Midwest and Great Plains Climate and Drought Outlook

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NOAA

USDA United States Department of Agriculture
Midwest Climate Hub

Regional Climate Centers

AASC American Association of State Climatologists

National Drought Mitigation Center

The Ohio State University
College of Food, Agricultural and Environmental Sciences

General Information

- **Providing climate services to the Central Region**
  - Collaboration Activity Between:
    - NOAA NCEI/NWS/OAR/NIDIS/CPC
    - USDA Climate Hubs
    - American Association of State Climatologists
    - Midwest and High Plains Regional Climate Centers
    - National Drought Mitigation Center

- **Next Regular Climate/Drought Outlook Webinar**
  - July 20, 2017 **(1 PM CDT)** Jeff Andresen – Michigan State Climatologist (MSU)

- **Northern Plains Drought Information Call (Tribal, State and Local Government as well as Ranchers, Farmers and Other Sectors that are being impacted in the area.)**
  - Wednesday June 21, 2017 **(10 AM CDT)** – Contact Doug Kluck for more details

- **Access to Future Climate Webinars and Information**
- http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars
- *http://mrcc.isws.illinois.edu/webinars.htm*
- *http://www.hprcc.unl.edu/webinars.php*

- **Open for questions at the end**

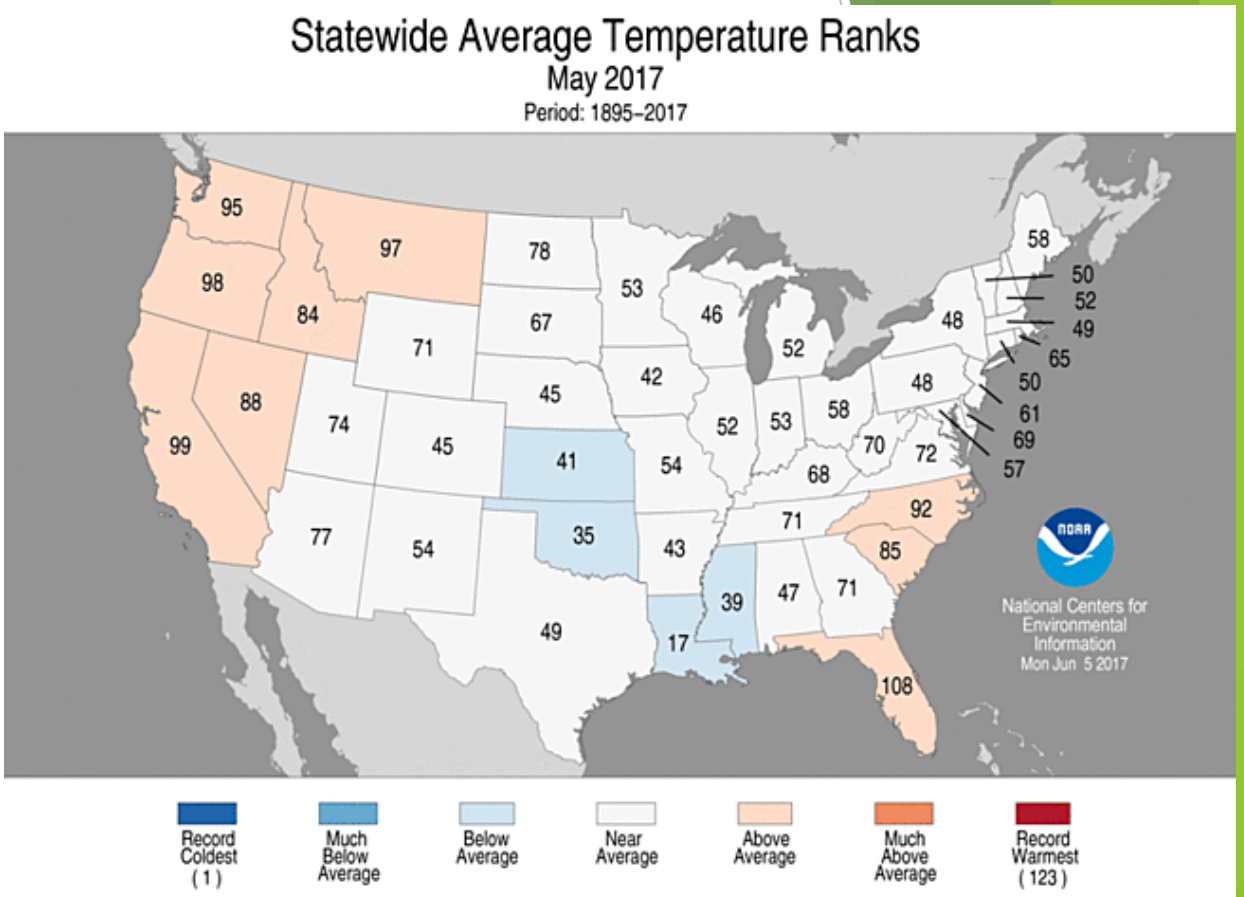
Agenda

- Recap May and March-May 2017
- Recent and Current Conditions
- Impacts in Ag, Snow/Water, and Others
- Climate Outlooks (Near-Term, Long-Term, and ENSO)

Recap May and March-May 2017

May Temperature Recap

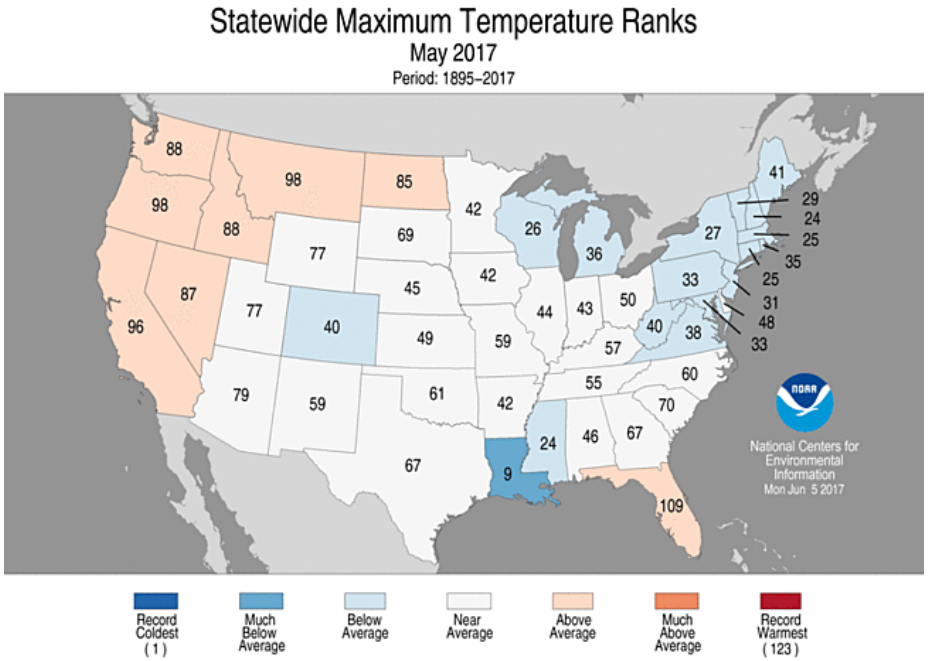
- **Near Average conditions across much of the North Central Region**
- **Above Average in Montana; Below Average in Kansas**

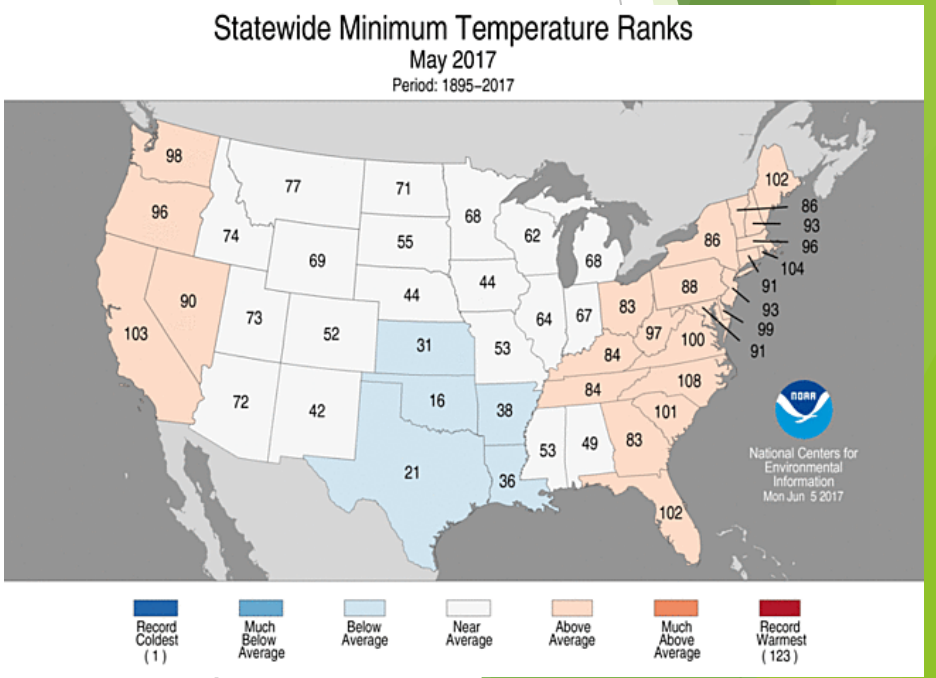


https://www.ncdc.noaa.gov/temp-and-precip/us-maps/

- **Contiguous U.S. was 60.6°F, 0.4°F above average, and ranked near the middle of the 123-year period of record**

