

Midwest and Great Plains Climate-Drought Outlook

May 18, 2017



Pat Guinan
Extension/State Climatologist
University of Missouri
guinanp@missouri.edu
573-882-5908

Southeastern Colorado after
April 30, 2017 Blizzard
(photographer unknown)



Western Kansas
Winter Wheat
April 30, 2017



Twitter: Ramsey Farms



Kimberly Combs



United States Department of Agriculture
Midwest Climate Hub



General Information

- **Providing climate services to the Central Region**

- Collaboration Activity Between:

- USDA Climate Hubs
- American Association of State Climatologists
- Midwest and High Plains Regional Climate Centers
- NOAA NCEI/NWS/OAR/NIDIS
- National Drought Mitigation Center/USDA

- **Next Climate/Drought Outlook Webinar**

- June 15th, 2017, Aaron Wilson, Ohio State Climate Office

- **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>

- **Open for questions at the end**

Agenda

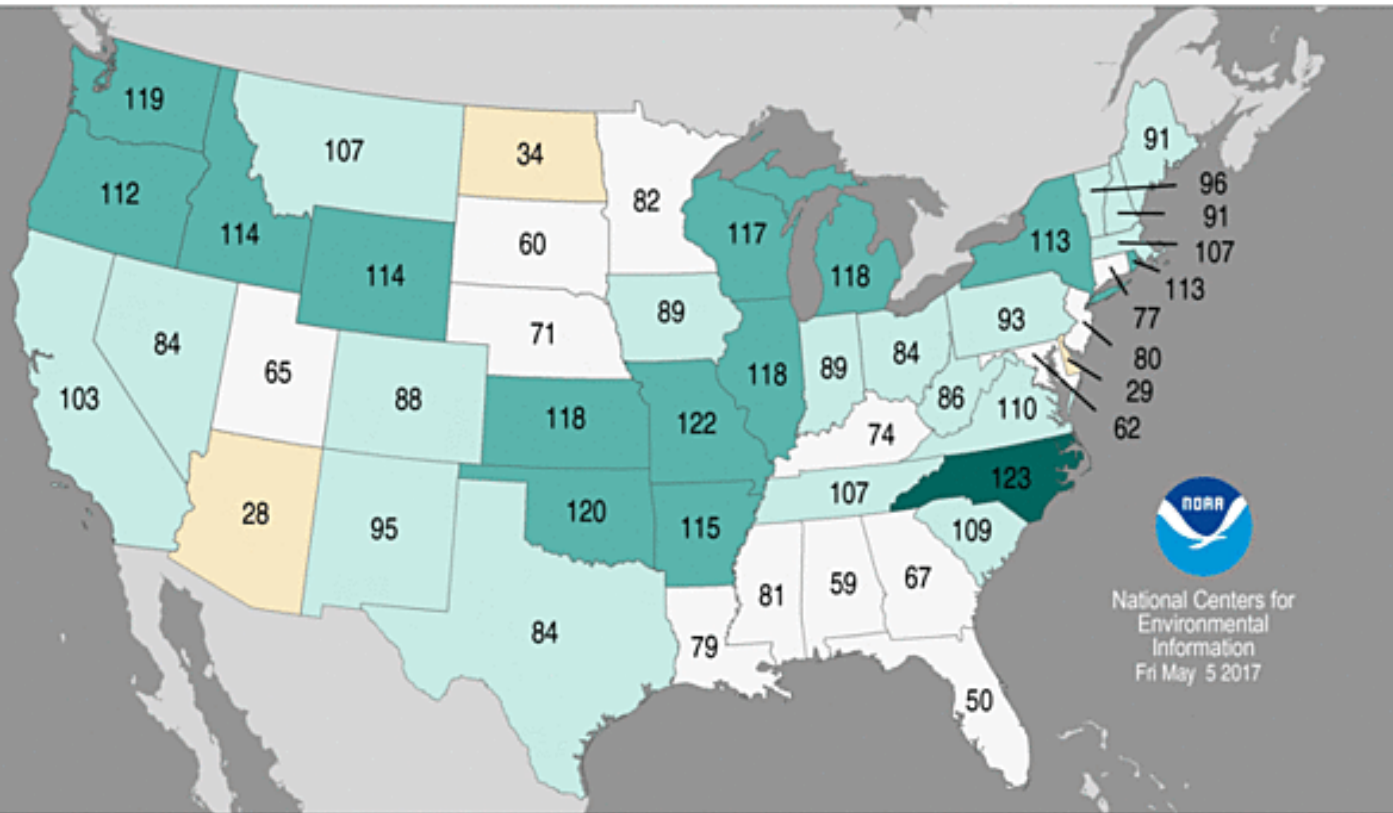
- **April and Jan-April 2017 Recap**
- **Recent and Current Conditions**
- **Impacts (Ag, Snow/Water, Other)**
- **Climate Outlooks**
- **Questions/Comments**

April and Jan-April 2017 Recap

The contiguous U.S. April precipitation was 0.91 inches above the 20th century average, making it the 2nd wettest April and wettest April since 1957

Statewide Precipitation Ranks

April 2017
Period: 1895–2017



National Centers for
Environmental
Information
Fri May 5 2017

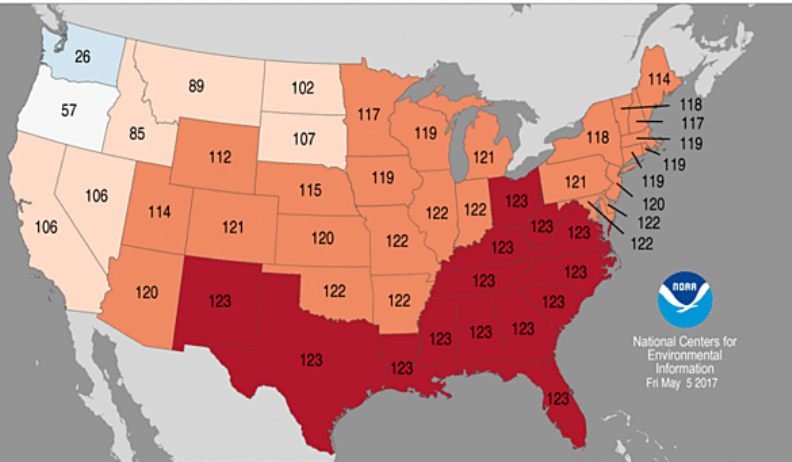
- Generally near to above average precipitation across much of the country.

- Very wet conditions across parts of the Pacific Northwest, southern Plains and Midwest.

- Record wettest in NC.

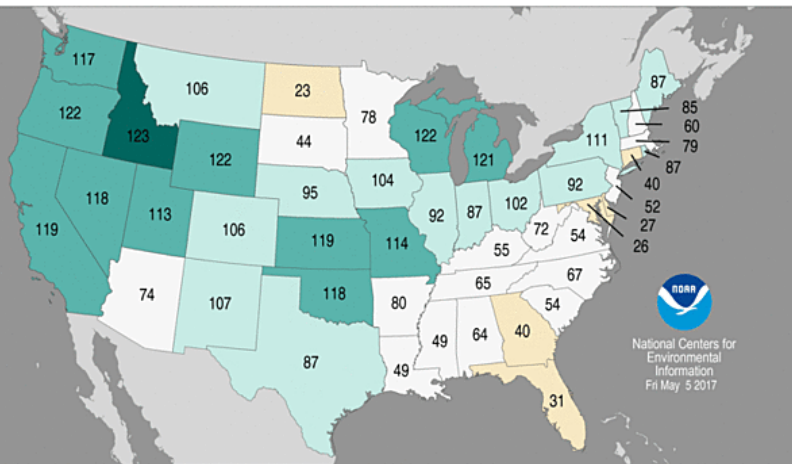
January-April Rankings

Statewide Average Temperature Ranks
January–April 2017
Period: 1895–2017



- With the exception of WA and OR, above average to record warmth across the country. It was the 2nd warmest first quarter of the year on record, and warmest Jan-April since 2012.

Statewide Precipitation Ranks
January–April 2017
Period: 1895–2017

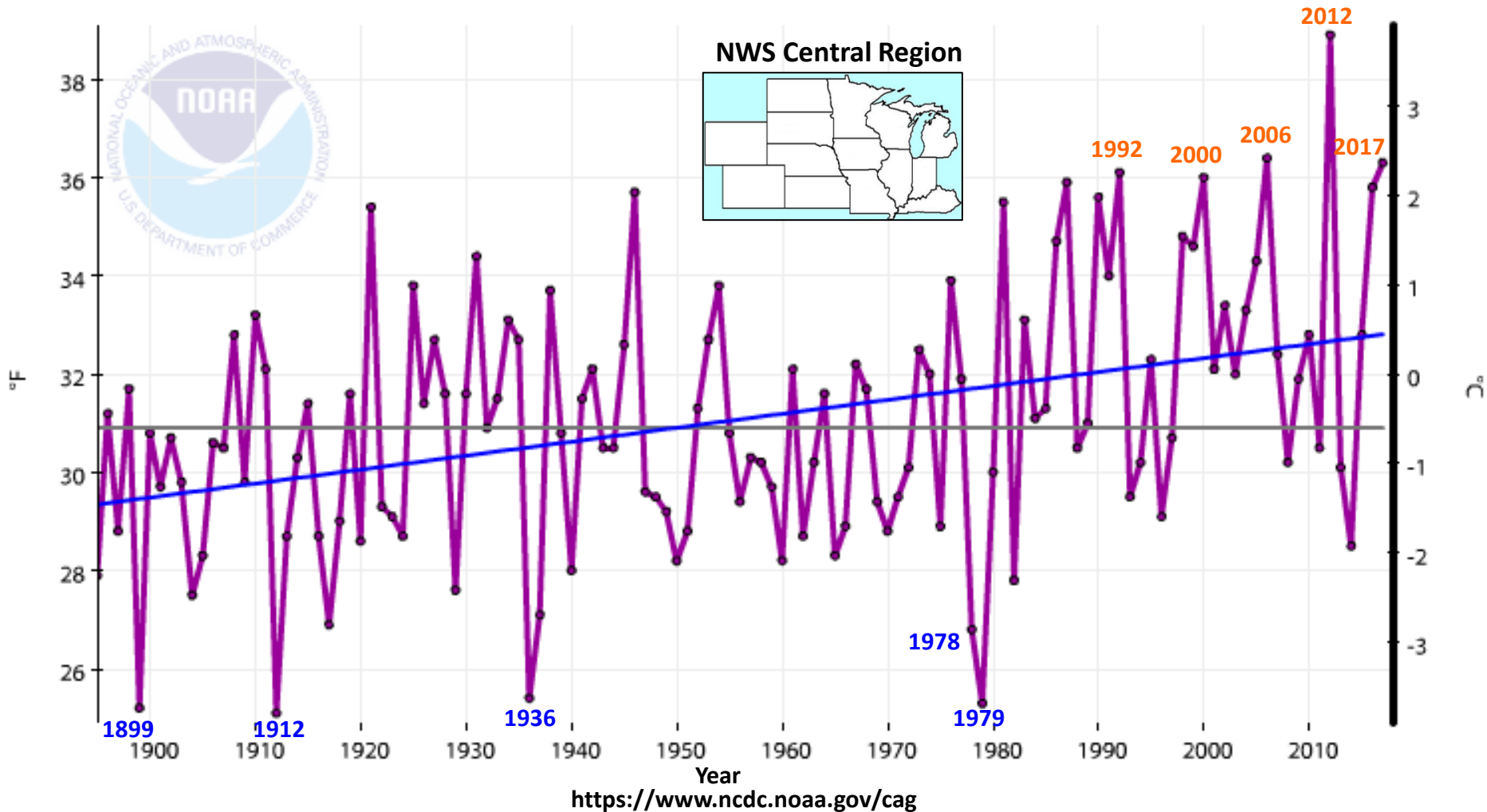


- Generally near average to wetter than average conditions across the U.S. It was the 5th wettest first quarter of the year on record, and wettest Jan-April since 1998.

