Central Region Climate Outlook
June 19, 2014

Brian Fuchs
Climatologist

National Drought Mitigation Center
University of Nebraska-Lincoln
bfuchs2@unl.edu
402-472-6775

Pilger, NE Tornado June 16, 2014

General Information

* **Providing climate services to the Central Region**
  * Collaboration Activity Between:
  * Collaboration with Dennis Todey (South Dakota State Climatologist), Jim Angel (Illinois State Climatologist), Doug Kluck and John Eise (NOAA), State Climatologists and the Midwest Regional Climate Center, High Plains Regional Climate Center, NOAAs Climate Prediction Center, Iowa State University, Brian Fuchs (National Drought Mitigation Center)

* **Next Climate/Drought Outlook Webinar**
  * July 17, 2014 with Dennis Todey (South Dakota 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*

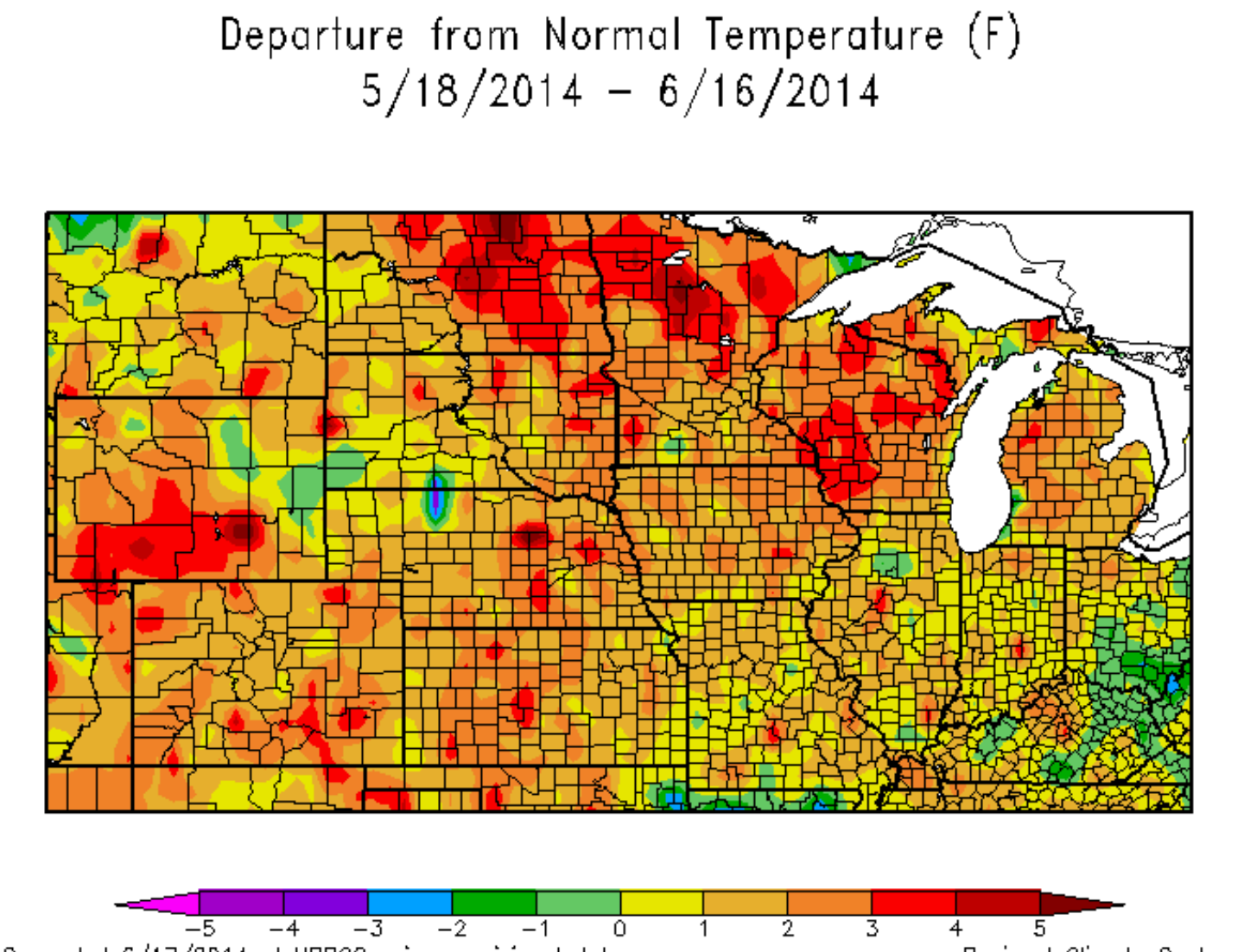
* **There will be time for questions at the end**

Agenda

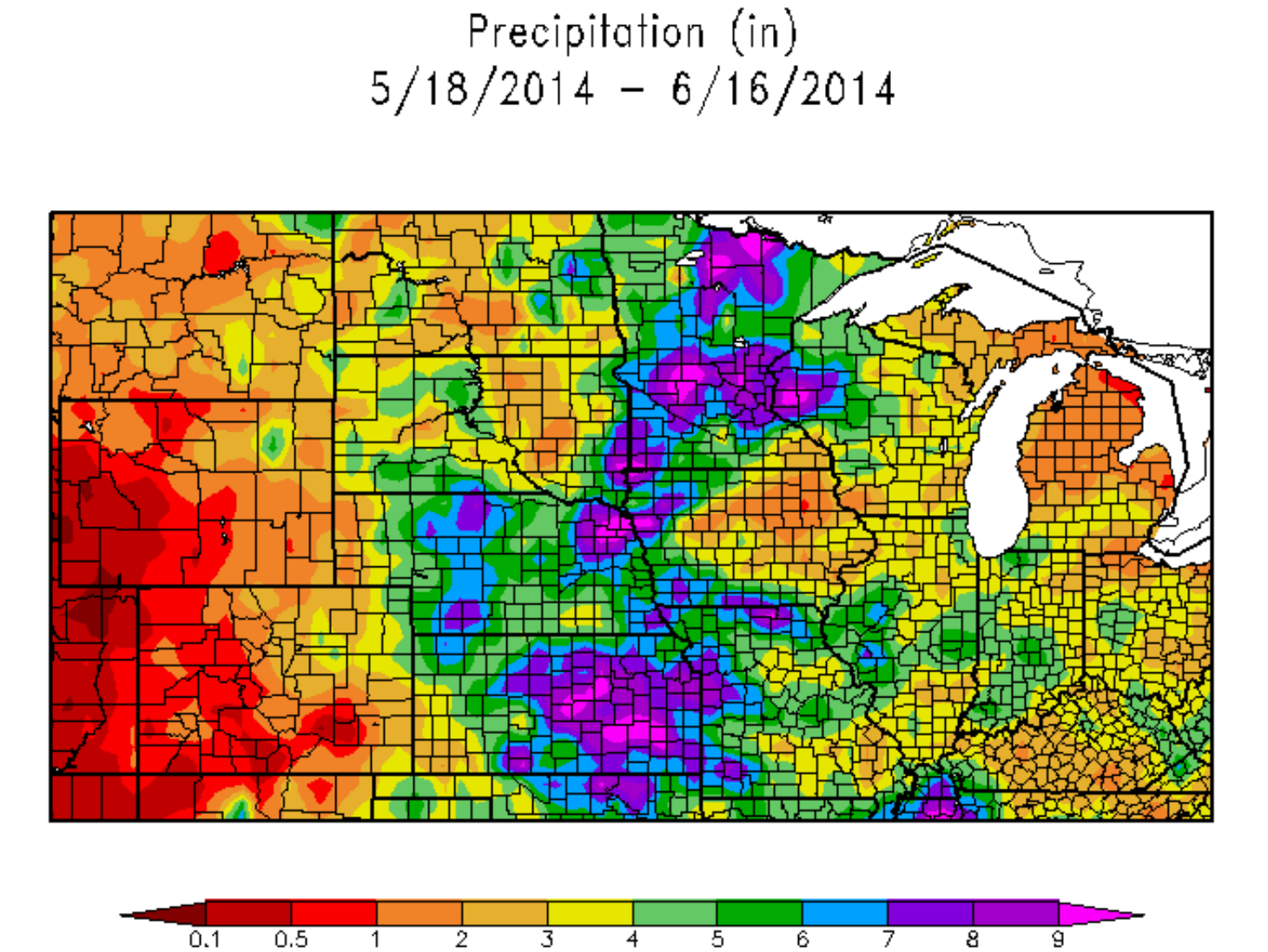
* **Current conditions**
* **Impacts**
* **Outlooks**