May Temperature Recap



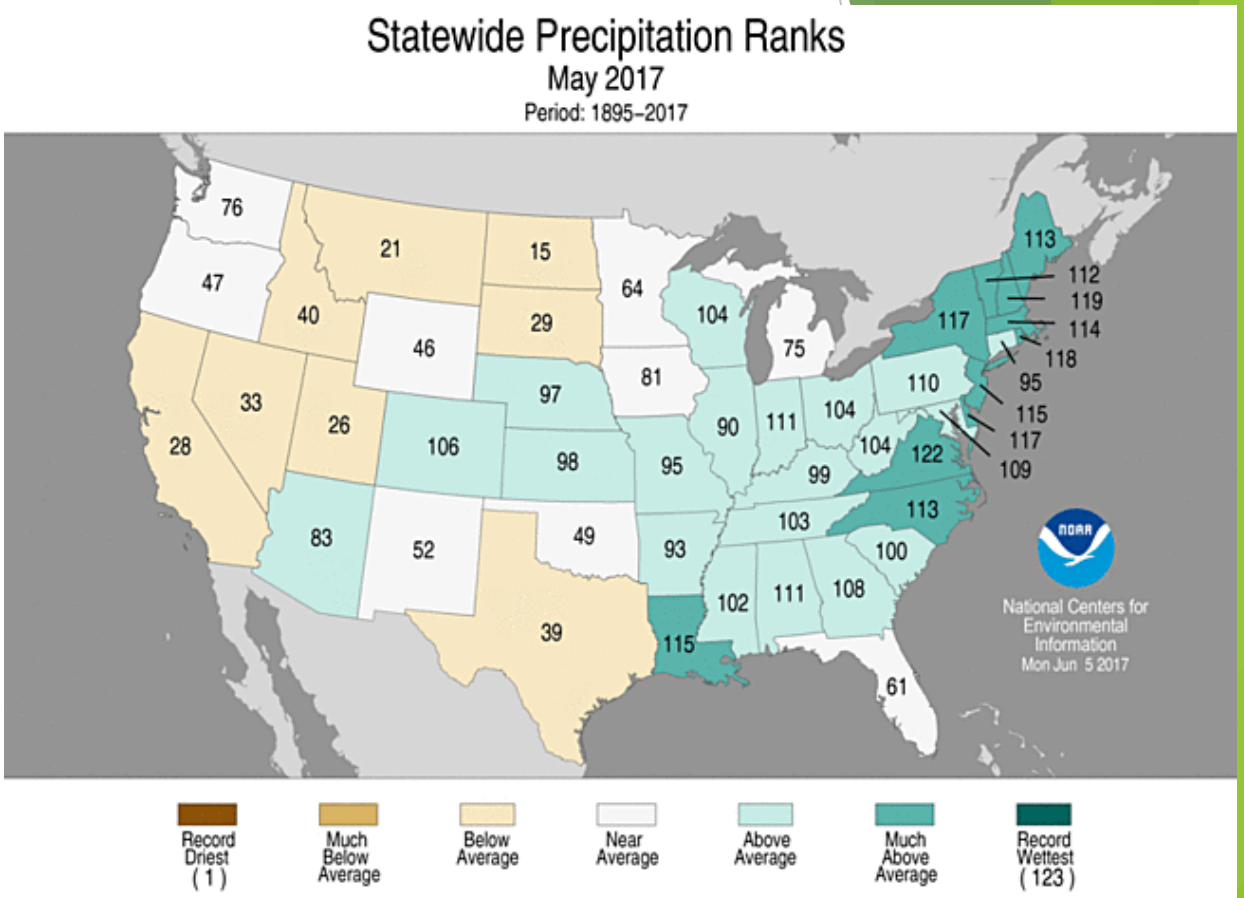


https://www.ncdc.noaa.gov/temp-and-precip/us-maps/

May Precipitation Recap

- **Above Average across the Eastern and Southern stretches of the region**

- **Below Average across the Dakotas and Montana**

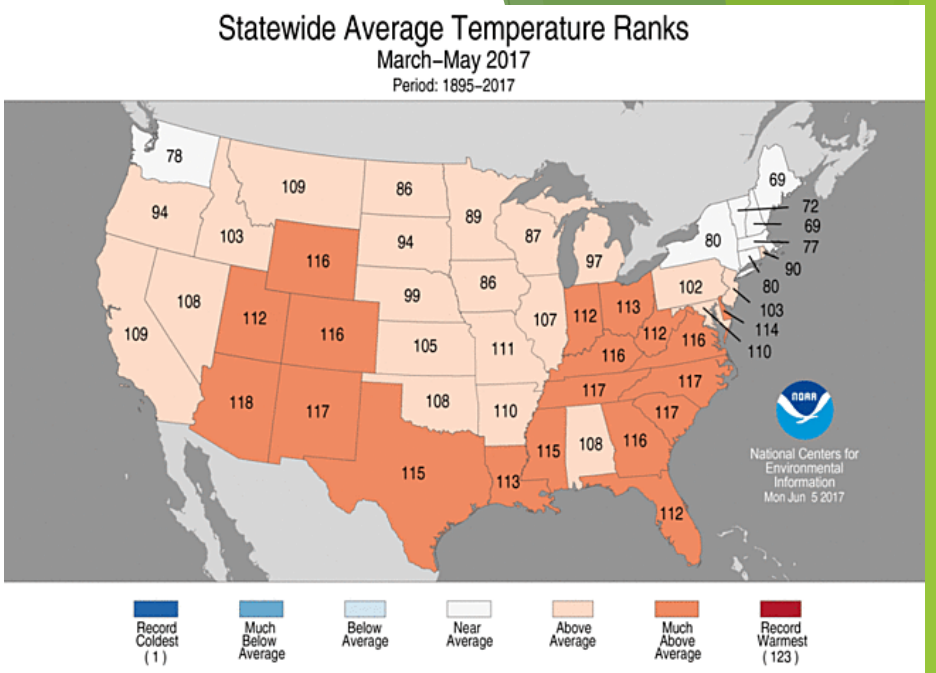


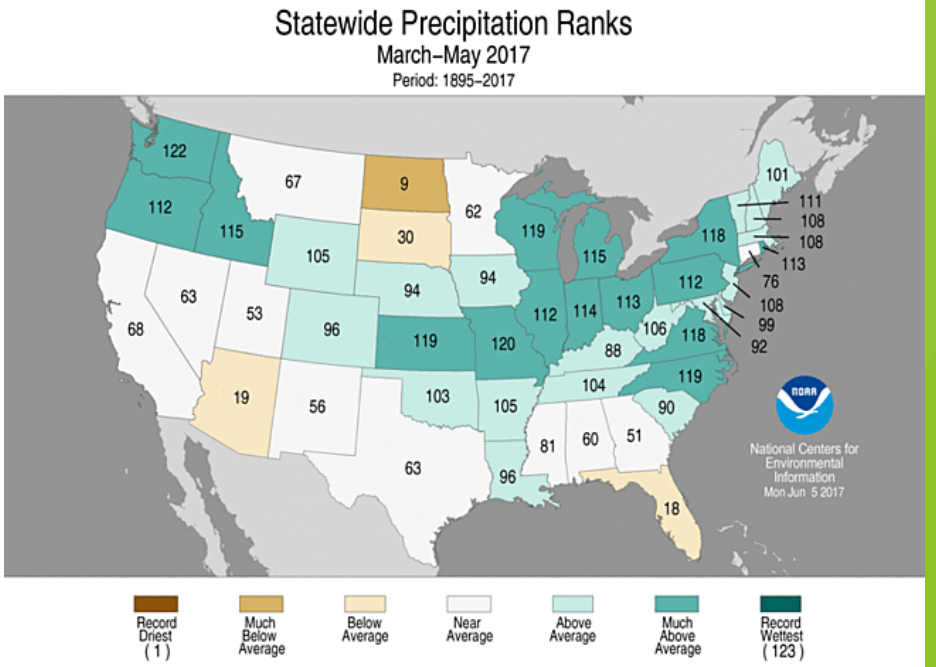
https://www.ncdc.noaa.gov/temp-and-precip/us-maps/

- **Contiguous U.S. precipitation total was 3.31 inches, 0.40 inch above average, tying 2009 as the 25th wettest on record**

March-May Ranks

- **Above to Much Above Average temperatures across the region**
- **East-Central-West: Much Above Average Precipitation**
- **Very Dry Across the Dakotas; 9th Driest in ND**





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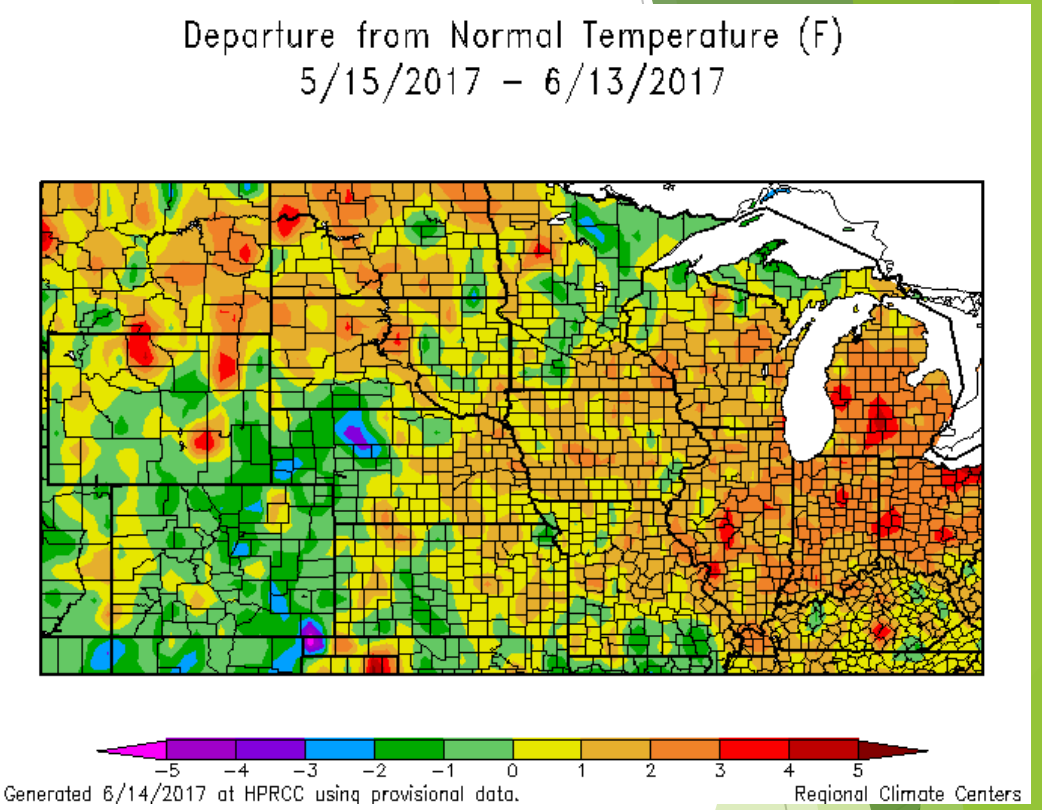
Recent and Current Conditions

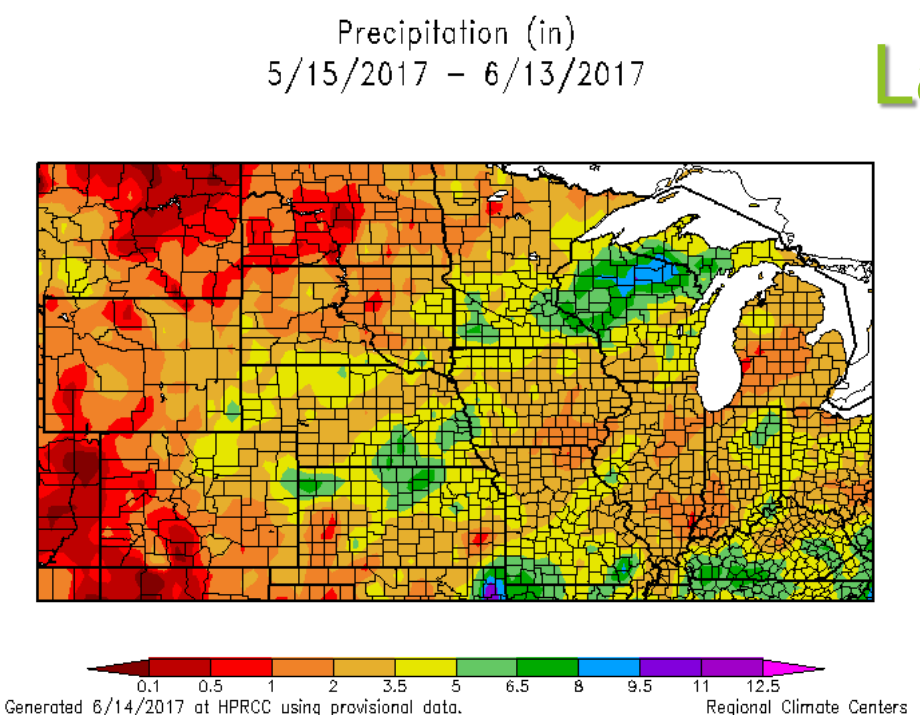
Last 30 Days Temperature



https://hprcc.unl.edu

- **Cooler than average from SE Wyoming and the Colorado Rockies into western Kansas, Nebraska, into the upper Midwest**
- **Warmer than average across E. Nebraska/Kansas eastward through Ohio/Michigan; Also in the N. Plains and Montana, N. Wyoming**

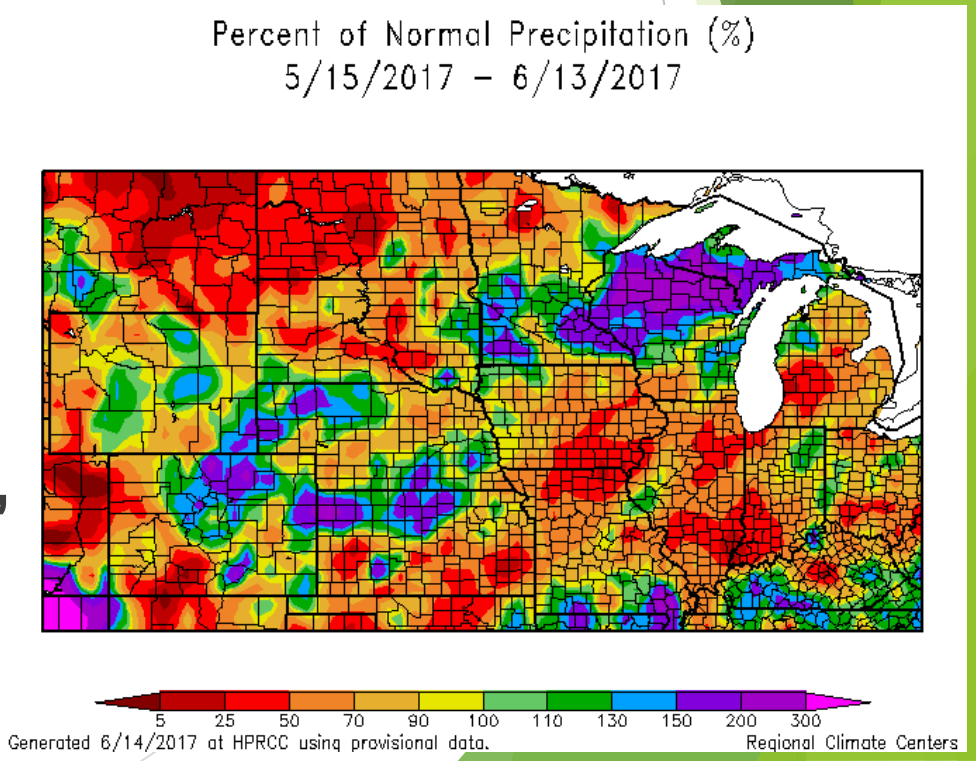
Last 30 Days Precipitation



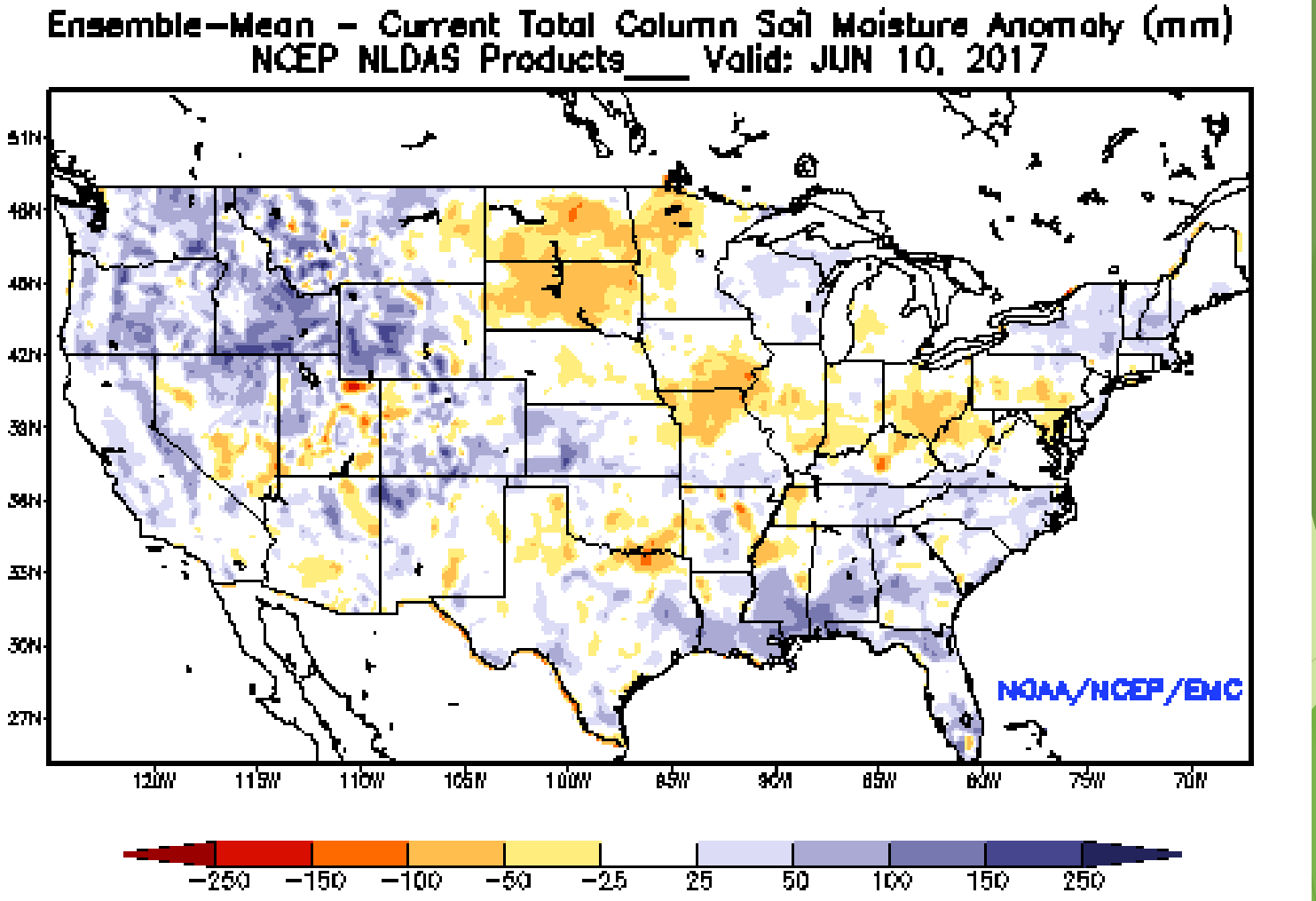
https://hprcc.unl.edu

- Wetter than normal conditions across much of N. Colorado and SE. Wyoming , NE. Nebraska, N. Kansas, S. Minnesota and N. Wisconsin