It was the 3rd warmest first quarter of year for the NWS Central Region

NWS Central Region, Average Temperature, January-April

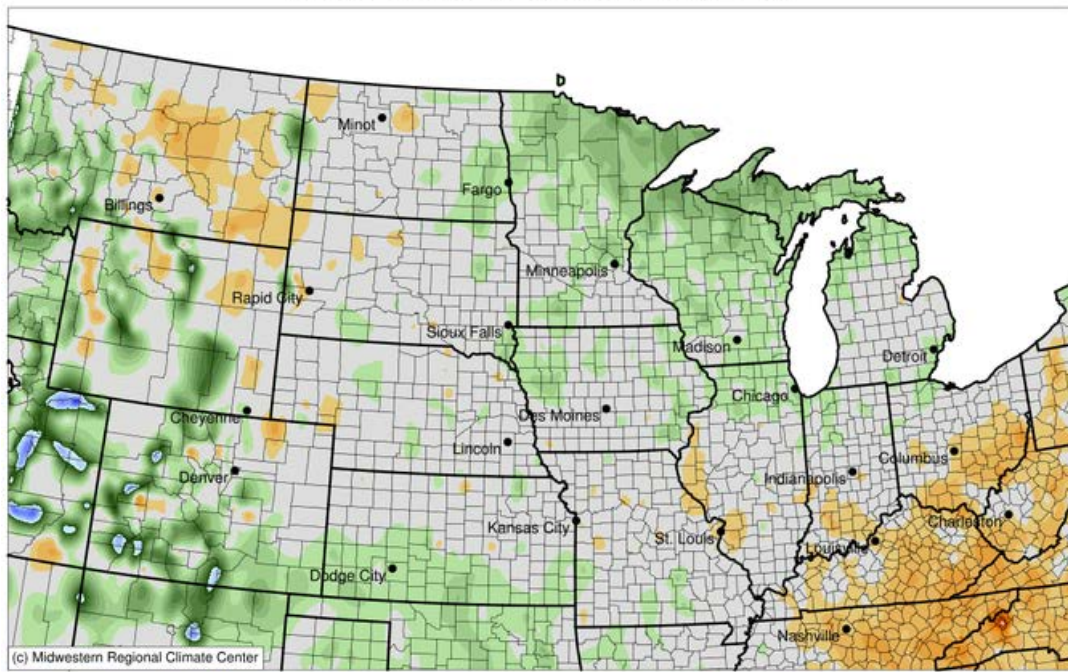
1895-2017 Trend +0.3°F/Decade
1901-2000 Mean: 30.9°F
Avg Temperature



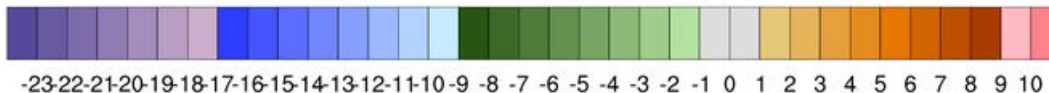
Recent and Current Conditions

Last 30 days Temperature

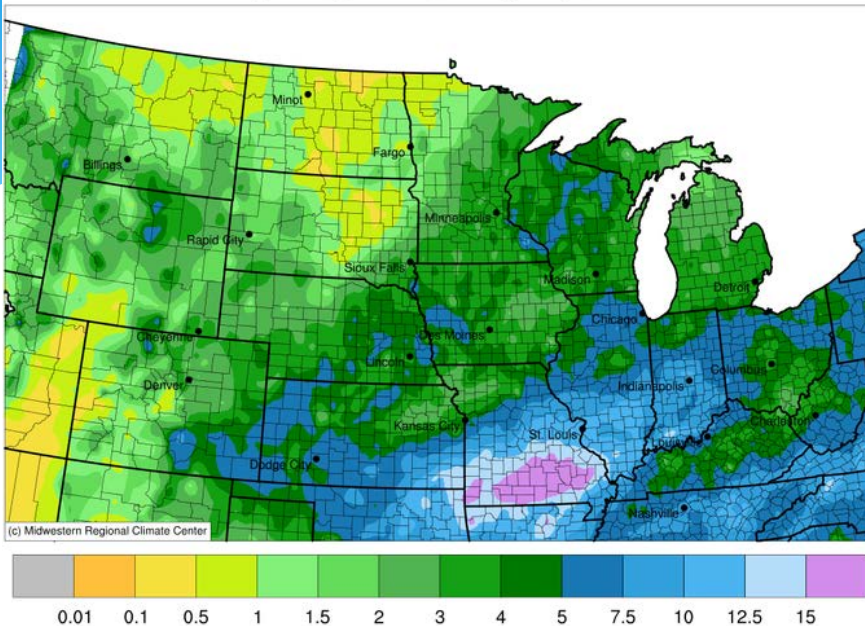
Average Temperature (°F): Departure from 1981-2010 Normals
April 19, 2017 to May 17, 2017



- **Cooler than average weather from the Rocky Mountains to southern KS. Cool conditions also in the upper Midwest**
- **Warmer than average across southeastern portions of the North Central region and eastern MT**



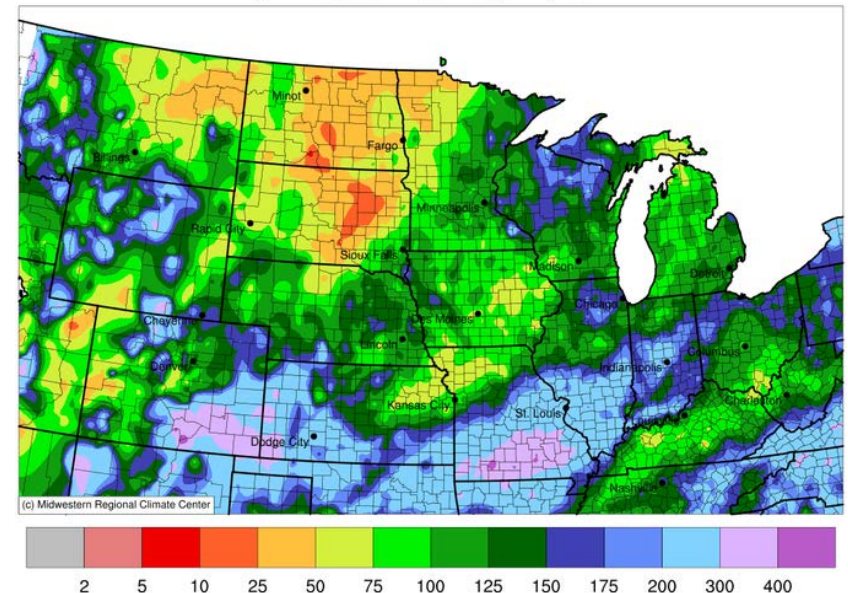
Accumulated Precipitation (in)
April 19, 2017 to May 17, 2017



- **Drier conditions in northeast MT, north central SD, ND and northwest MN**
- **Wetter weather across southern and eastern portions of the North Central region.**
- **Exceptional wetness across southeast CO, southwest KS and southern MO.**

Last 30 days Precipitation

Accumulated Precipitation (in): Percent of 1981-2010 Normals
April 19, 2017 to May 17, 2017

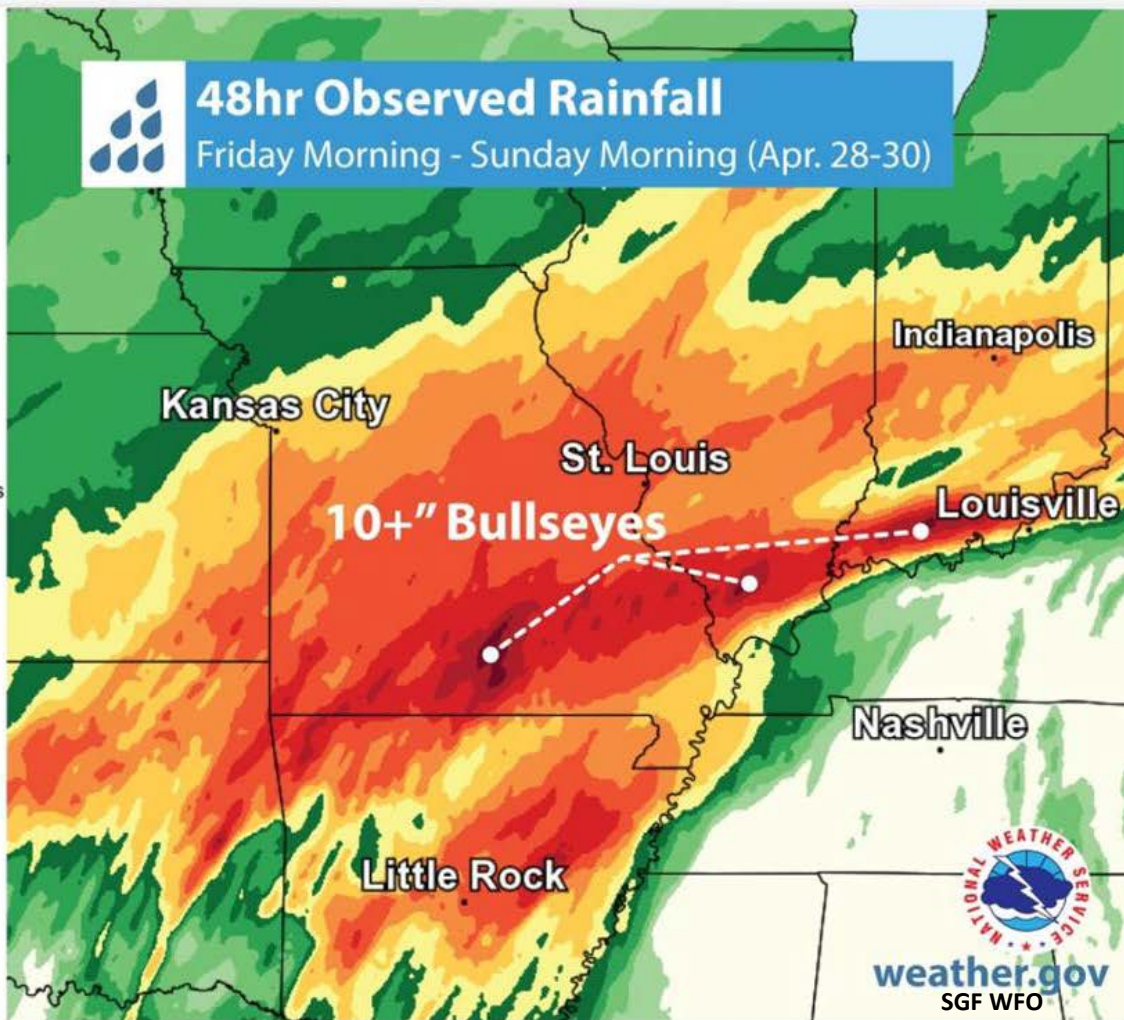


Major Flood Event



48hr Observed Rainfall

Friday Morning - Sunday Morning (Apr. 28-30)

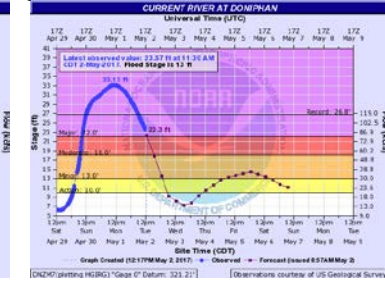
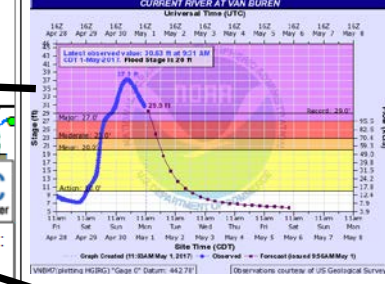
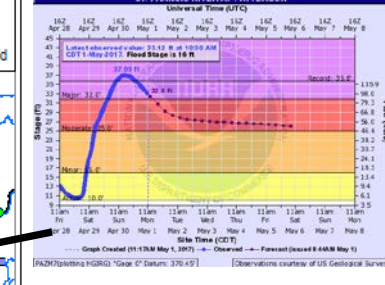
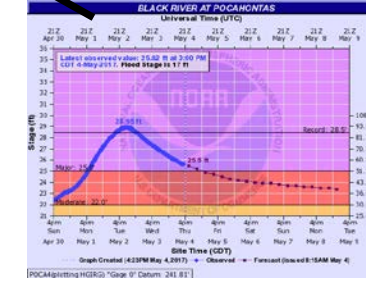
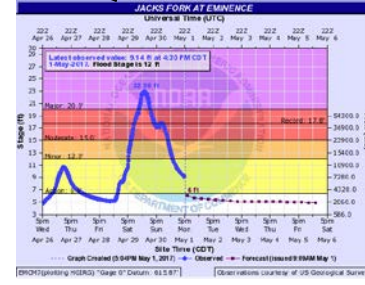
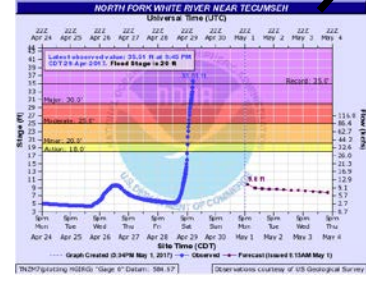
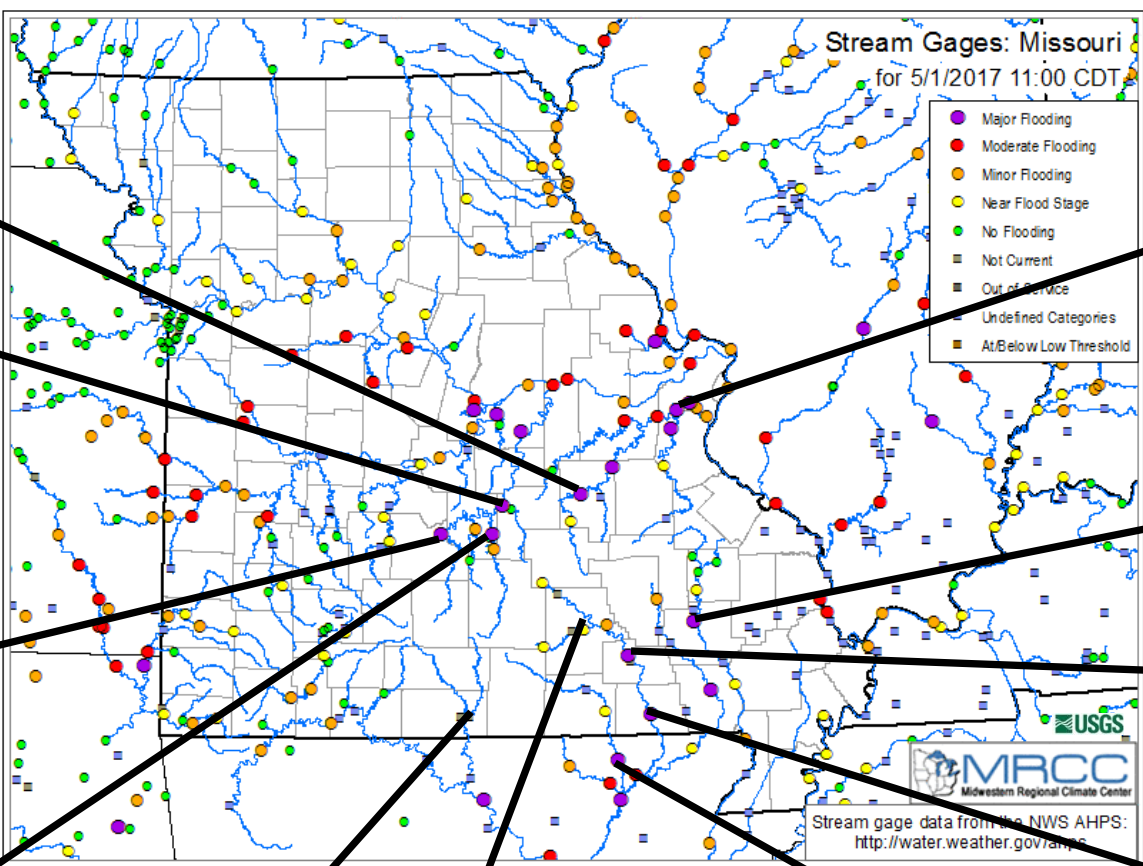
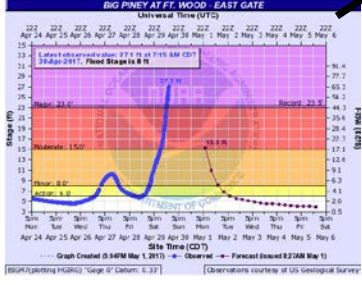