Pilger, NE Tornadoes. June 16, 2014

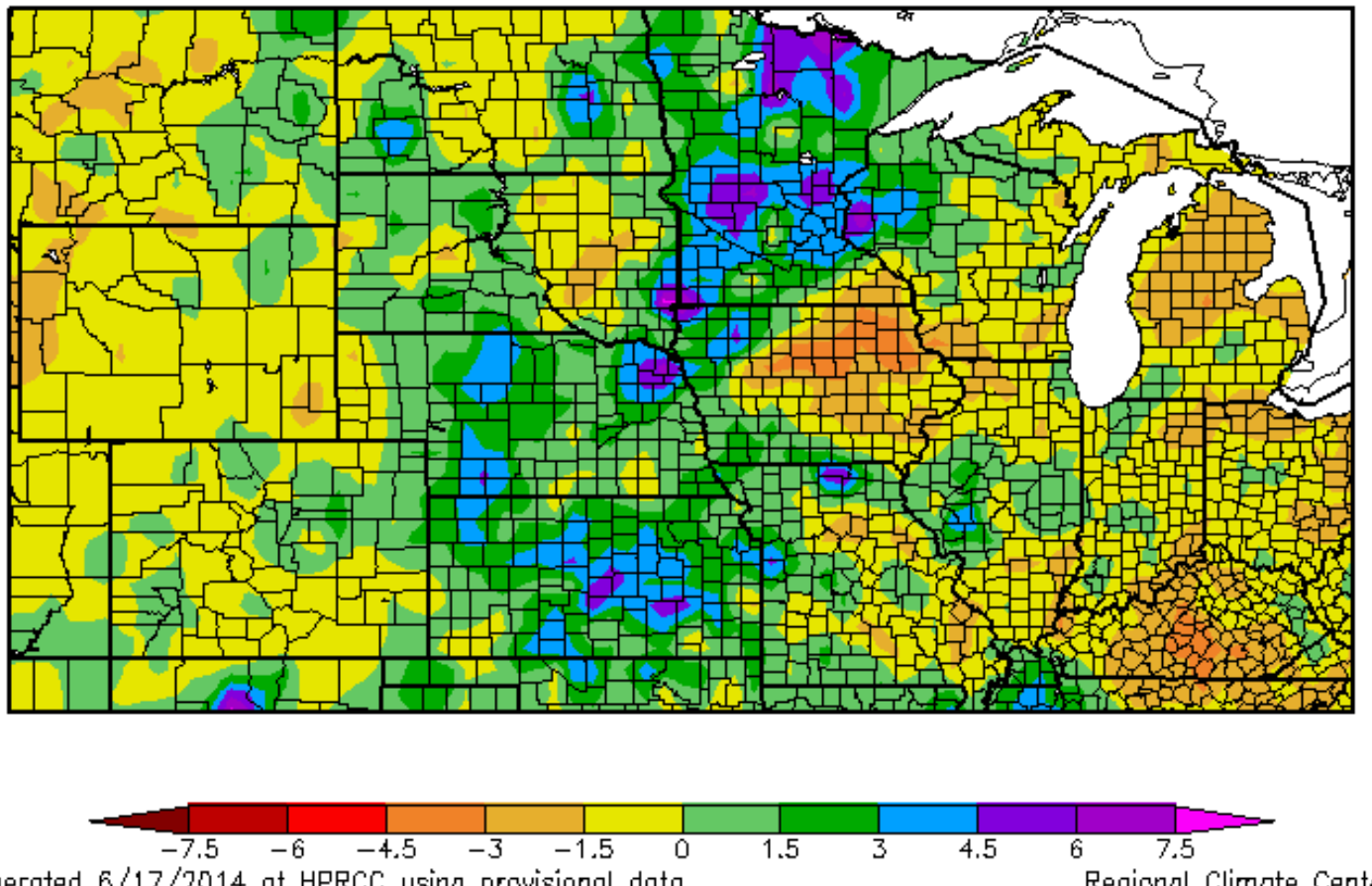
30-Day Temperature Departure



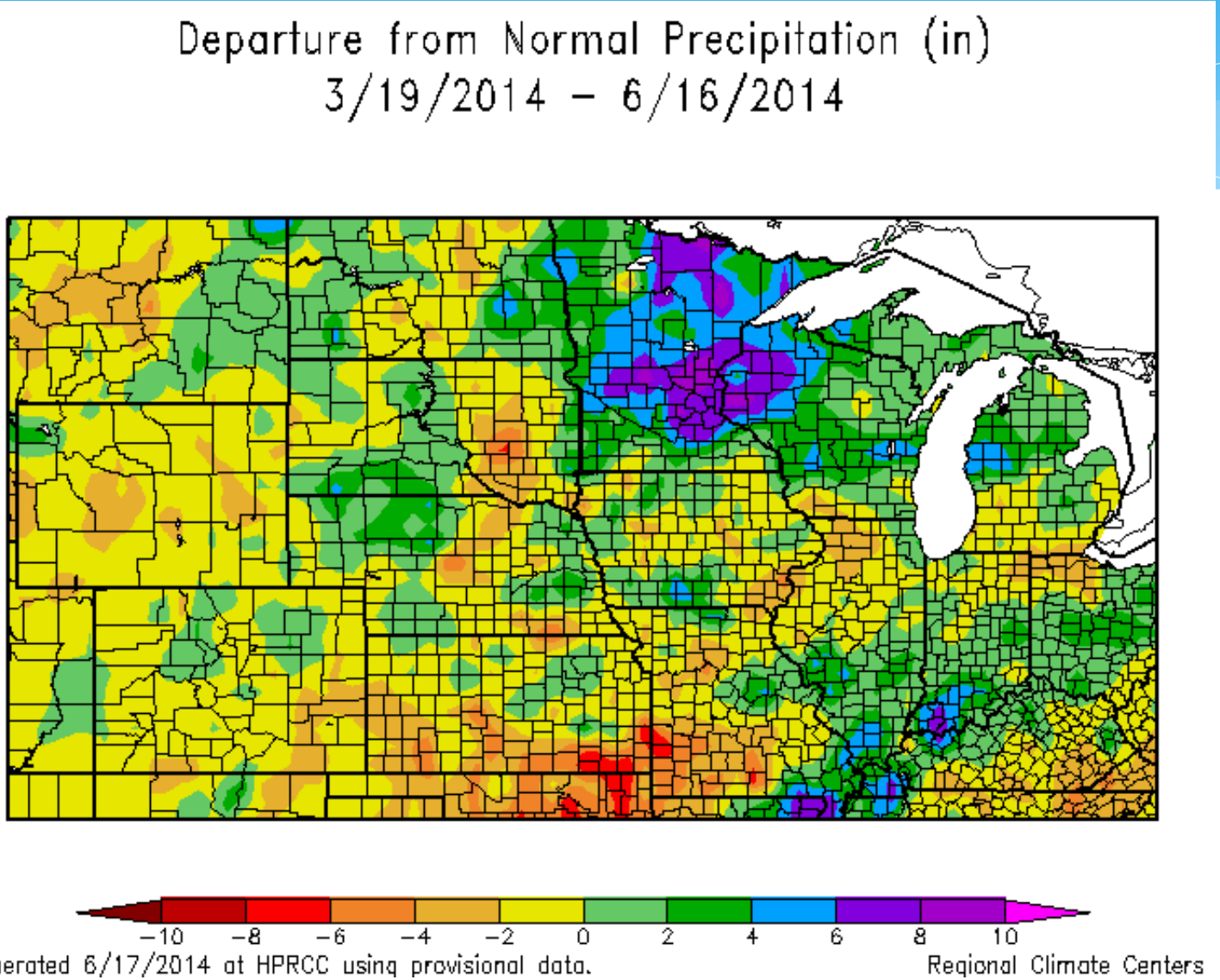
30-Day Precipitation



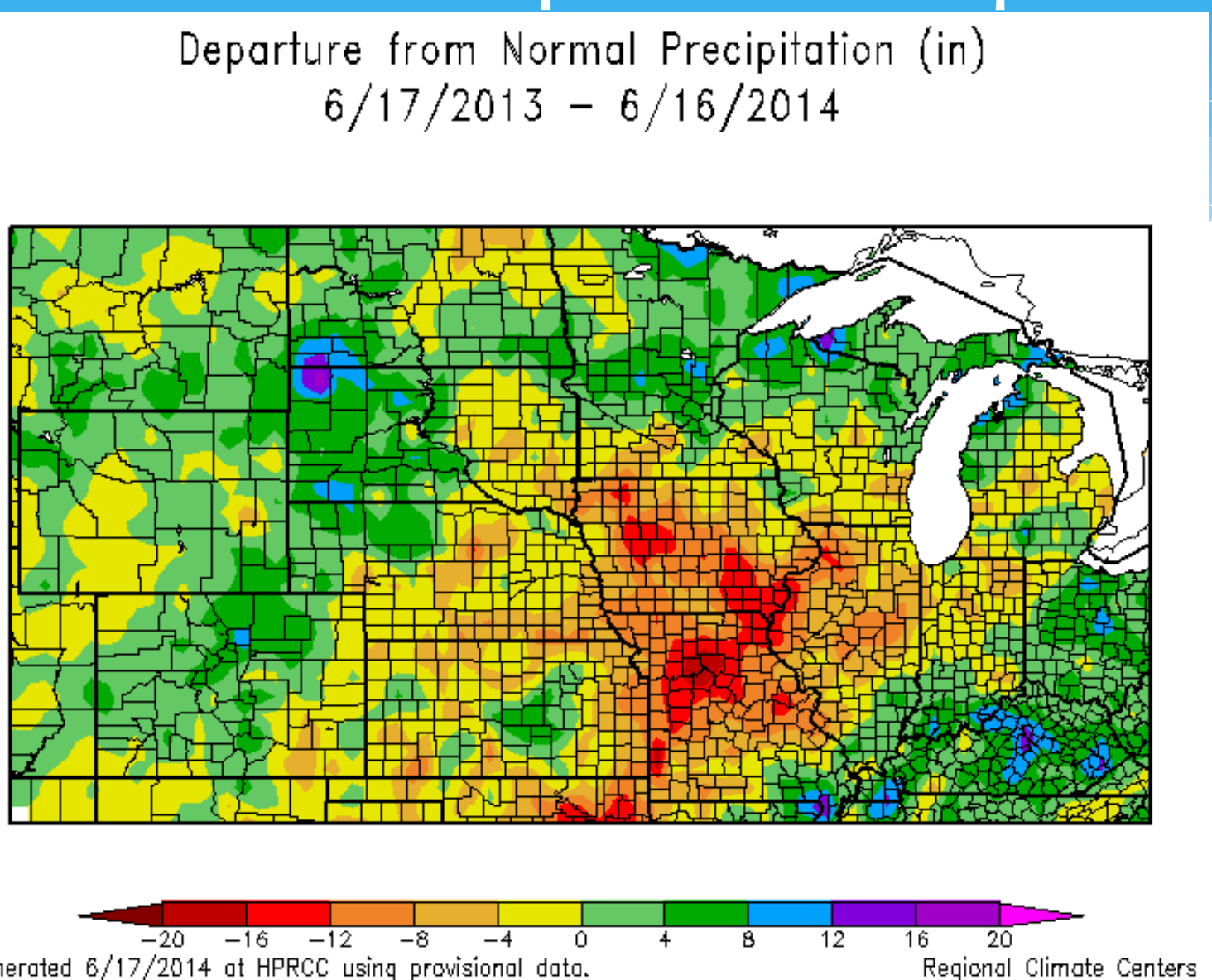
30-Day Precipitation Departure



90-Day Precipitation Departure

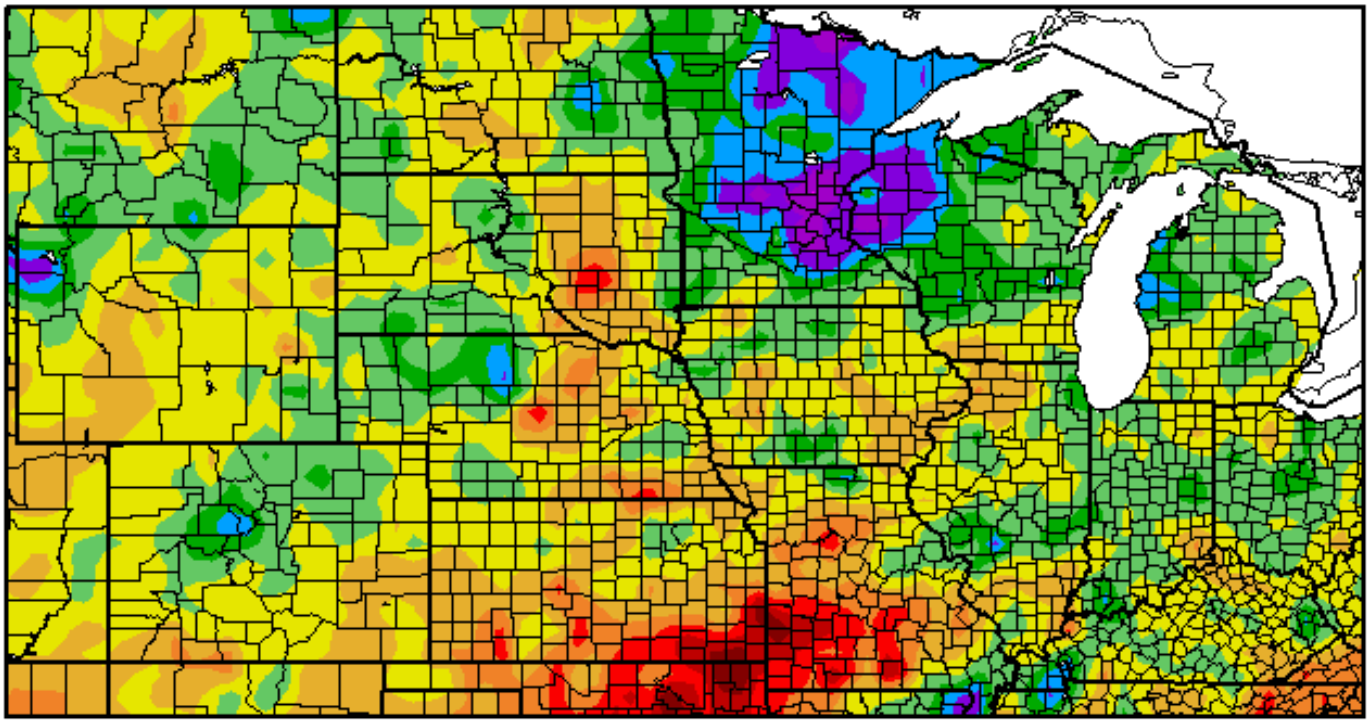


12-Month Precipitation Departure



Year to Date Precipitation

Departure from Normal Precipitation (in)
1/1/2014 – 6/16/2014



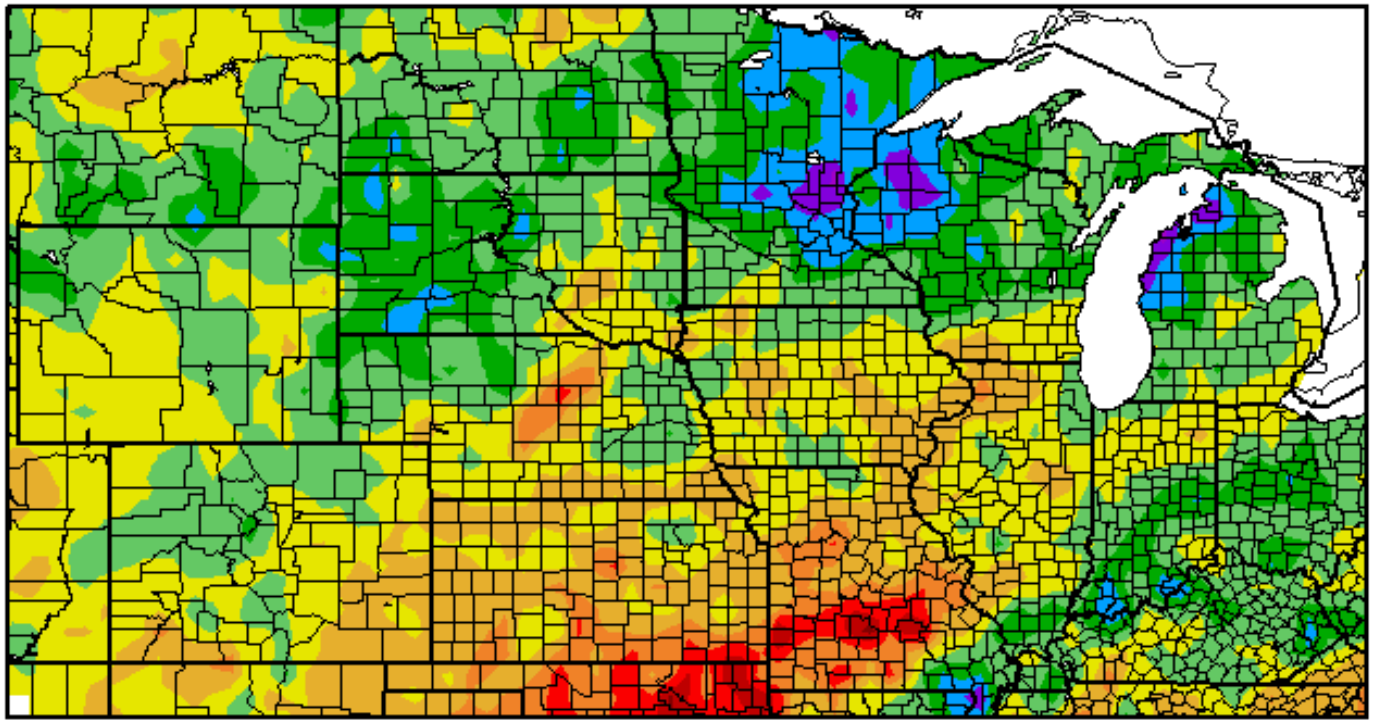
−10 −8 −6 −4 −2 0 2 4 6 8 10

Generated 6/17/2014 at HPRCC using provisional data.

Regional Climate Centers

Water Year Precipitation

Departure from Normal Precipitation (in)
10/1/2013 – 6/16/2014

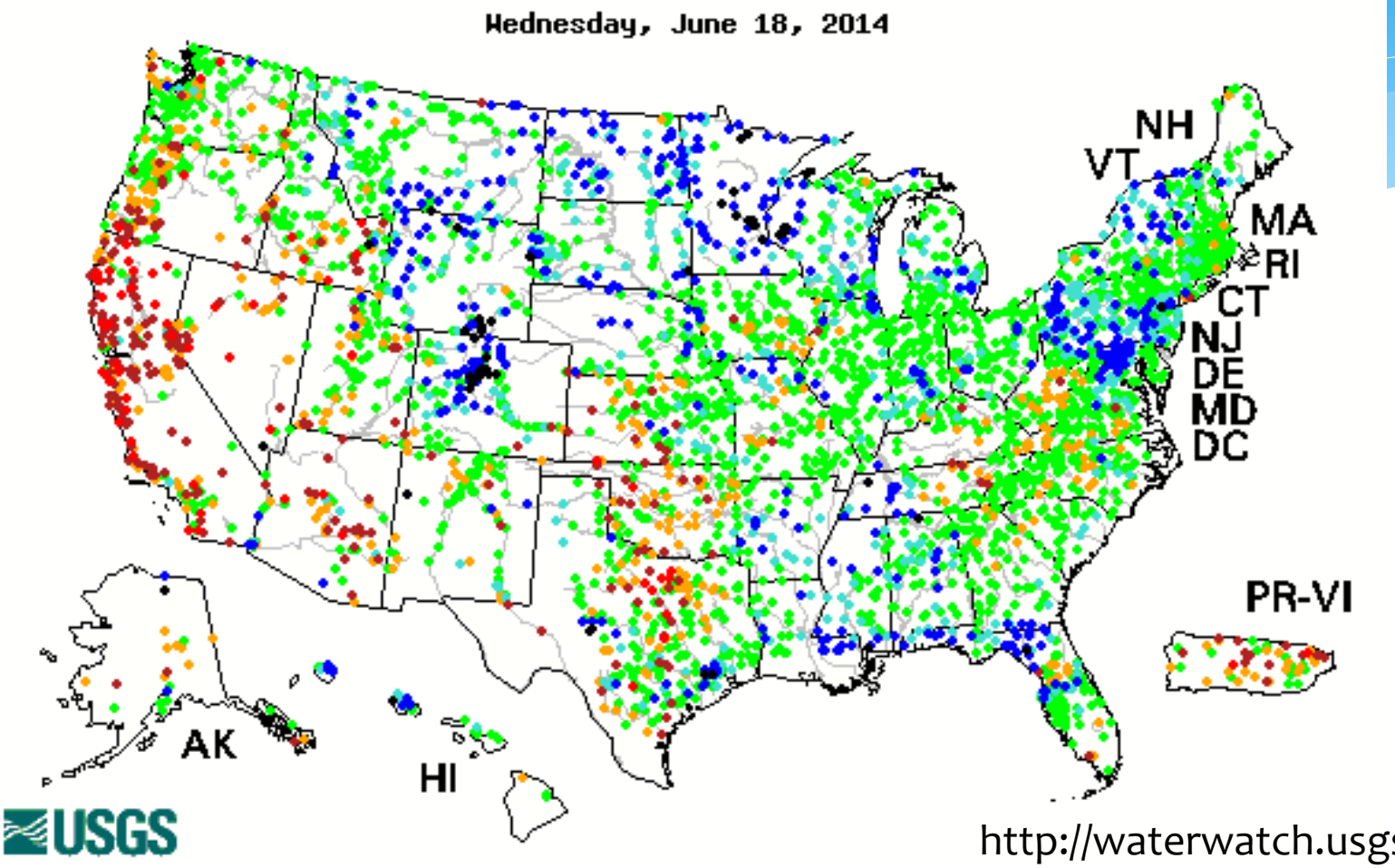


−15 −12 −9 −6 −3 0 3 6 9 12 15

Generated 6/17/2014 at HPRCC using provisional data.