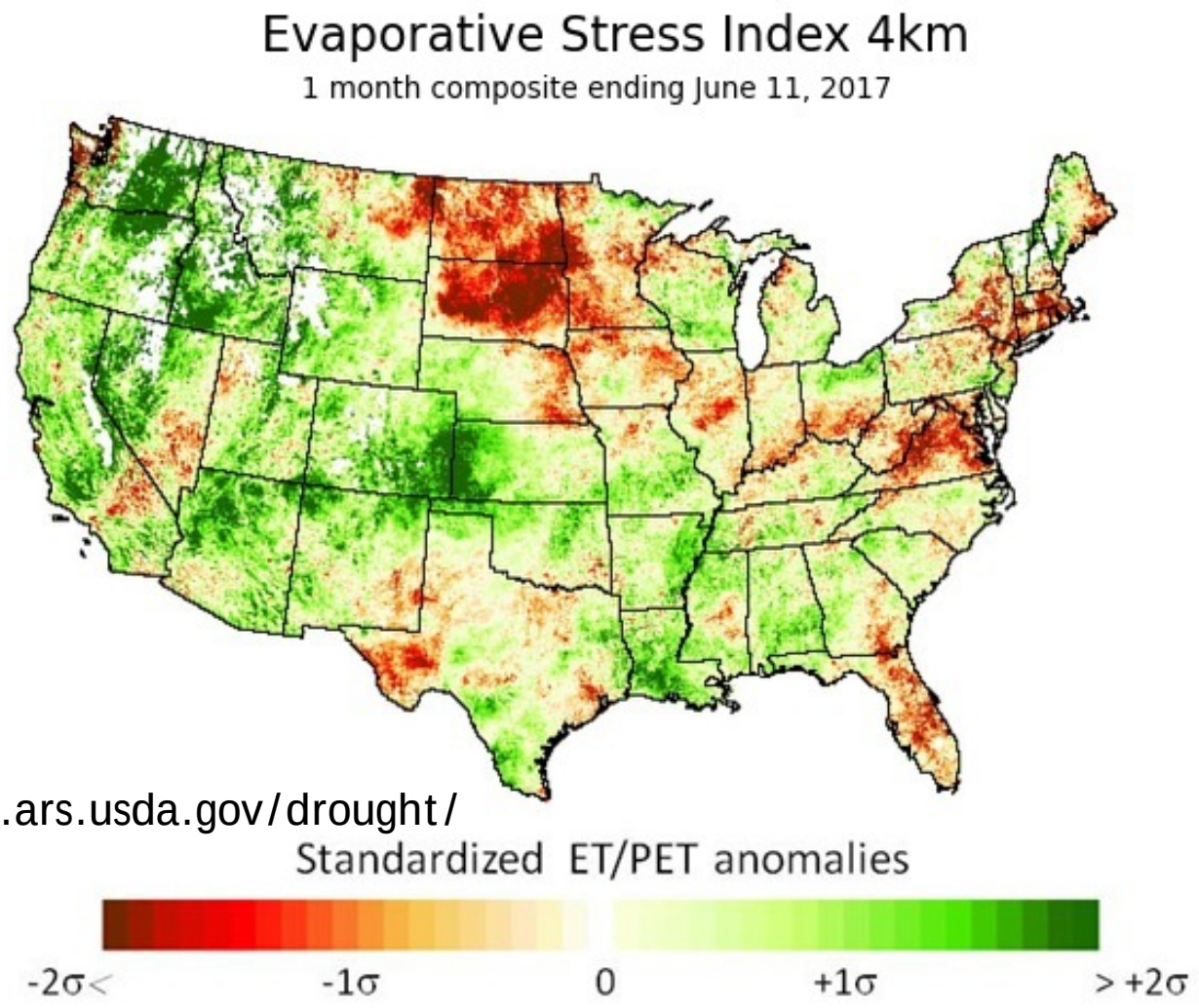
- Critically dry across Montana, the Dakotas, and NW. Minnesota
- Other areas in Missouri, Iowa, Michigan, Illinois, Indiana, and Ohio drying out rapidly (some exceptions)



Soil Moisture

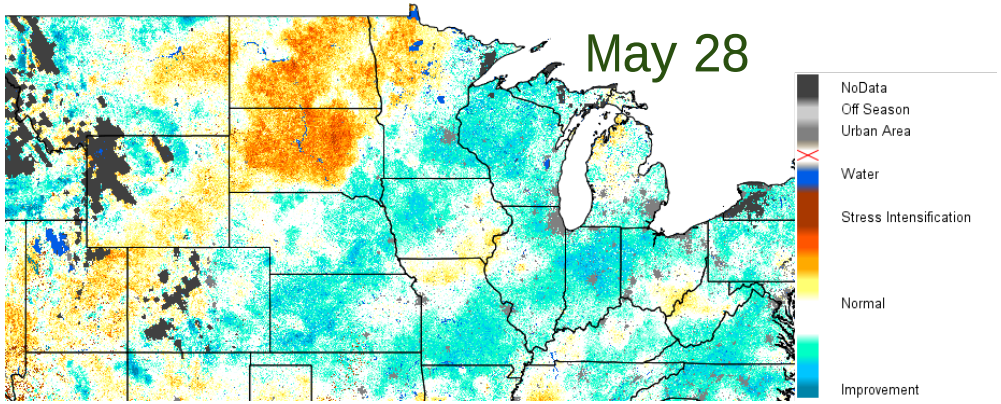


Evaporative Stress Index



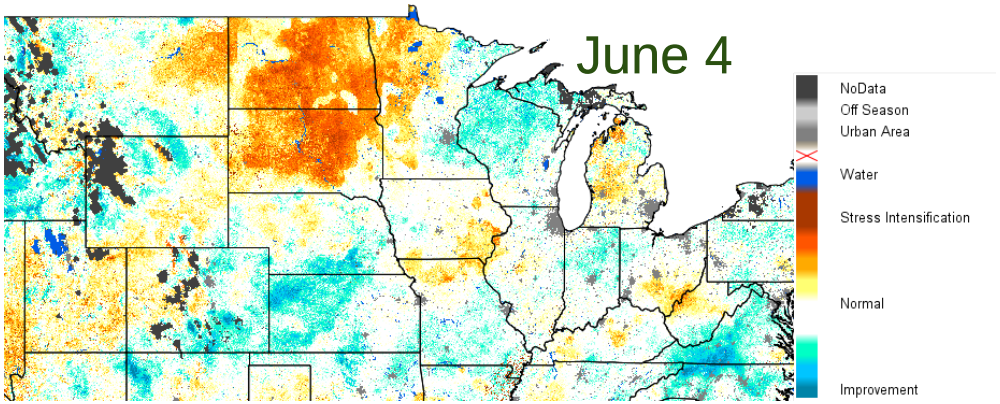
https://hrsl.ba.ars.usda.gov/drought/

The Evaporative Stress Index (ESI) describes temporal anomalies in evapotranspiration (ET), highlighting areas with anomalously high or low rates of water use across the land surface.



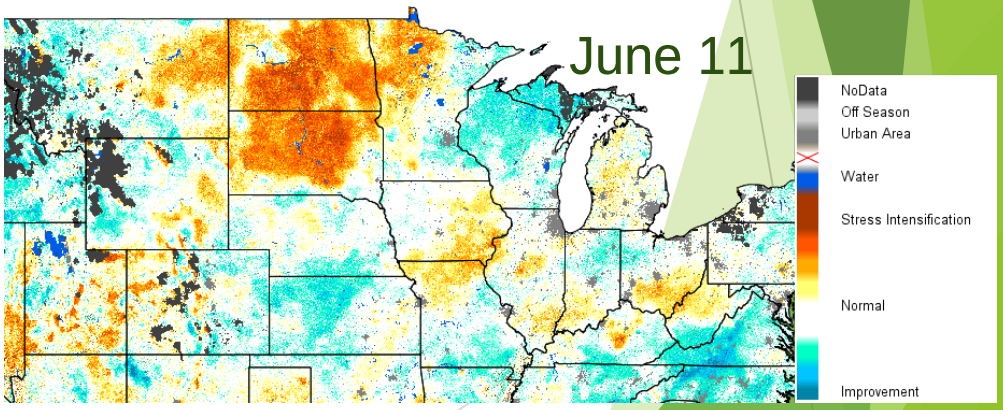
QuickDri

https://vegdri.cr.usgs.gov/viewer/



QuickDRI models incorporate multiple remote sensing- and climate-based input variables that portray key components of the hydrologic cycle influencing drought-related vegetation stress.

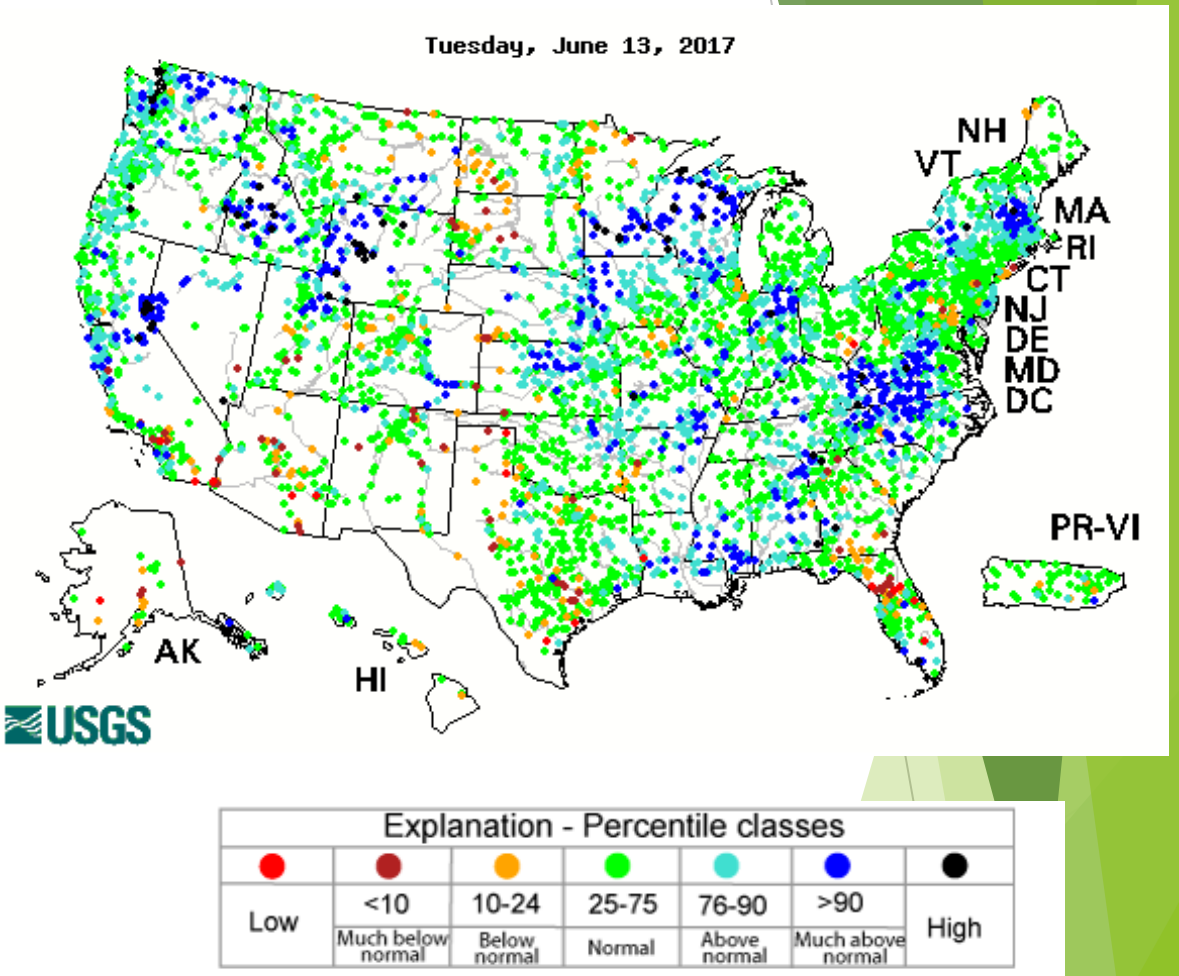
Indication of rapidly developing drought.