Graphic Created
April 30th, 2017
9:57 AM CDT

- Two strong storm systems impacted the Mid-Mississippi Valley region during the end of April and early May, but it was the first system, on Apr 28-30, that dropped the majority of rainfall and contributed to major flooding.

<http://www.weather.gov/sgf/28-30AprilHistoricFloodingEvent>

Major Flooding and Record Crests

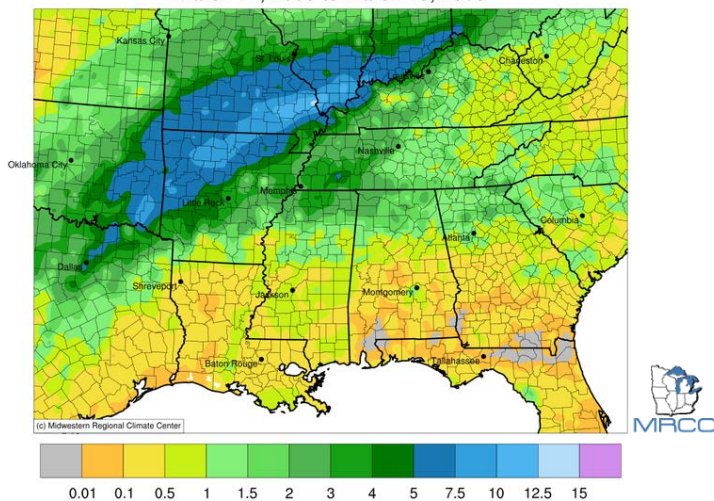


Stream gage data from the NWS AHPs: <http://water.weather.gov/ahps/>

Four similar major flood events have occurred in the past decade...

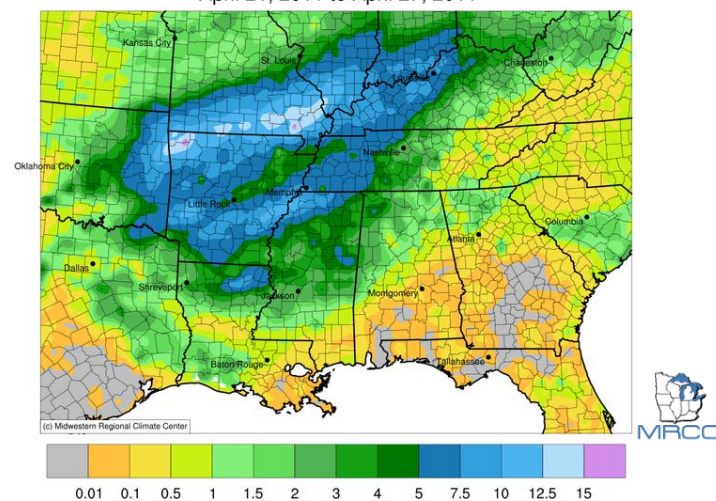
1

Accumulated Precipitation (in)
March 14, 2008 to March 19, 2008



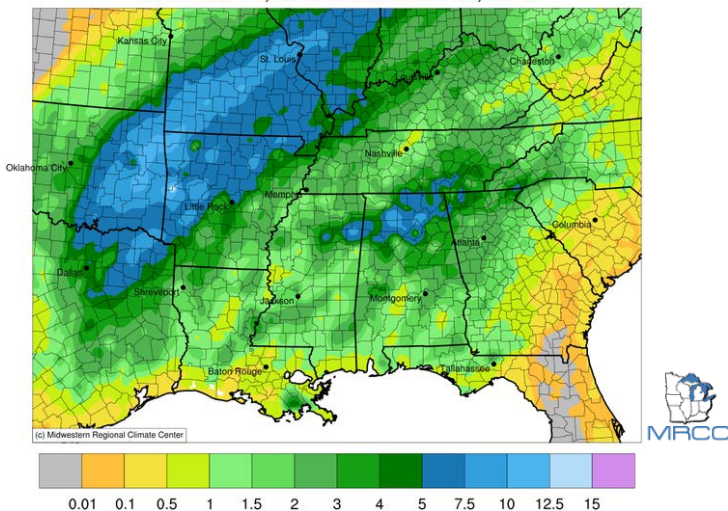
2

Accumulated Precipitation (in)
April 21, 2011 to April 27, 2011



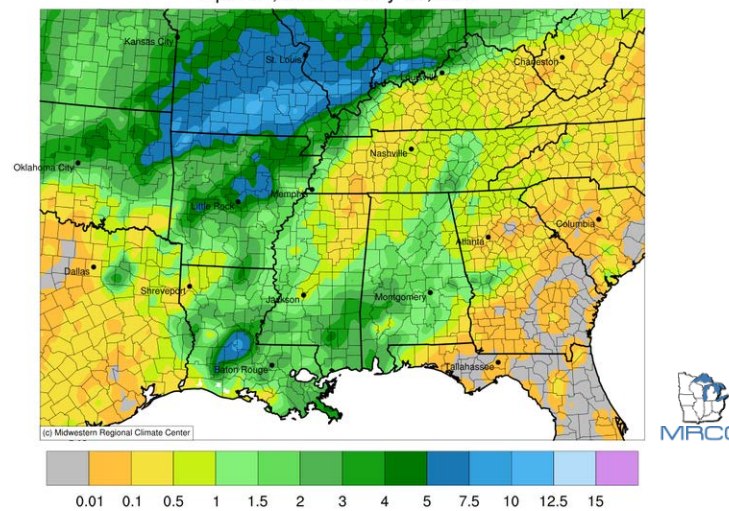
3

Accumulated Precipitation (in)
December 26, 2015 to December 29, 2015

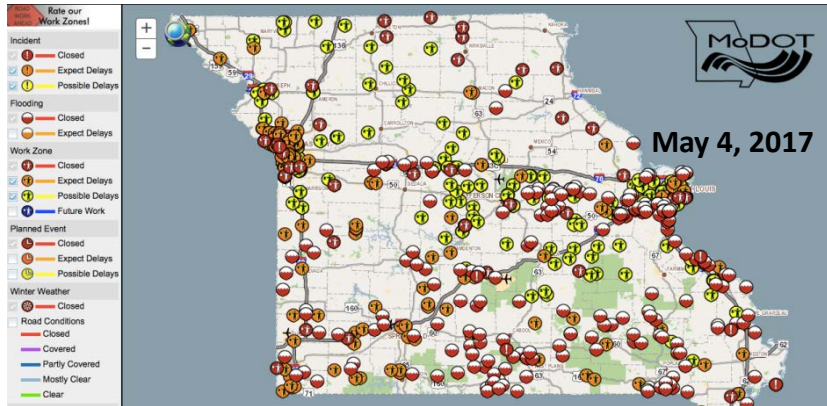


4

Accumulated Precipitation (in)
April 28, 2017 to May 01, 2017



Impacts



Half-red, half-white circles indicate roads closed due to flooding. At one point, more than 300 roads were closed in MO.

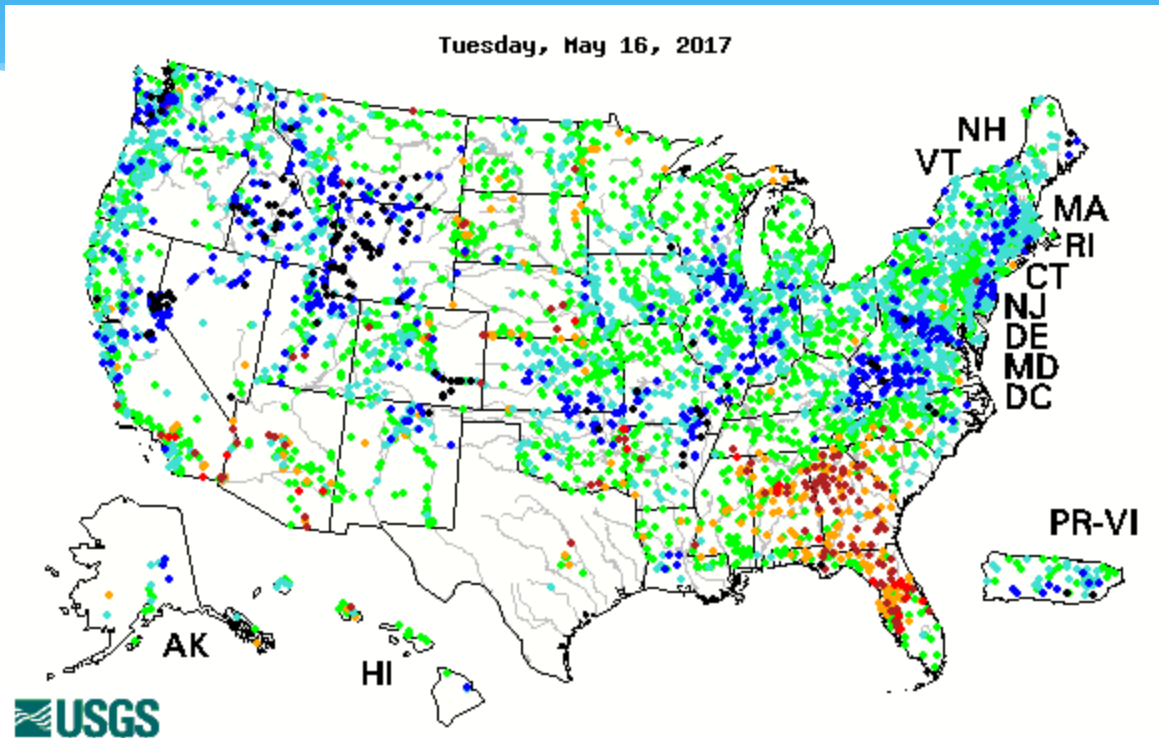
- Hundreds of road closures (MO, AR, IL, IN)
 - major traffic problems, I-44 and I-55 shut down in places;
- Damage to infrastructure (MO, AR, IL, IN)
 - washed out roads and bridges, failed levies, flooded homes and businesses;
- Flooded farmland (MO, AR, IL, IN)
 - millions of acres of flooded bottomland and millions of dollars of damage to row crops, pastures, orchards, sod farms, fruit and vegetable producers, CSAs etc.;
 - replanting in earnest;
- Casualties (MO, AR, IL, IN)
 - hundreds of water rescues, evacuations and 12 fatalities.