Regional Climate Centers

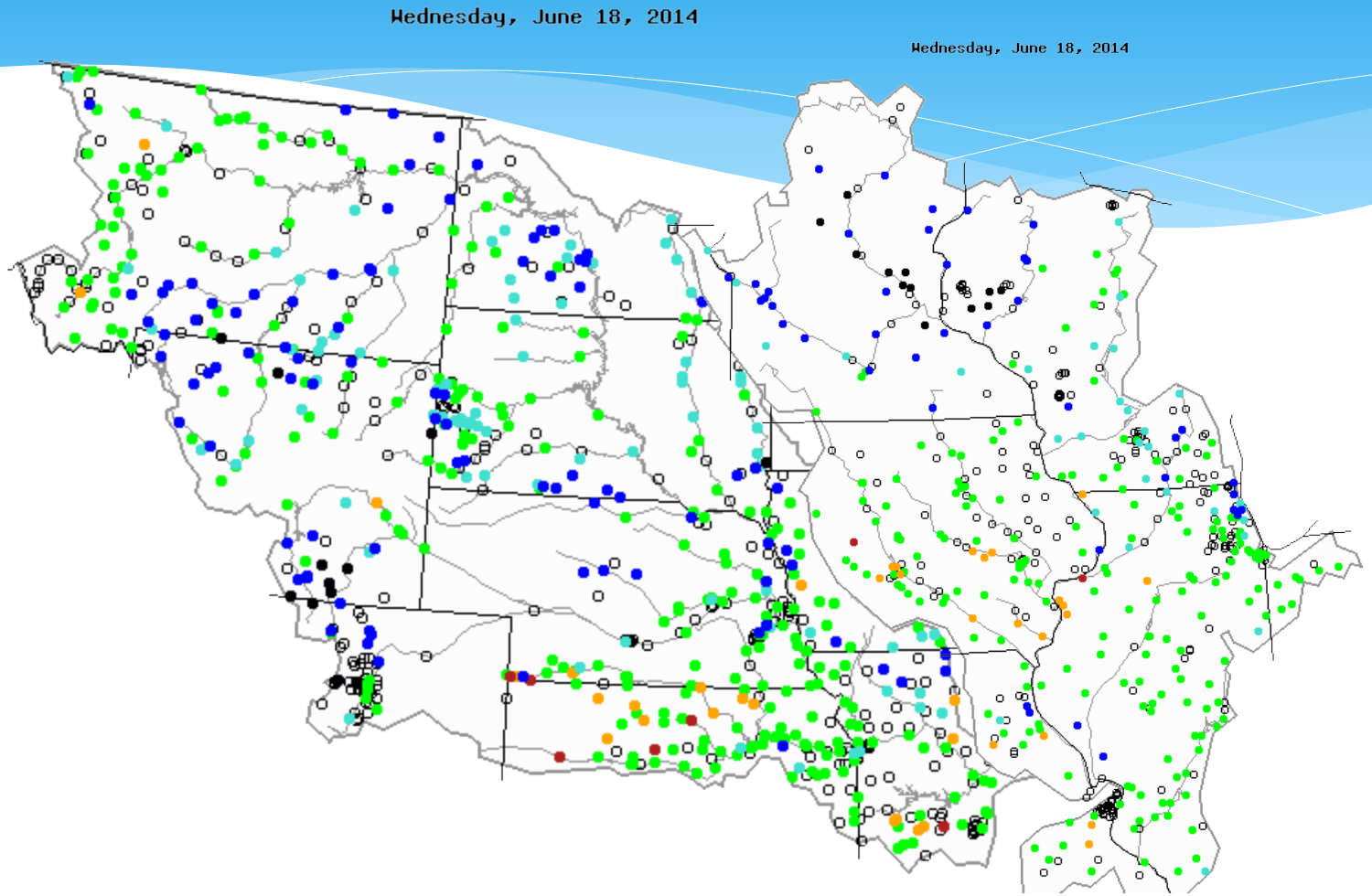
28-Day Average Streamflow



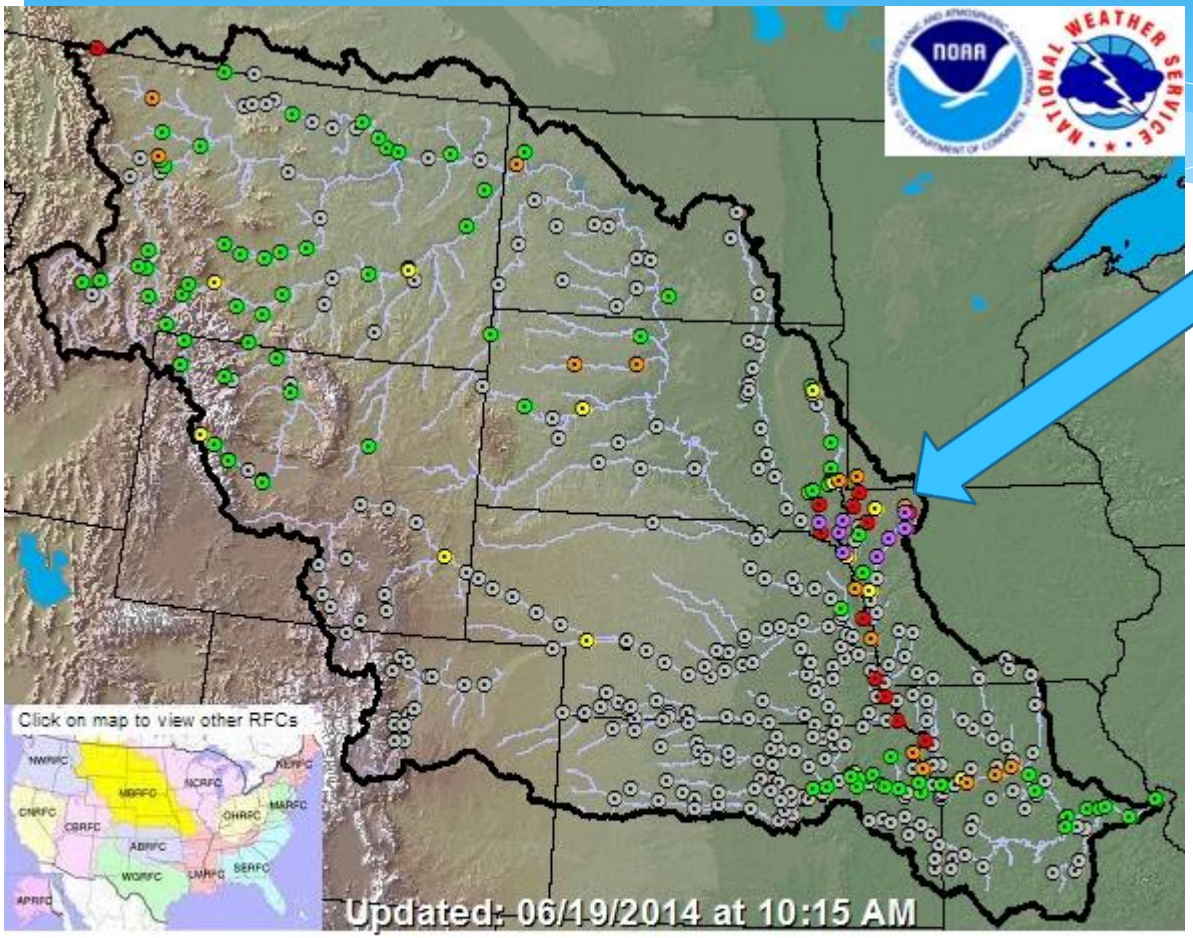
http://waterwatch.usgs.gov/

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

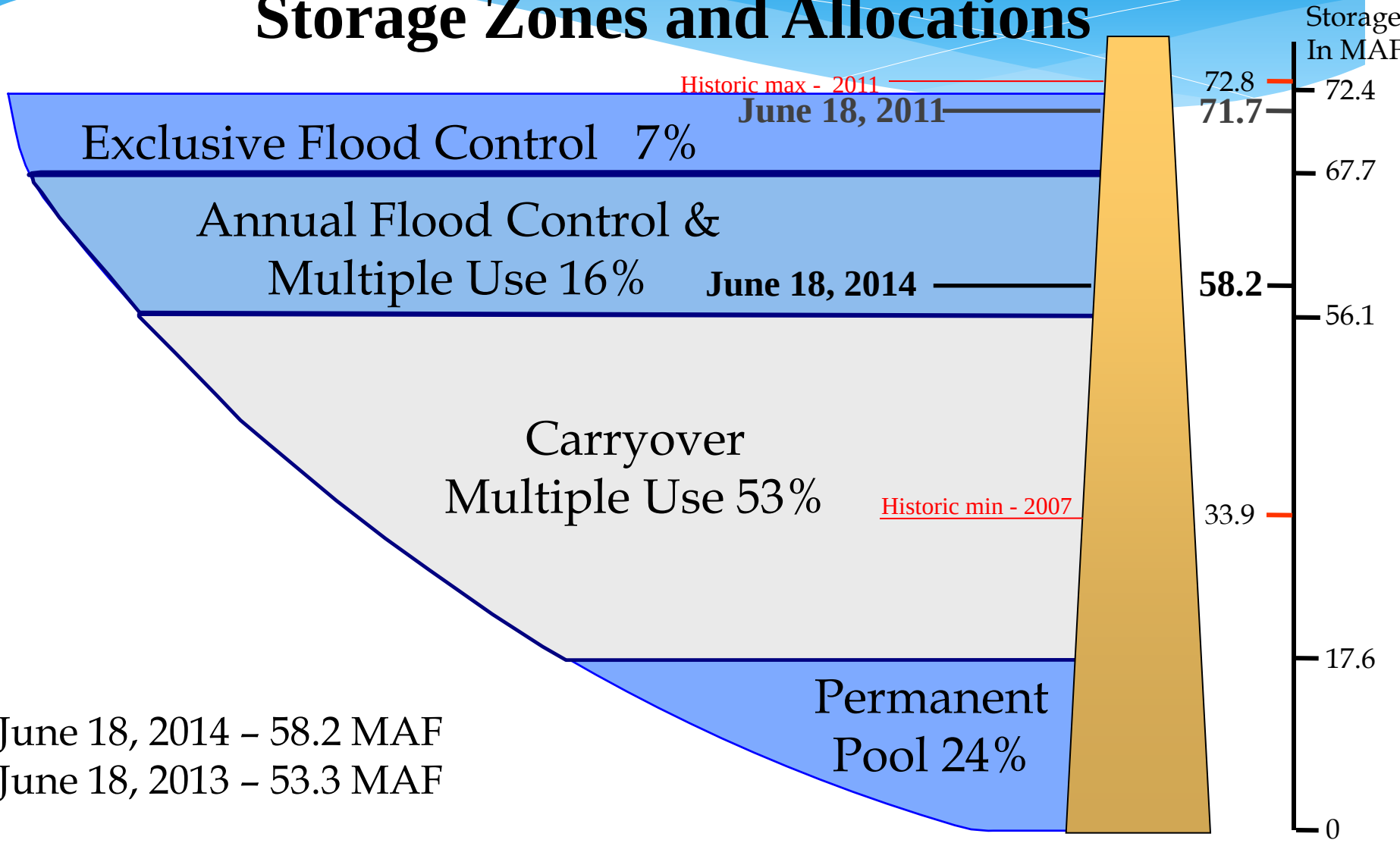


MISSOURI BASIN
RIVER FORECAST CENTER



Flooding issues due to excessive recent rainfall in the basin

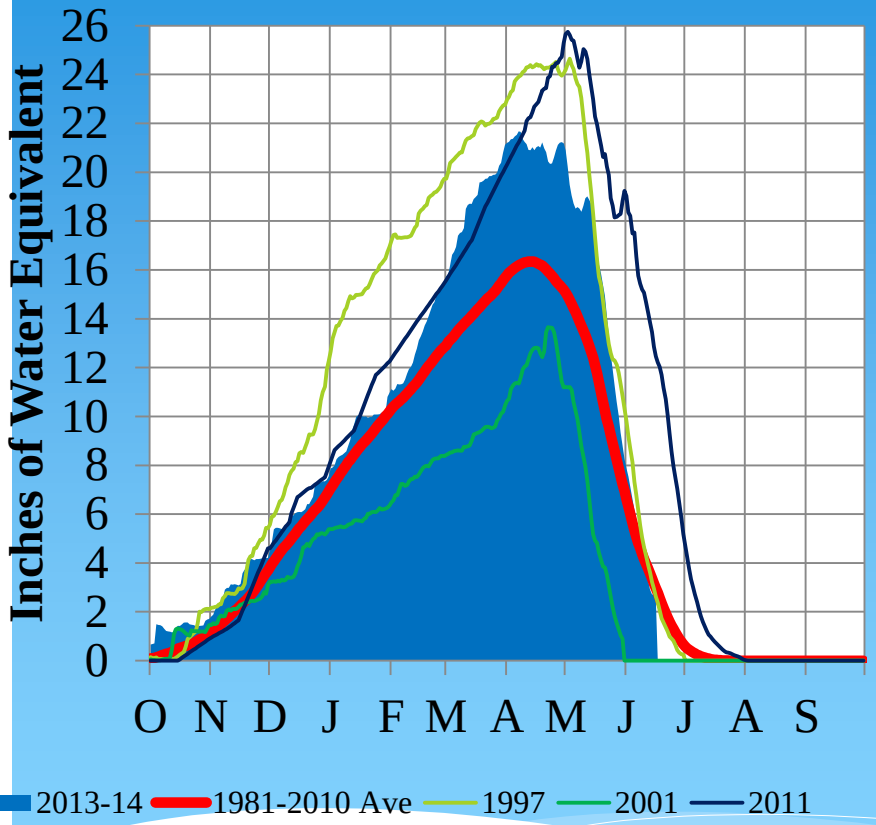
Missouri River Mainstem System
Storage Zones and Allocations



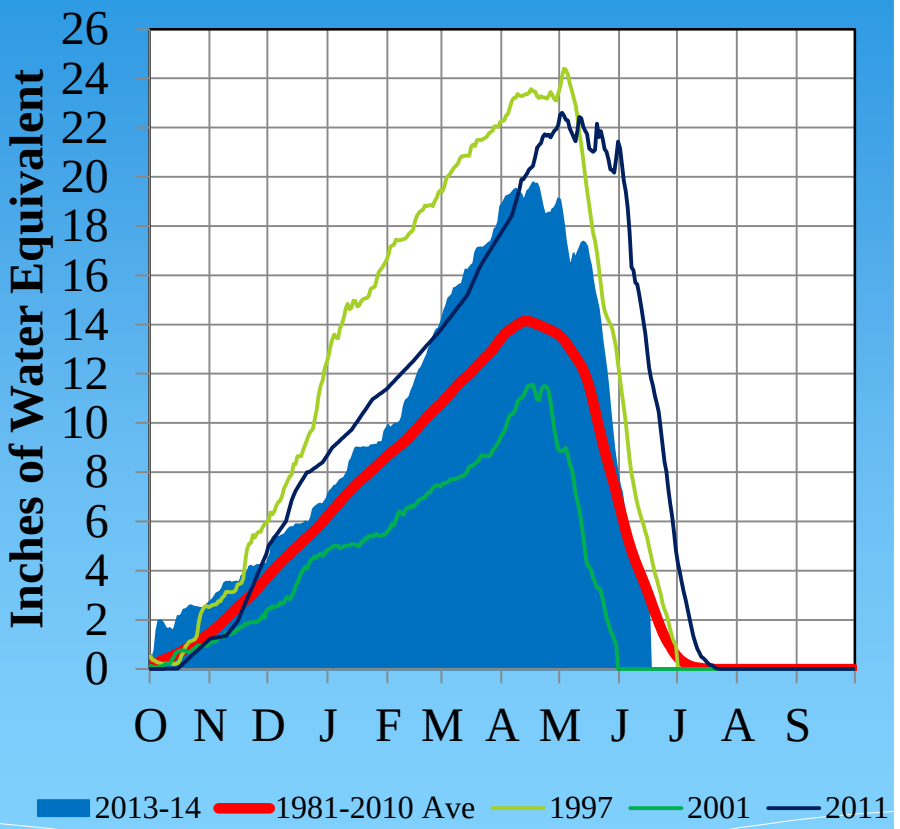
June 18, 2014 – 58.2 MAF
June 18, 2013 – 53.3 MAF

Missouri River Basin – Mountain Snowpack Water Content
2013-2014 with comparison plots from 1997*, 2001*, and 2011
June 16, 2014

Total above Fort Peck



Total Fort Peck to Garrison



The Missouri River basin mountain snowpack normally peaks near April 15. By June 16, usually about 25 – 29% of the normal peak mountain snowpack accumulation remains. On June 16, 2014, the mountain snowpack in the "Total above Fort Peck" reach was 2.5" 15% of the normal April 15 peak. On June 16, 2014, the mountain snowpack in the "Total Fort Peck to Garrison" reach was 2.7", 19% of the normal April 15 peak. The mountain snowpack peaked in the "Total above Fort Peck" reach on April 7 at 132% of the normal April 15 peak. The mountain snowpack peaked in the "Total Fort Peck to Garrison" reach on April 17 at 140% of the normal April 15 peak.

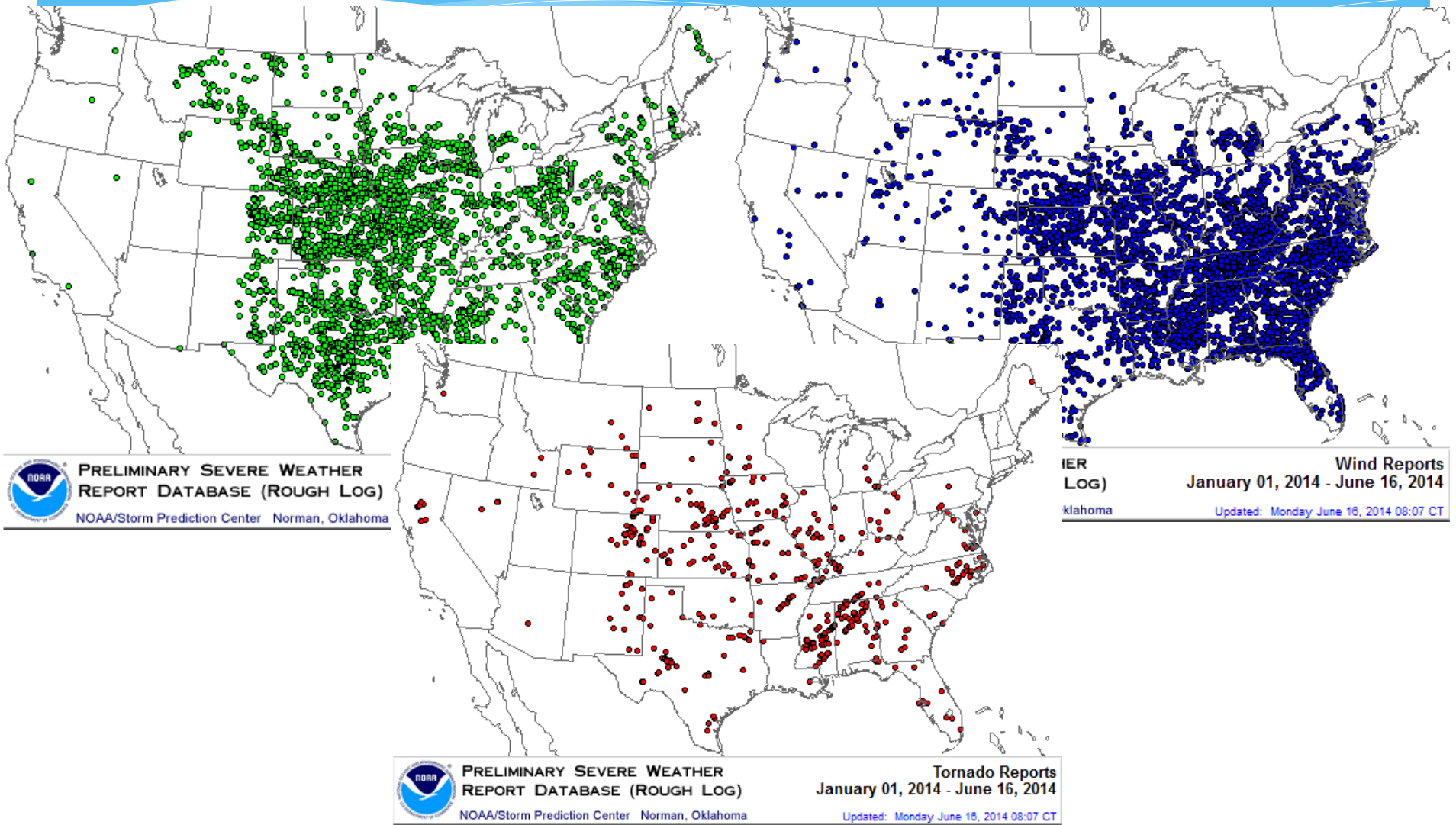
*Generally considered the high and low year of the last 20-year period.

Provisional data. Subject to revision.

Missouri River Mainstem Reservoir Summary

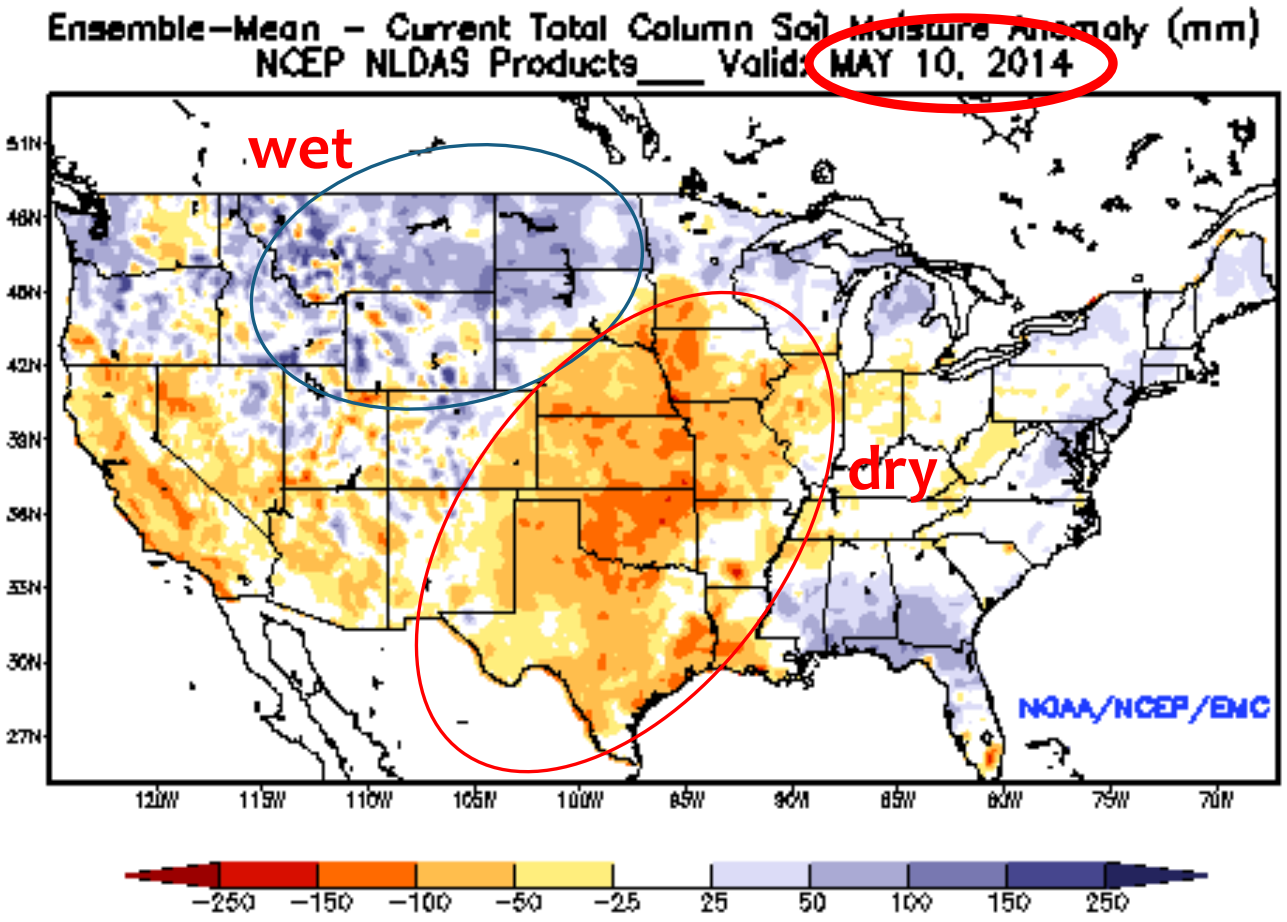
* Runoff Forecast = 31.1 MAF (123%)
* 13% of flood control storage filled
* Reduced releases reduced to provide downstream flood reduction
* Return to regular releases in 1-2 weeks