NDMC CALMIT University of Nebraska - Lincoln Center for Advanced Land Management Information Technologies USGS science for a changing world USDA NASA NLDAS HPRCC N

24-Day Average Streamflow

- Below average streamflow across western portions of the Dakotas and NW. MN
- Note N. Missouri and S. Iowa – quick response to drying conditions due to strong evaporative demand and high clay content in soils



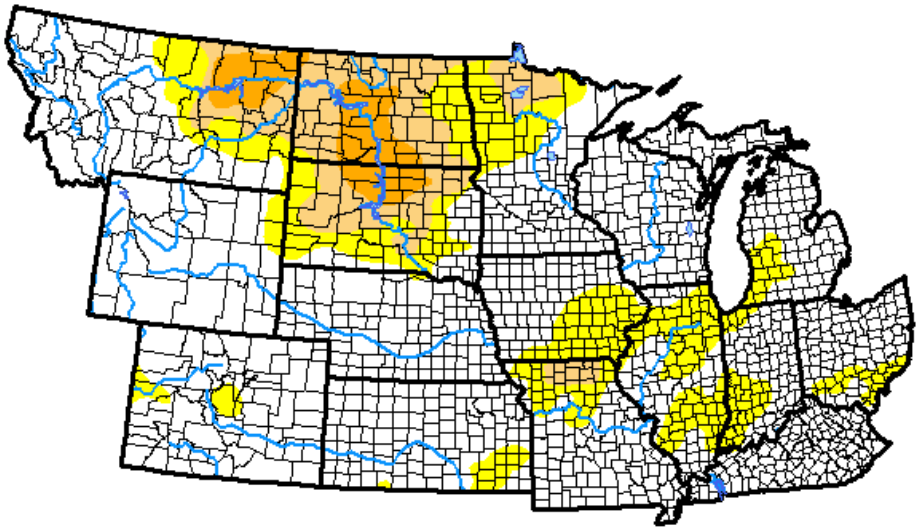
https://waterwatch.usgs.gov/images/index.php?mt=pa28d&st=us

- Streamflow high across N. Kansas, E. NE and W. Iowa, S. MN, and Wisconsin, parts of S. Missouri, Illinois, NE. Indiana and W. Ohio

US Drought Monitor

U.S. Drought Monitor

NWS Central Region



June 13, 2017

(Released Thursday, Jun. 15, 2017)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	71.32	28.68	12.04	3.81	0.00	0.00
Last Week *06-06-2017*	79.49	20.51	11.54	1.59	0.00	0.00
3 Months Ago *03-14-2017*	72.96	27.04	14.97	1.54	0.06	0.00
Start of Calendar Year *01-03-2017*	65.79	34.21	12.04	1.70	0.00	0.00
Start of Water Year *09-27-2016*	76.71	23.29	7.36	1.93	0.12	0.00
One Year Ago *06-14-2016*	75.78	24.22	2.52	0.11	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.

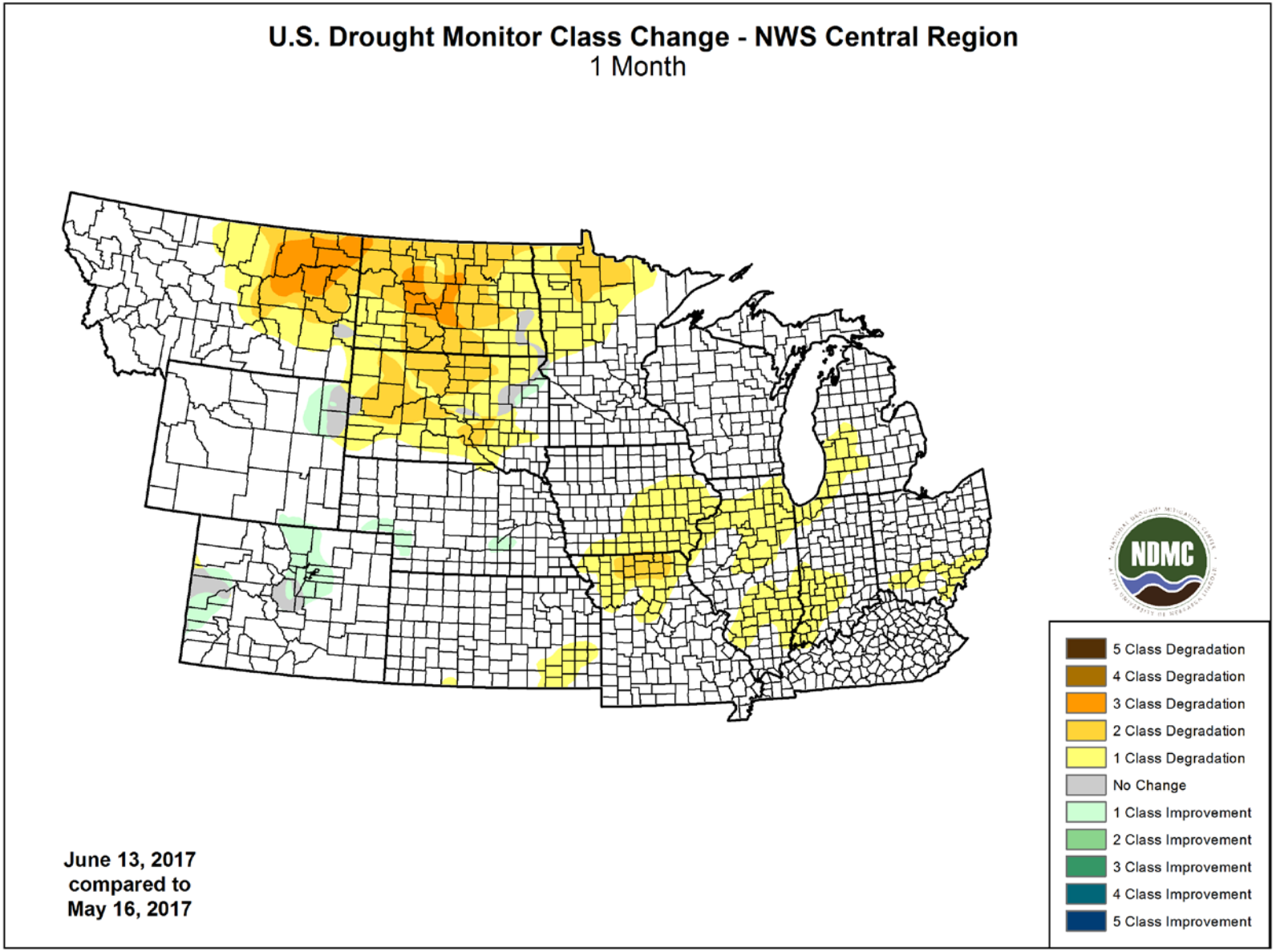
Author:

David Miskus

NOAA/NWS/NCEP/CPC

http://droughtmonitor.unl.edu/

US Drought Monitor – 1 mo. Change



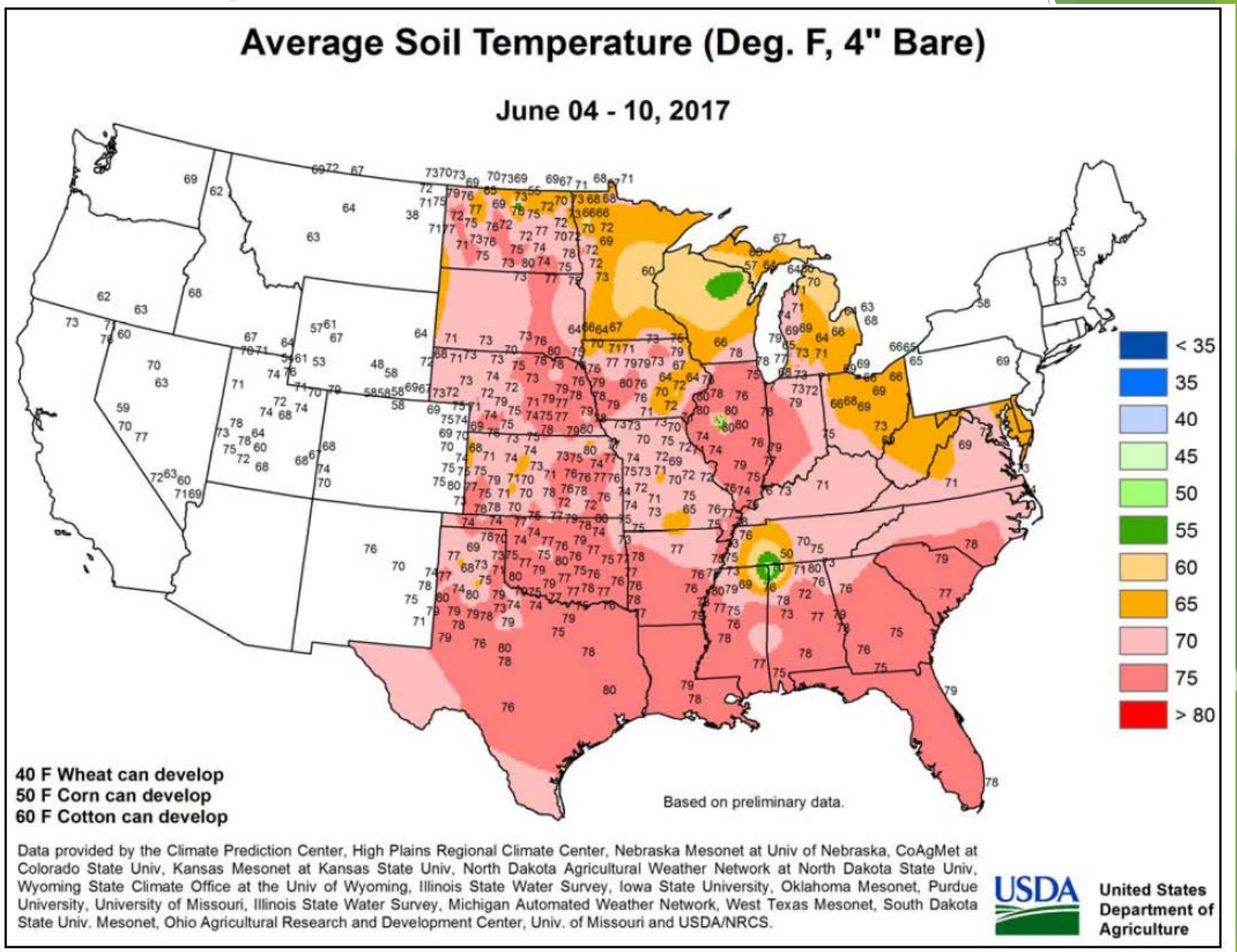
http://droughtmonitor.unl.edu

Sidewall Compaction Issues in Cornbelt https://agcrops.osu.edu/newsletter/corn-newsletter/2017-16/side-wall-and-pinch-row-compaction Credit: John Fulton