7-Day Average Streamflow

Tuesday, May 16, 2017

- Generally normal to above average streamflows across much of the North Central region with pockets of below to much below normal streamflows in the northern Plains and upper Midwest.
- Some ongoing record streamflows in MT, WY, CO and southern Missouri



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

<http://waterwatch.usgs.gov/index.php?id=pao7d>

US Drought Monitor

U.S. Drought Monitor

NWS Central Region

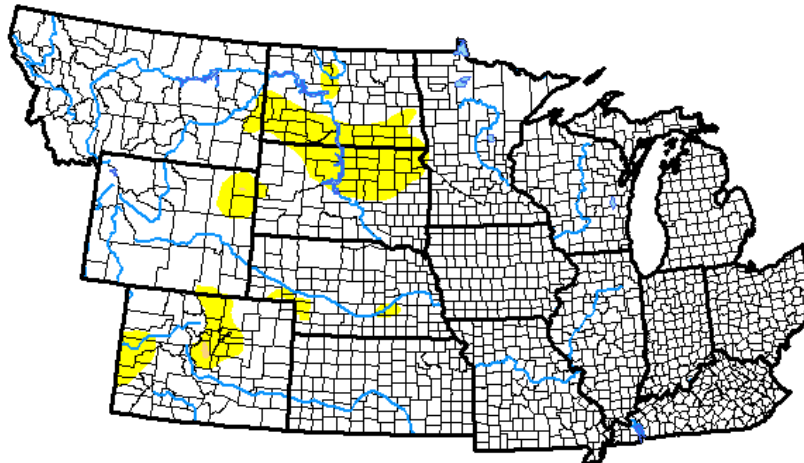
May 16, 2017

(Released Thursday, May, 18, 2017)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	92.57	7.43	0.05	0.00	0.00	0.00
Last Week <i>05-09-2017</i>	93.45	6.55	0.21	0.00	0.00	0.00
3 Months Ago <i>02-14-2017</i>	74.89	25.11	10.46	0.54	0.00	0.00
Start of Calendar Year <i>01-03-2017</i>	65.79	34.21	12.04	1.70	0.00	0.00
Start of Water Year <i>09-27-2016</i>	76.71	23.29	7.36	1.93	0.12	0.00
One Year Ago <i>05-17-2016</i>	91.59	8.41	1.44	0.09	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:

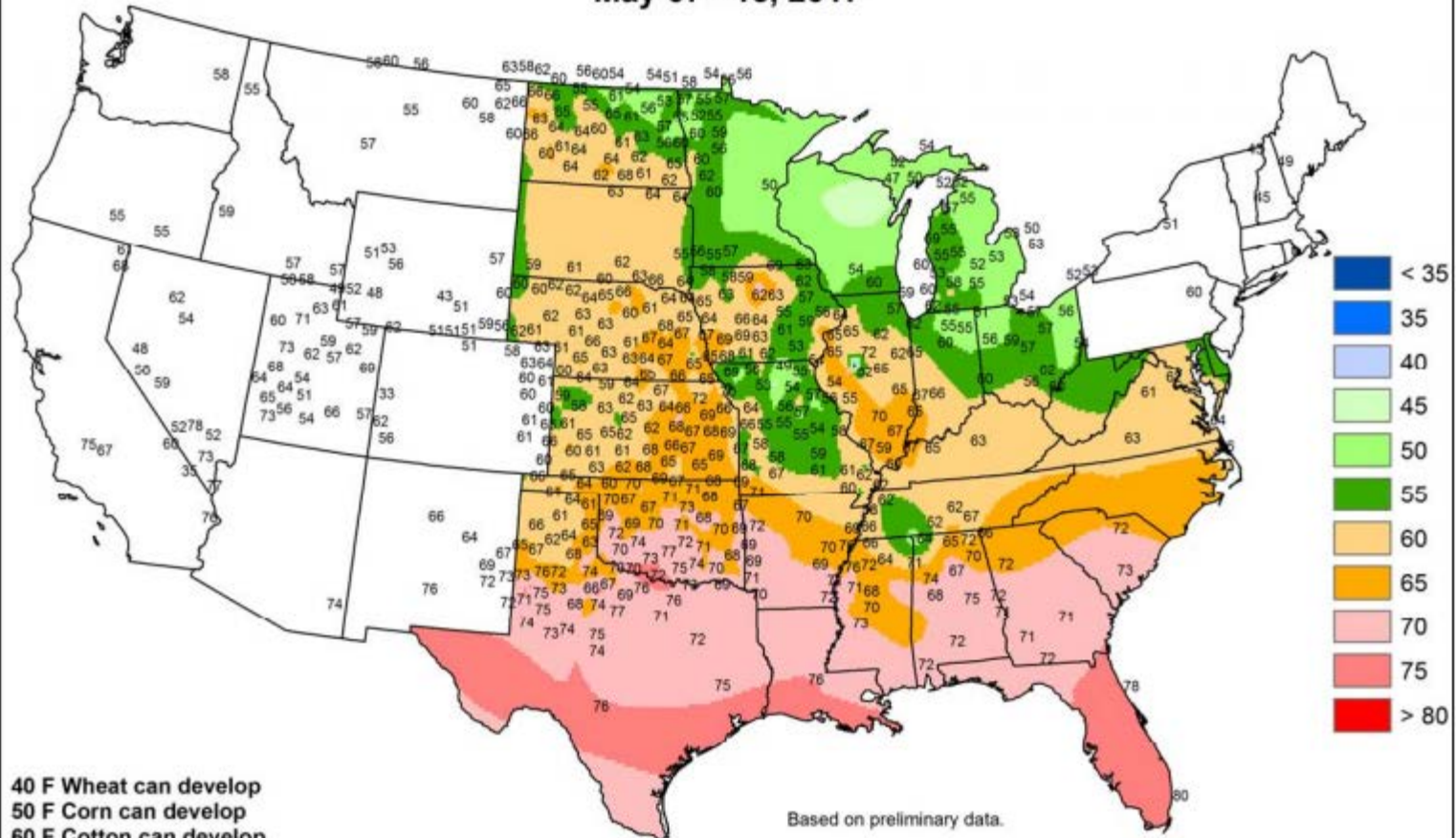
Brad Rippey
U.S. Department of Agriculture



Agriculture

Average Soil Temperature (Deg. F, 4" Bare)

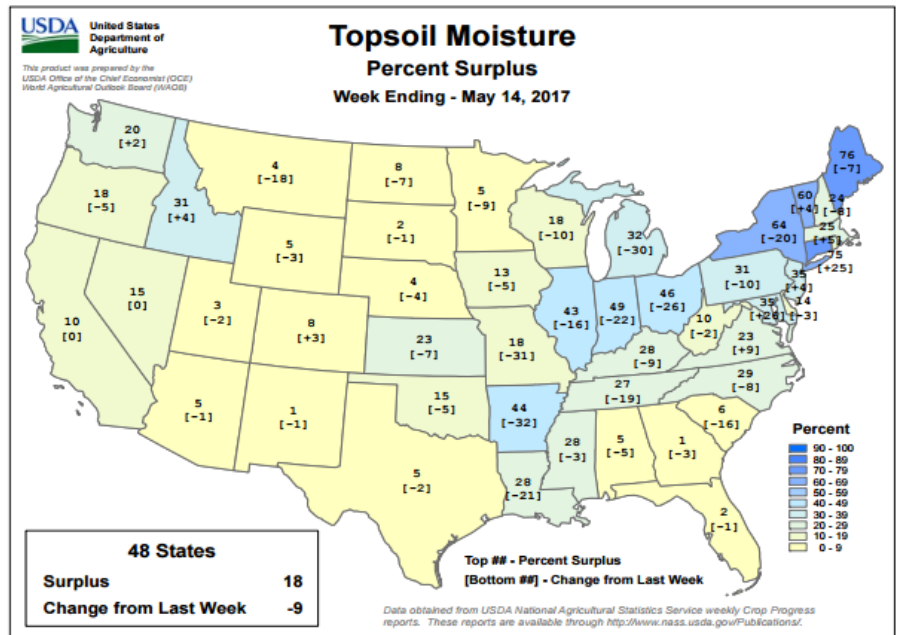
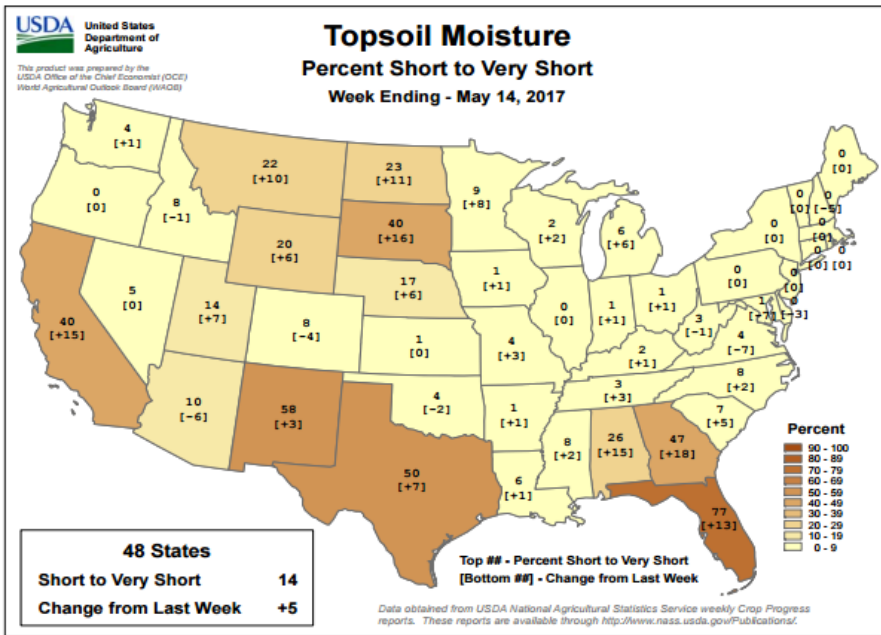
May 07 - 13, 2017



Data provided by the Climate Prediction Center, High Plains Regional Climate Center, Nebraska Mesonet at Univ of Nebraska, CoAgMet at Colorado State Univ, Kansas Mesonet at Kansas State Univ, North Dakota Agricultural Weather Network at North Dakota State Univ, Wyoming State Climate Office at the Univ of Wyoming, Illinois State Water Survey, Iowa State University, Oklahoma Mesonet, Purdue University, University of Missouri, Illinois State Water Survey, Michigan Automated Weather Network, West Texas Mesonet, South Dakota State Univ. Mesonet, Ohio Agricultural Research and Development Center, Univ. of Missouri and USDA/NRCS.



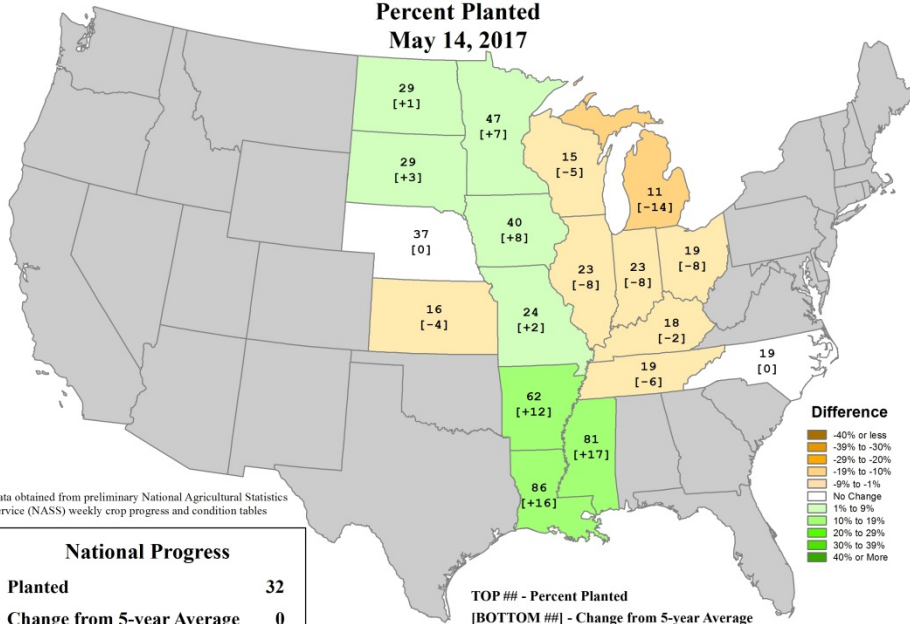
NASS Topsoil moisture



Soybean Progress

U.S. Soybeans Progress

Percent Planted
May 14, 2017



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

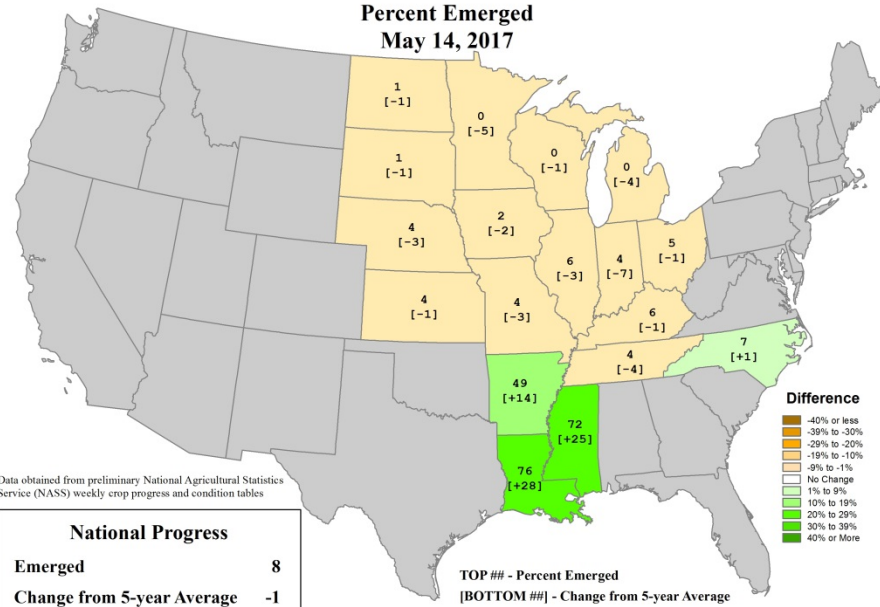
National Progress	
Planted	32
Change from 5-year Average	0