Severe Weather Taking a Toll



Agriculture

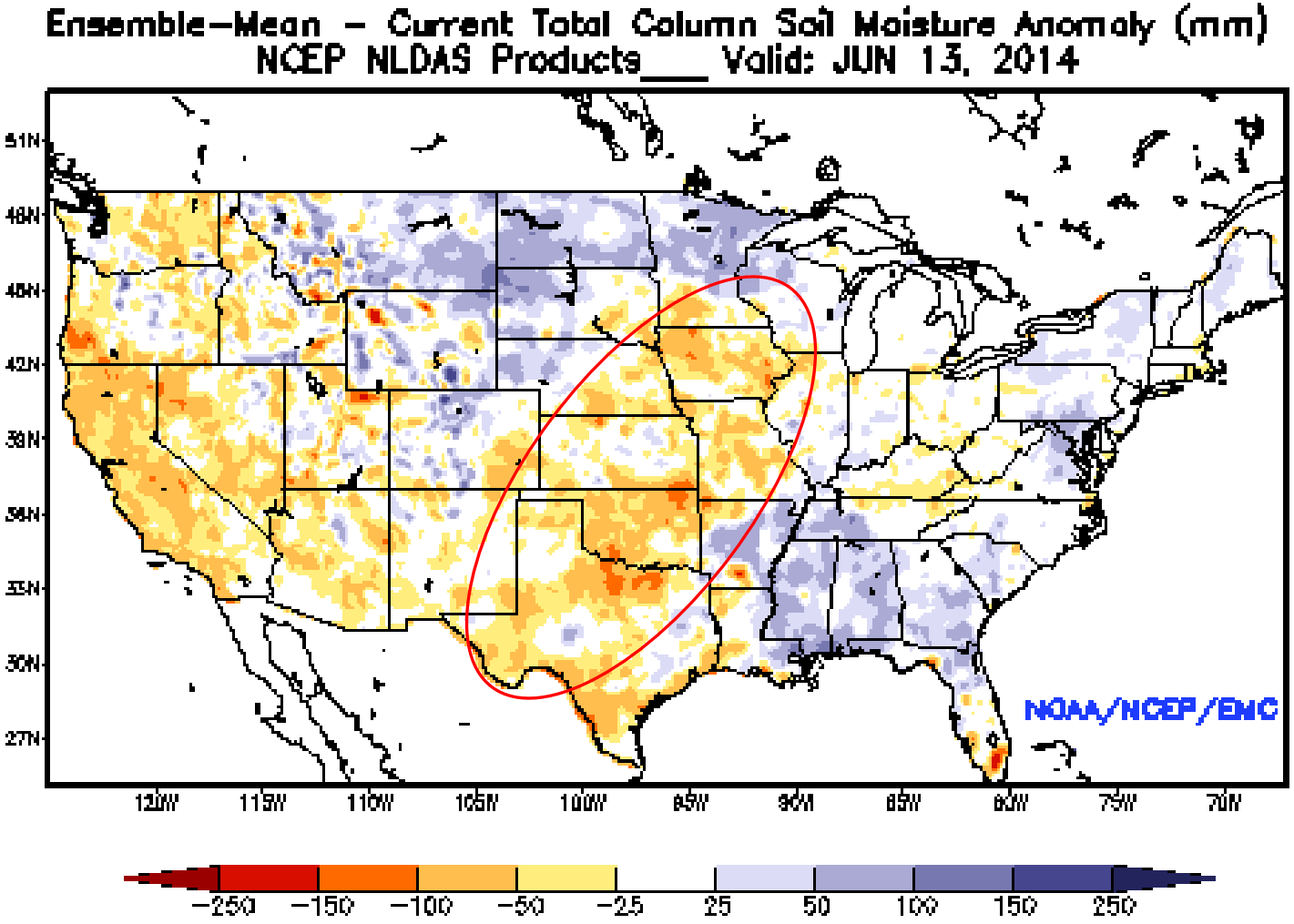
Soil Moisture Anomaly



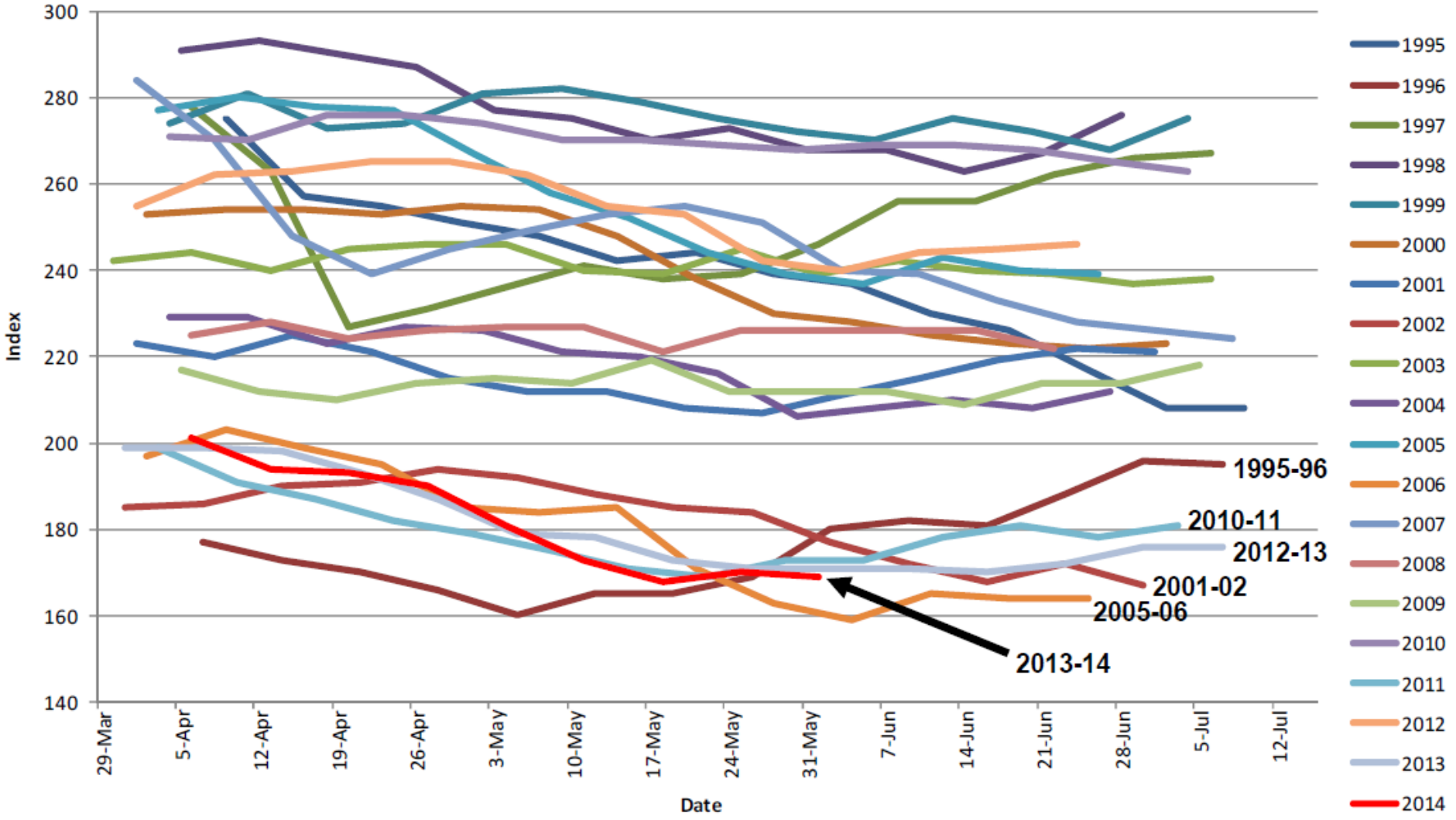
Soil Moisture Anomaly in millimeters

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

Soil Moisture Anomaly



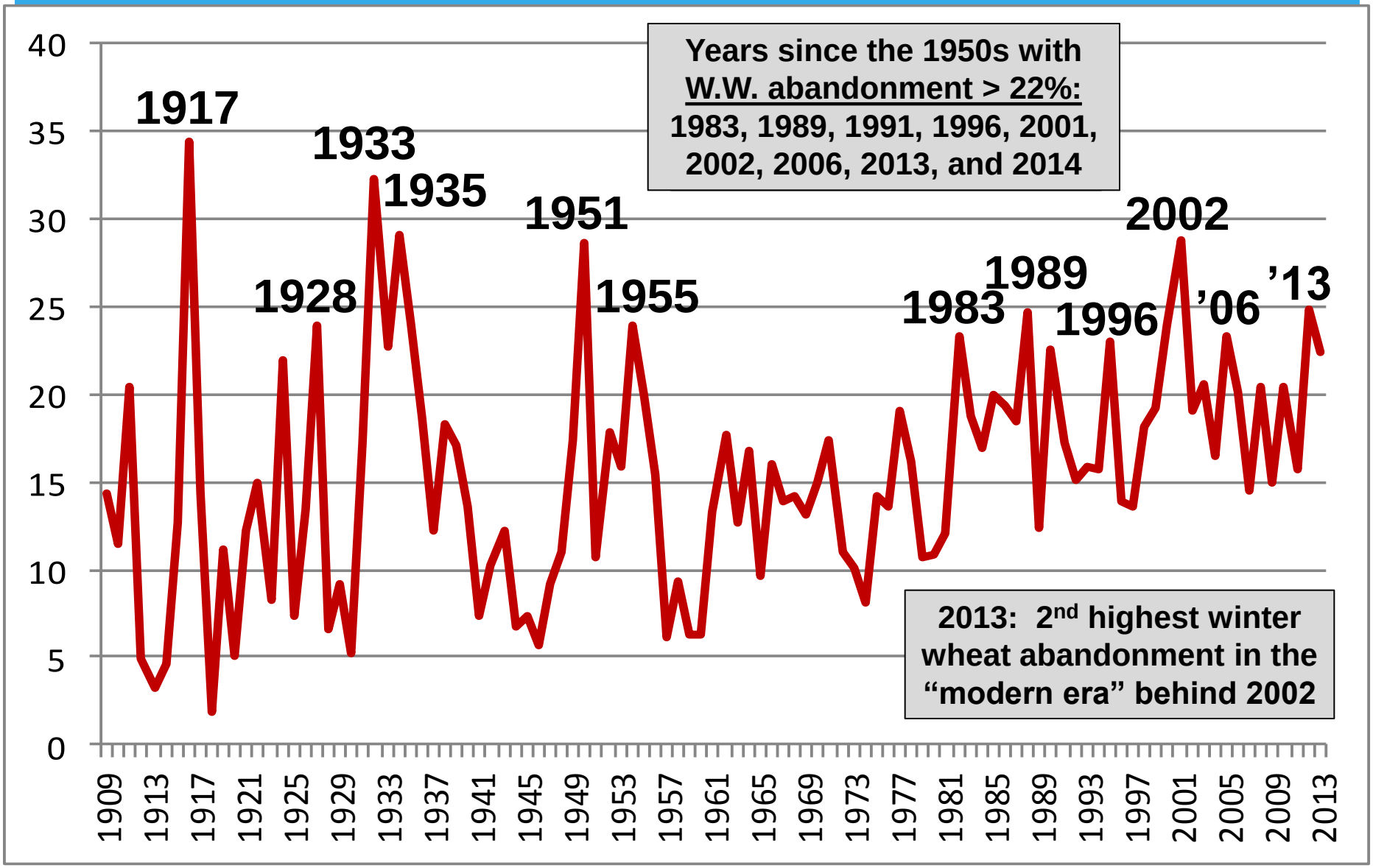
U.S. WINTER WHEAT Condition Index



Based on NASS crop progress data.

Index Weighting: Excellent = 4; Good = 3; Fair = 2; Poor = 1; Very Poor = 0

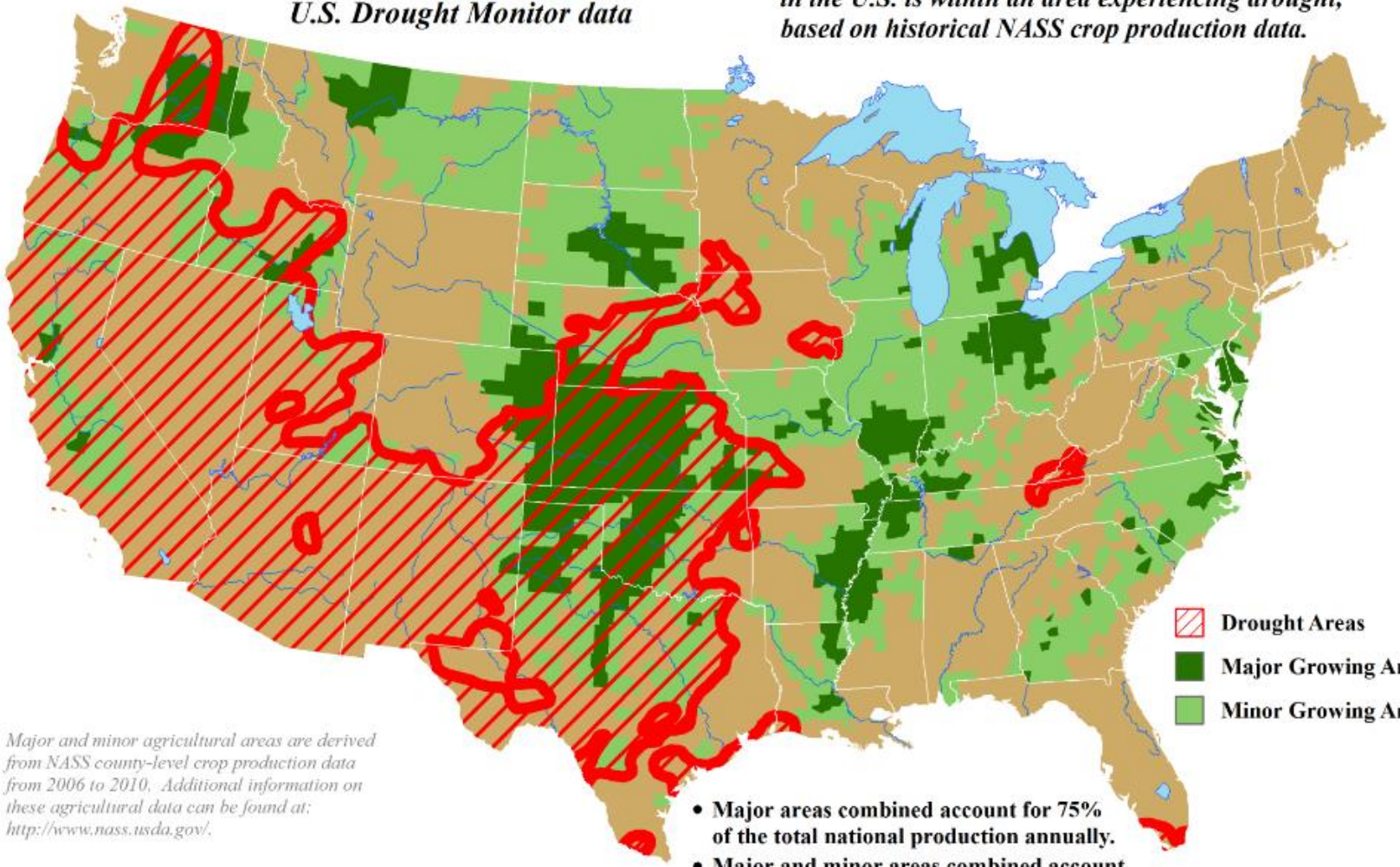
Percent U.S. Winter Wheat Abandonment 1909-2014



U.S. Winter Wheat Areas Experiencing Drought

Reflects June 10, 2014
U.S. Drought Monitor data

Approximately 48% of the winter wheat grown in the U.S. is within an area experiencing drought, based on historical NASS crop production data.



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

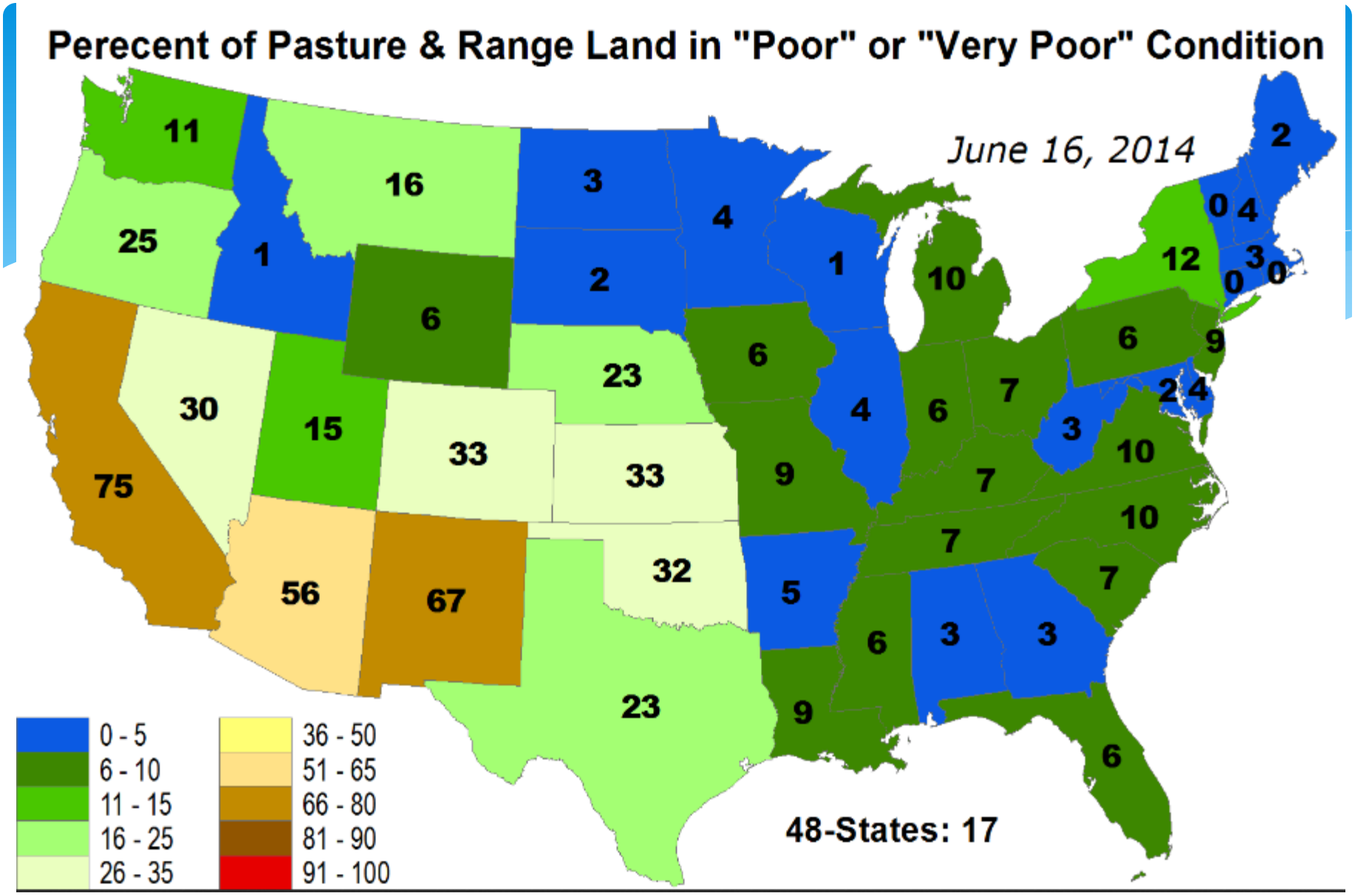
Major and minor agricultural areas are derived from NASS county-level crop production data from 2006 to 2010. Additional information on these agricultural data can be found at: http://www.nass.usda.gov/.

