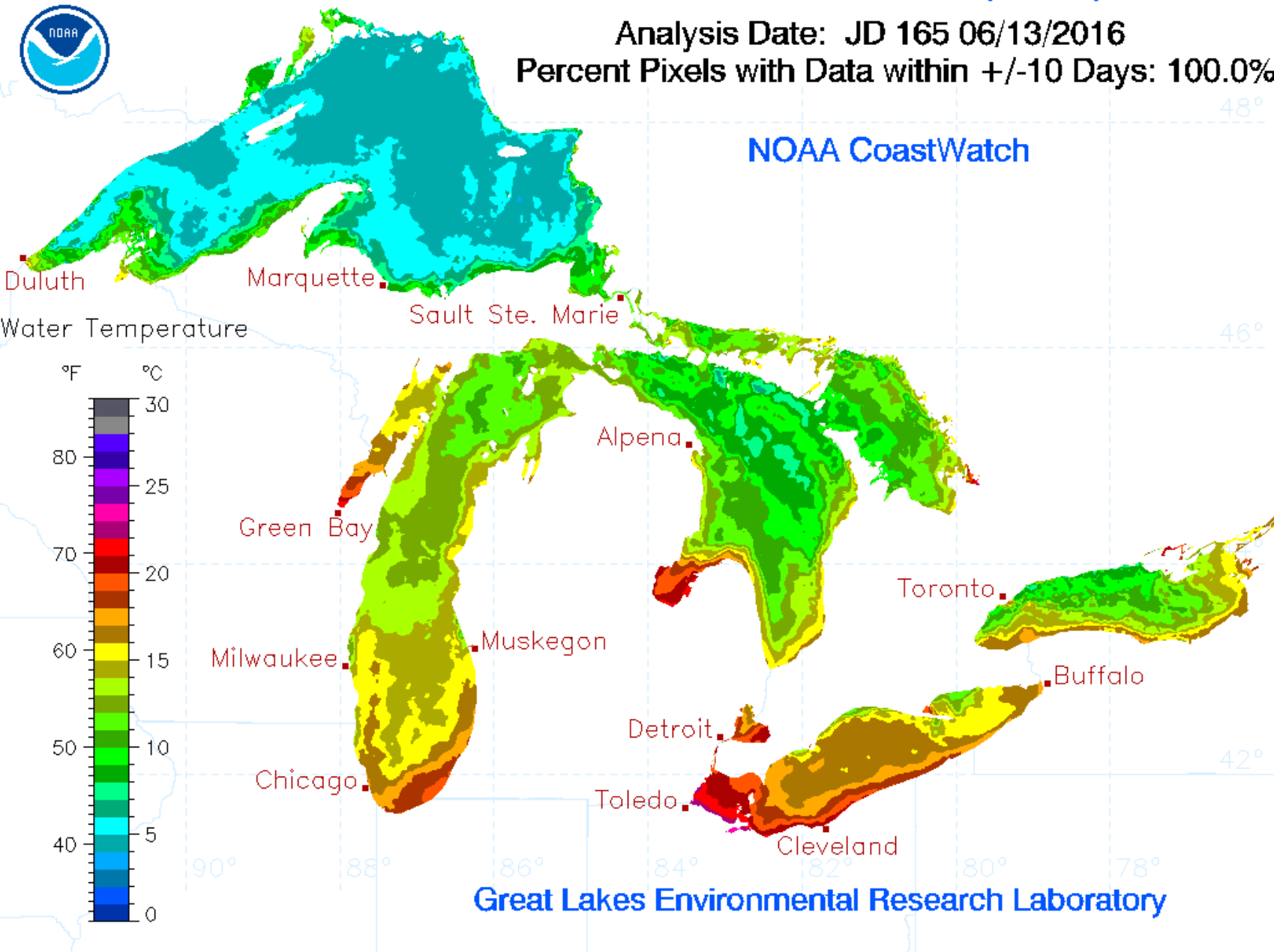
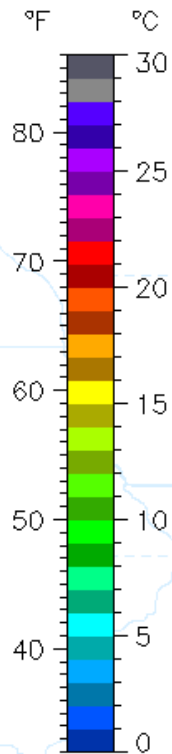


Analysis Date: JD 165 06/13/2016

Percent Pixels with Data within +/-10 Days: 100.0%

NOAA CoastWatch

Water Temperature



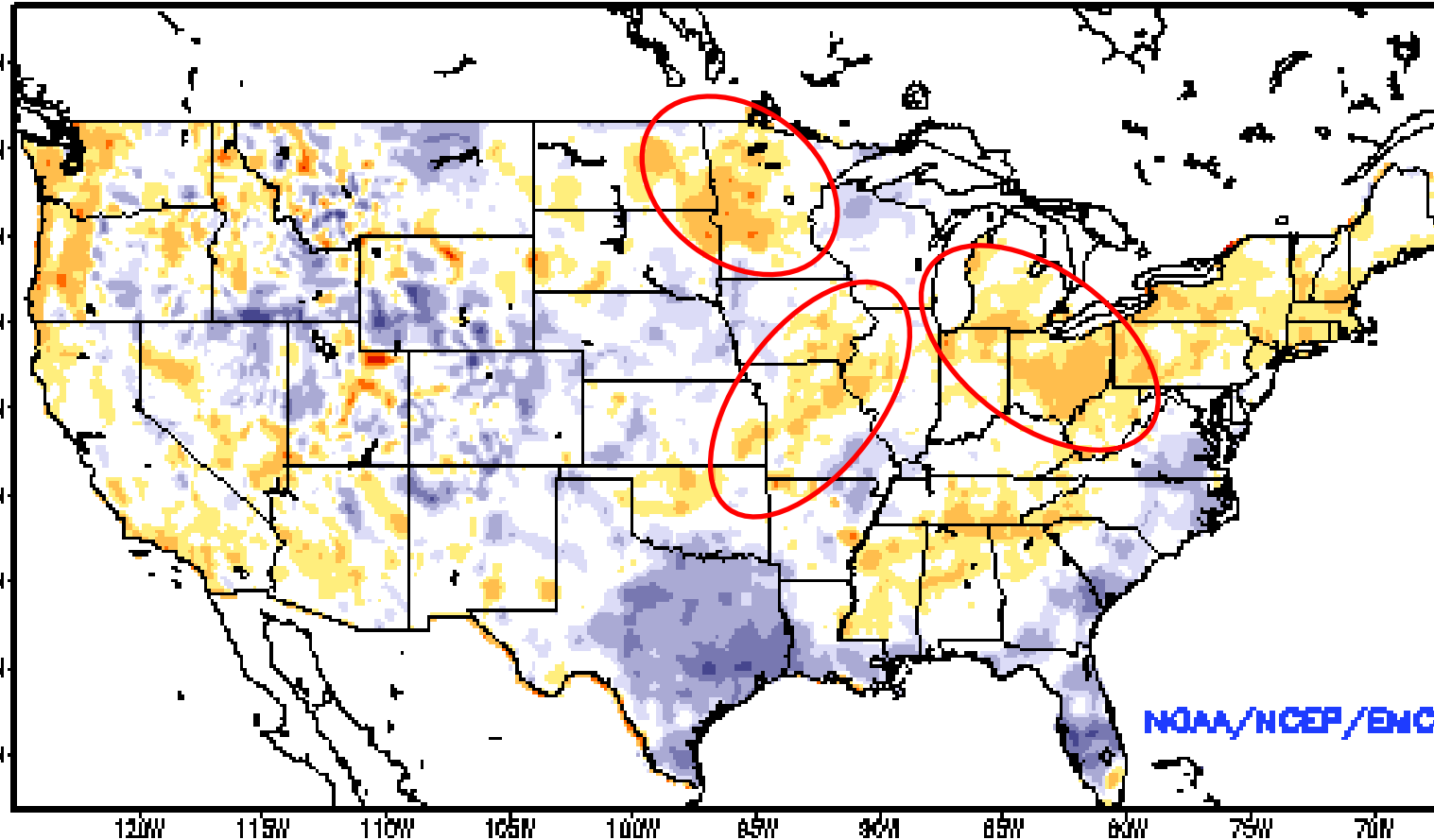
Great Lakes Environmental Research Laboratory



# Soil Moisture Anomaly

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

**Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)  
NCEP NLDAS Products Valid: JUN 11, 2016**



# NASS Soil Moisture Conditions

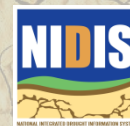
Topsoil Moisture Condition - Selected States: Week Ending June 12, 2016

State	:Very short :	Short :	Adequate :	Surplus
-----				
Percent				
Colorado .....	2	11	77	10
Illinois .....	1	17	75	7
Indiana .....	6	25	61	8
Iowa .....	-	12	82	6
Kansas .....	2	17	76	5
Kentucky .....	1	11	76	12
Michigan .....	13	33	51	3
Minnesota .....	1	7	78	14
Missouri .....	3	25	66	6
Nebraska .....	2	23	70	5
North Dakota ...:	1	15	76	8
Ohio .....	2	29	63	6
South Dakota ...:	5	17	71	7
Wisconsin .....	-	5	81	14
Wyoming .....	3	18	63	16

[http://www.nass.usda.gov/Statistics\\_by\\_State/](http://www.nass.usda.gov/Statistics_by_State/)