TOP ## - Percent Planted
[BOTTOM ##] - Change from 5-year Average

USDA Agricultural Weather Assessments
World Agricultural Outlook Board

U.S. Soybeans Progress

Percent Emerged
May 14, 2017



Data obtained from preliminary National Agricultural Statistics Service (NASS) weekly crop progress and condition tables

National Progress	
Emerged	8
Change from 5-year Average	-1

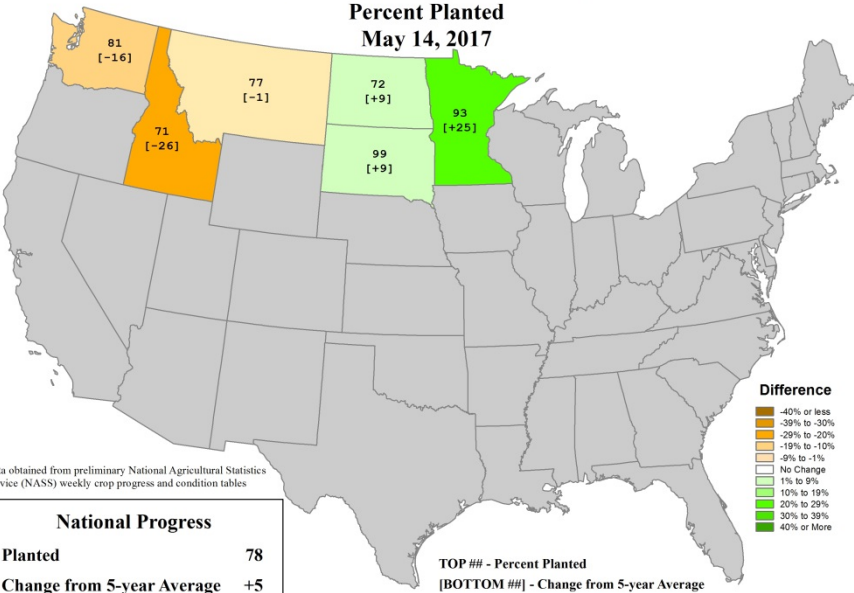
TOP ## - Percent Emerged
[BOTTOM ##] - Change from 5-year Average

USDA Agricultural Weather Assessments
World Agricultural Outlook Board

Spring Wheat Progress

U.S. Spring Wheat Progress

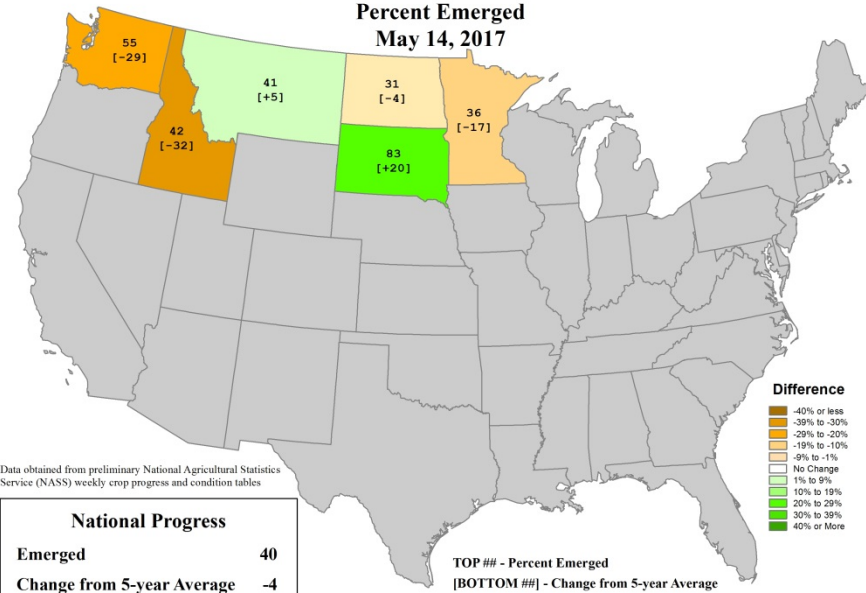
Percent Planted
May 14, 2017



USDA Agricultural Weather Assessments
World Agricultural Outlook Board

U.S. Spring Wheat Progress

Percent Emerged
May 14, 2017



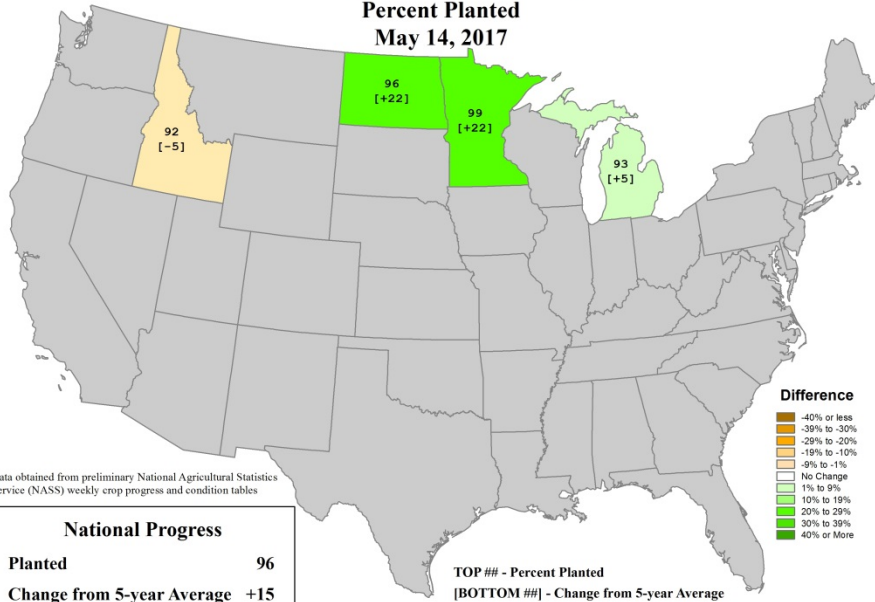
USDA Agricultural Weather Assessments
World Agricultural Outlook Board