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/.

USDA **Agricultural Weather Assessments**
World Agricultural Outlook Board

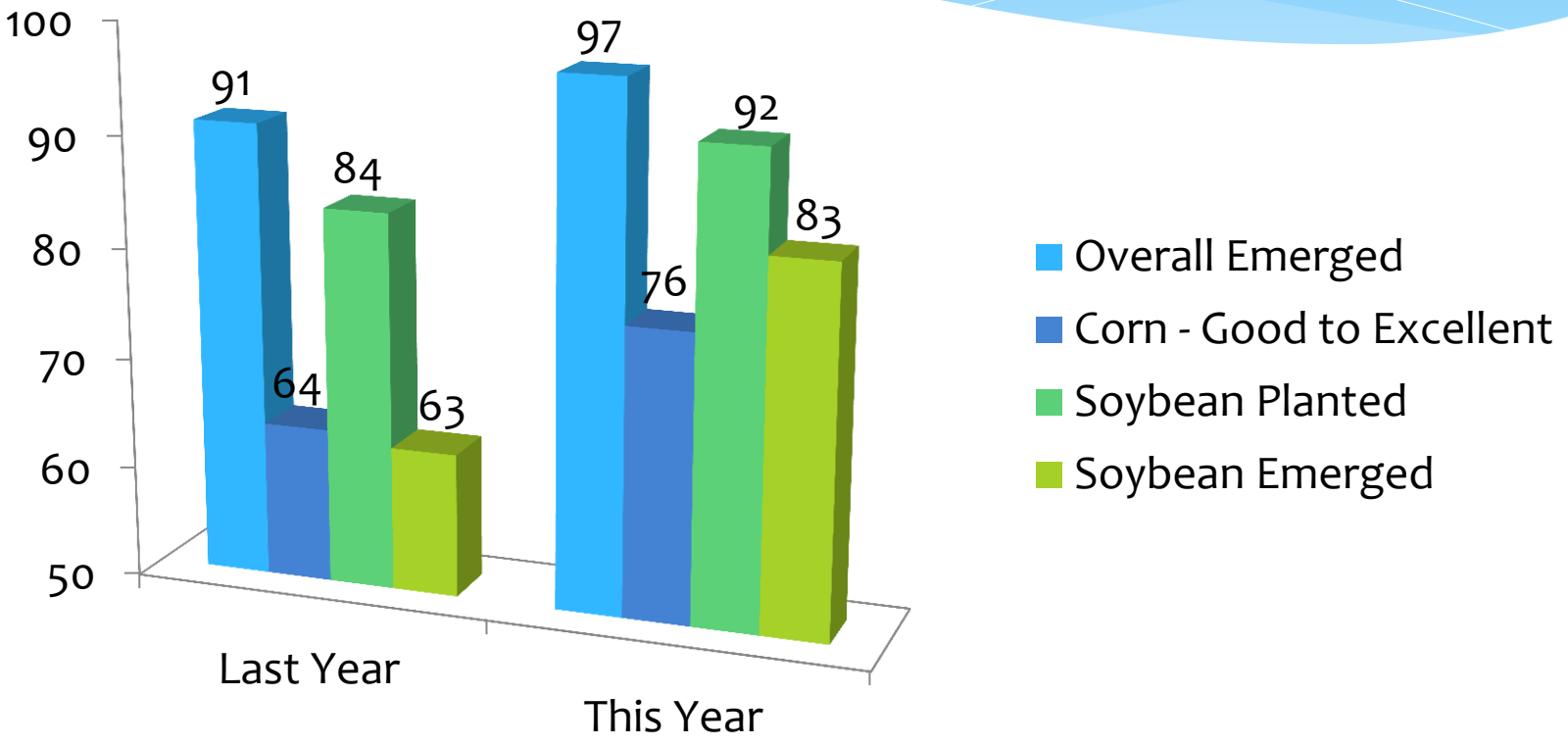
USDA Wheat Outlook

* USDA wheat forecast is down 2% from the May 1 forecast and down 10% from 2013.
* Total production is forecast to be 1.38 billion bushels.


Perecent of Pasture & Range Land in "Poor" or "Very Poor" Condition
June 16, 2014
11
25
16
1
6
3
4
2
1
10
2
0
4
12
3
0
0
6
9
6
23
4
6
7
2
4
3
10
30
15
33
33
9
7
10
75
7
32
56
67
5
6
3
3
7
23
9
6
48-States: 17
0 - 5
6 - 10
11 - 15
16 - 25
26 - 35
36 - 50
51 - 65
66 - 80
81 - 90
91 - 100

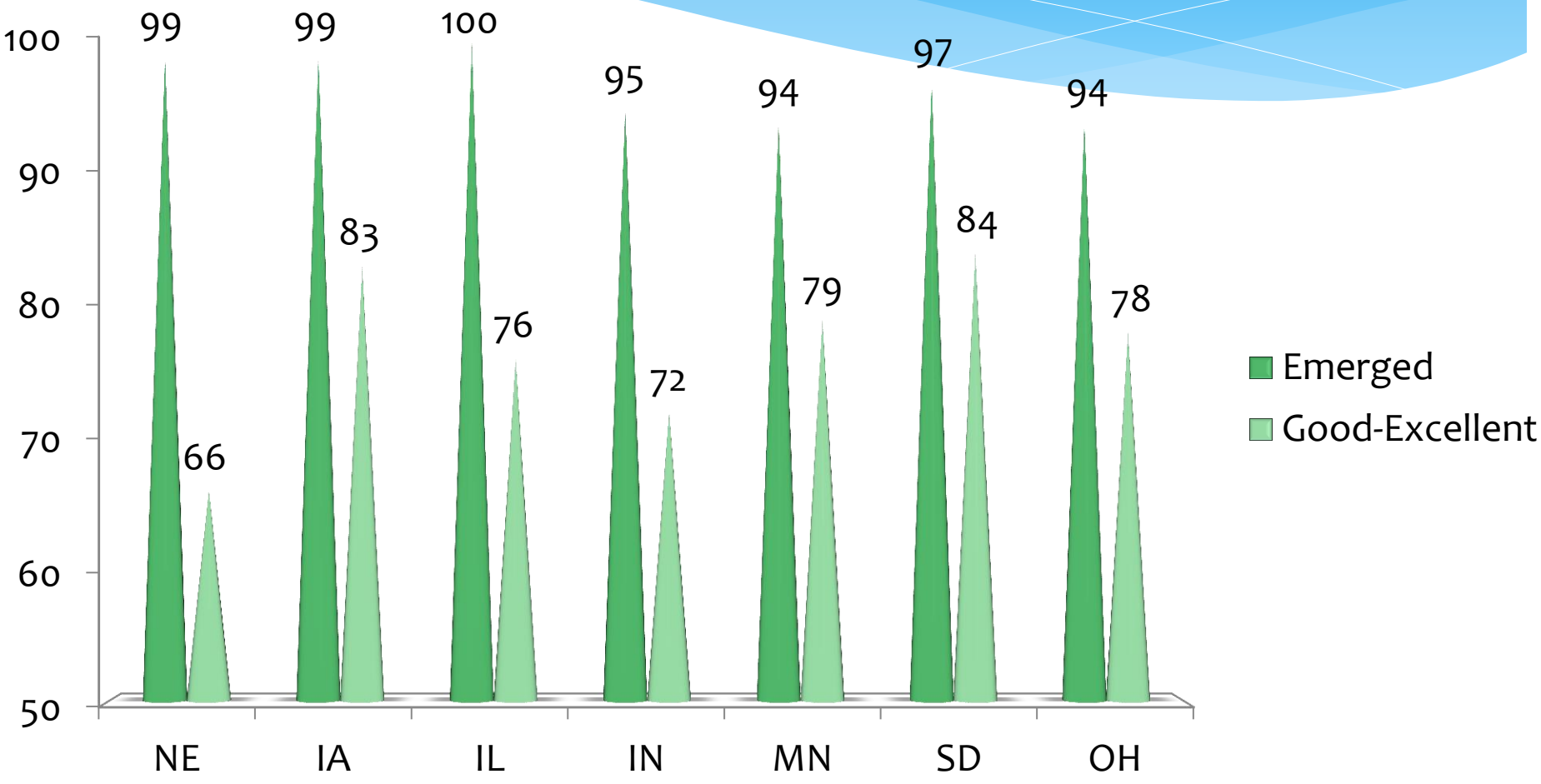
USDA

Crop Progress

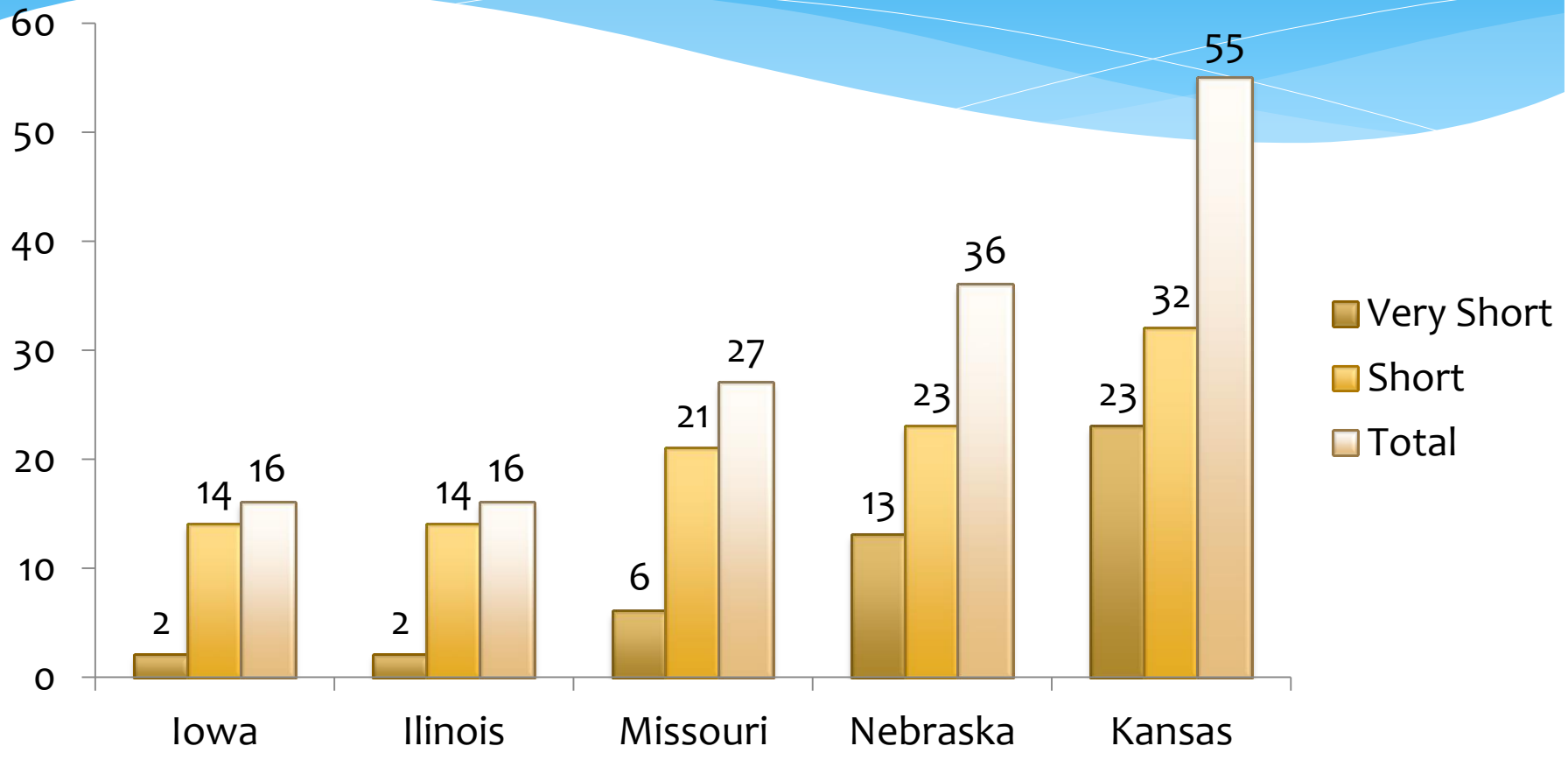


http://www.usda.gov/oce/weather/pubs/Weekly/Wwcb/wwcb.pdf

Corn Progress

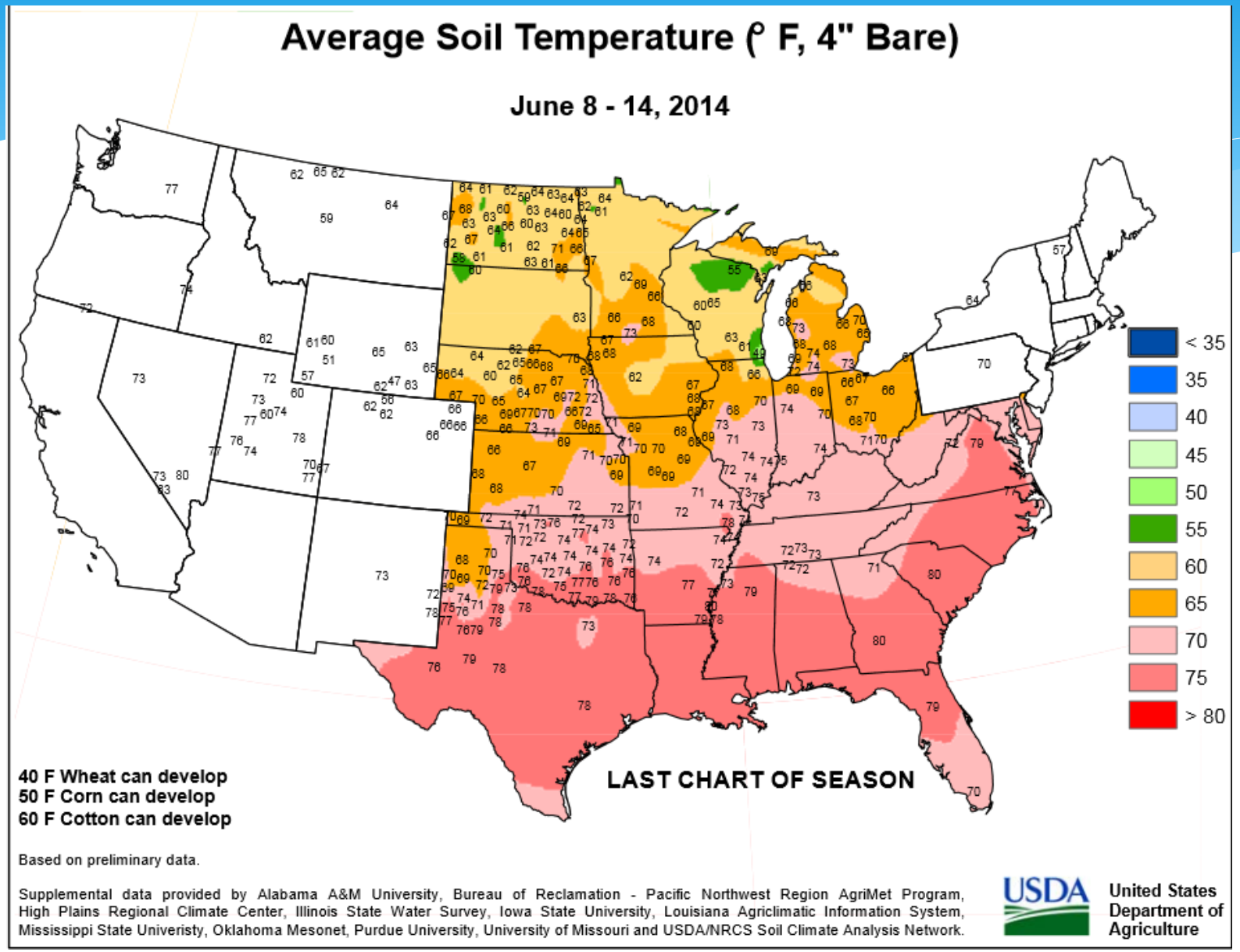


Sub-Soil Moisture



Topsoil in the USDA NASS reports refers to the top 6 inches of soil
Sub-soil refers to the layer below that and can extend down to 3 feet

4-Inch Soil Temperatures

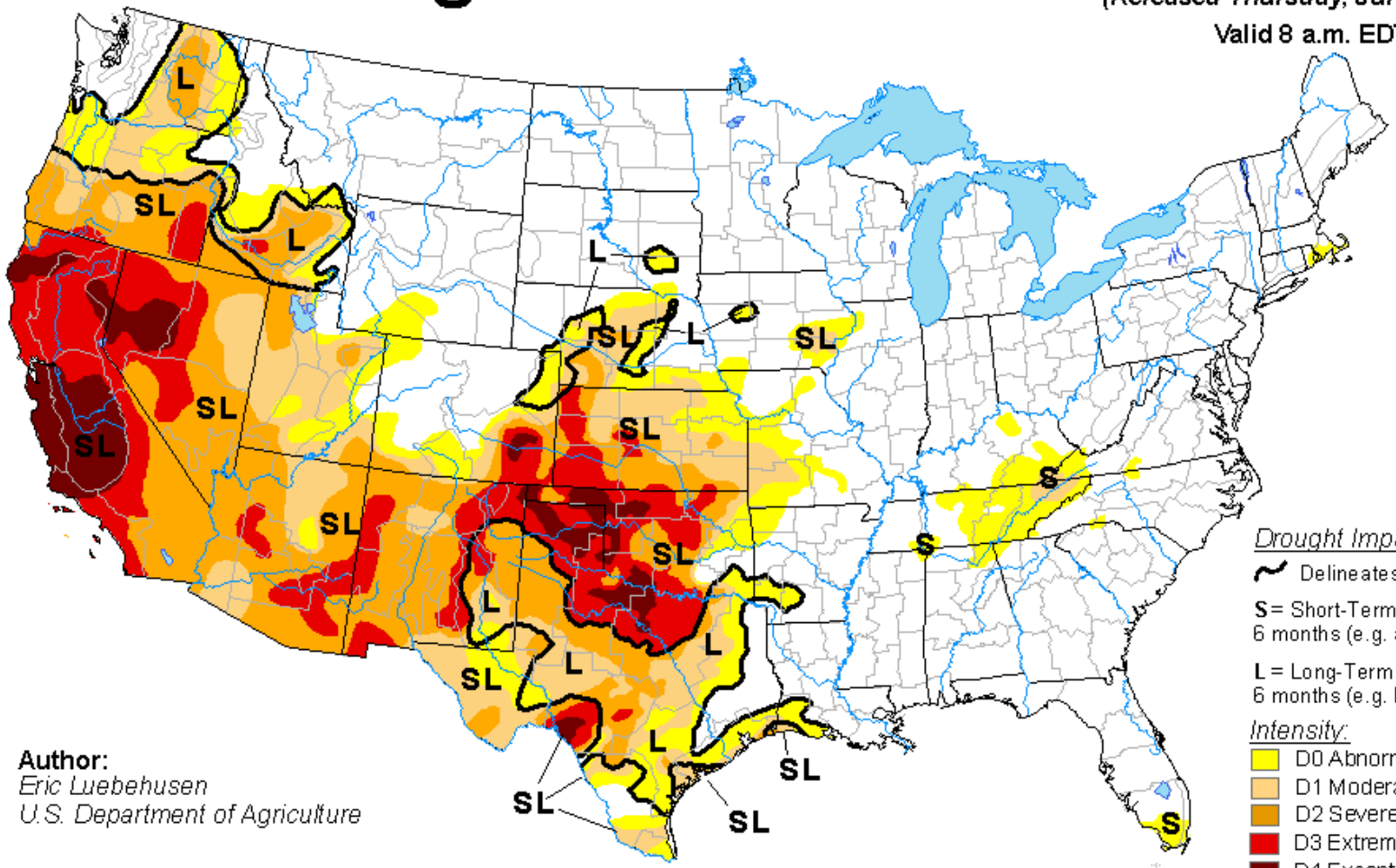


U.S. Drought Monitor

June 17, 2014

(Released Thursday, Jun. 19, 2014)

Valid 8 a.m. EDT



Author:
Eric Luebehusen
U.S. Department of Agriculture

Drought Impact Types:

Delineates dominant impacts

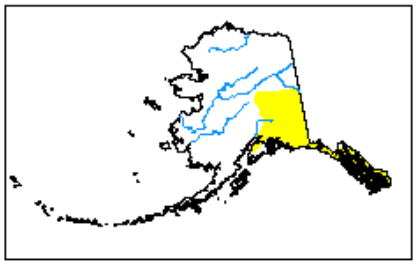
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

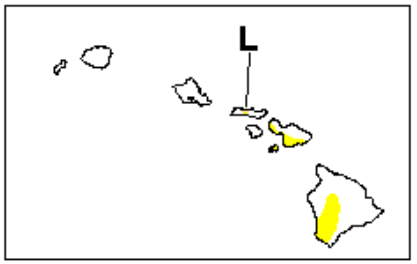
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

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.