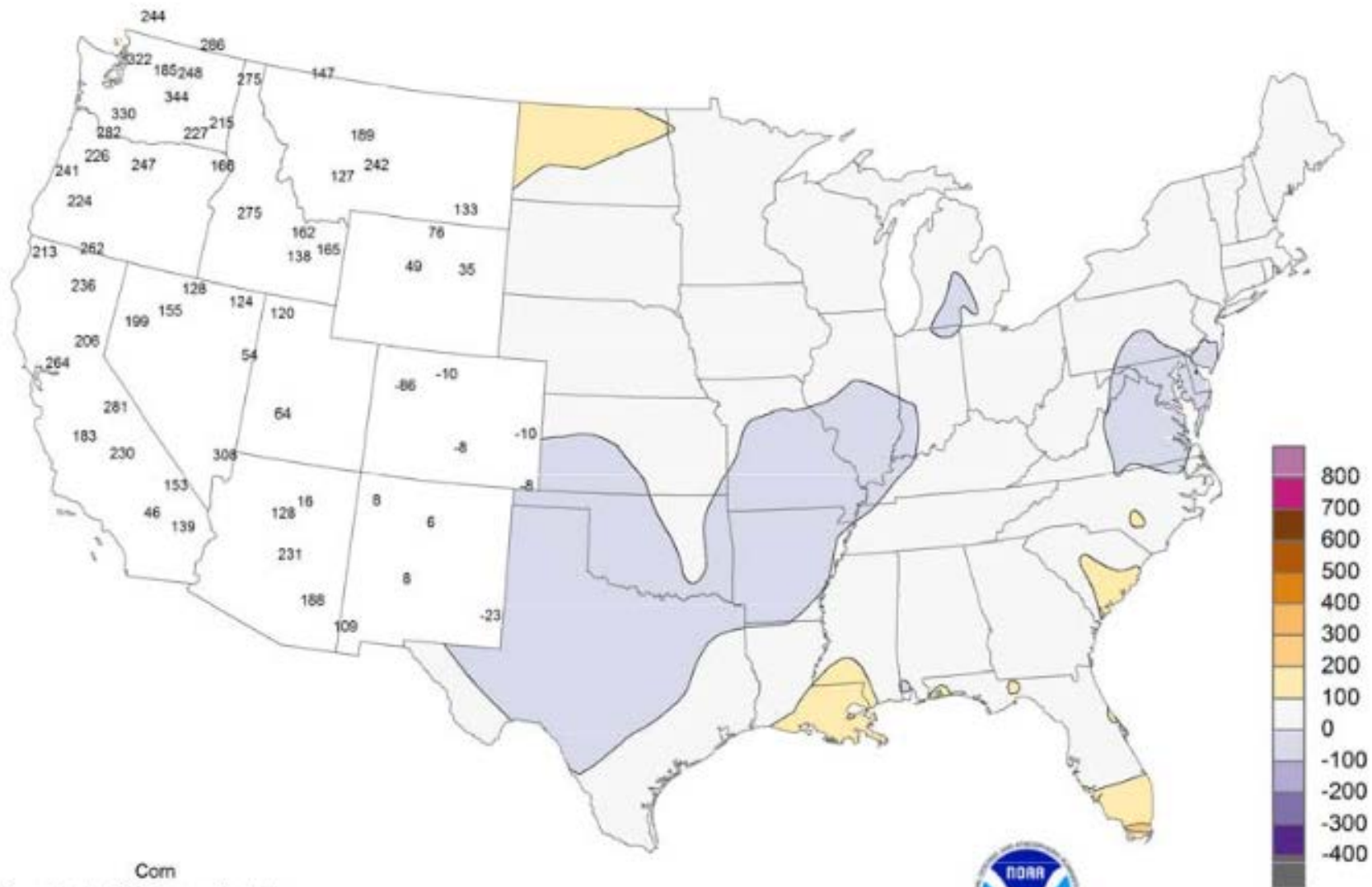
Subsoil Moisture Condition - Selected States: Week Ending June 12, 2016

State	:Very short :	Short :	Adequate :	Surplus
-----				
percent				
Colorado .....	3	10	81	6
Illinois .....	1	13	77	9
Indiana .....	4	18	72	6
Iowa .....	-	7	85	8
Kansas .....	2	12	82	4
Kentucky .....	1	7	80	12
Michigan .....	4	24	65	7
Minnesota .....	1	7	79	13
Missouri .....	3	14	79	4
Nebraska .....	-	12	82	6
North Dakota ...:	2	16	79	3
Ohio .....	2	21	70	7
South Dakota ...:	4	14	78	4
Wisconsin .....	-	6	83	11
Wyoming .....	3	17	71	9



# Departure from Normal Growing Degree Days

## APR 1 - JUN 11, 2016



Corn

Computed to 50°F base with daily maximum temperature limited to 86°F or less and daily minimum to 50°F or more.

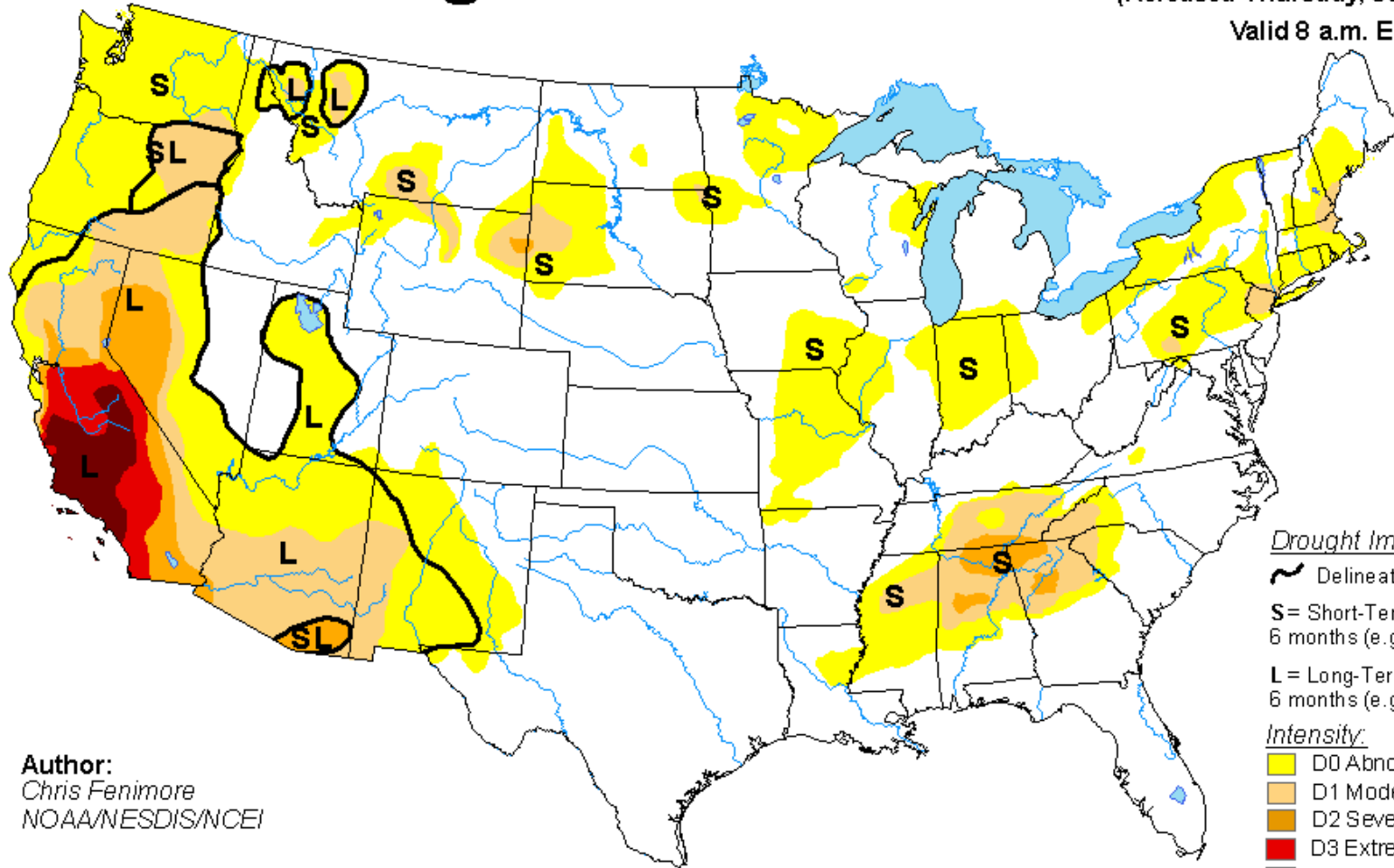


# U.S. Drought Monitor

June 14, 2016

(Released Thursday, Jun. 16, 2016)

Valid 8 a.m. EDT



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

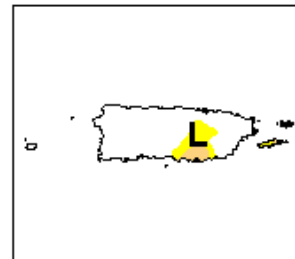
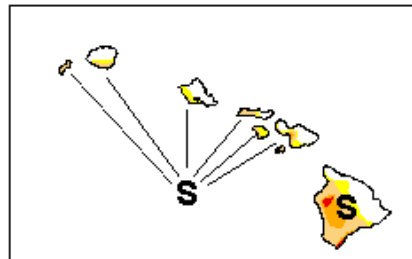
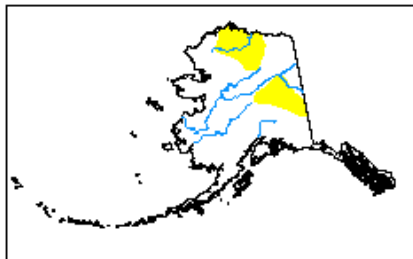
Drought Impact Types:

- ~ 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/>



# Drought Condition (Percent Area): United States

**Statistics type:**  Traditional (D0-D4, D1-D4, etc.)  Categorical (D0, D1, etc.)

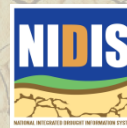
## Conditions for the U.S., including Alaska, Hawaii and Puerto Rico

Week	Date	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2016-06-14	64.55	35.45	11.59	4.00	1.89	0.92
Last Week	2016-06-07	68.12	31.88	11.15	3.80	2.05	0.92
3 Months Ago	2016-03-15	69.21	30.79	10.53	5.43	3.14	1.56
Start of Calendar Year	2015-12-29	70.64	29.36	15.70	9.67	5.25	2.26
Start of Water Year	2015-09-29	47.02	52.98	26.82	16.82	9.58	2.51
One Year Ago	2015-06-16	59.10	40.90	20.67	11.38	5.64	2.39

## Conditions for the Contiguous U.S.

Week	Date	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2016-06-14	60.89	39.11	13.77	4.76	2.26	1.11
Last Week	2016-06-07	65.17	34.83	13.24	4.48	2.45	1.11
3 Months Ago	2016-03-15	66.50	33.50	12.41	6.46	3.76	1.87
Start of Calendar Year	2015-12-29	66.99	33.01	18.74	11.56	6.28	2.70
Start of Water Year	2015-09-29	44.91	55.09	31.36	20.09	11.45	3.00
One Year Ago	2015-06-16	60.39	39.61	24.66	13.62	6.76	2.86

As of 6/14/16 just over **67,200,000** people are being impacted by drought in the CONUS.



# U.S. Drought Monitor

## NWS Central Region

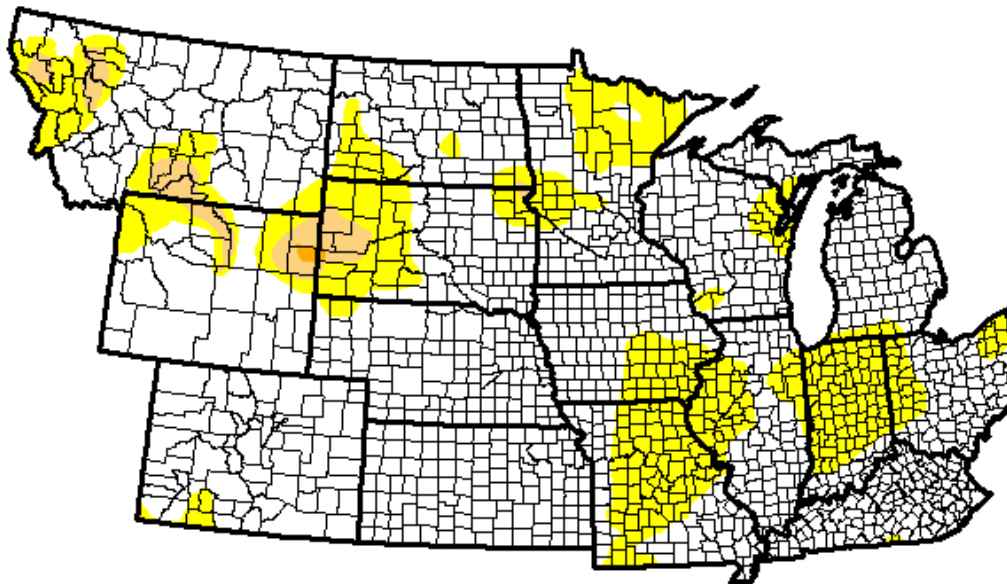
**June 14, 2016**

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*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	75.78	24.22	2.52	0.11	0.00	0.00
<b>Last Week</b> <i>6/7/2016</i>	84.91	15.09	2.08	0.11	0.00	0.00
<b>3 Months Ago</b> <i>3/15/2016</i>	73.98	26.02	3.50	0.63	0.00	0.00
<b>Start of Calendar Year</b> <i>12/29/2015</i>	78.96	21.04	5.65	2.67	0.45	0.00
<b>Start of Water Year</b> <i>9/29/2015</i>	71.52	28.48	5.67	3.66	2.15	0.00
<b>One Year Ago</b> <i>6/16/2015</i>	79.81	20.19	4.16	0.00	0.00	0.00



Intensity:



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

**Author:**

Chris Fenimore  
NOAA/NESDIS/NCEI



# U.S. Drought Monitor Missouri Watershed

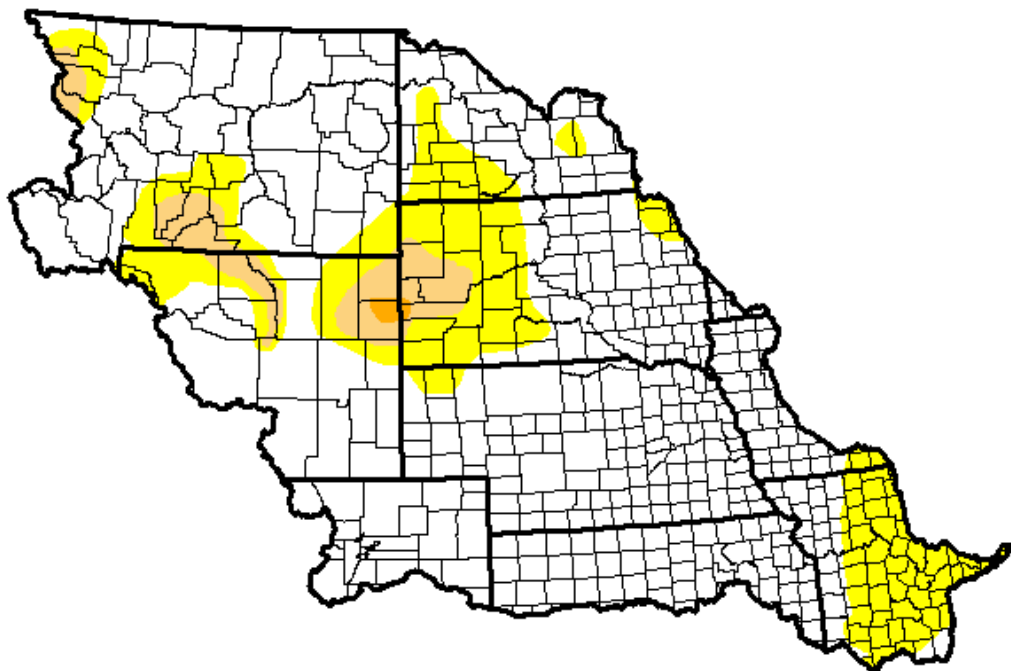
**June 14, 2016**

*(Released Thursday, Jun. 16, 2016)*

Valid 8 a.m. EDT

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	76.34	23.66	4.96	0.25	0.00	0.00
<b>Last Week</b> <i>6/7/2016</i>	81.47	18.53	3.96	0.25	0.00	0.00
<b>3 Months Ago</b> <i>3/15/2016</i>	66.36	33.64	5.87	1.15	0.00	0.00
<b>Start of Calendar Year</b> <i>12/29/2015</i>	76.44	23.56	5.55	1.28	0.00	0.00
<b>Start of Water Year</b> <i>9/29/2015</i>	65.65	34.35	6.75	3.42	0.66	0.00
<b>One Year Ago</b> <i>6/16/2015</i>	86.79	13.21	2.39	0.00	0.00	0.00



Intensity:

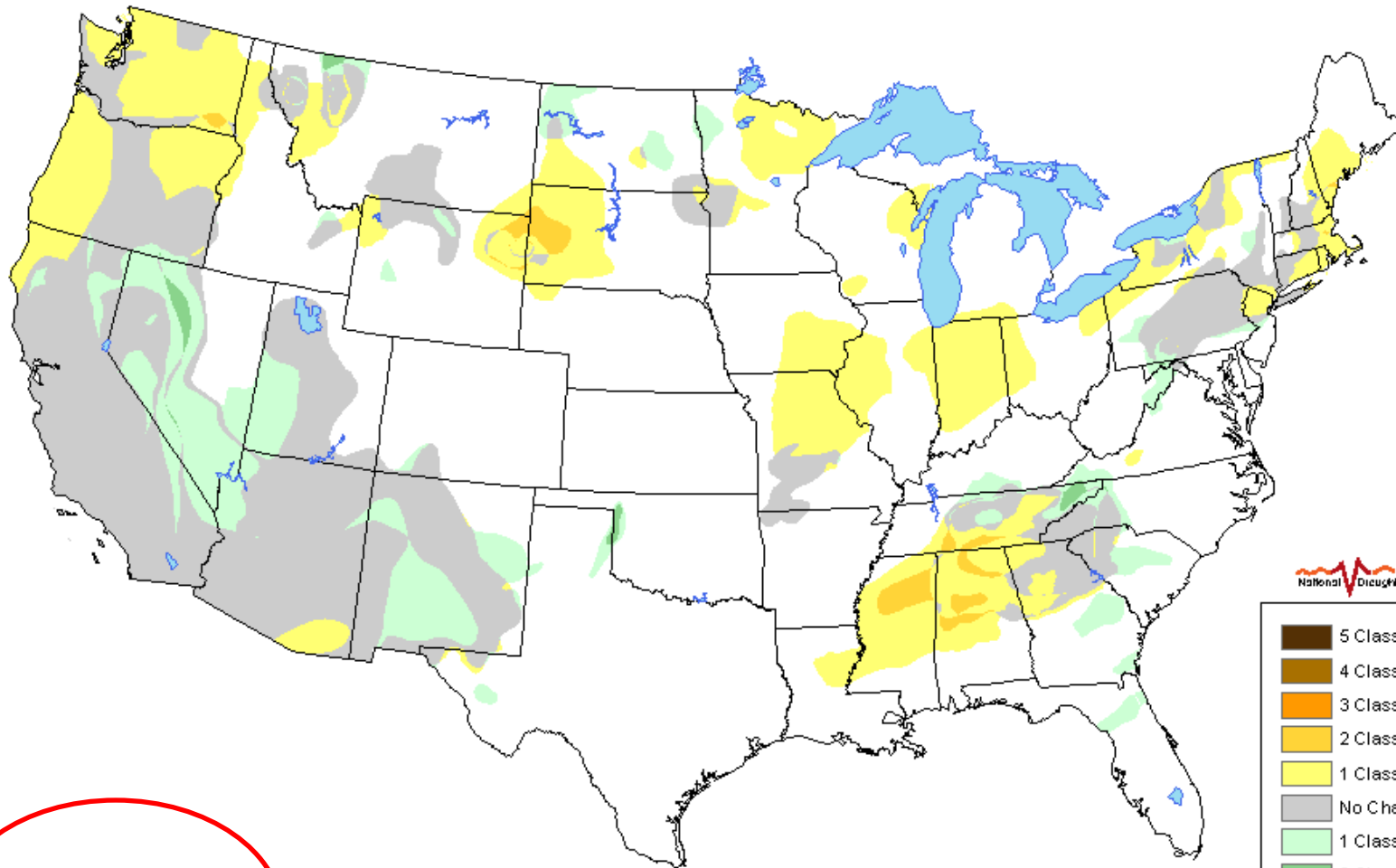
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