Slides courtesy of Brad Rippey, USDA/OCE

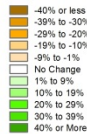
Sugarbeets and Sorghum Progress

U.S. Sugarbeets Progress

Percent Planted
May 14, 2017

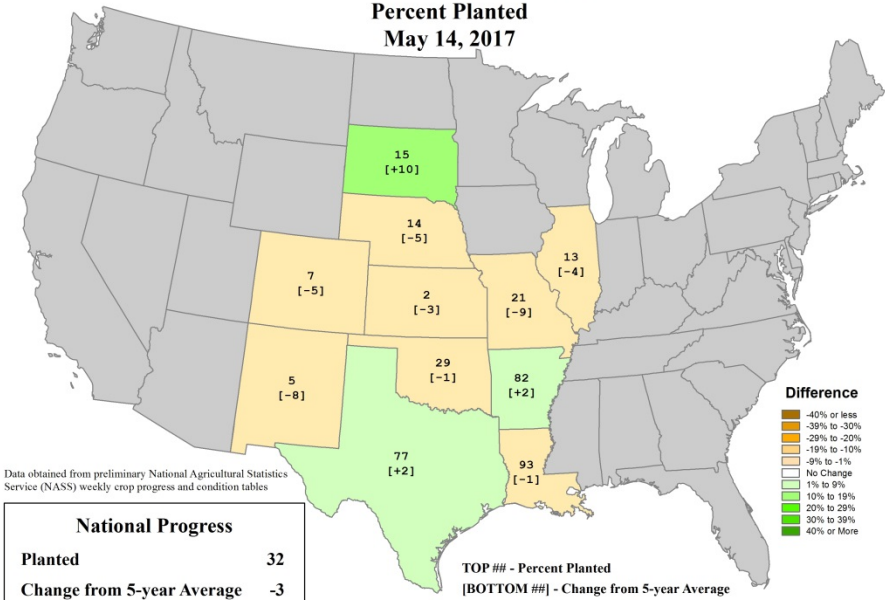


Difference

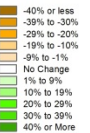


U.S. Sorghum Progress

Percent Planted
May 14, 2017



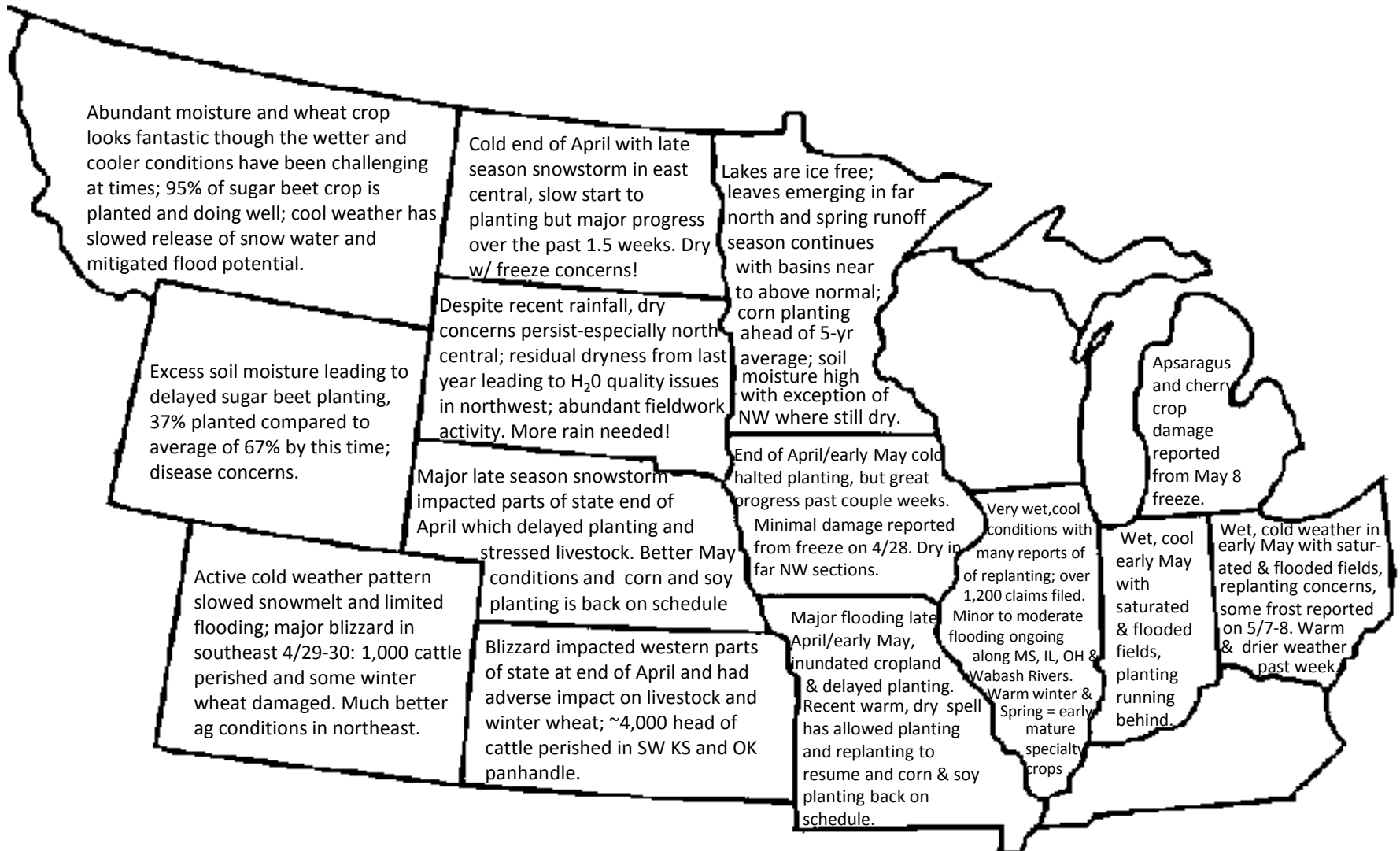
Difference



USDA Agricultural Weather Assessments
World Agricultural Outlook Board

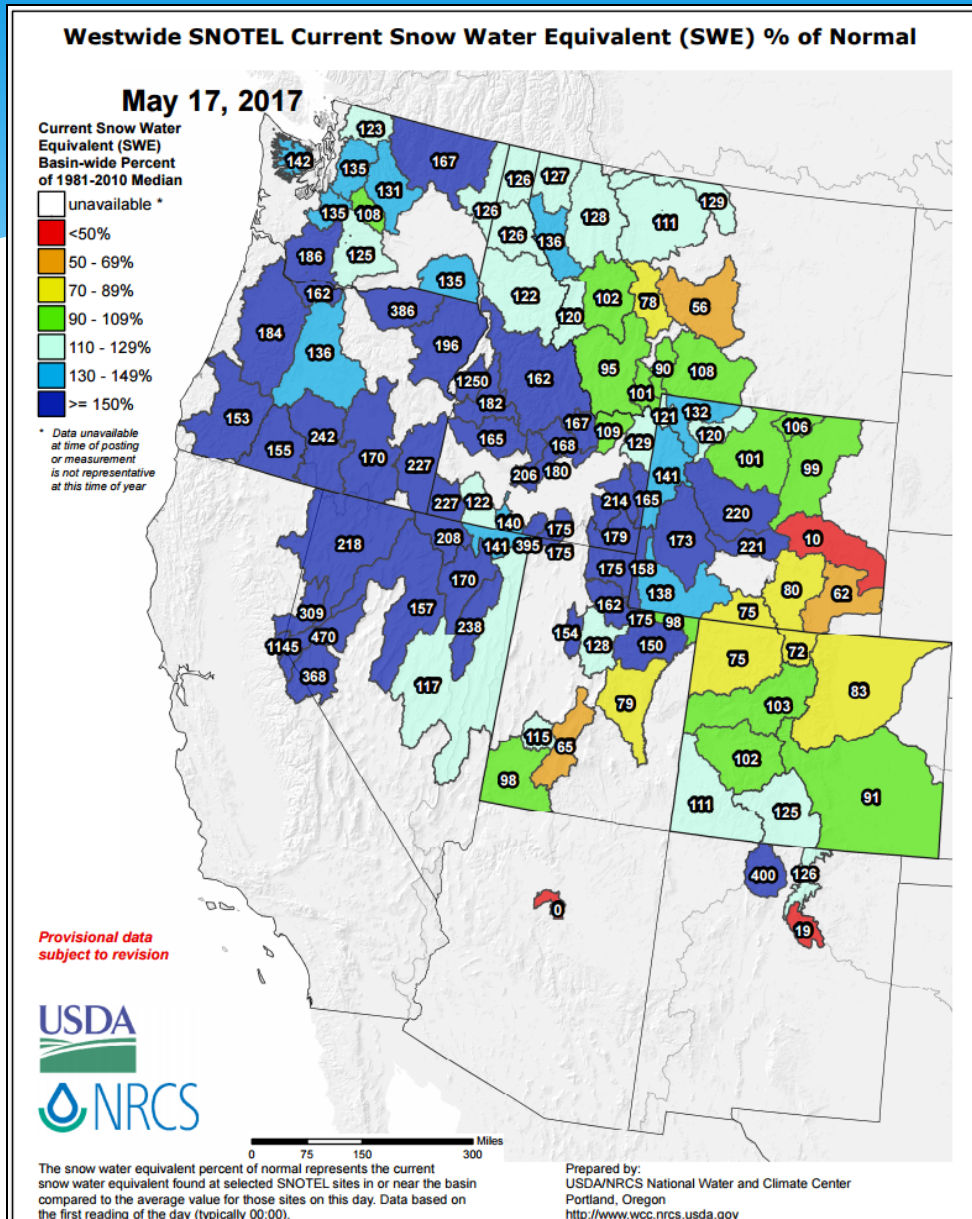
USDA Agricultural Weather Assessments
World Agricultural Outlook Board

Impacts



Water/Snow

NRCS Snow Water Equivalent

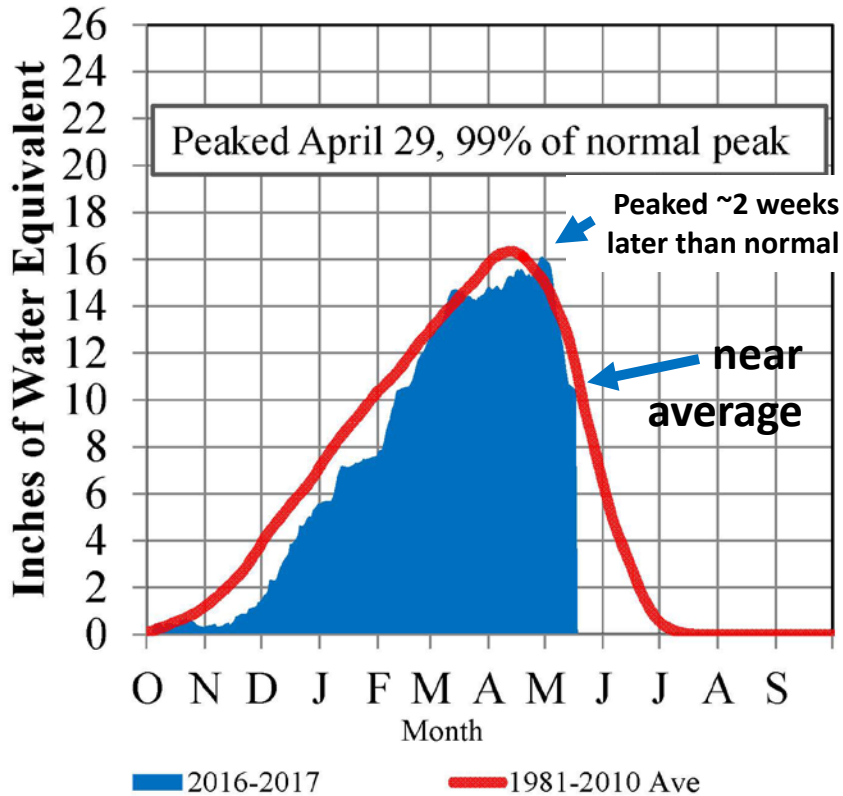


- * Many watersheds in northern intermountain west in excess of 150%
- * Less SWE % of normal in MT and central and southern Rockies

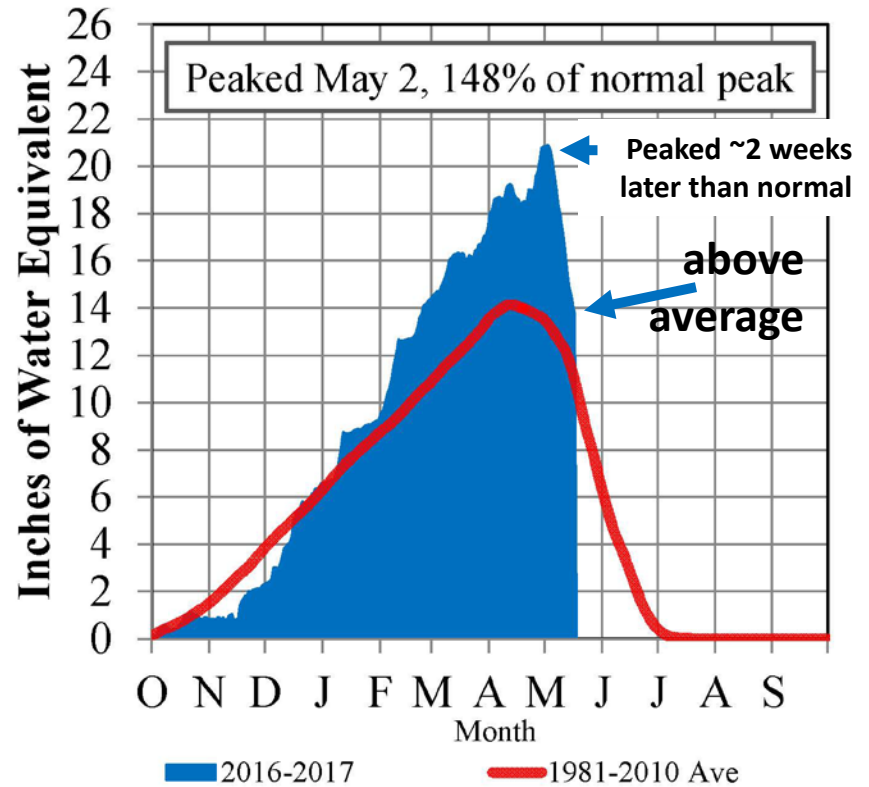
Missouri River Basin Mountain Snowpack

May 17, 2017

Total above Fort Peck



Total Fort Peck to Garrison



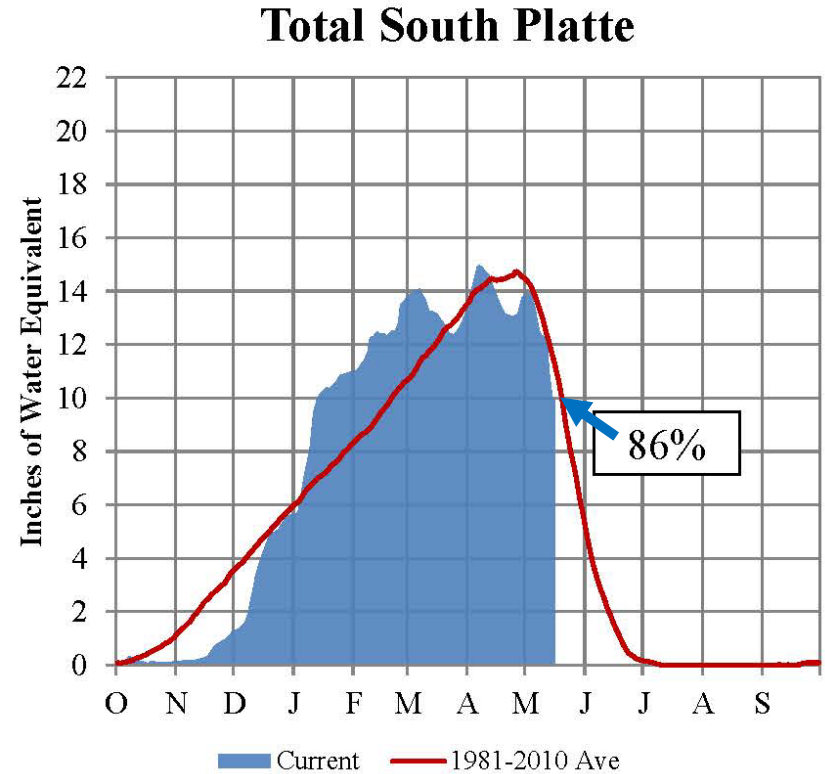
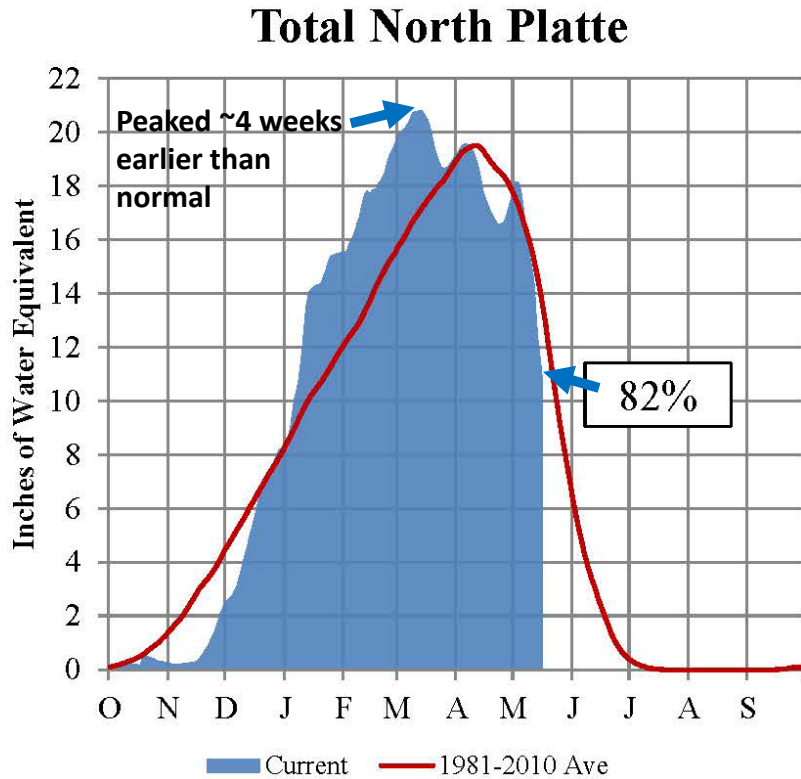
The Missouri River Basin mountain snowpack normally peaks near April 15.

Provisional data. Subject to revision.

<http://www.nwd-mr.usace.army.mil/rcc/reports/snow.pdf>

Platte River Basin - Mountain Snowpack Water Content Water Year 2016-2017

May 16, 2017



The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of May 15, 2017, the mountain snowpack SWE in the "Total North Platte" reach is currently 11.6", 82% of average. The mountain snowpack SWE in the "Total South Platte" reach is currently 9.9", 86% of average.