USDA National Drought Mitigation Center

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

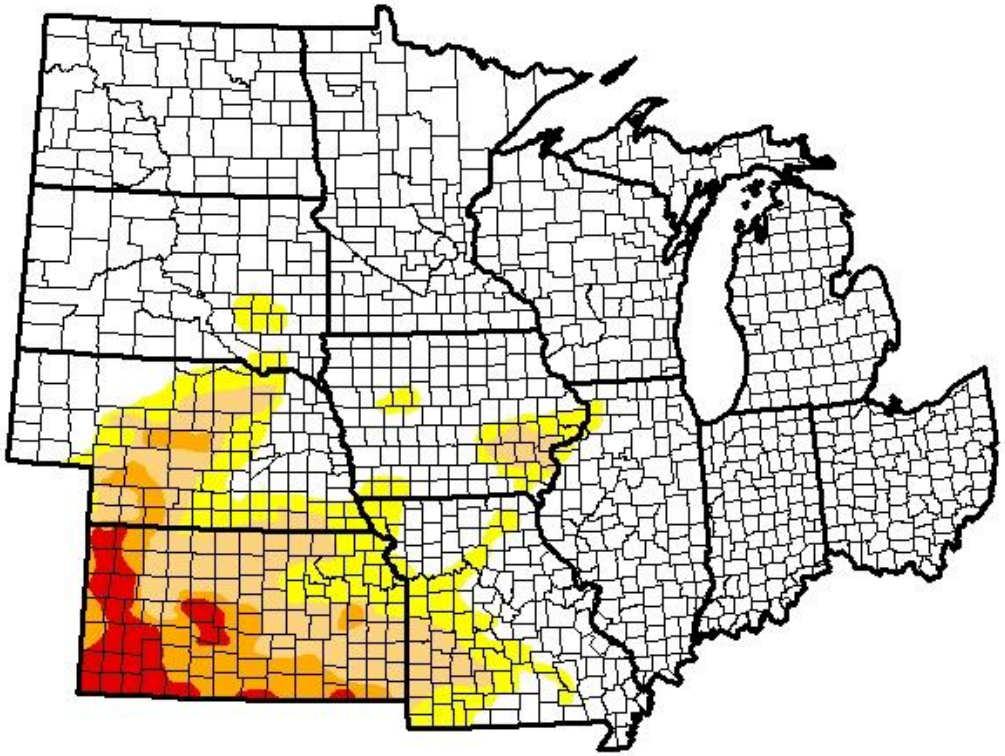
Week	Date	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6/17/2014	58.64	41.36	29.70	21.25	9.71	2.62
Last Week	6/10/2014	57.95	42.05	30.20	21.70	10.17	2.24
3 Months Ago	3/18/2014	56.48	43.52	31.34	18.60	7.07	1.37
Start of Calendar Year	12/31/2013	54.20	45.80	26.01	13.96	3.31	0.31
Start of Water Year	10/1/2013	44.21	55.79	37.21	17.33	2.56	0.24
One Year Ago	6/18/2013	51.88	48.12	37.76	25.11	10.54	3.66

Conditions for the Contiguous U.S.

Week	Date	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	6/17/2014	54.73	45.27	35.55	25.43	11.63	3.14
Last Week	6/10/2014	53.91	46.09	36.15	25.97	12.18	2.68
3 Months Ago	3/18/2014	48.53	51.47	37.48	22.27	8.47	1.64
Start of Calendar Year	12/31/2013	48.24	51.76	30.95	16.67	3.96	0.37
Start of Water Year	10/1/2013	39.57	60.43	41.21	20.70	3.06	0.29
One Year Ago	6/18/2013	46.73	53.27	44.77	30.04	12.61	4.38

The National Drought Mitigation Center | 3310 Holdrege Street | P.O. Box 830988 | Lincoln, NE 68583–0988
phone: (402) 472–6707 | fax: (402) 472–2946 | Contact Us

U.S. Drought Monitor
North Central



June 17, 2014

(Released Thursday, Jun. 19, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	77.98	8.32	7.84	3.58	2.29	0.00
Last Week *6/10/2014*	74.15	9.52	9.86	3.07	3.40	0.00
3 Months Ago *3/18/2014*	56.37	19.32	16.07	6.27	1.96	0.00
Start of Calendar Year *12/31/2013*	58.55	20.04	13.18	7.15	1.08	0.00
Start of Water Year *10/1/2013*	37.82	26.00	20.08	14.87	1.22	0.00
One Year Ago *6/18/2013*	68.98	8.73	8.30	5.67	5.36	2.96

Intensity:

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

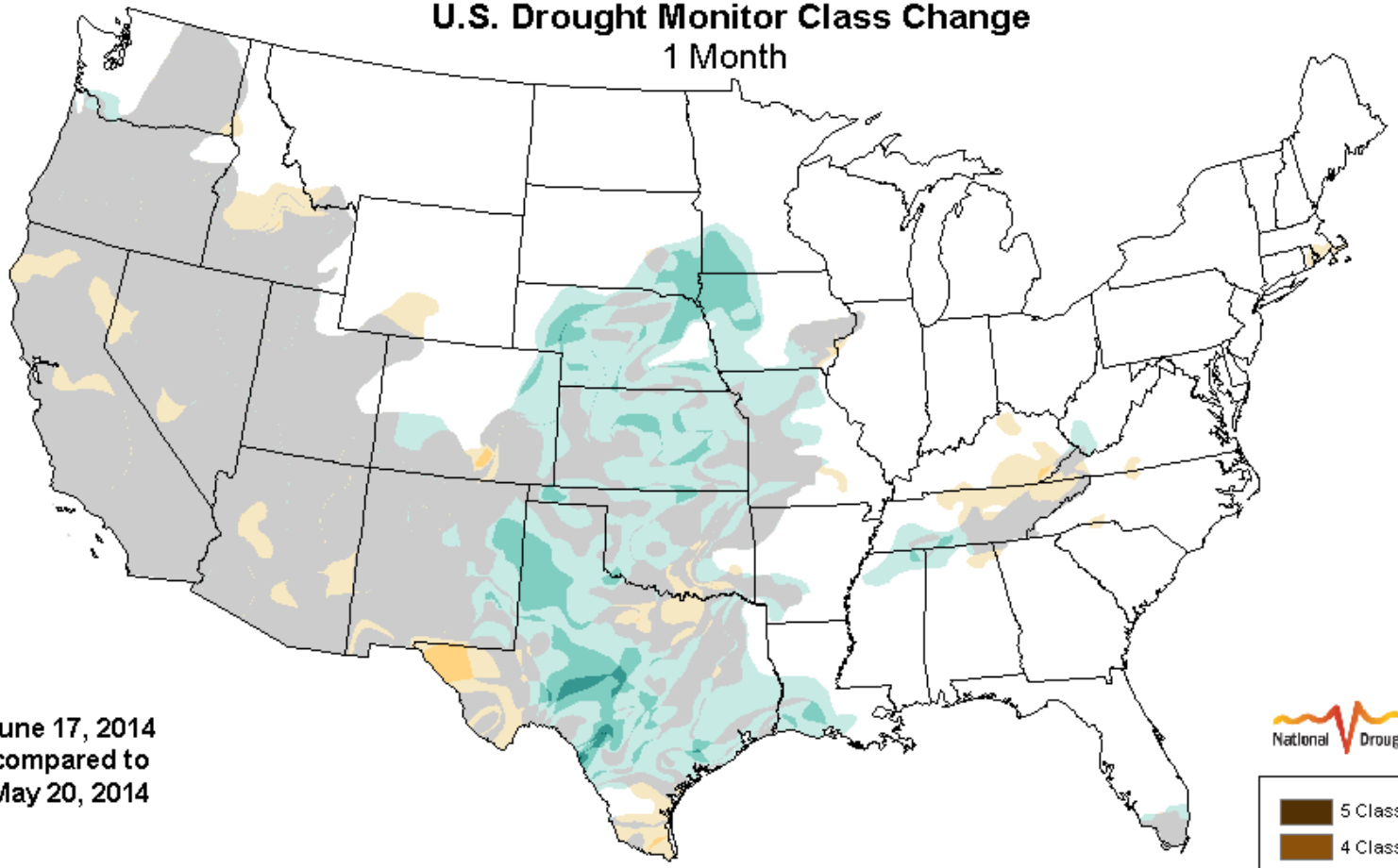
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Eric Luebehusen
U.S. Department of Agriculture

http://droughtmonitor.unl.edu/

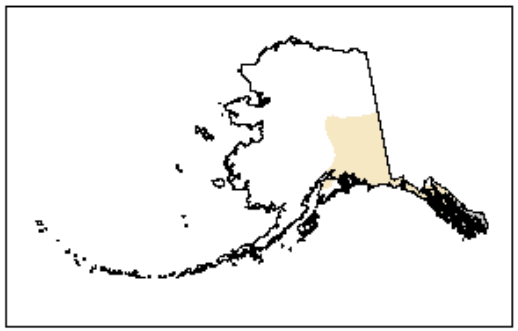
U.S. Drought Monitor Class Change

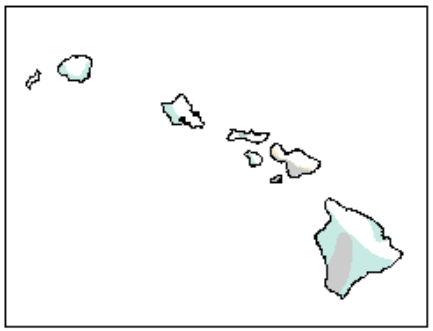
1 Month

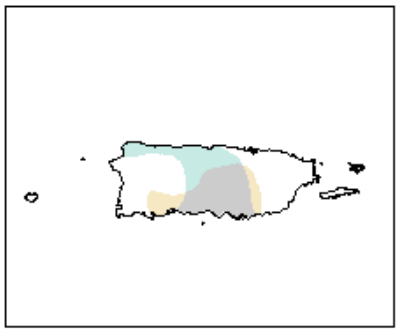


June 17, 2014
compared to
May 20, 2014

National Drought Mitigation Center







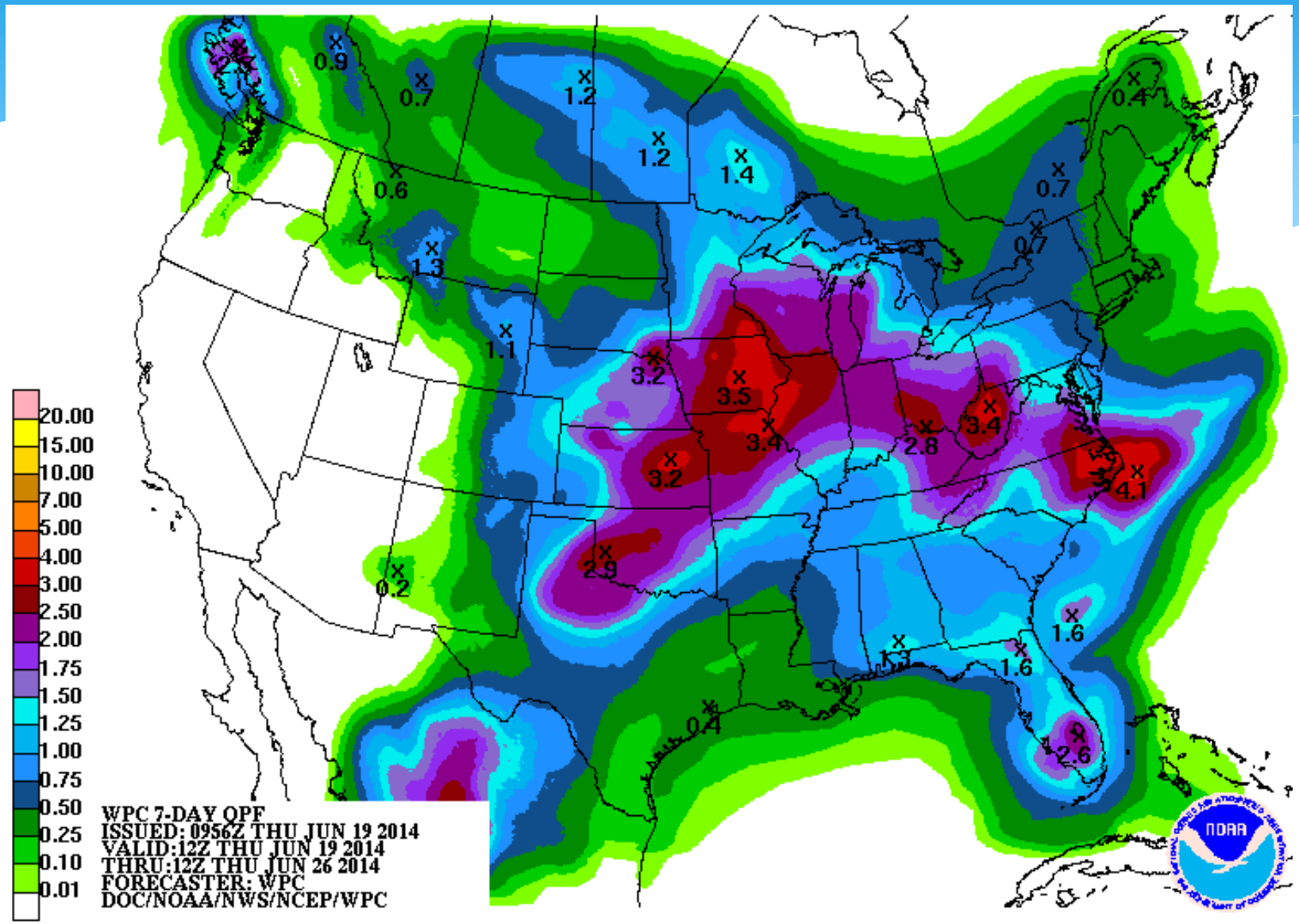
- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