Winter Wheat Conditions in SD. Courtesy of Laura Edwards, SD State Climatologist

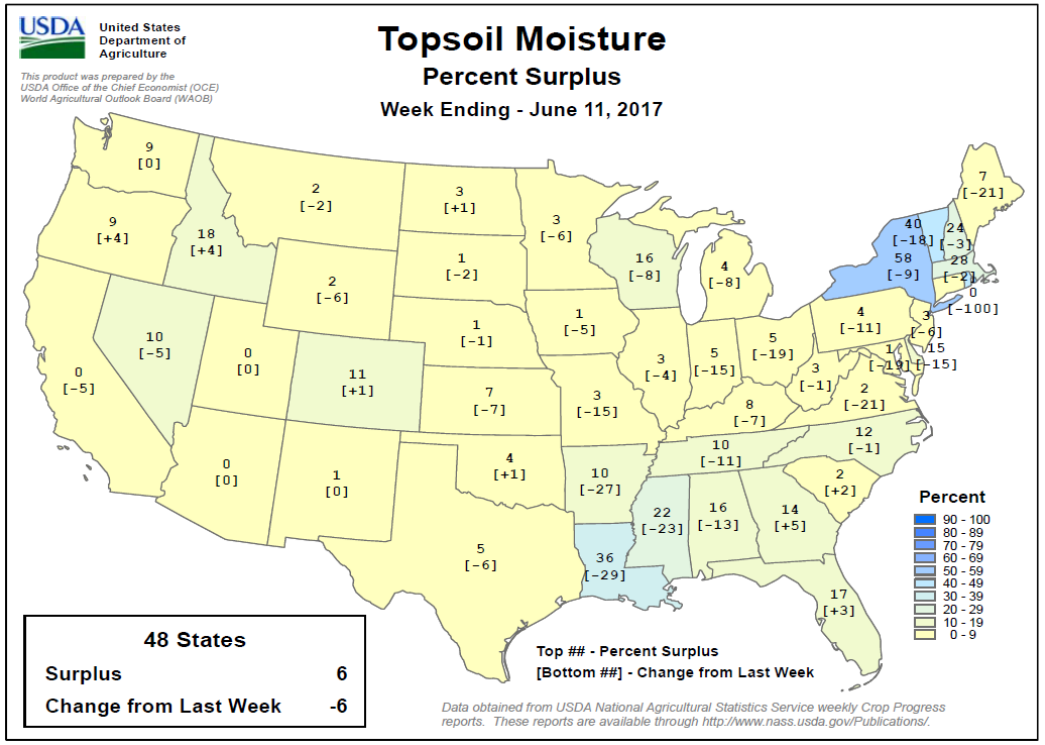
Impacts on Agriculture

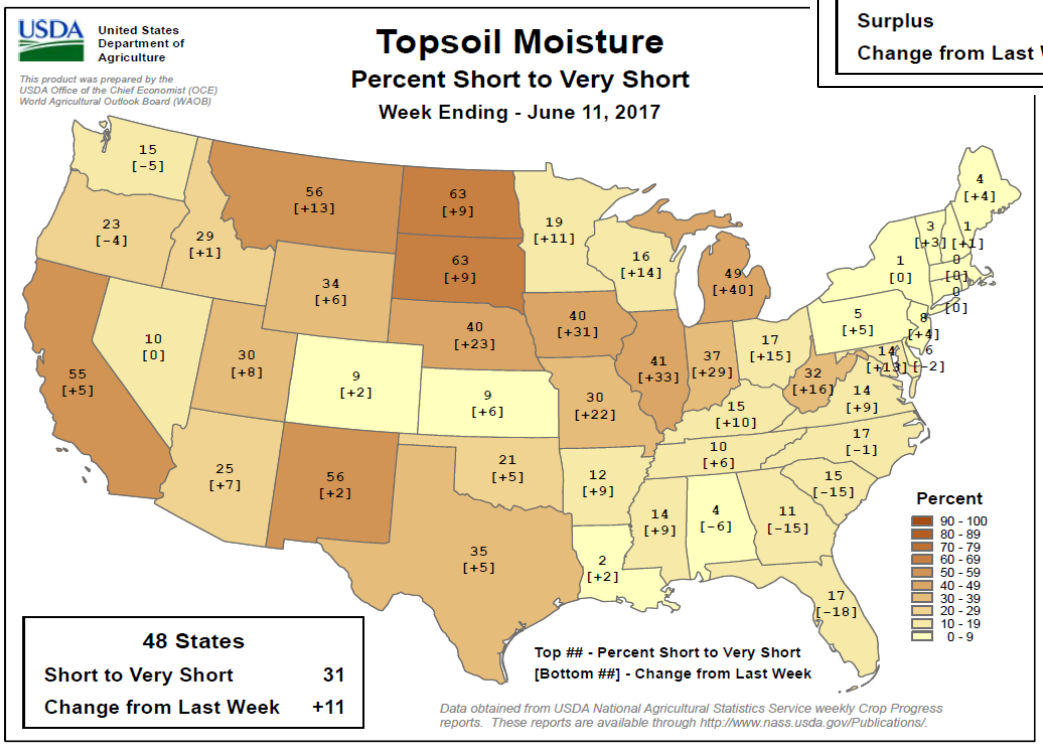
Soil Temperatures



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

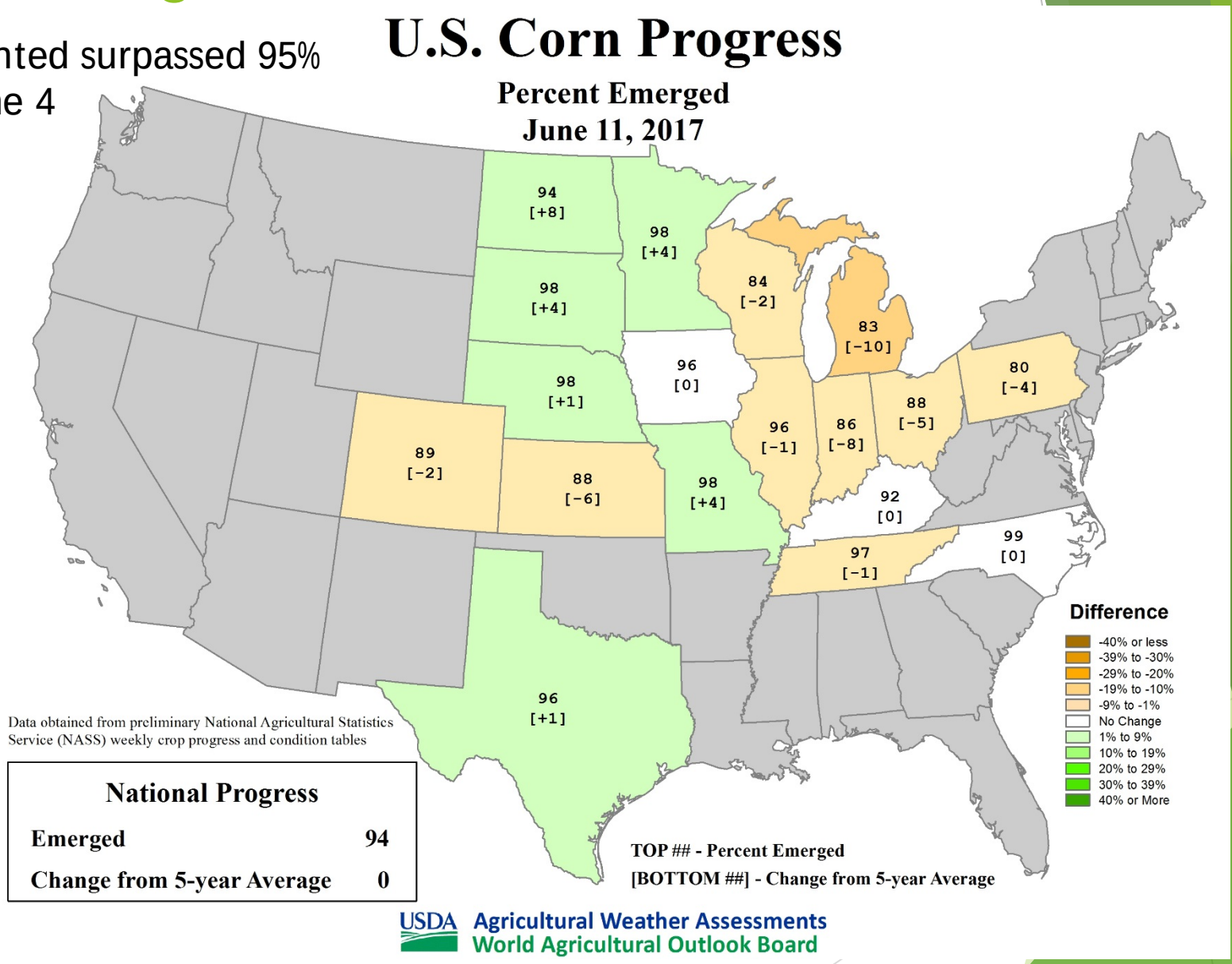
NASS Topsoil moisture





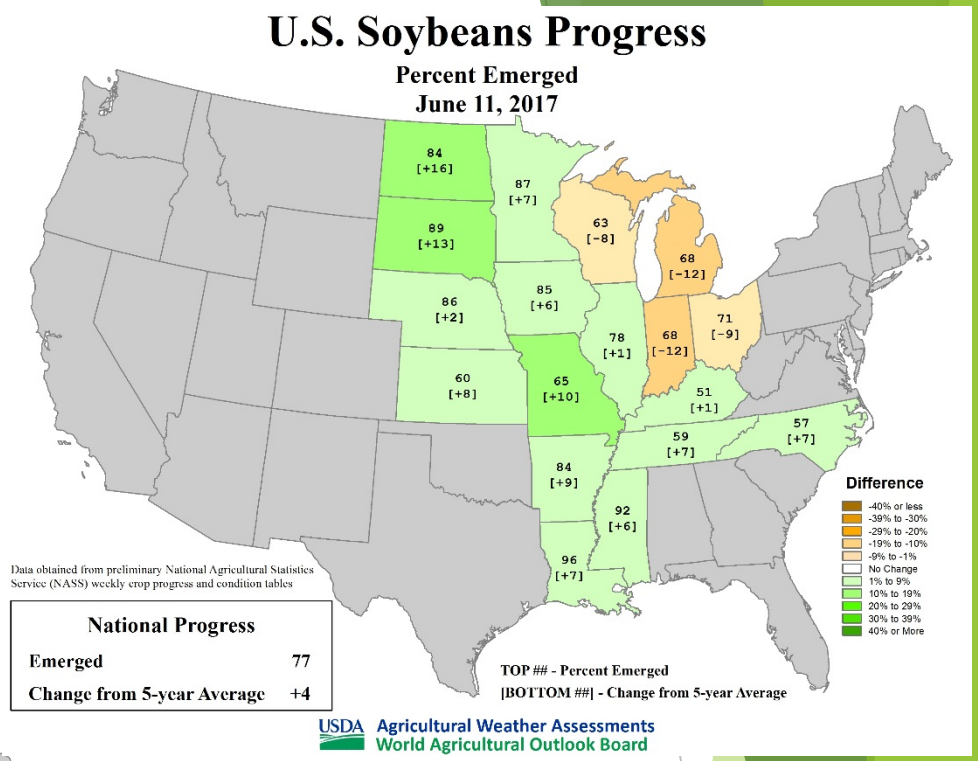
Corn Progress

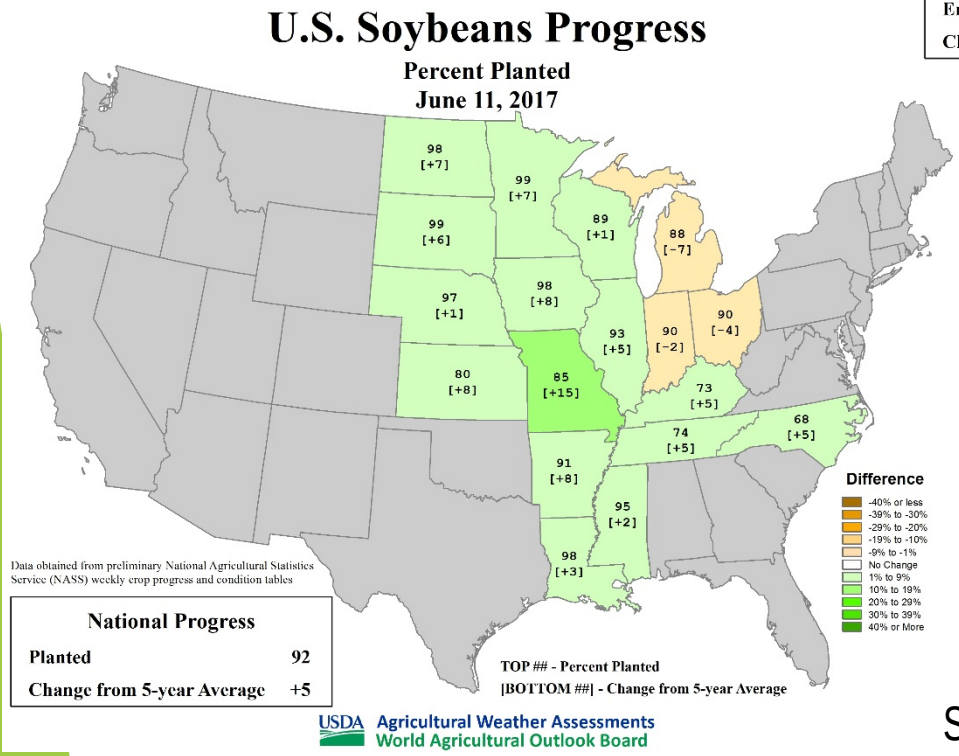
*% Planted surpassed 95% on June 4



Slides courtesy of Brad Rippey, USDA/OCE