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NOAA/NESDIS/NCEI



# U.S. Drought Monitor Class Change 1 Month



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

June 14, 2016  
compared to  
May 17, 2016

# Regional Impacts

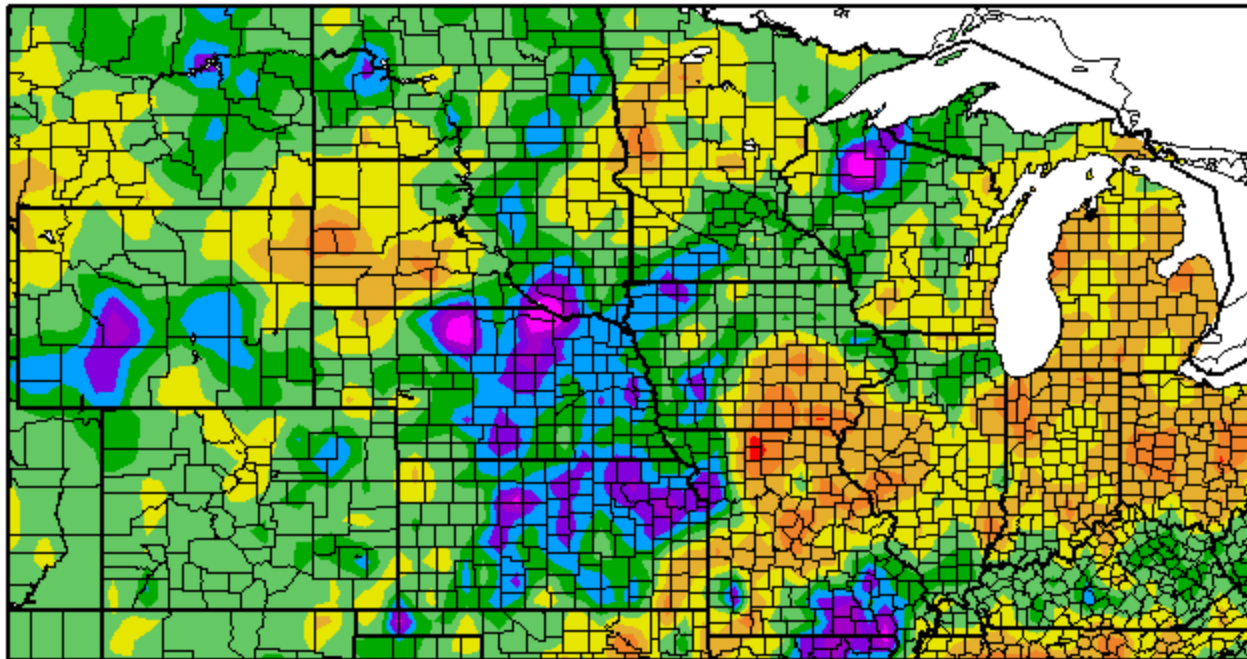


Rapid spring melt-off of snowpack in the Rocky Mountains



# Flash Drought Developing?

Departure from Normal Precipitation (in)  
4/17/2016 - 6/15/2016



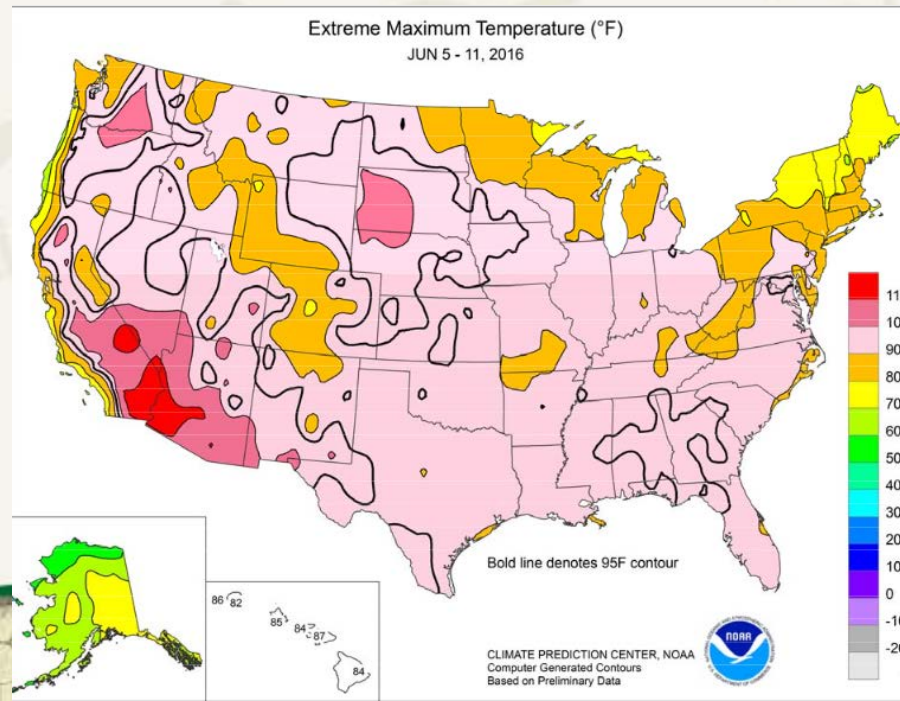
Generated 6/16/2016 at HPRCC using provisional data.

Regional Climate Centers



# Early June Extreme Heat

- ▶ June 9, daily-record highs in South Dakota climbed to 100°F in Aberdeen and 95°F in Sioux Falls
- ▶ Rapid City closed the week with consecutive daily-record highs (98 and 103°F, respectively) on June 10-11.
- ▶ In Wyoming, daily-record highs for June 10 surged to 99°F in Greybull and Worland. The following day, record-setting highs for June 11 reached 102°F in Valentine, NE, and 100°F in Mitchell, SD.