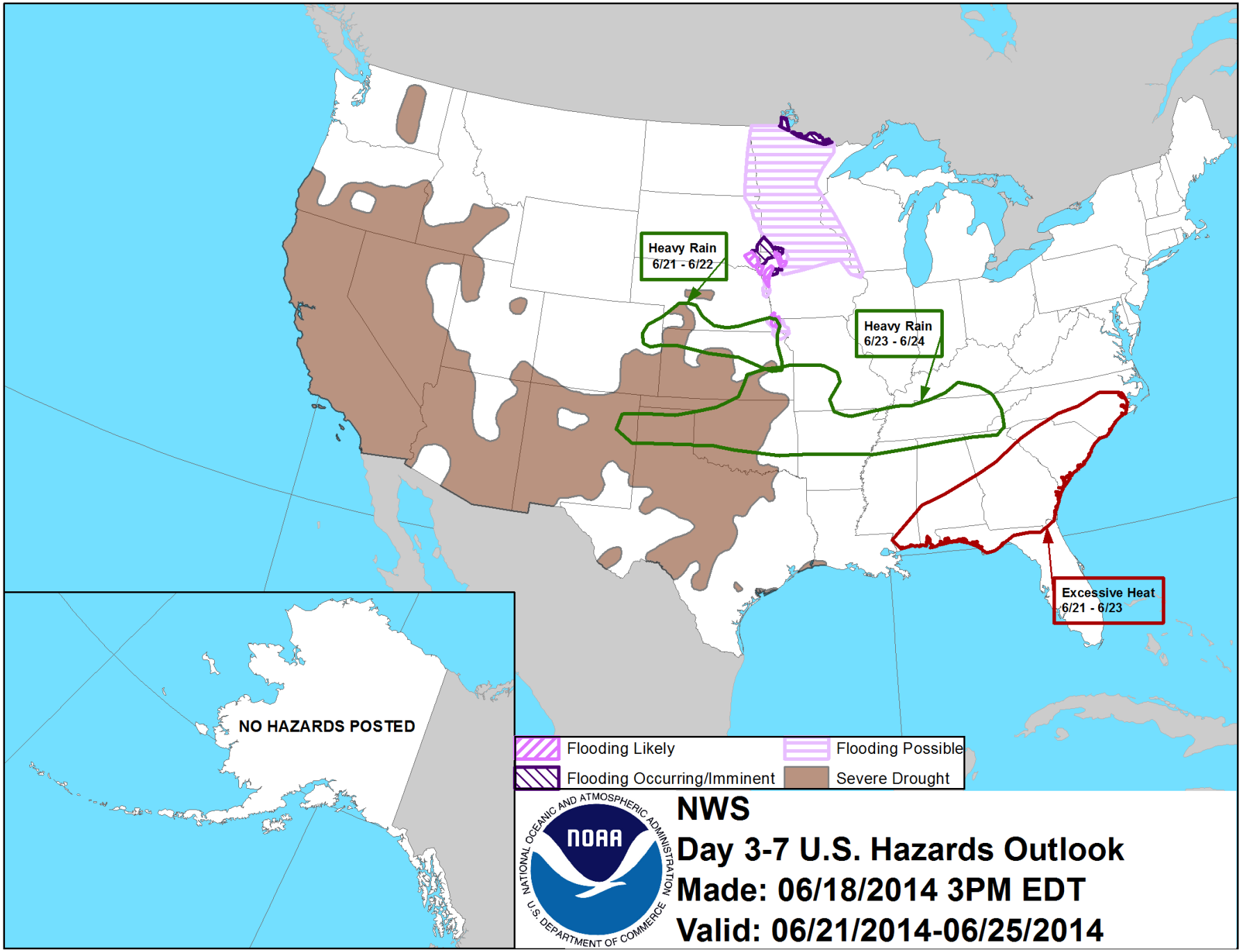
http://droughtmonitor.unl.edu

Climate Outlooks

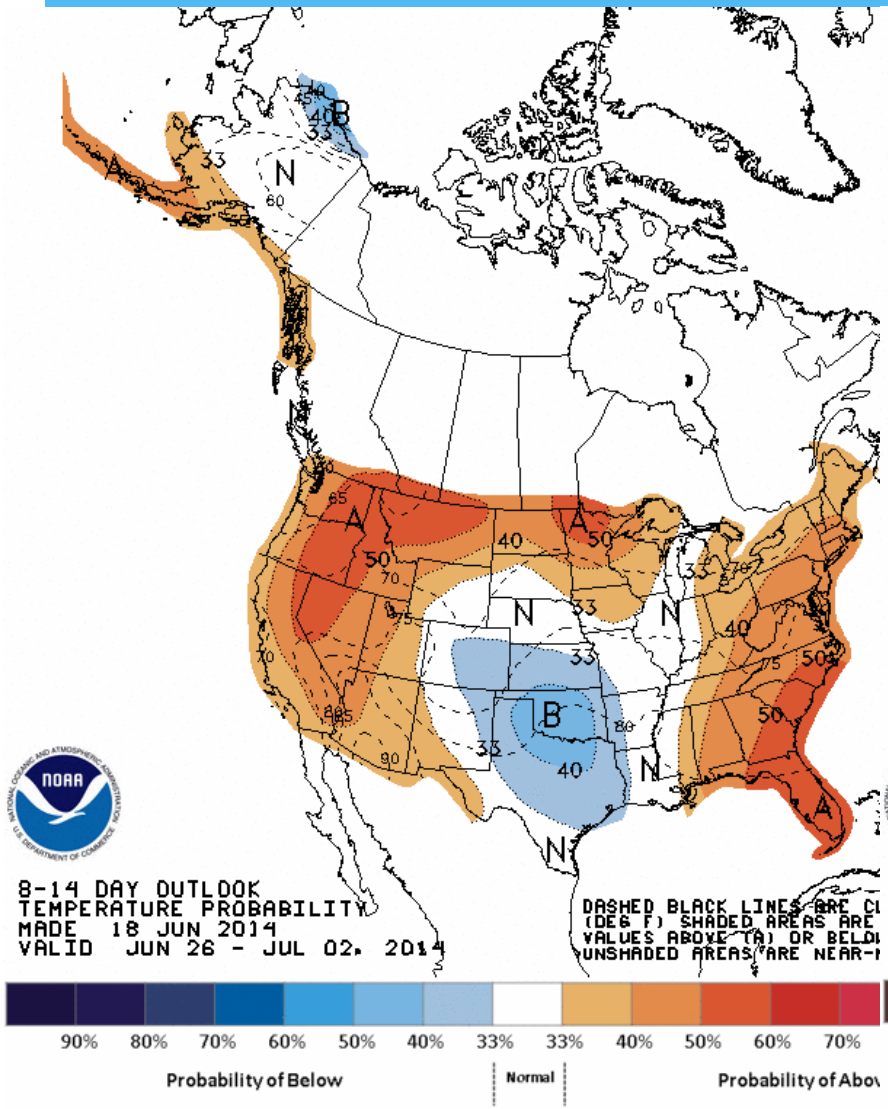
* 7-day precipitation forecast
* 8-14 day outlook
* Monthly/Seasonal
* 6 Months (April - September)
* Seasonal Drought Outlooks
* El Nino Coming?

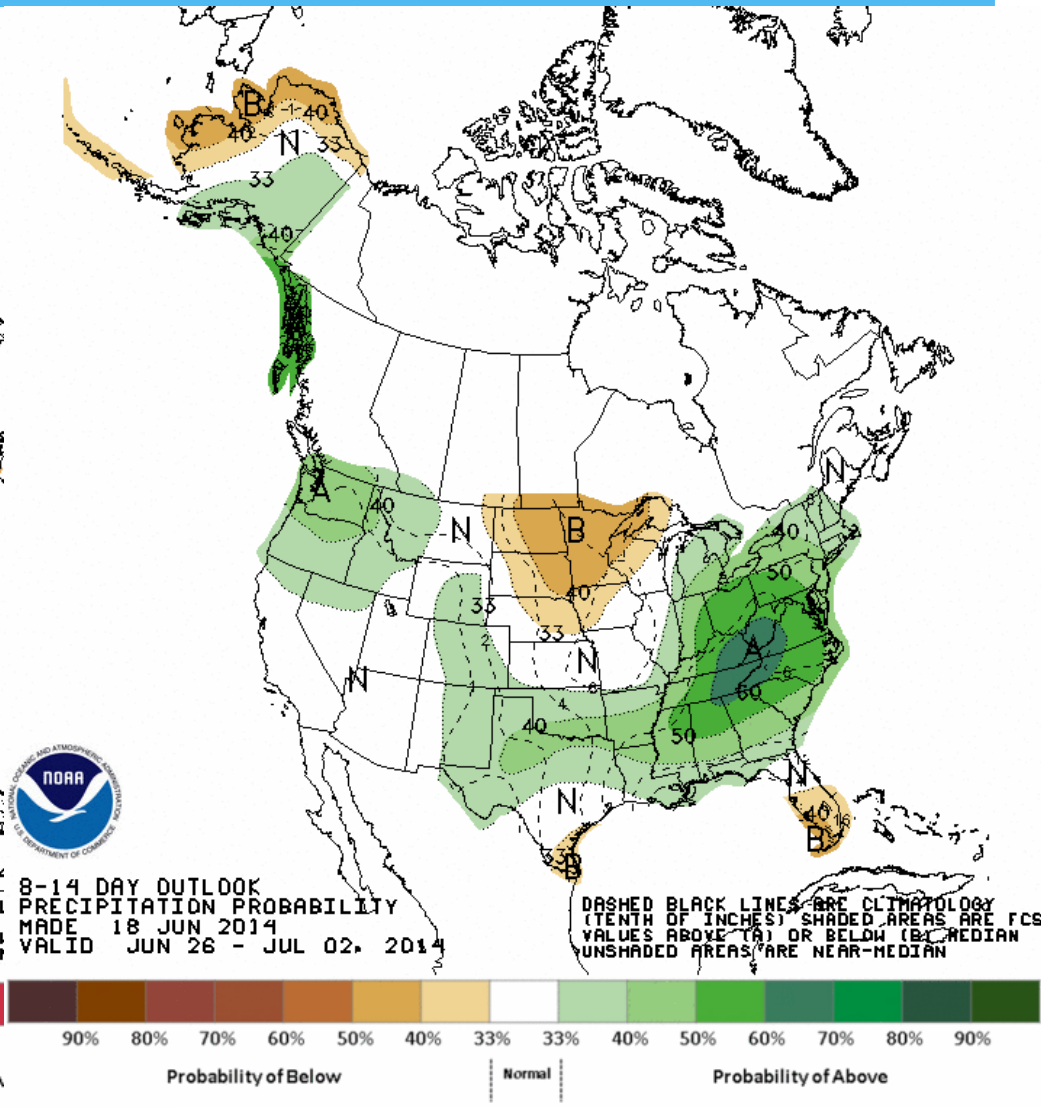
7 Day QPF


20.00
15.00
10.00
7.00
5.00
4.00
3.00
2.50
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.10
0.01
WPC 7-DAY QPF
ISSUED: 0956Z THU JUN 19 2014
VALID:12Z THU JUN 19 2014
THRU:12Z THU JUN 26 2014
FORECASTER: WPC
DOC/NOAA/NWS/NCEP/WPC
0.9
0.7
1.2
1.2
1.4
0.4
0.6
0.7
0.7
1.3
1.1
3.2
3.5
3.4
3.2
2.8
3.4
4.1
2.9
0.2
1.6
1.6
0.4
2.6
NOAA

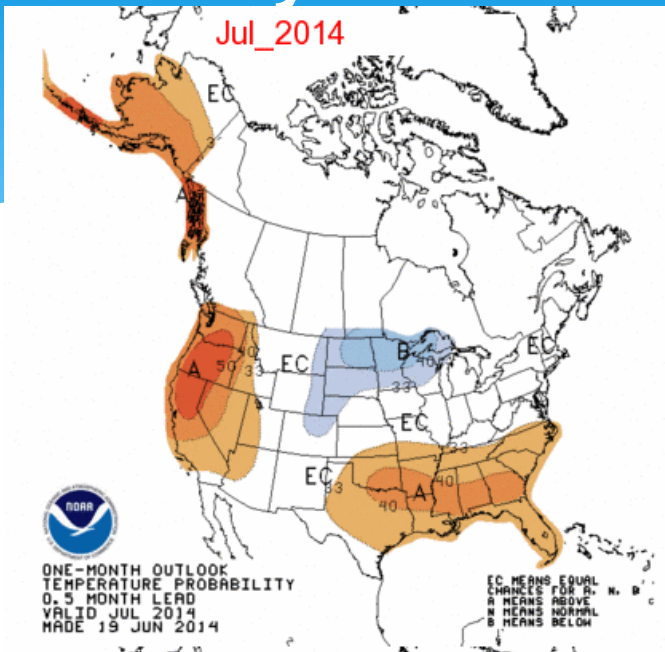

Heavy Rain
6/21 - 6/22
Heavy Rain
6/23 - 6/24
Excessive Heat
6/21 - 6/23
NO HAZARDS POSTED
Flooding Likely
Flooding Possible
Flooding Occurring/Imminent
Severe Drought
NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
NWS
Day 3-7 U.S. Hazards Outlook
Made: 06/18/2014 3PM EDT
Valid: 06/21/2014-06/25/2014