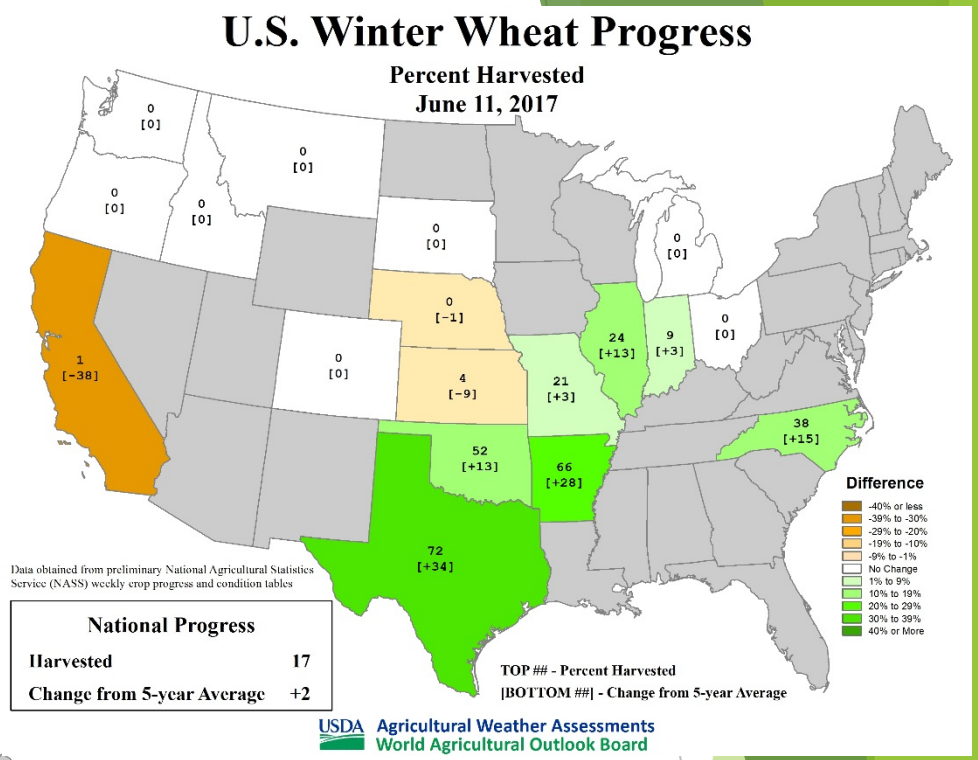
Soybean Progress

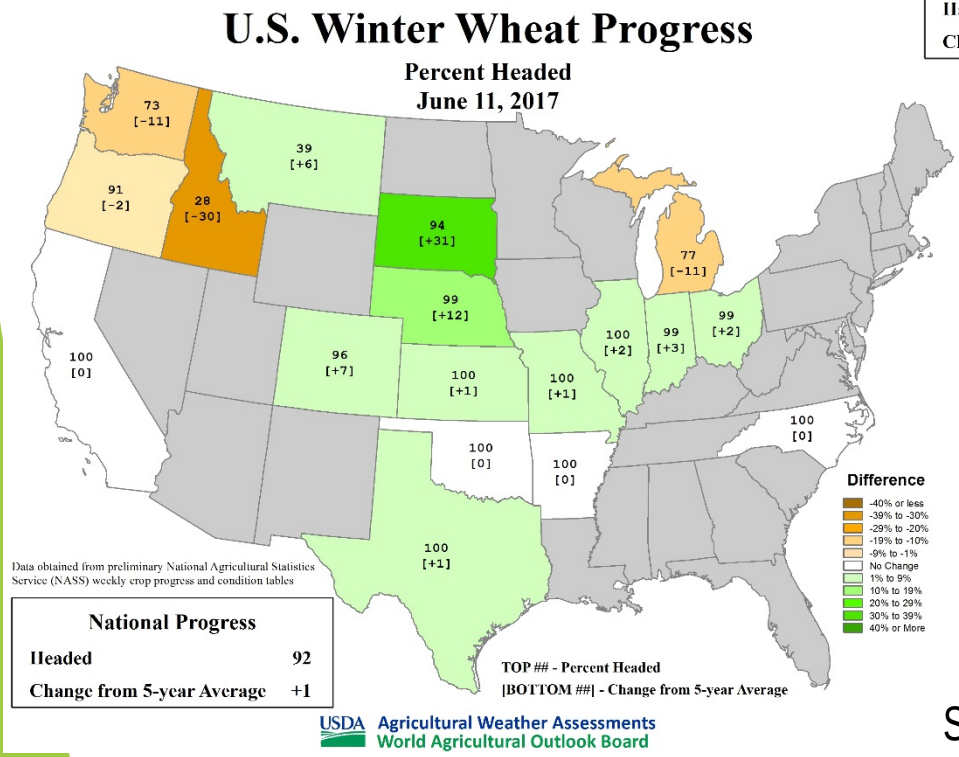




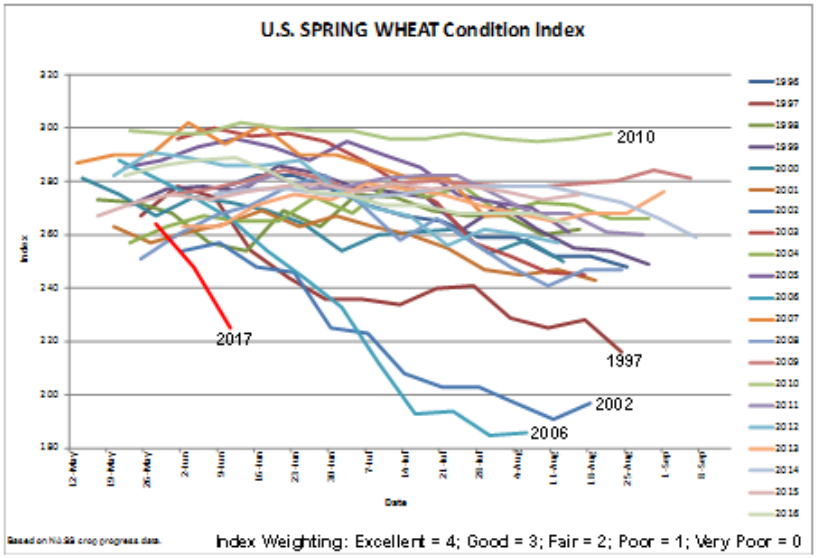
Slides courtesy of Brad Rippey, USDA/OCE

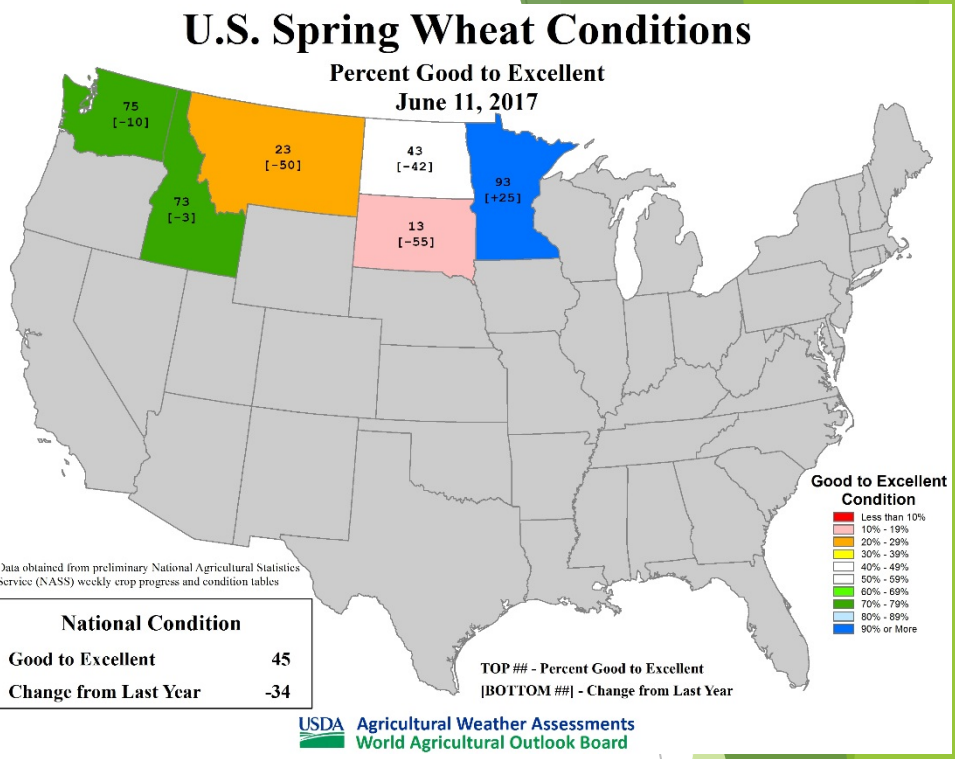
Winter Wheat Progress

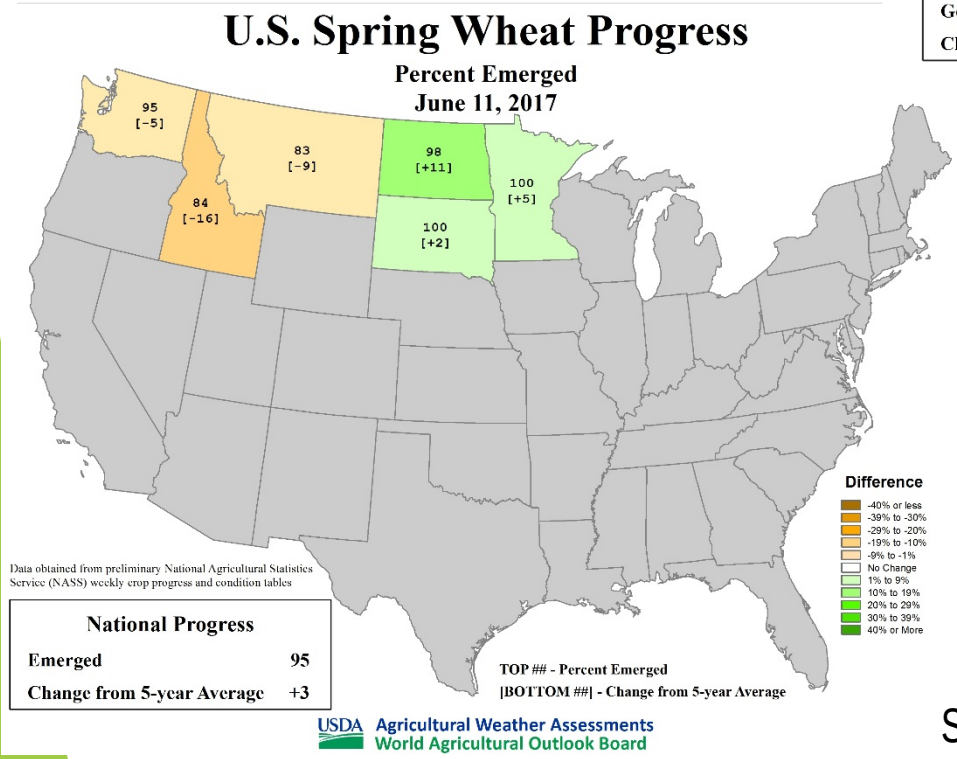




Slides courtesy of Brad Rippey, USDA/OCE





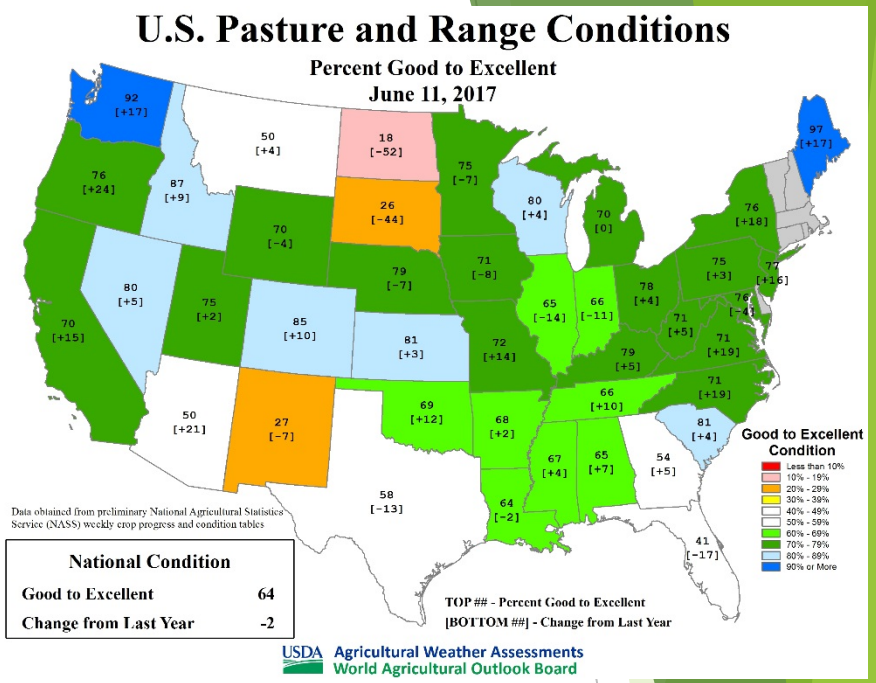


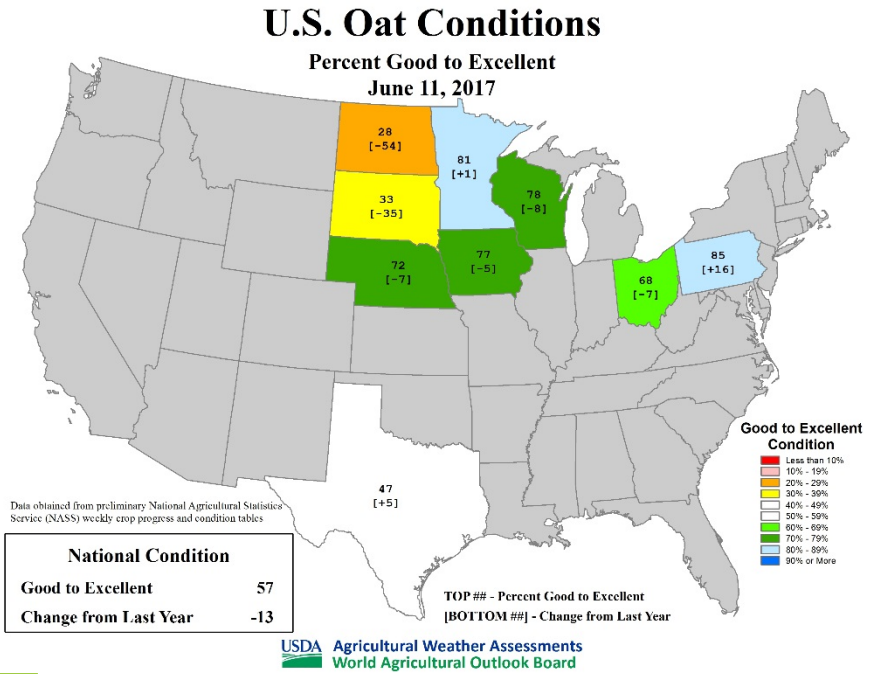
Spring Wheat Progress

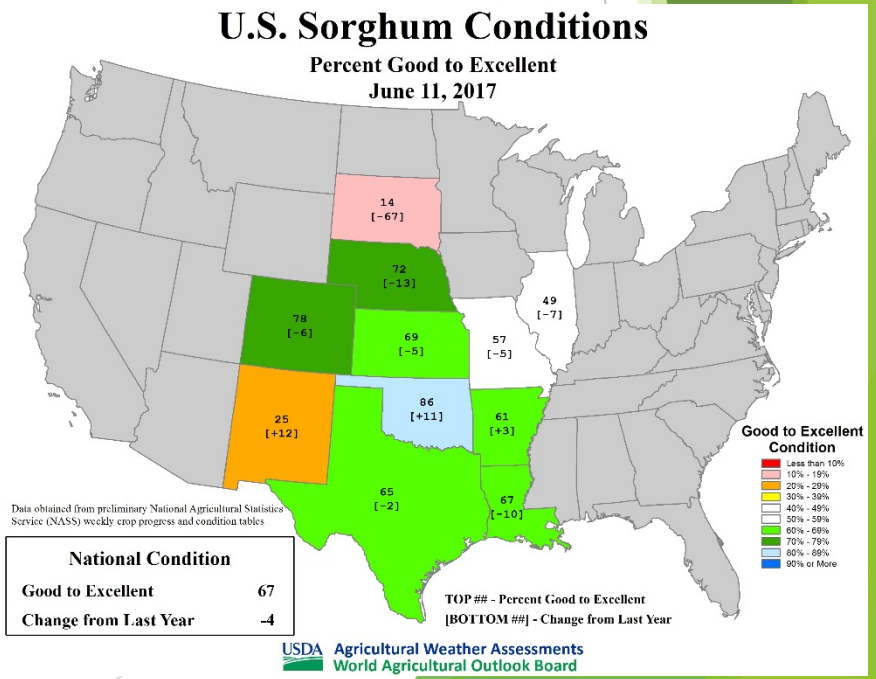
Slides courtesy of Brad Rippey, USDA/OCE