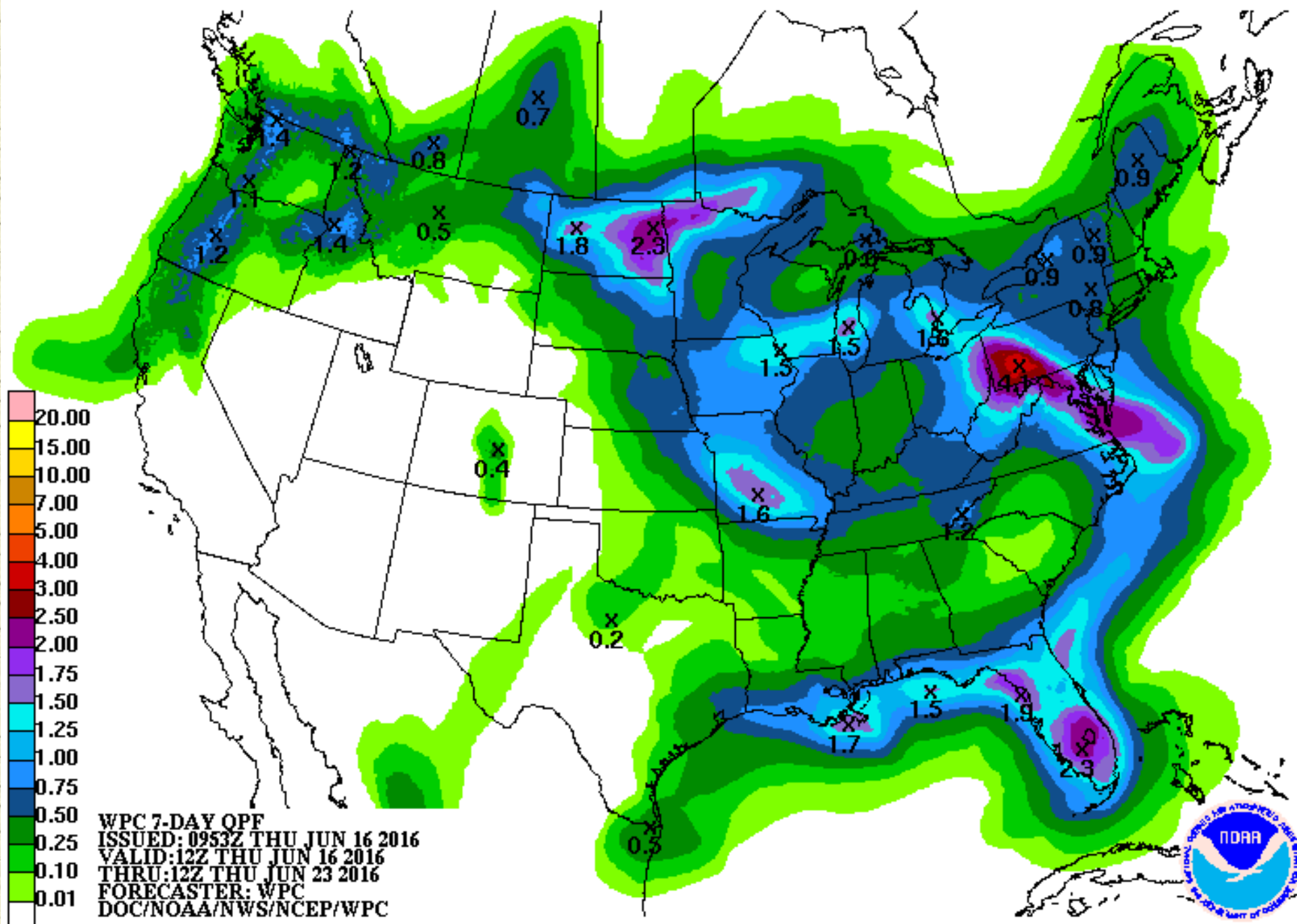


# Climate Outlooks

- **7-day precipitation forecast**
- **8-14 day outlook**
- **ENSO Outlook**
- **Monthly/Seasonal**
- **Autumn Outlook (Sep-Oct)**
- **Winter Outlook ( Dec-Feb )**
- **Spring Outlook (Mar-May)**
- **Seasonal Drought Outlook**

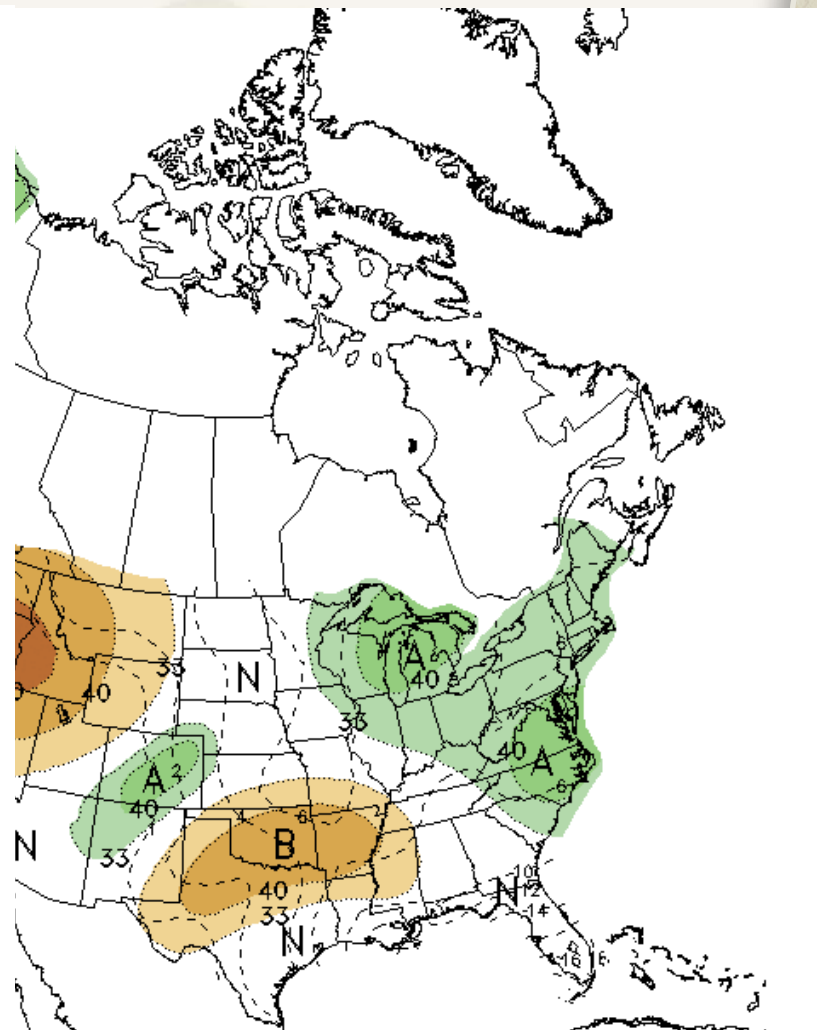
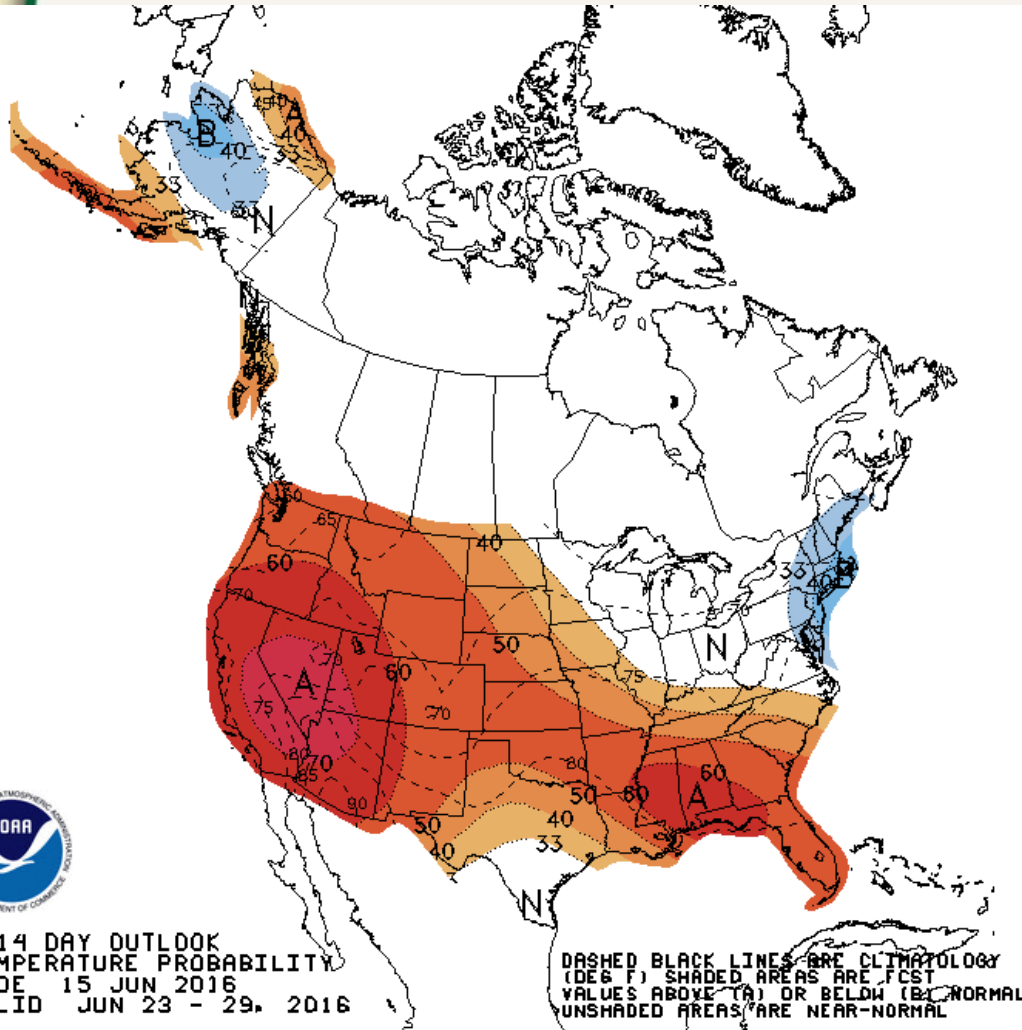




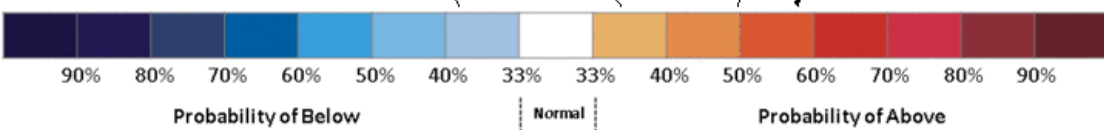


[http://www.wpc.ncep.noaa.gov/medr/medr\\_mean.shtml](http://www.wpc.ncep.noaa.gov/medr/medr_mean.shtml)