Other various issues

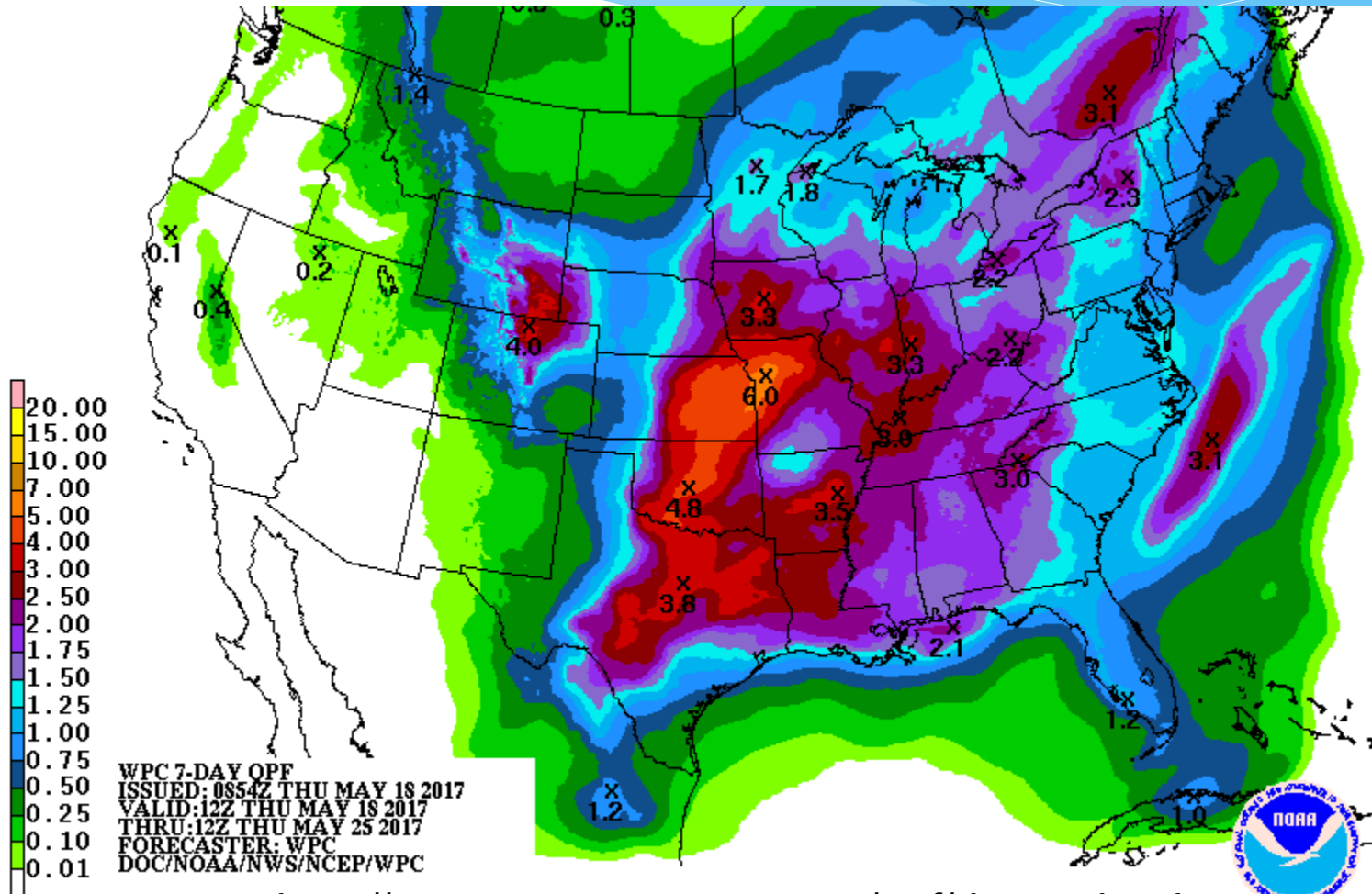
- * Potential N-loss with heavy rainfall
- * Emergence issues with wet, cool soil
- * Prolonged wetness restricts root development
- * Diseases, i.e. root rot
- * Replant- MO, IL, IN, OH
- * Late planting and replanting may lead to early autumn freeze concerns

Climate Outlooks

- * **7-day precipitation forecast**
- * **6-10 day outlook**
- * **Significant River Flood Outlook**
- * **ENSO Predictions**
- * **June**
- * **Summer (Jun-Jul-Aug)**

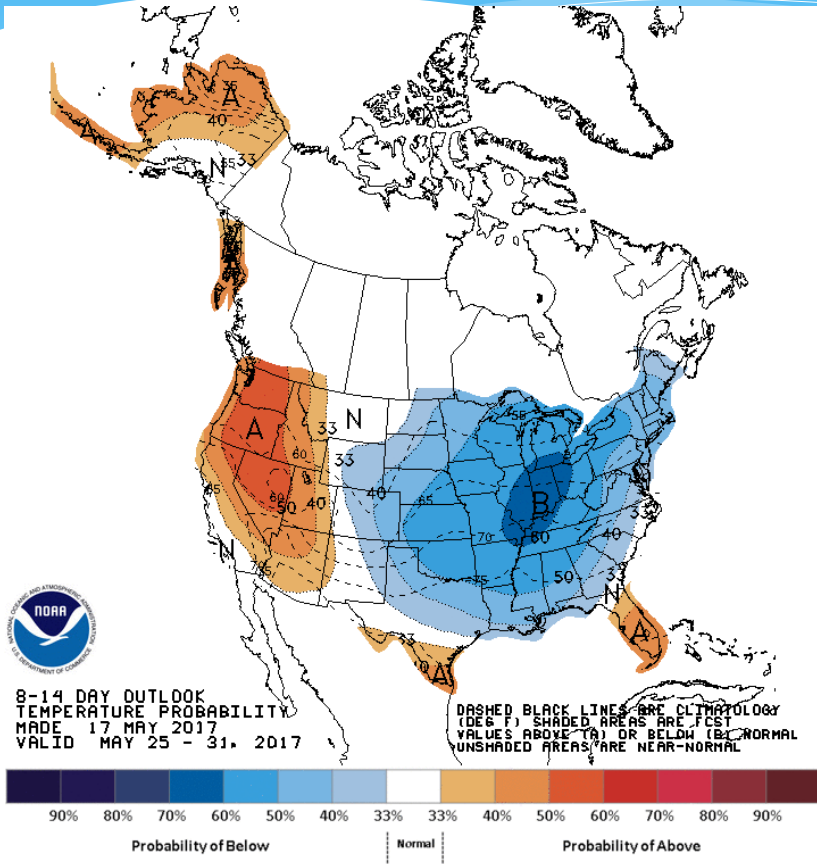
7-day Quantitative Precipitation Forecast

Valid: 7 AM Thu, May 18 – 7 AM, May 25, 2017

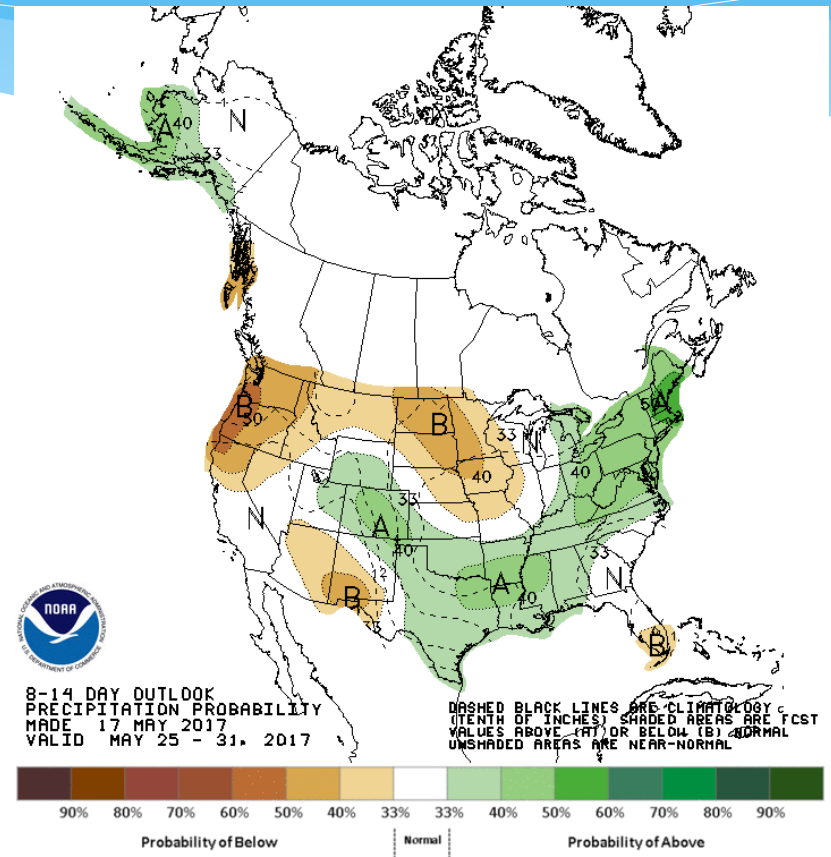


<http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml>

Temperature and Precipitation Probabilities for May 25-31, 2017



Temperature



Precipitation



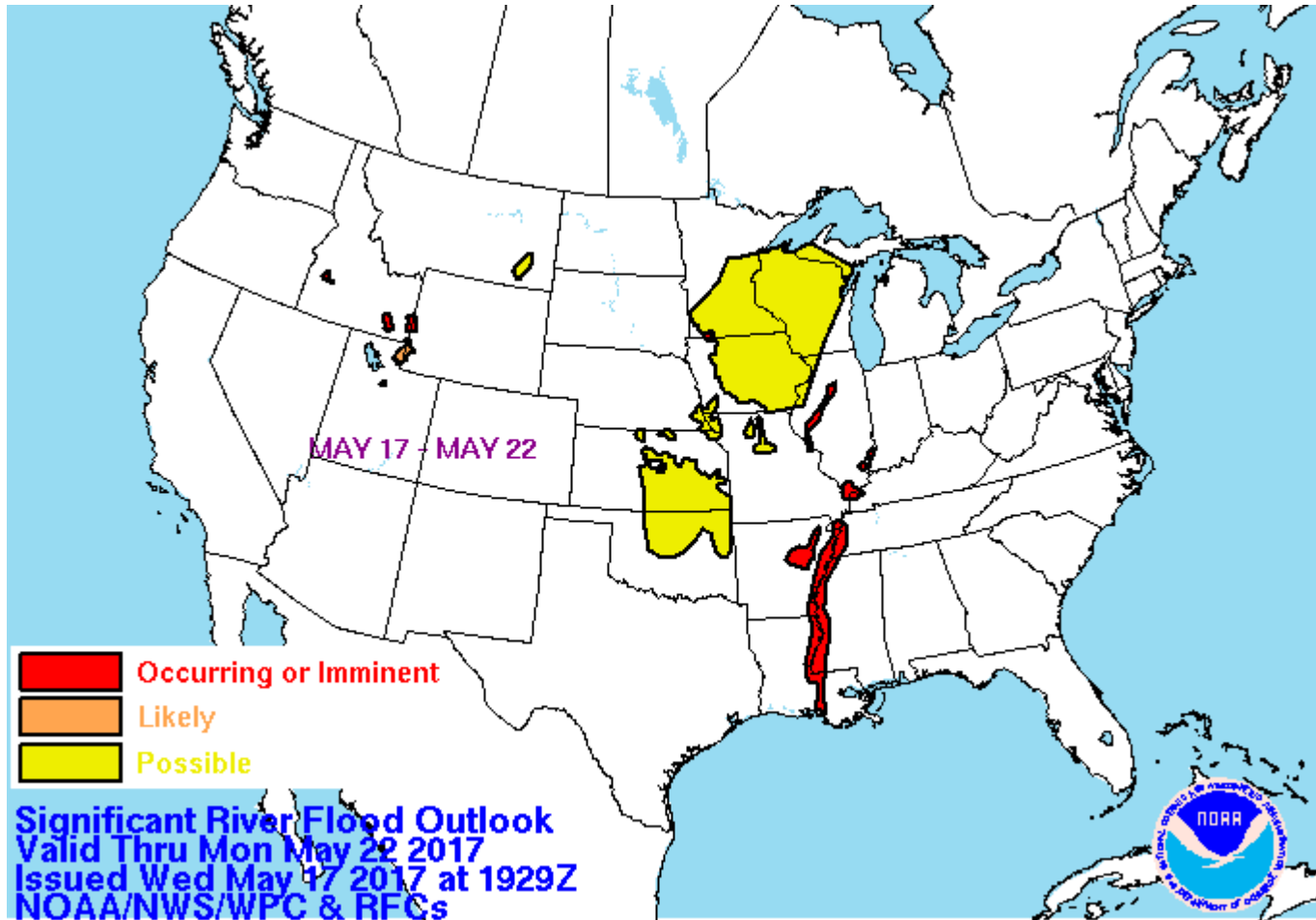
NATIONAL WEATHER SERVICE

Significant River Flood Outlook

Click a region on the national map below to access more detailed RFC data.