Pastureland, Oats, and Sorghum

Slides courtesy of Brad Rippey, USDA/OCE

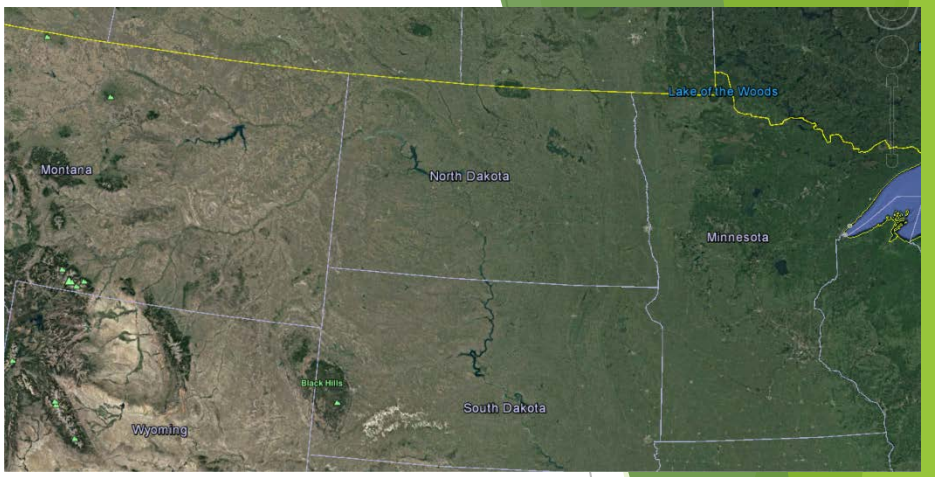






Regional Impacts: Northern Tier

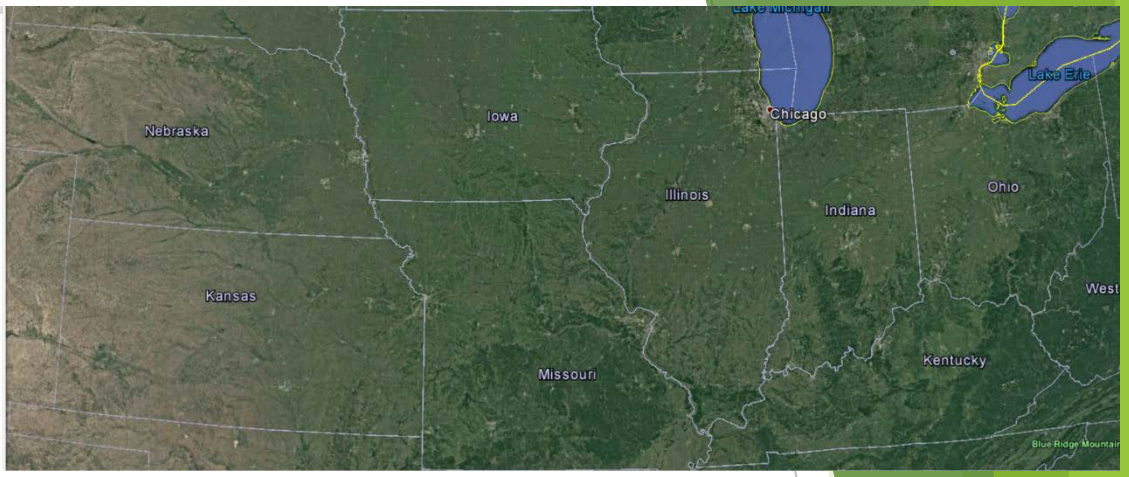
Rapid Drought Development



- Cattle are being sold, both yearlings (that would normally go to feed at this time) and also cow/calf pairs (which indicates herd culling)
- Winter wheat being cut for hay instead of harvesting for grain (central and north); short on pasture; alfalfa not being cut; may turn to sunflower or millet
- Burn bans across the Dakotas; SD State Drought Task Force initiated
- Fort Peck tribe has prepared a "Disaster Declaration" for the drought conditions on the reservation (MT)
- Cool May – no fruit damage (MN)
- Hot June - Rapid loss of soil moisture – some plant stress (MN)

Regional Impacts: Southern Tier

Wet to Hot/Dry – Drought Looming?



- Good conditions where corn planted on time and not too wet; Heat helps develop deeper roots
- Late corn/soybean plants struggling with heat stress (rolling, turning yellow – potassium uptake issues)
- Sidewall compaction issues; Soil crusting and soybean breaking necks during emergence
- No water for germination in some cases (soybeans, pumpkins) – some farmers still waiting to plant
- If dryness continues – there will be additional stress on irrigation and nurseries

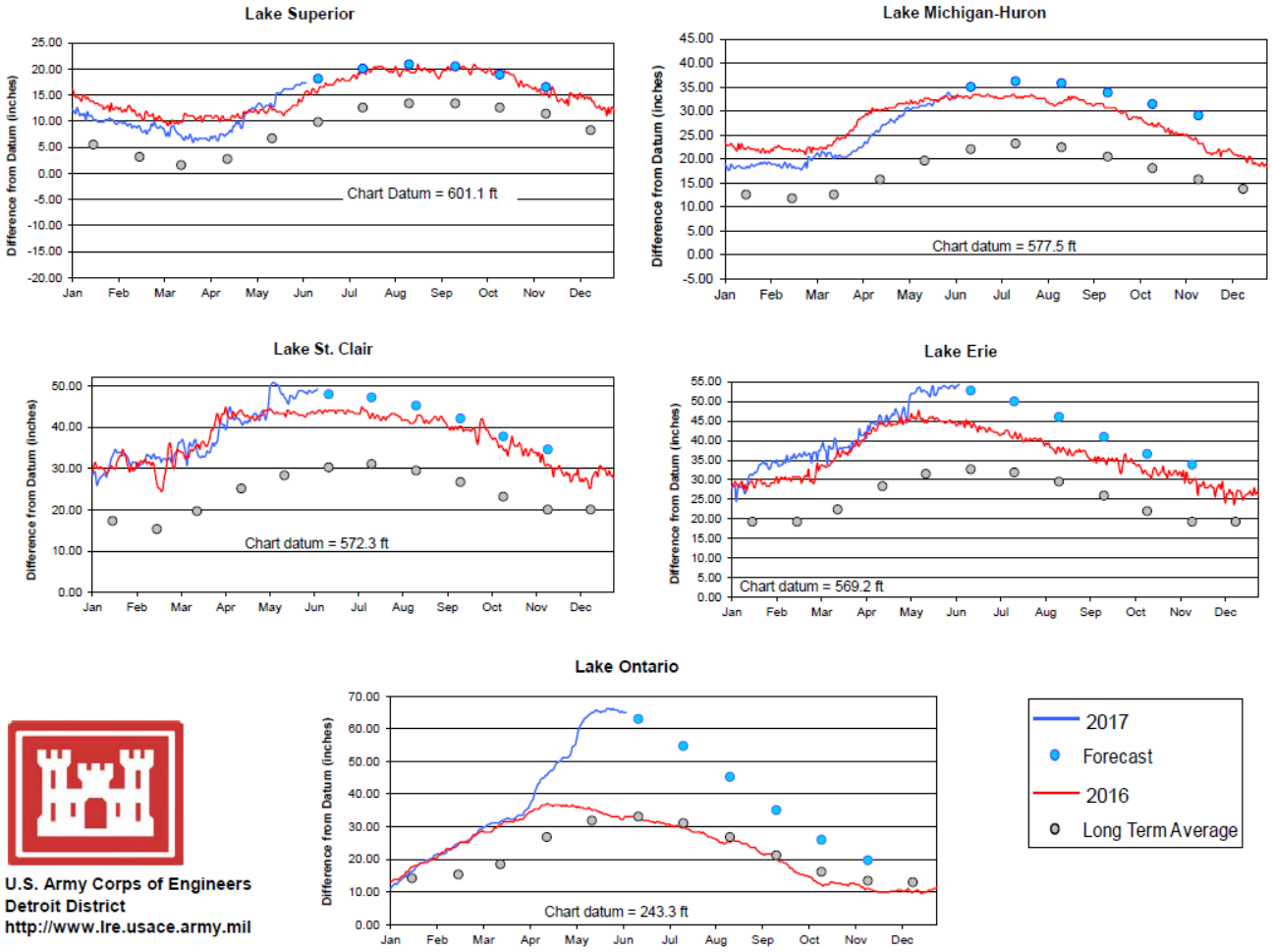
Impacts on Water/Snow

Cliff Creek flowing into the Hoback River (western WY) Photo credit: Tony Chambers

New Fork River in Sublette County (W. WY) on June 8. Photo credit: Lesta Winer

June 1, 2017: MODIS satellite image showing sediment plume from Maumee River drainage after a weekend of heavy rainfall

Great Lakes Water Levels

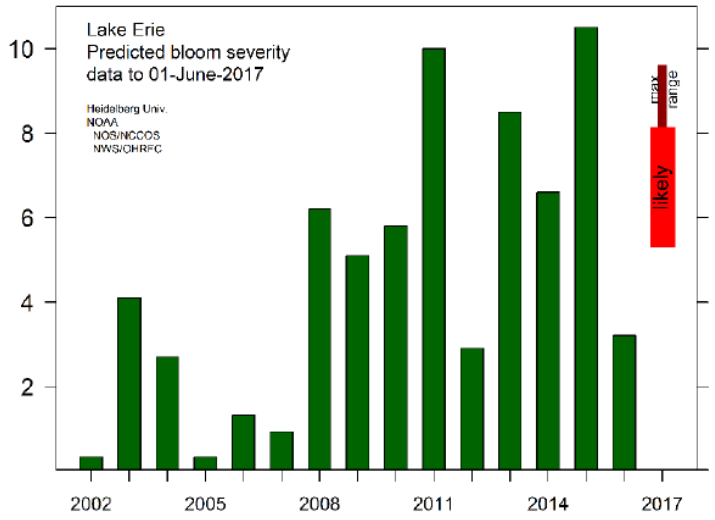


U.S. Army Corps of Engineers
Detroit District
http://www.lre.usace.army.mil

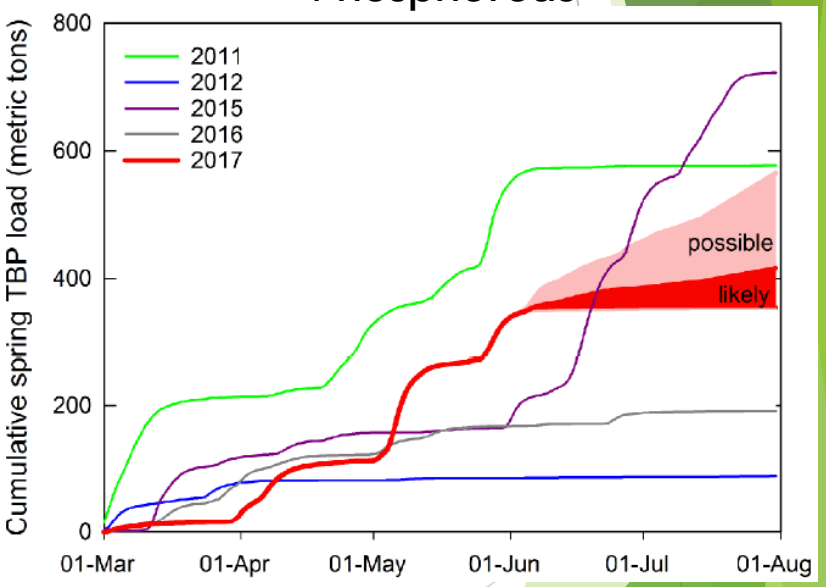
- **Lake Erie's water levels are the highest since 1998.**
- **Some locals have complained about the rising water levels along beaches and piers.**
- **Kelly Reardon, Cleveland *Plain Dealer*, June 7**