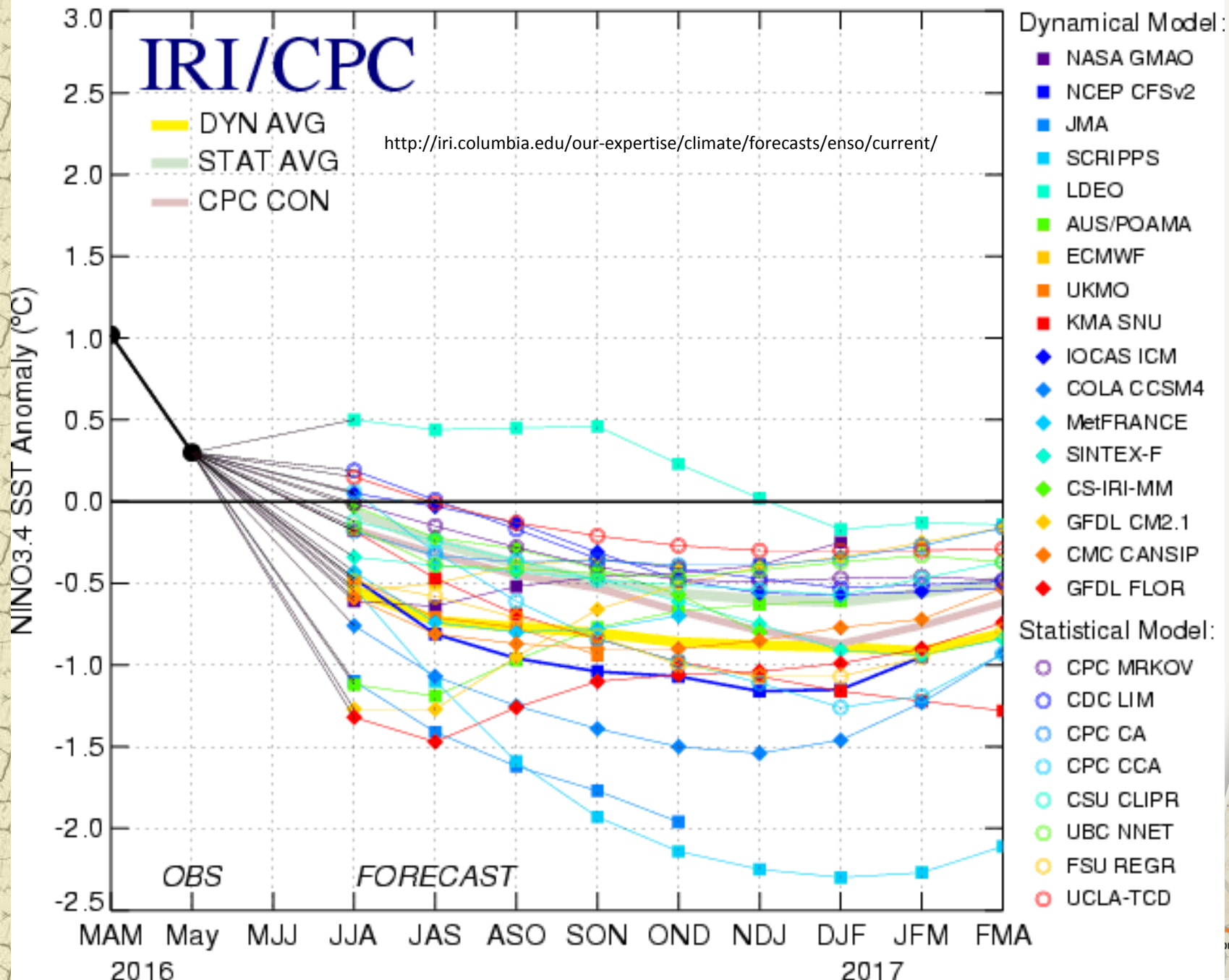
# 8-14 day Outlook



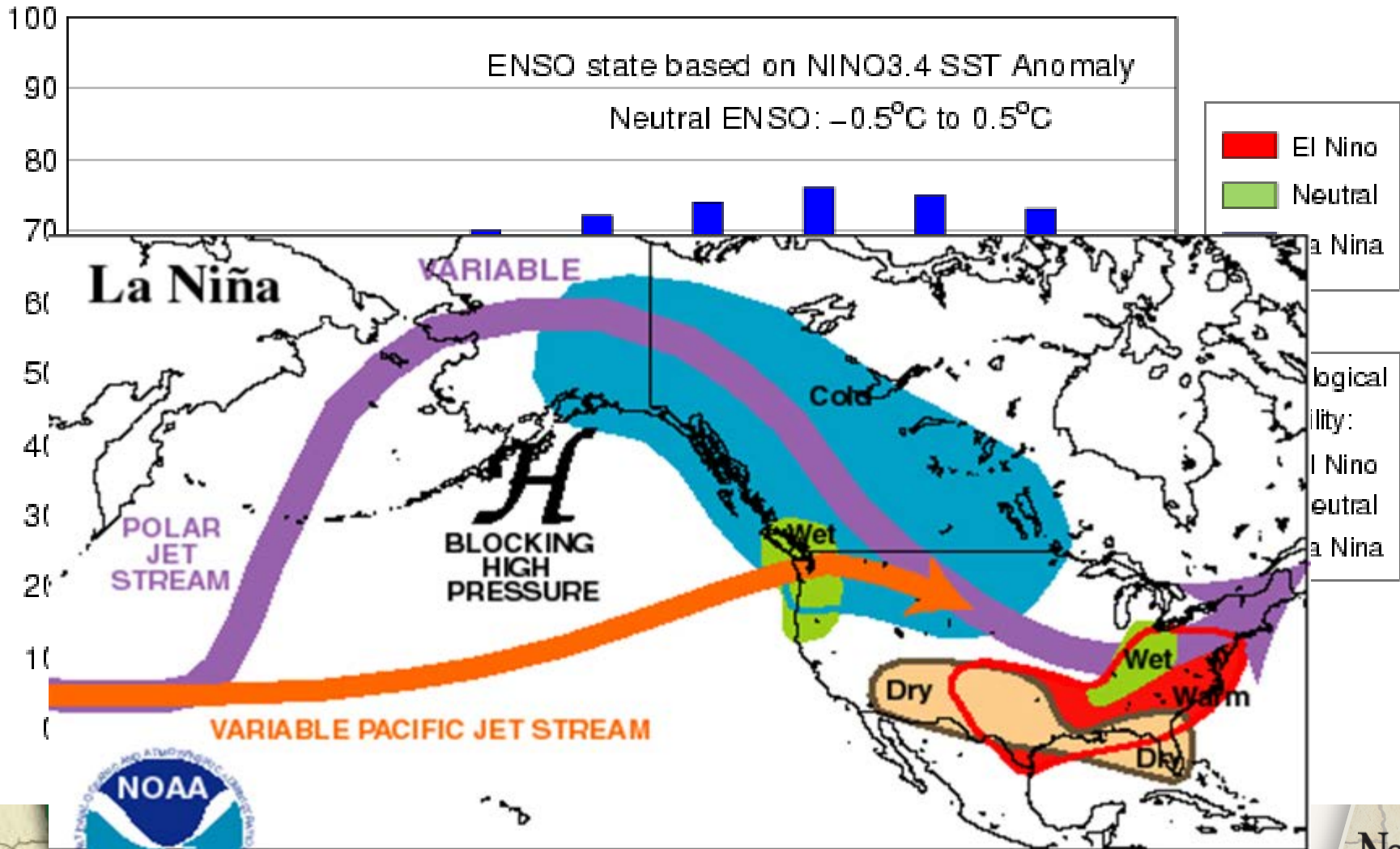
8-14 DAY OUTLOOK  
 TEMPERATURE PROBABILITY  
 MADE 15 JUN 2016  
 VALID JUN 23 - 29, 2016



# Mid-Jun 2016 Plume of Model ENSO Predictions



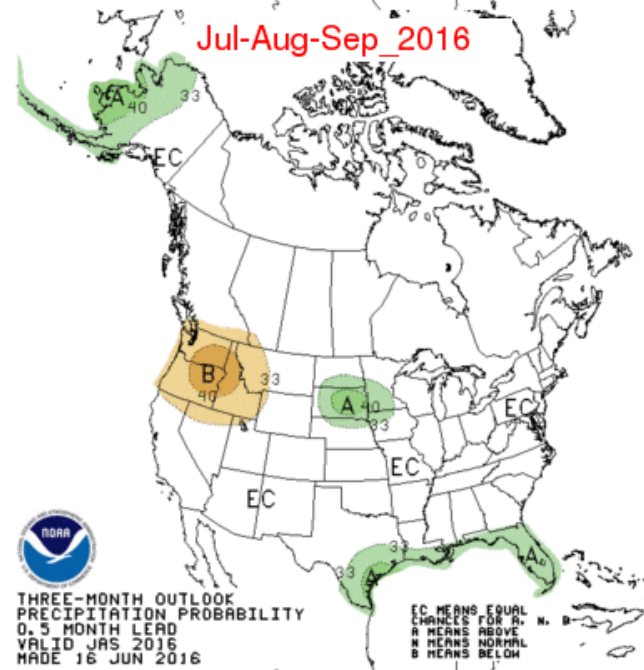
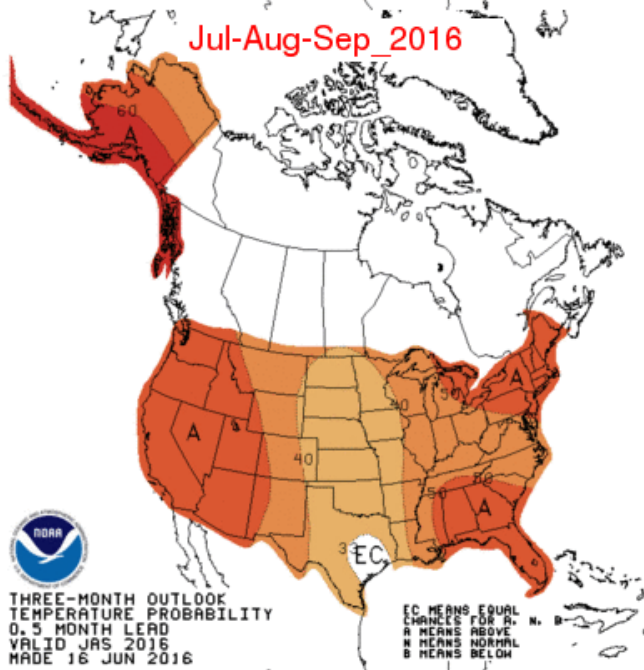
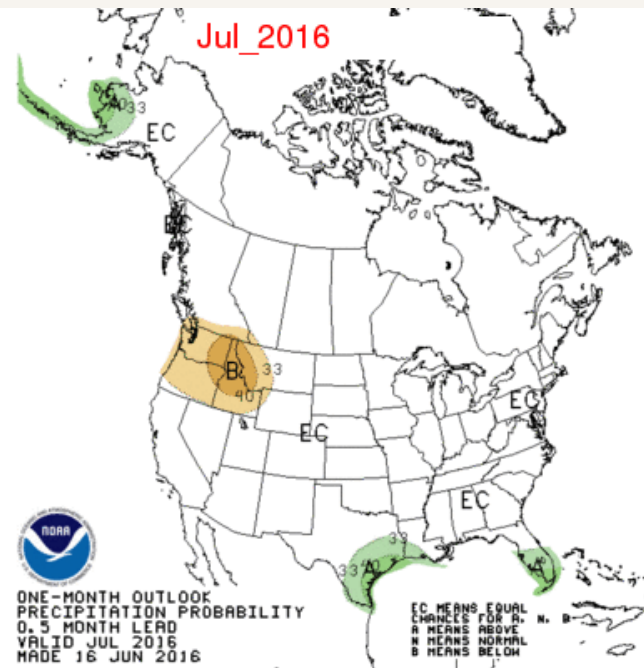
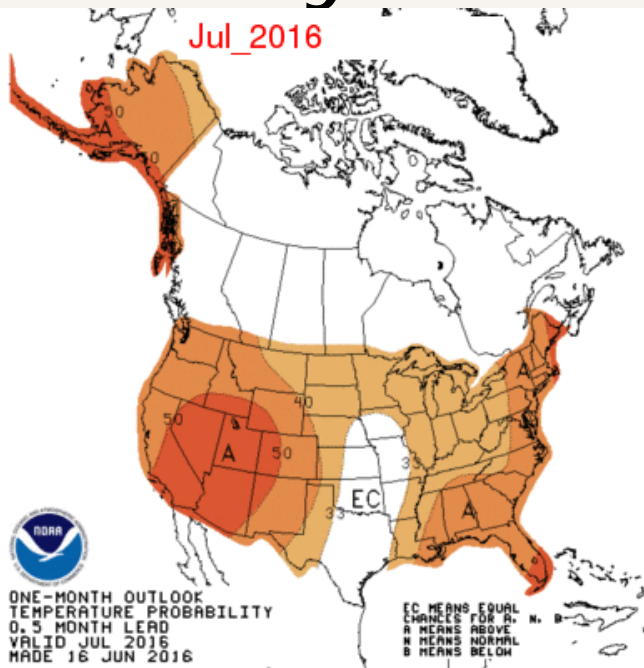
# Early-Jun CPC/IRI Official Probabilistic ENSO Forecast