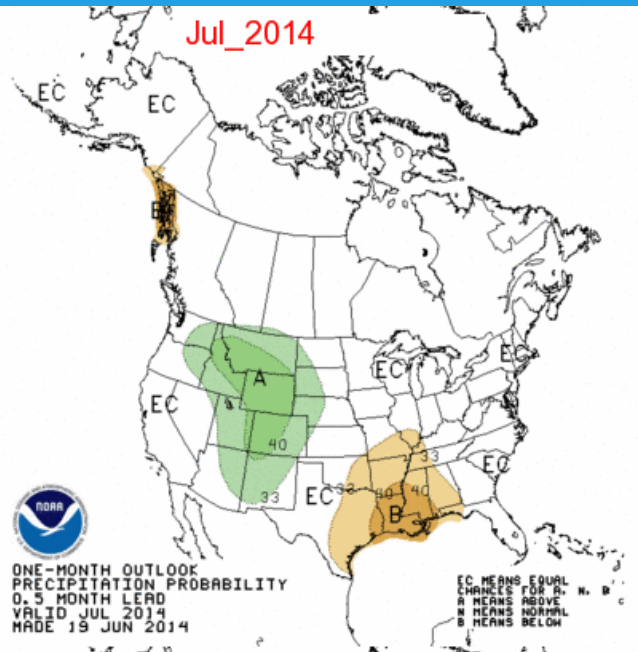
8-14 Day Outlook

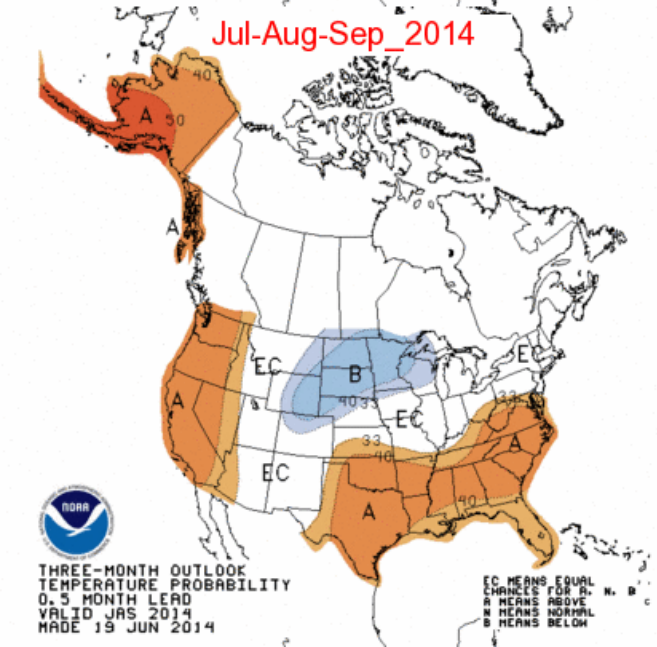


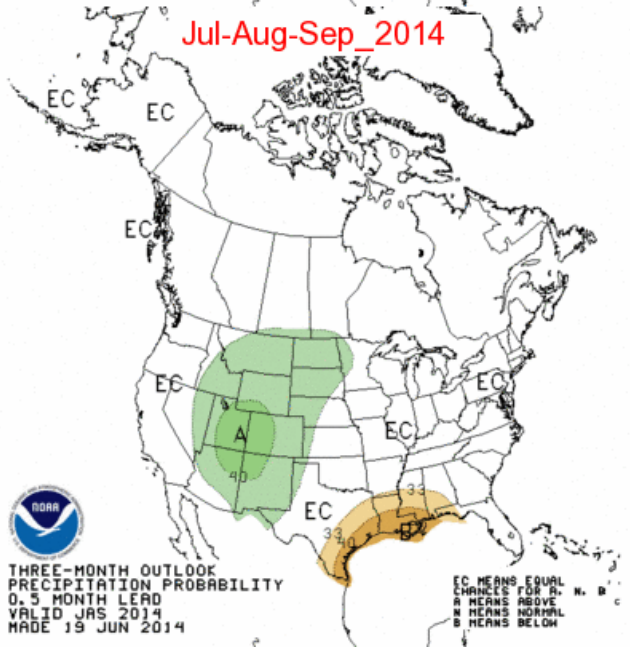


Monthly and Seasonal Outlooks

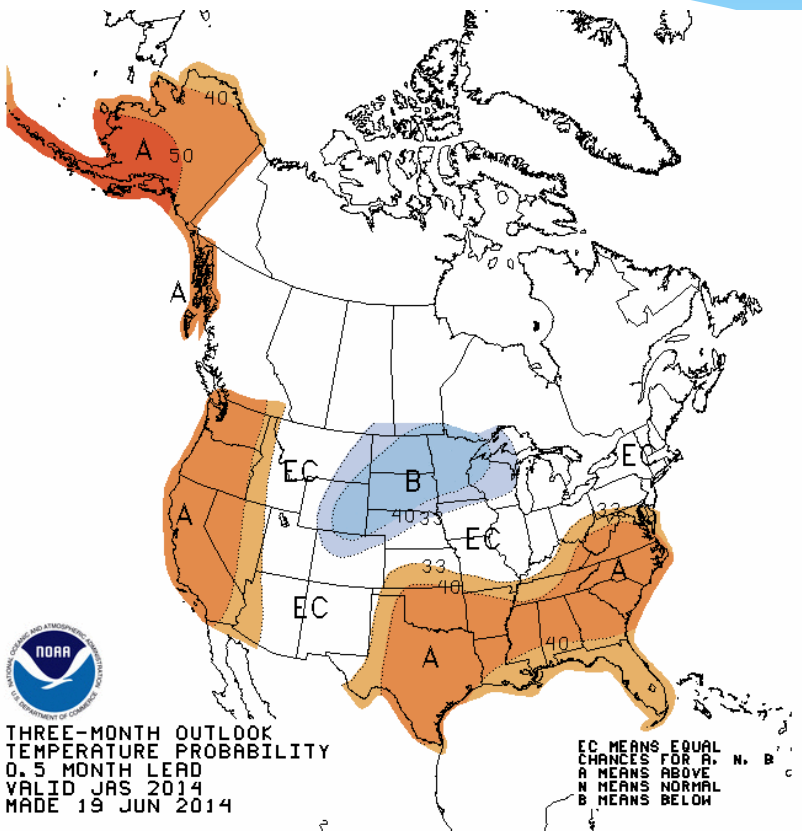




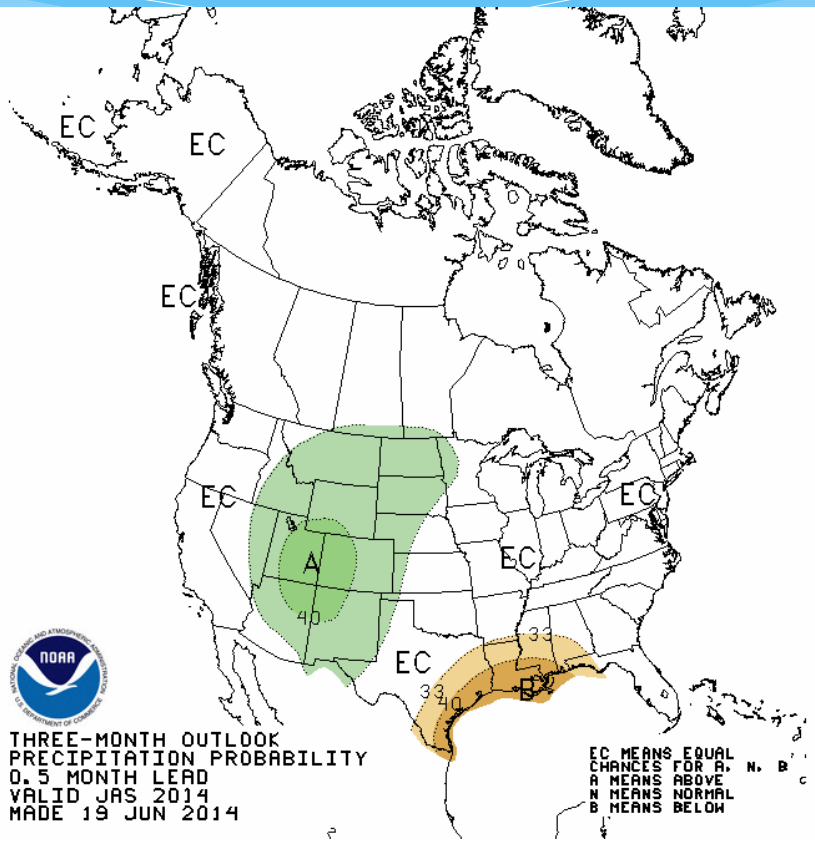




3 Month Temperature and Precipitation Probabilities (July-September)

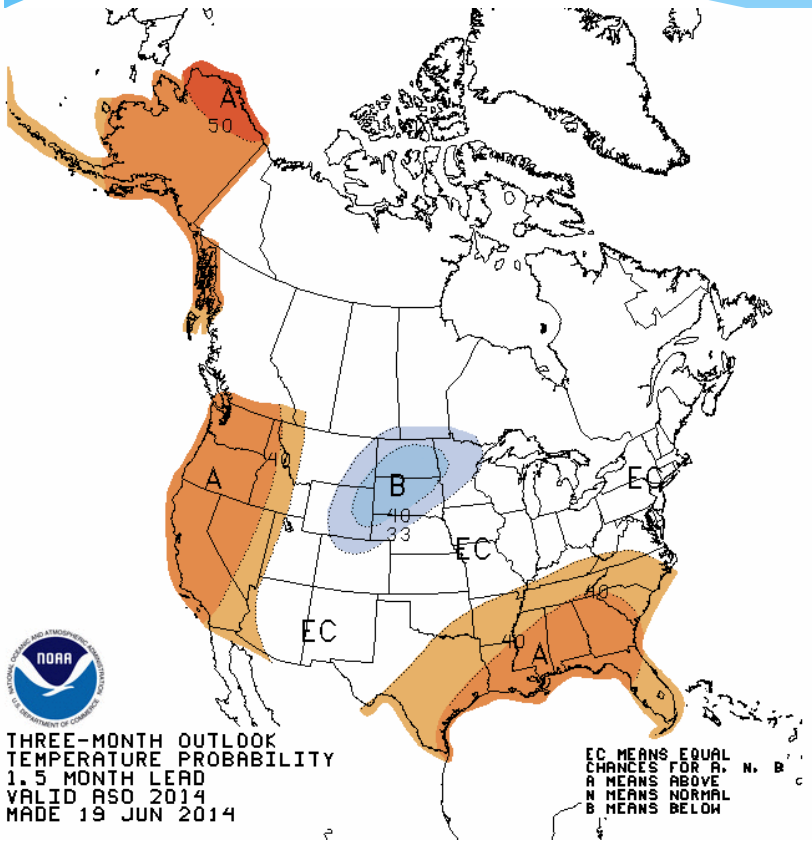


Temperature

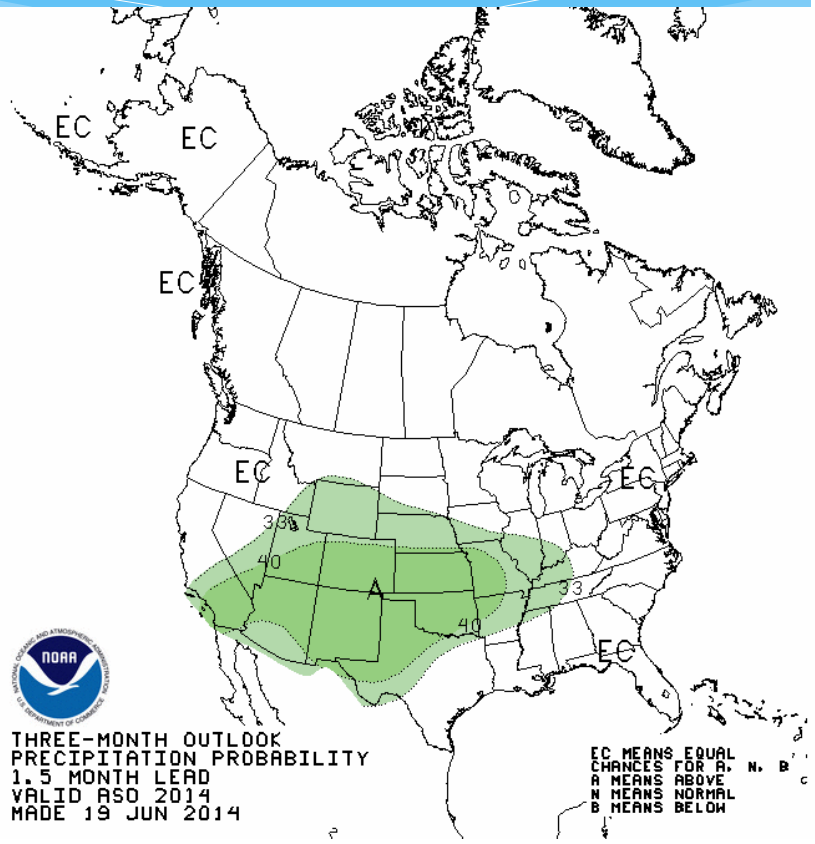


Precipitation

3 Month Temperature and Precipitation Probabilities (August-October)

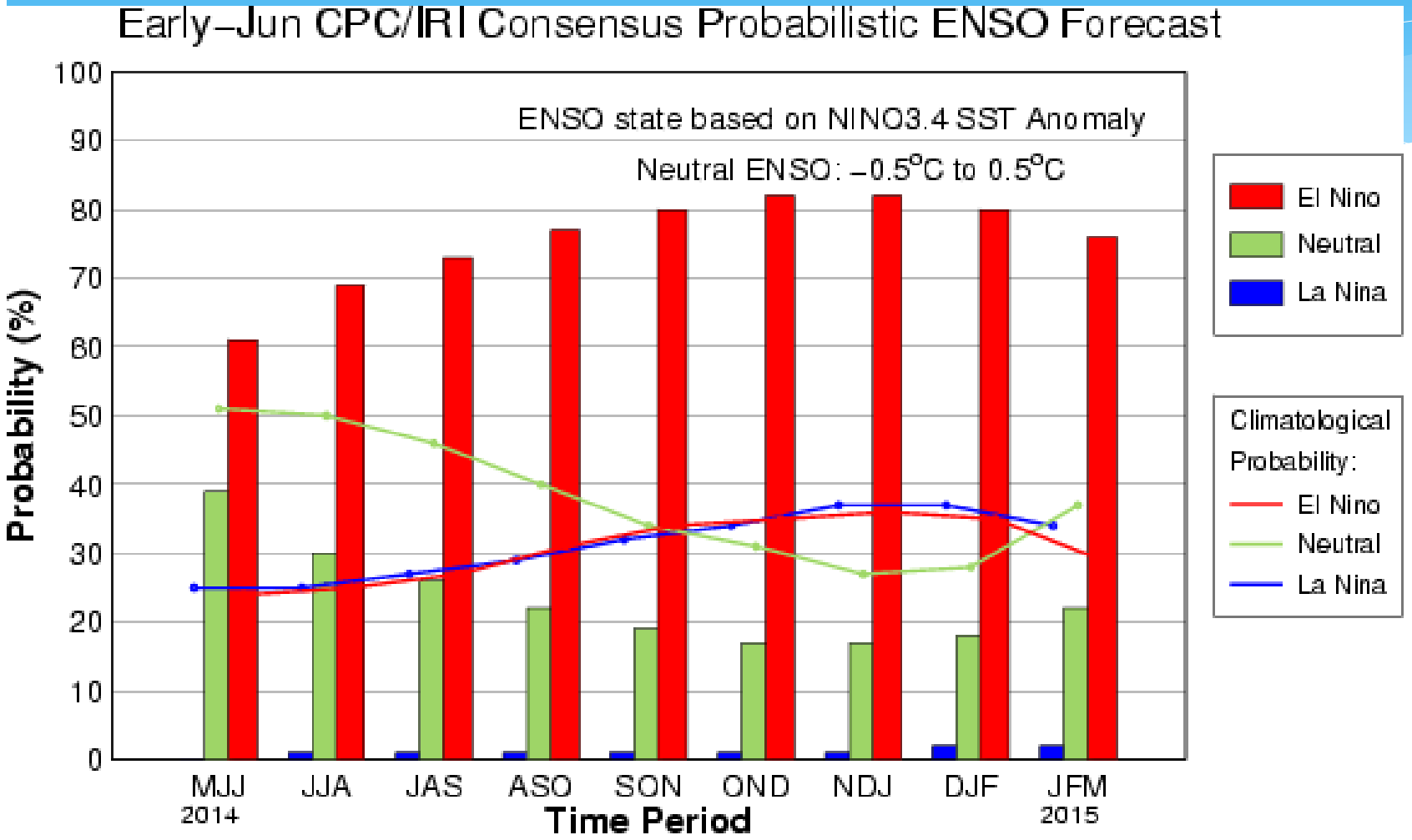


Temperature



Precipitation

El Nino/La Nina Forecast

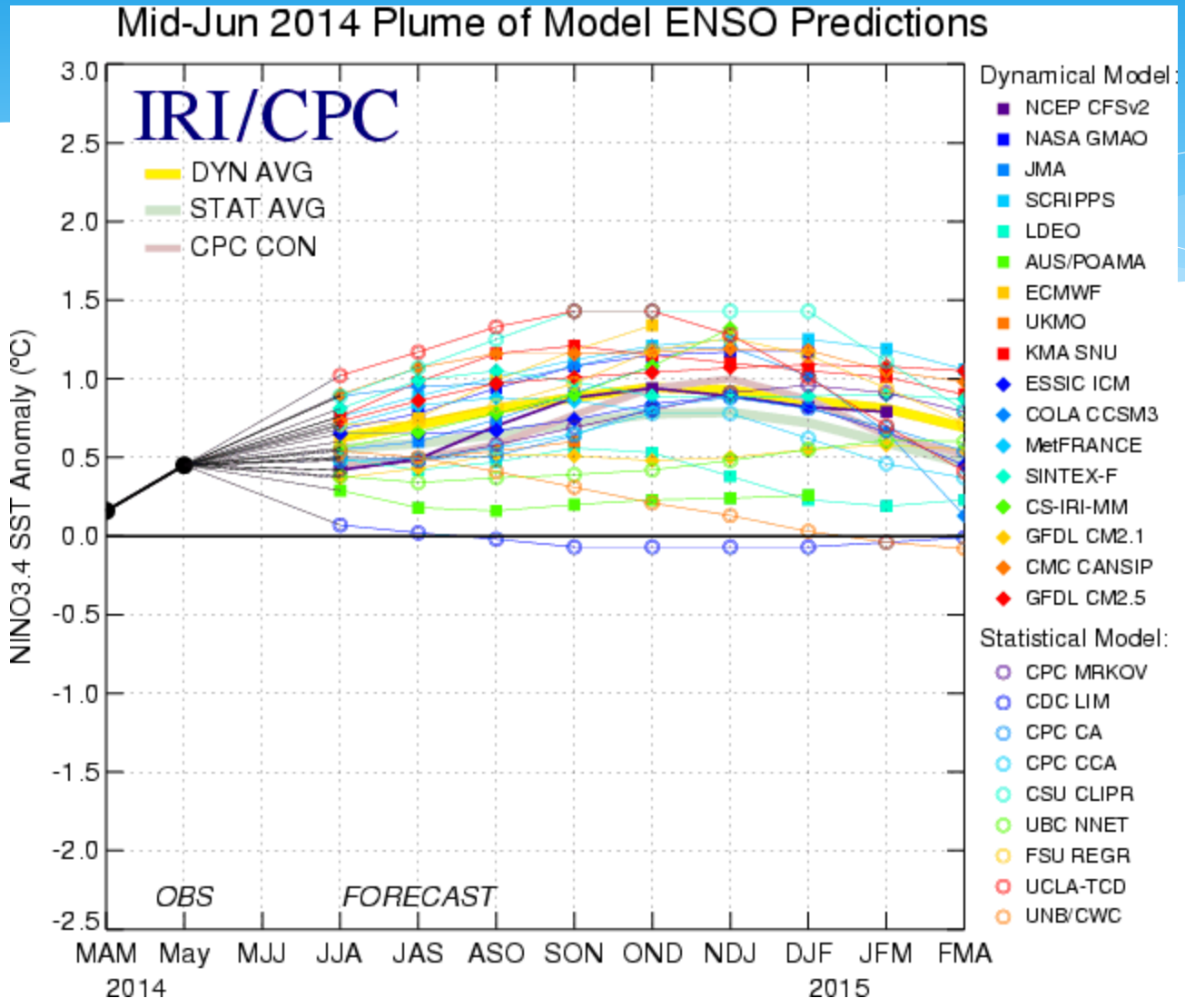


http://iri.columbia.edu/

IRI/CPC ENSO Forecast Probabilities

Season	La Niña	Neutral	El Niño
MJJ 2014	~0%	50%	50%
JJA 2014	1%	40%	59%
JAS 2014	2%	36%	62%
ASO 2014	2%	31%	67%
SON 2014	2%	29%	69%
OND 2014	1%	29%	70%
NDJ 2014	1%	27%	72%
DJF 2014	1%	33%	66%
JFM 2015	2%	40%	58%

IRI/CPC ENSO Forecast Plume

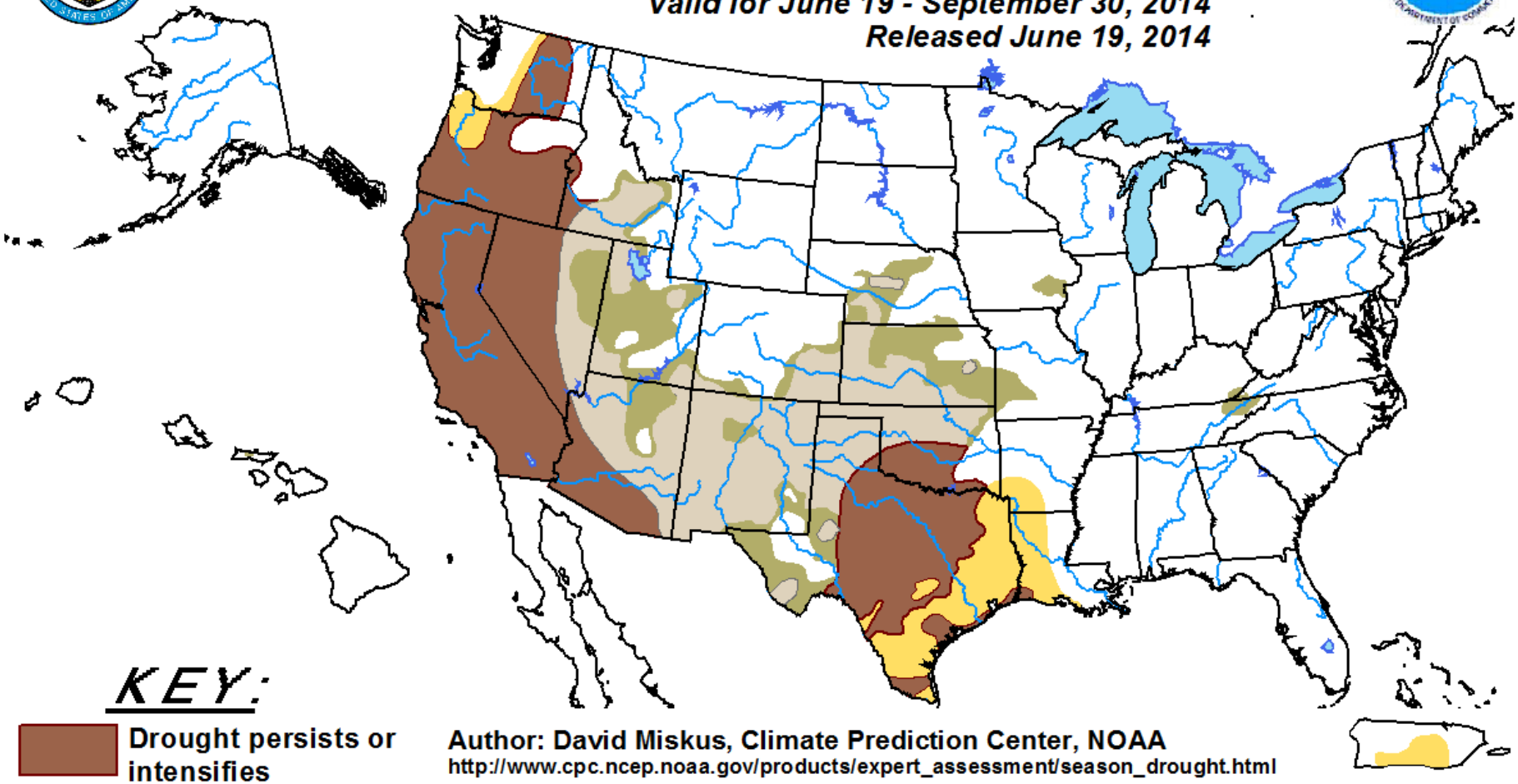


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for June 19 - September 30, 2014

Released June 19, 2014



KEY:

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

Author: David Miskus, Climate Prediction Center, NOAA
http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.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)

Summary

* **Recent Conditions**
  * **Warmer than normal conditions over the region have allowed for agriculture to catch up in crop development and progress.**
  * **Some areas have experienced an abundance of rain over the last month leading to some flooding issues especially in and along the Missouri River and adjoining tributaries.**
  * **Severe weather has been very active with many locations reporting damage from wind, hail, and tornadoes.**

Summary

* **Outlooks**
  * **El Nino is still very bullish for the summer/autumn outlooks with a moderate episode expected.**
  * **A cooler/wetter signal over the upper Midwest and Dakotas has developed for the rest of summer.**
  * **Continued drought improvements are expected in Nebraska, Kansas, Colorado, and Iowa.**

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
  - Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov
- Climate Portal: www.climate.gov
- U.S. Drought Portal: 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:
  * **Climate:**
  * Jim Angel: jimangel@Illinois.edu, 217-333-0729
  * Dennis Todey: dennis.todey@sdstate.edu , 605-688-5141
  * Doug Kluck: doug.kluck@noaa.gov, 816-994-3008
  * John Eise: john.eise@noaa.gov, 816-268-3144
  * Mike Timlin: mtimlin@illinois.edu; 217-333-8506
  * Natalie Umphlett: numphlett2@unl.edu ; 402 472-6764
  * Brian Fuchs: bfuchs2@unl.edu 402 472-6775

  * **Weather:**
  * crhroc@noaa.gov