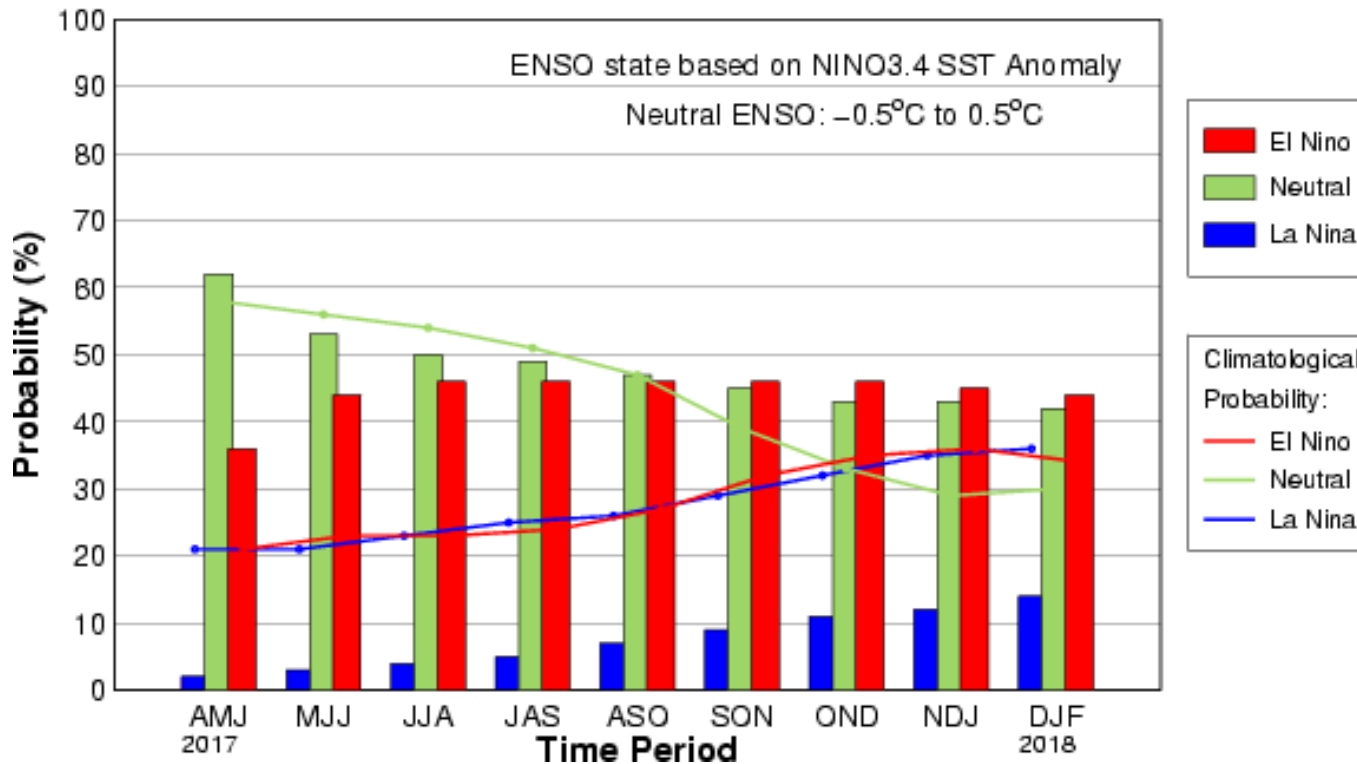
Issued Wed, May 17, 2017 and valid thru Mon, May 22, 2017



<http://www.wpc.ncep.noaa.gov/nationalfloodoutlook/>

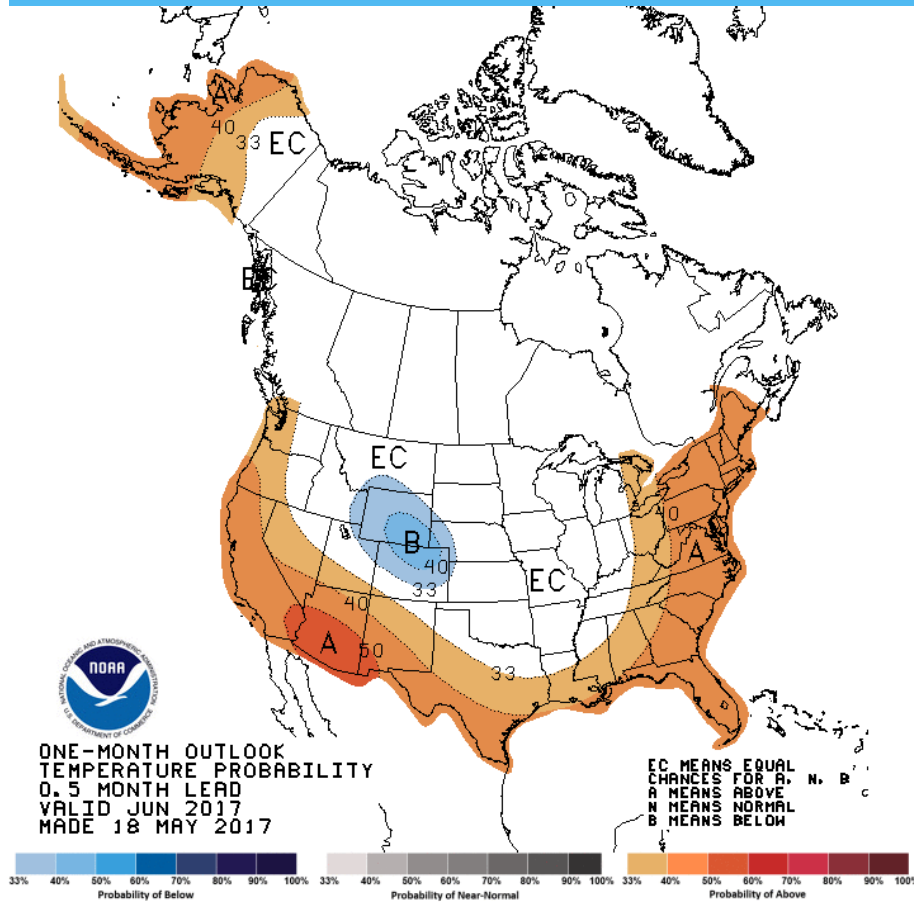
ENSO Forecast

Early-May CPC/IRI Official Probabilistic ENSO Forecast

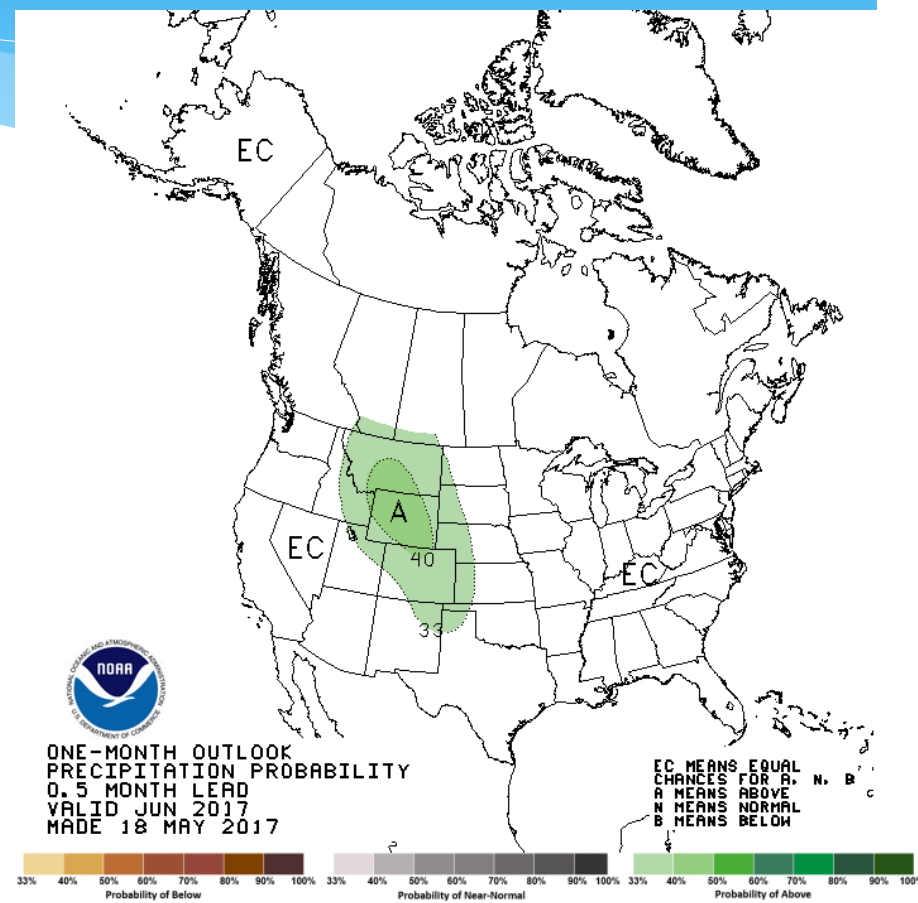


**El Niño and neutral
equally likely from
summer through the
upcoming winter;
La Niña unlikely in
2017**

June Temperature and Precipitation Probabilities



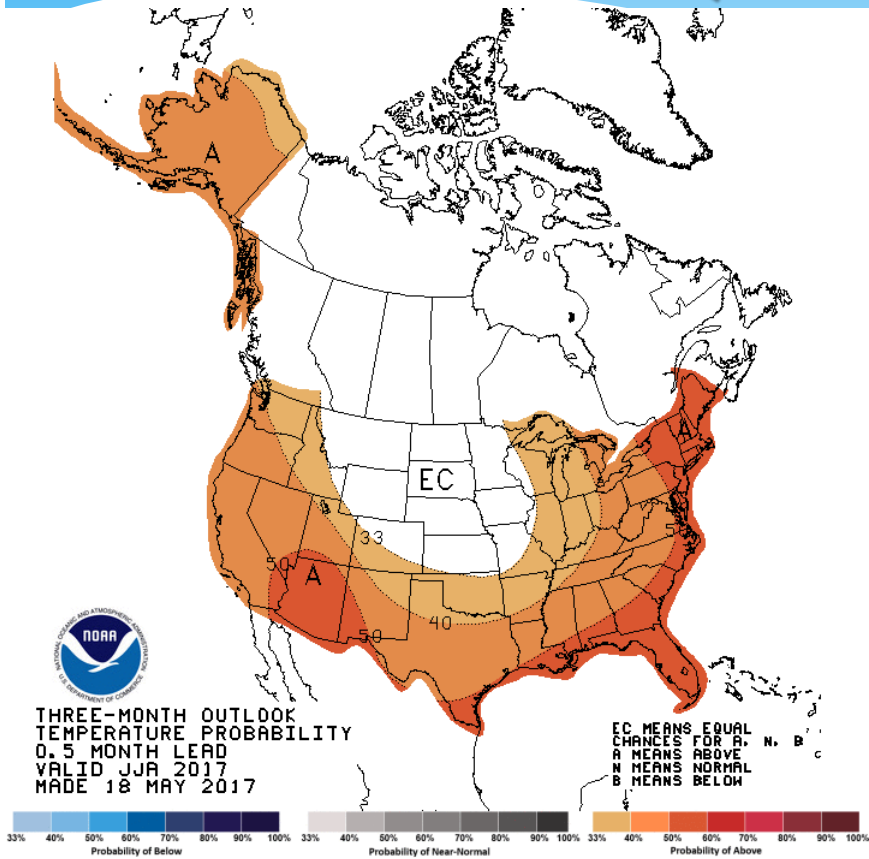
Temperature



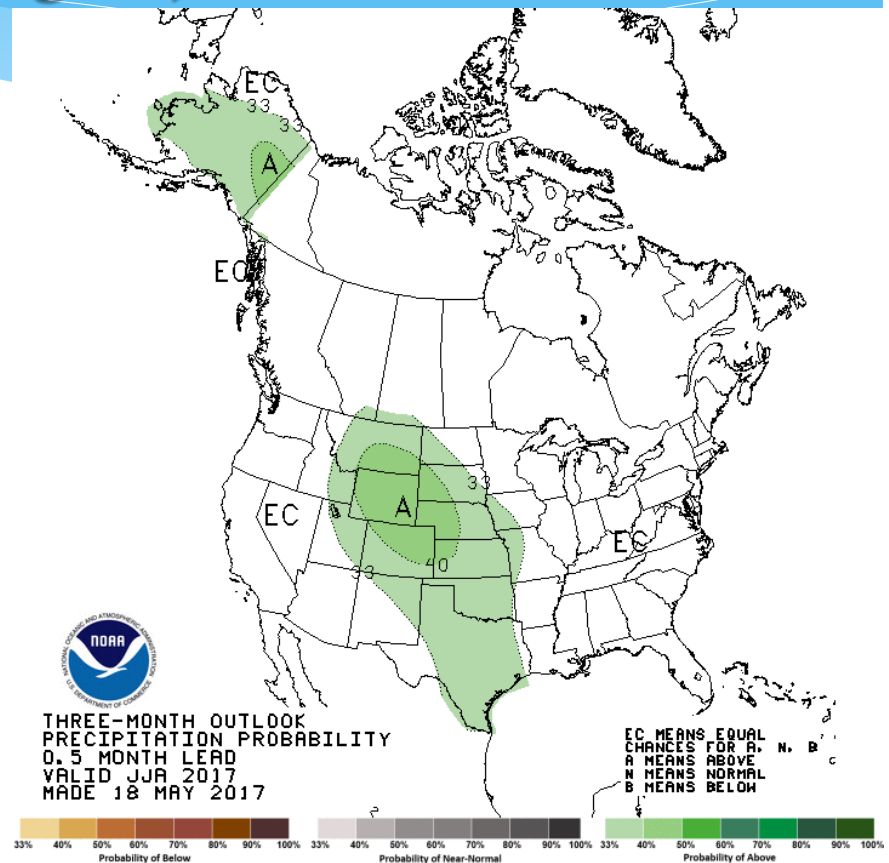
Precipitation

<http://www.cpc.ncep.noaa.gov/products/predictions/30day/>

Summer Temperature and Precipitation Probabilities (June-August)



Temperature



Precipitation

Summary - Conditions

- * 2nd warmest and 5th wettest first quarter of year on record for U.S.
- * Wetter across southern and eastern portions of North Central Region, drier conditions from NE MT to portions of Dakotas and NW MN. Extreme wetness in SE CO, southern KS, southern MO, southern IL and southern IN.
- * More opportunities for fieldwork activity and planting in northern and western portions of North Central Region.

Summary - Outlooks

- * Flood potential possible with near-term forecasted rainfall event and antecedent conditions across northern and central Mississippi River Basin and Lower Missouri River Basin, downstream from Nebraska City, NE.
- * Equal likelihood of neutral or El Niño from summer through winter
- * Delayed planting and replanting concerns
- * Disease opportunities, crop emergence issues
- * Nitrogen loss
- * Freeze potential far north?
- * Dakotas Dryness

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:**

- * Pat Guinan: GuinanP@missouri.edu, 573-882-5908

- * Dennis Todey: dennis.todey@ars.usda.gov , 515-294-2013

- * Doug Kluck: doug.kluck@noaa.gov, 816-994-3008

- * 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