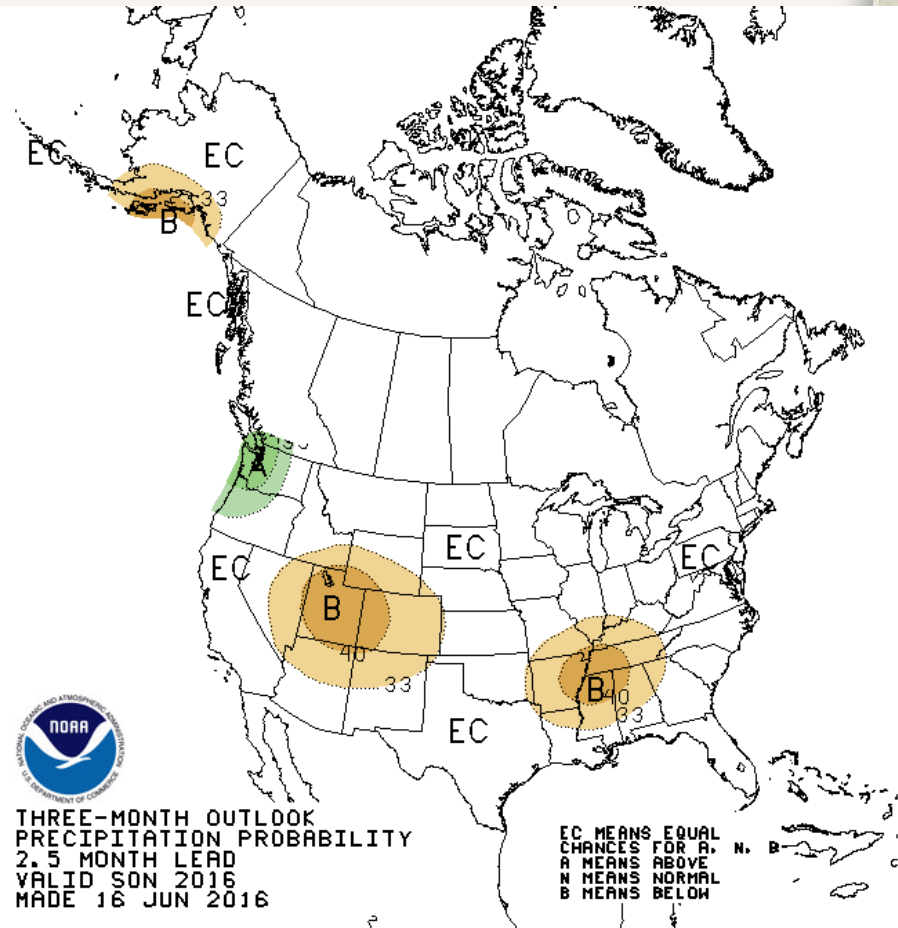
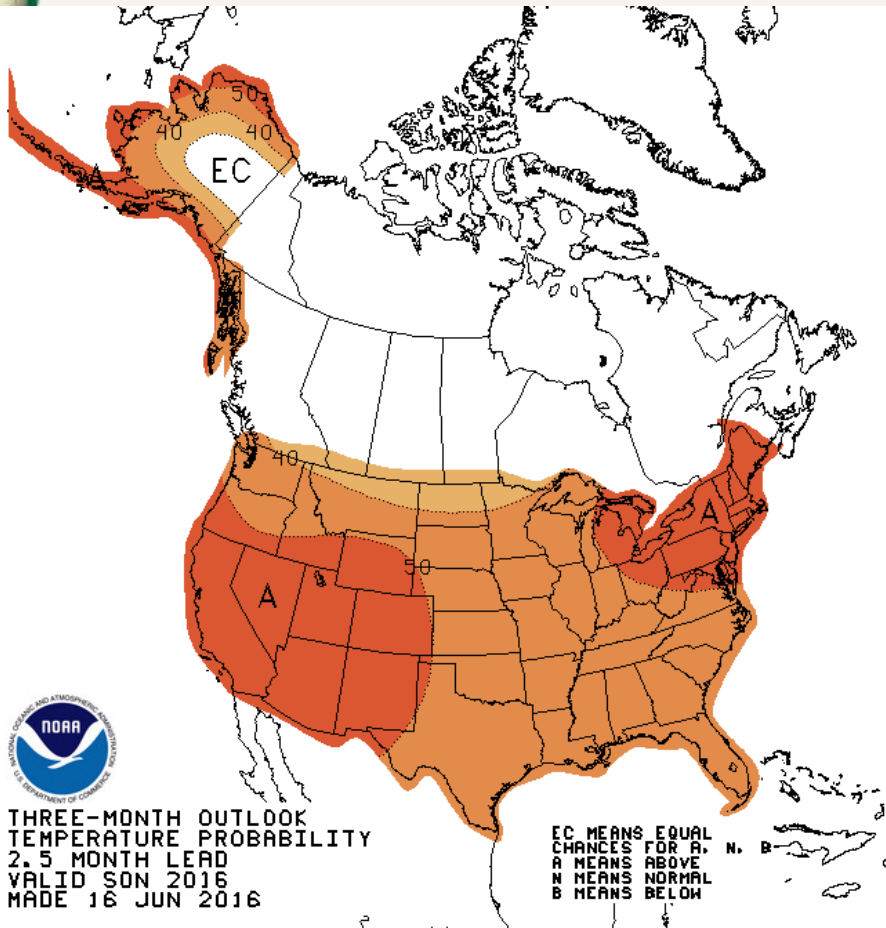
Climate Prediction Center/NCEP/NWS



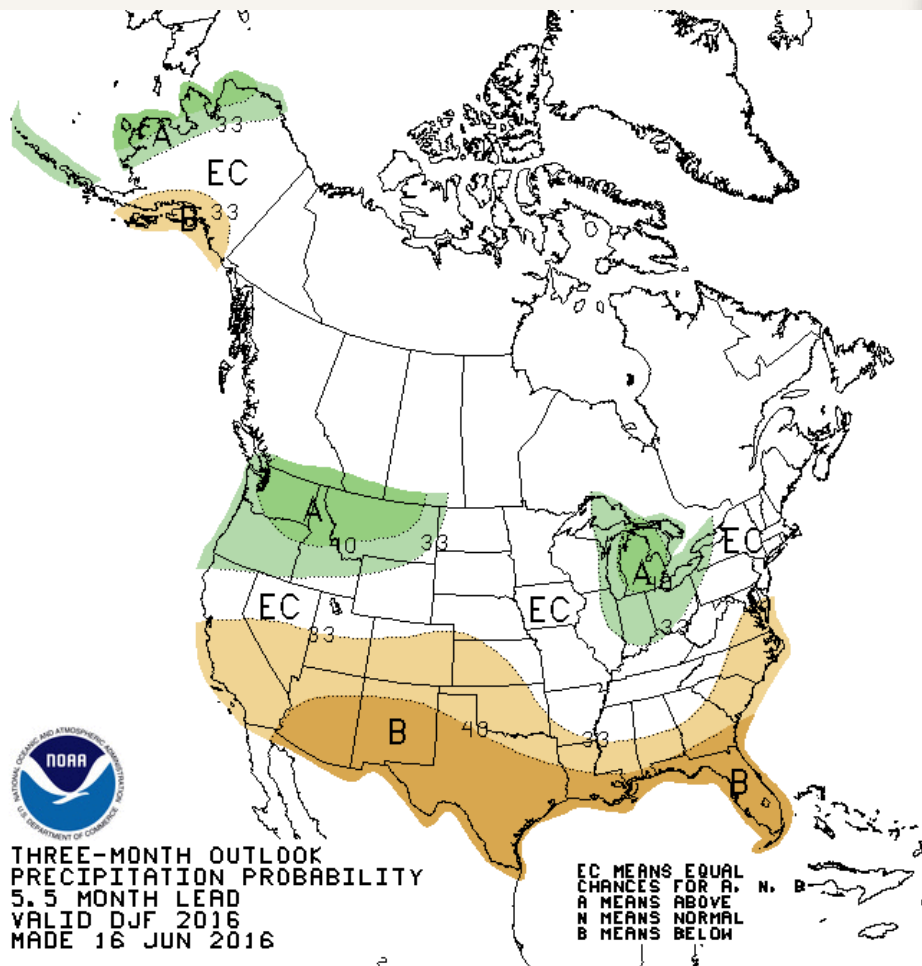
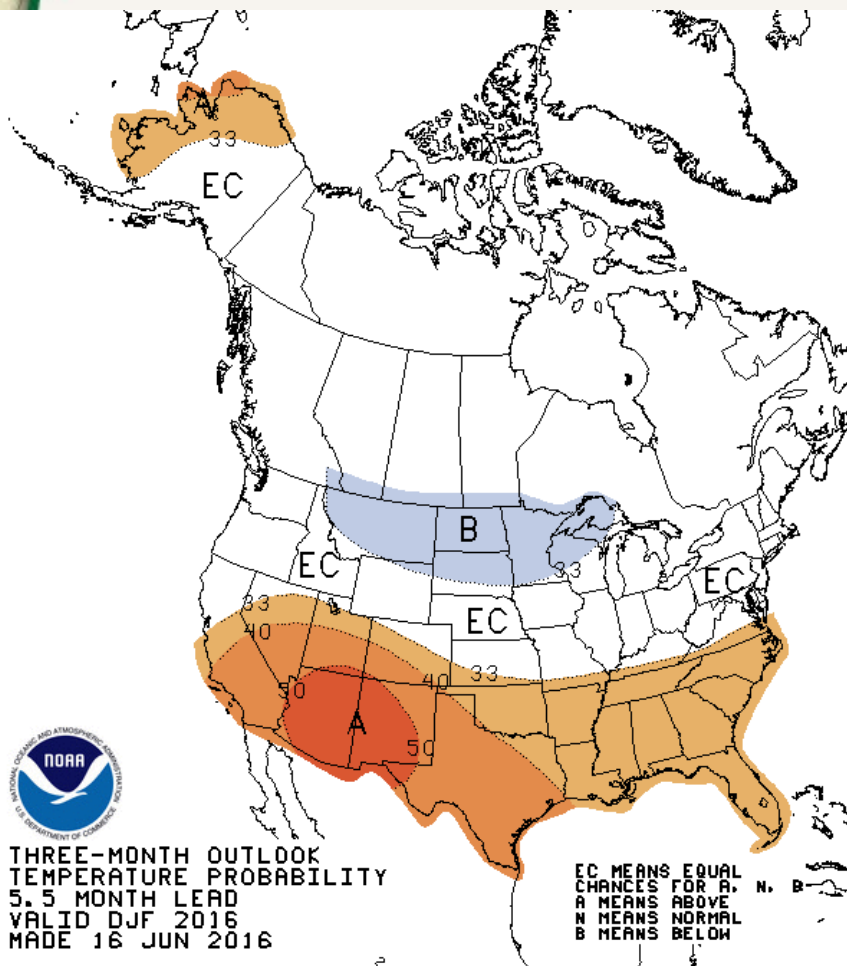
# Monthly and Seasonal Outlook



# Autumn Outlook SON



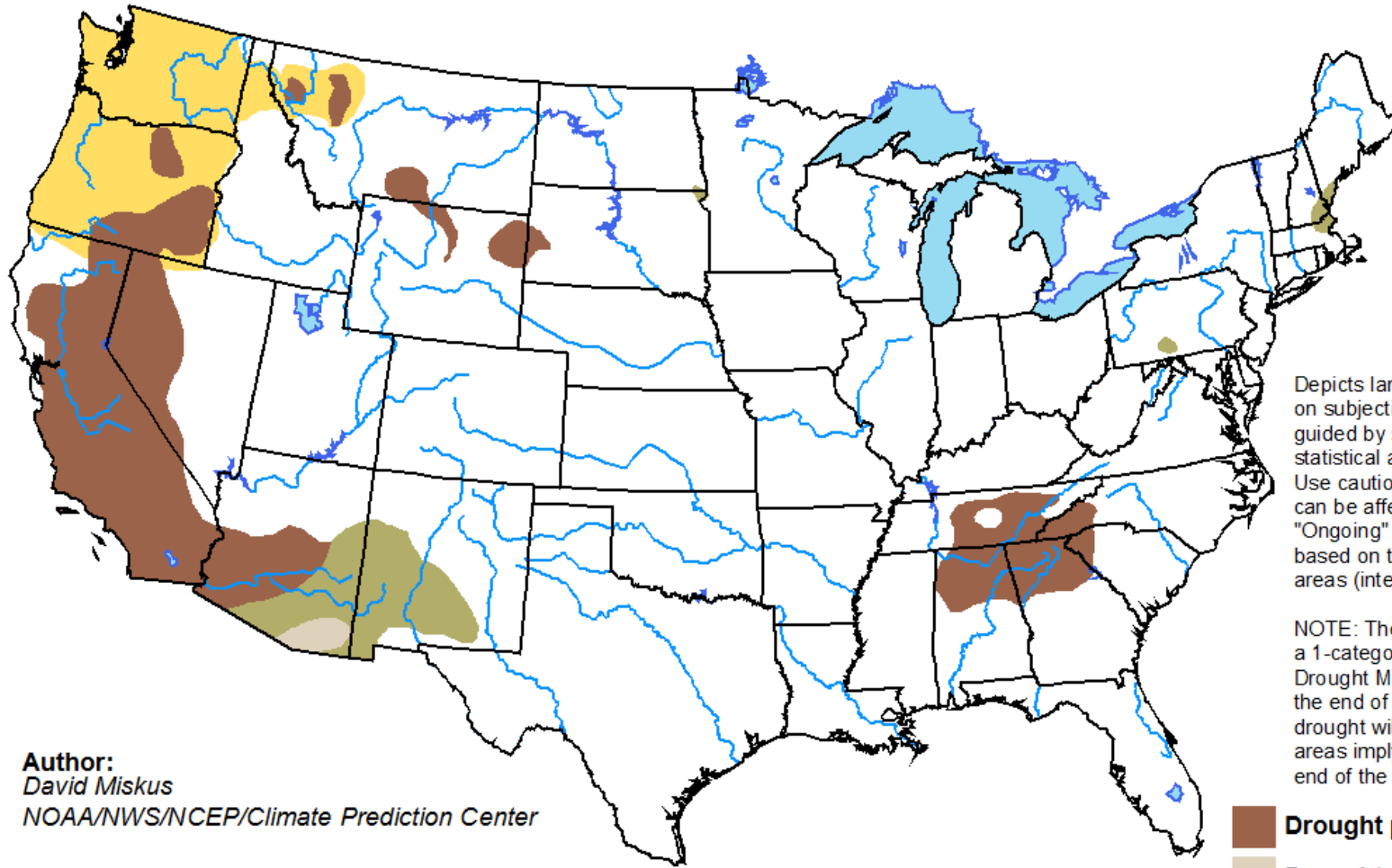
# Winter Outlook DJF



# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period





Valid for June 16 - September 30, 2016  
Released June 16, 2016

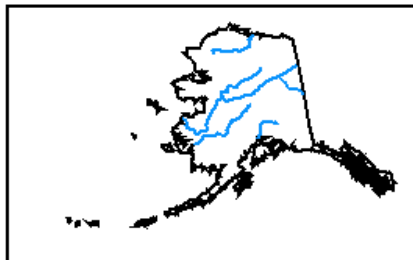


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to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

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

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



<http://go.usa.gov/3eZ73>



# Summary

- ▶ Most of the region has been warmer than normal and drier than normal over the last month. 2016 has been well above normal for temperatures over the region.
- ▶ A rapid melt of the Rocky Mountain snow has sent a great deal of water into the Platte and Missouri Basins.
- ▶ Drought is not an issue currently in the region, but we are watching conditions closely as temperatures are stressing conditions along with the lack of rain. Sub-Soil moisture is good based upon full recharge (December). Flash Drought developing in places already.
- ▶ La Nina will continue to intensify, we should anticipate a La Nina winter for 2016-2017.



# Further Information - Partners

- ▣ **Today's and Past Recorded Presentations and :**
  - <http://mrcc.isws.illinois.edu/webinars.htm>
  - <http://www.hprcc.unl.edu>
- NOAA's National Climatic Data Center: [www.ncdc.noaa.gov](http://www.ncdc.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/>
- State climatologists
  - <http://www.stateclimate.org>
- Regional climate centers
  - <http://mrcc.isws.illinois.edu>
  - <http://www.hprcc.unl.edu>



# Thank You and Questions?

## ▣ Questions:

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**National Drought Mitigation Center**

NOAA's Drought Risk Management Research Center



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