Lake Erie Harmful Algal Bloom Projection

Projected Bloom Severity



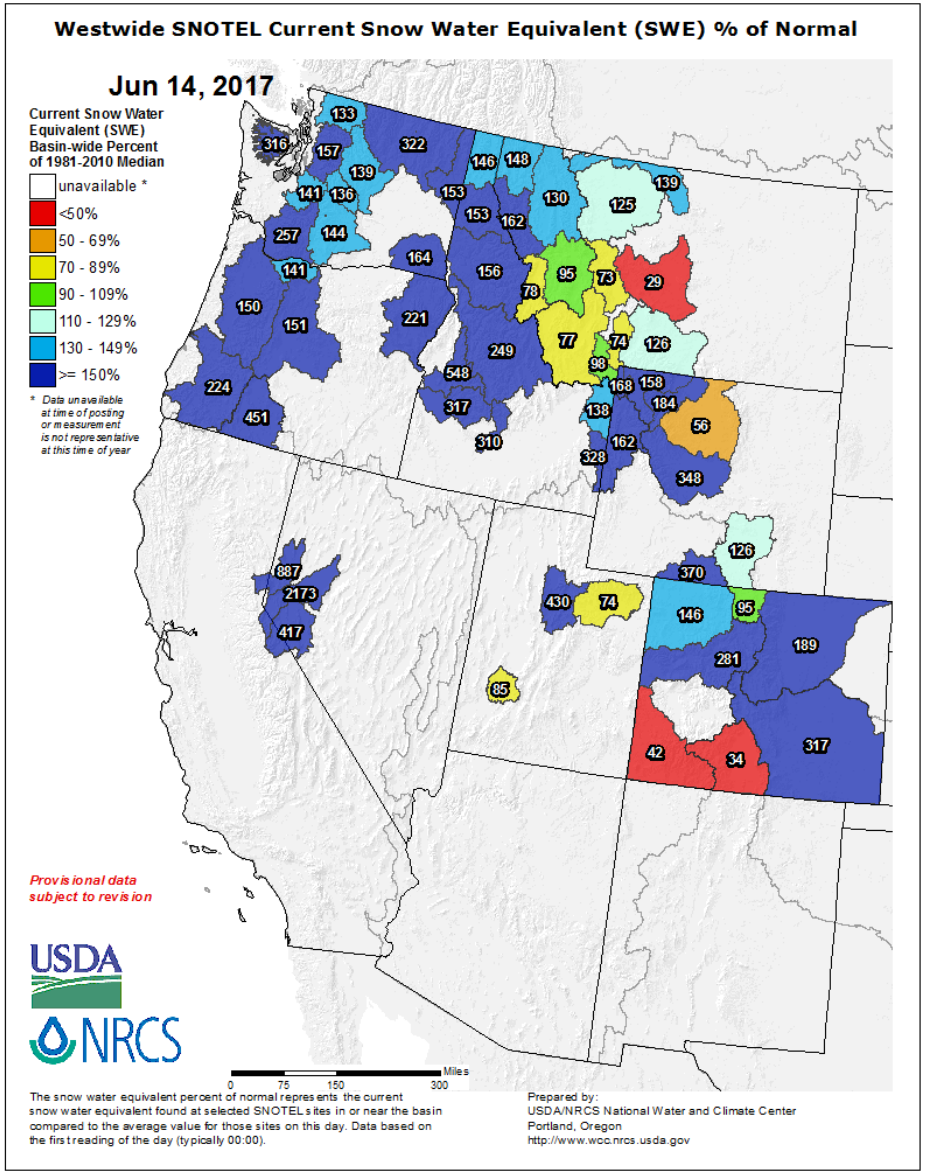
Cumulative Total Bioavailable Phosphorous



https://nccospublicstor.blob.core.windows.net/hab-data/bulletins/lake-erie/current/bulletin_current.pdf

NRCS Snow Water Equivalent

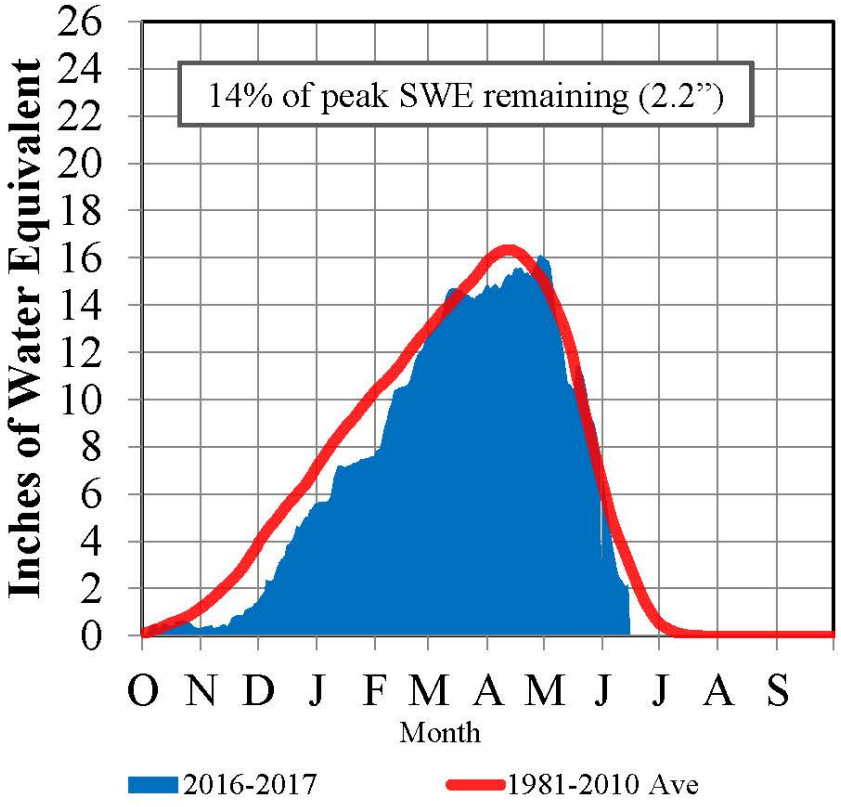
- Montana
  - NW: Greater than average
  - S/SW: Dropped rapidly
- Wyoming
  - Lot of snow in the Wind River Mountains (8'+ at higher elevations (~10,500)
  - Snow coming off the Teton Mountains pretty quickly
  - The rivers are full and raging; some flooding but not as bad as years past
  - Livestock turnout dates onto US Forest Service land is delayed in some areas due to snow still coming off
- Colorado
  - Cooler May delayed the snowmelt; still in full swing
  - Streams are in good condition and reservoirs and lakes are filling up



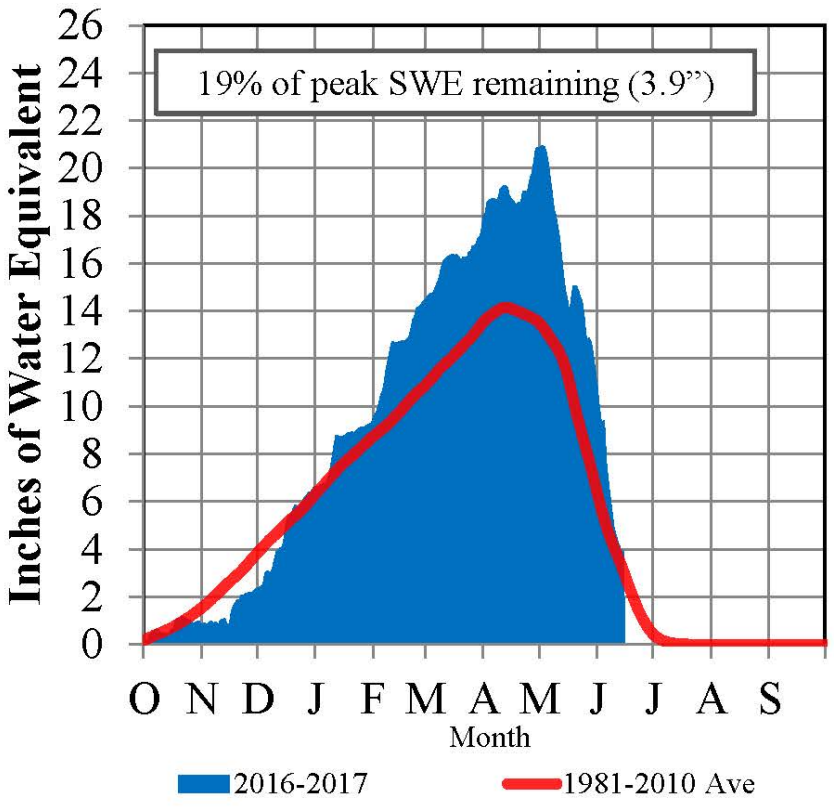
Mountain Snowpack

June 14, 2017

Total above Fort Peck



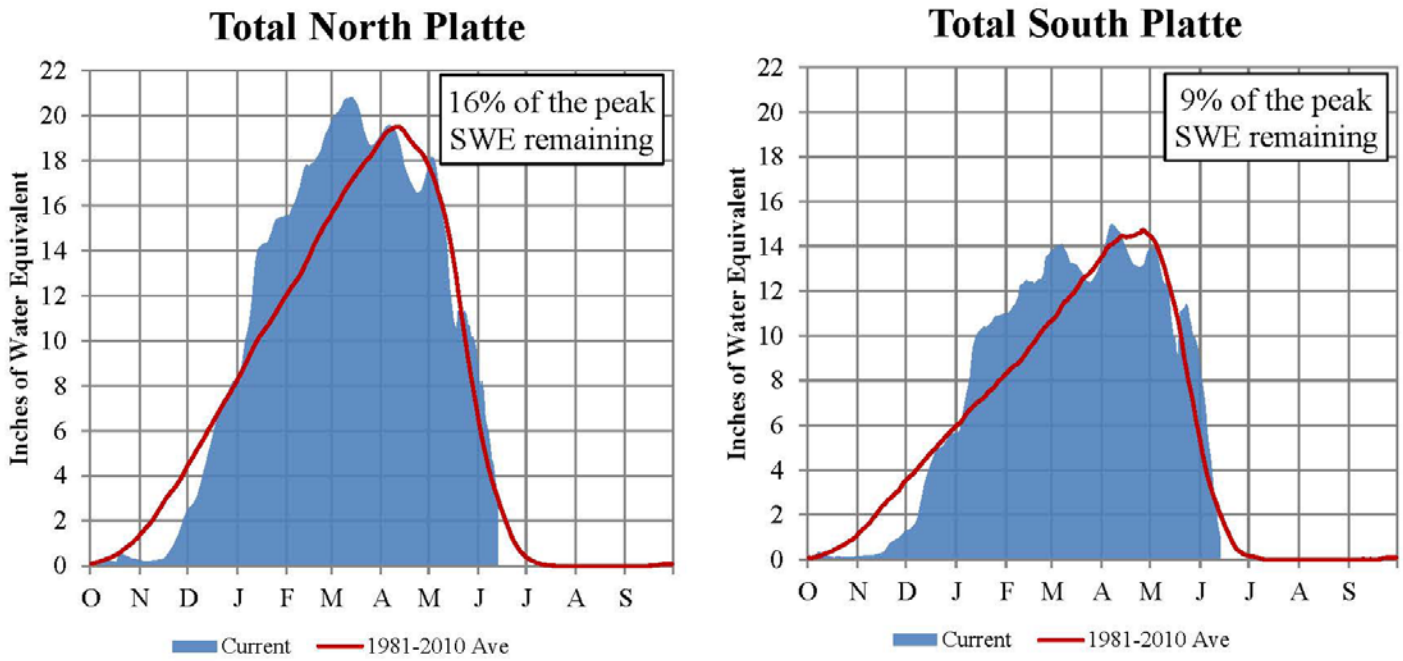
Total Fort Peck to Garrison



Source: USDA-NRCS

Slides courtesy Kevin Grode CIV USARMY CENWD (US)

Platte River Basin - Mountain Snowpack Water Content
Water Year 2016-2017
June 13, 2017



The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of June 12, 2017, the mountain snowpack SWE in the "Total North Platte" reach is currently 3.4", 16% of the peak SWE remaining. The mountain snowpack SWE in the "Total South Platte" reach is 1.3", 9% of the peak SWE remaining.

Source: USDA, Natural Resource Conservation Service

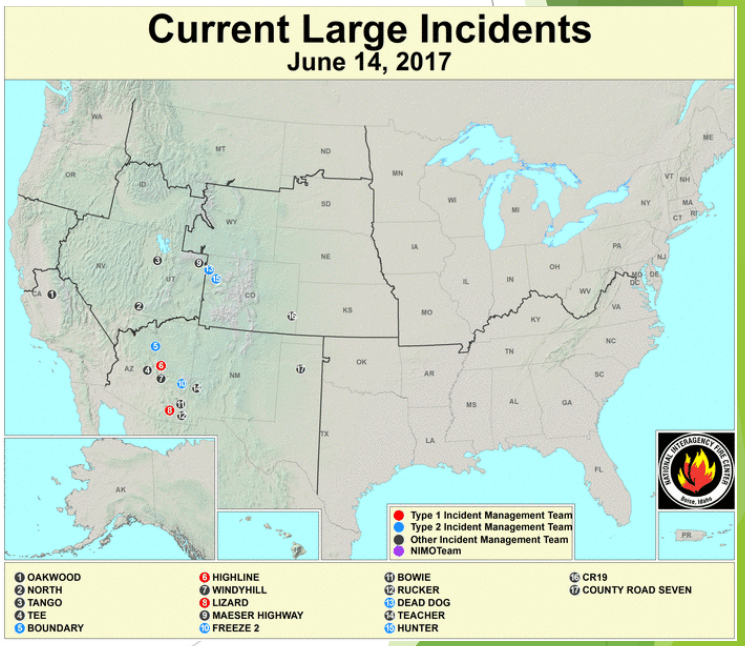
Provisional Data. Subject to Revision

Slides courtesy Kevin Grode CIV USARMY CENWD (US)

Other Various Issues

- ND: State Ag Commissioner desire to open Conservation Reserve Program Lands (http://bismarcktribune.com/business/local/ag-commissioner-looks-to-crp-to-help-hay-shortage/article_7aef98af-ab19-58ec-a7c5-20c36a73f1bb.html)
  - With pheasants nesting – transition of CRP lands will be slow and not expected until late July/early August

- Fire Risk across the Northern Plains?
  - No large events currently
  - Rangelands are past the precipitation peak so opportunity for improvement is diminishing



Other Various Issues

Potential Evapotranspiration approaching 3-inches for the month

June 3, 2017,MU Campus

June 12, 2017, MU Campus

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From NWS: May 19, 2017 ; 6"+ in < 4 hours; West Fork of Blue River at Salem rose ~9 feet per hour just before the United States Geological Service (USGS) equipment maxed out at 7:30 pm EDT; millions of dollars of damage

- WI: So wet, there is concern of getting plants in the ground
- NE: Some plant stress but conditions are good overall
- MI: Impacts of the May 8 and 9 freeze events are evident but vary widely


THE EL NIÑO-YO
HI
LO
LO
WEATHER GUY
UNUSUALLY COLD & WET
FLOODS, DROUGHTS, BLIZZARDS, YOU NAME IT.
SUDDEN SEVERE STORMS
UN-SEASONABLY WARM
DRYER THAN NORMAL

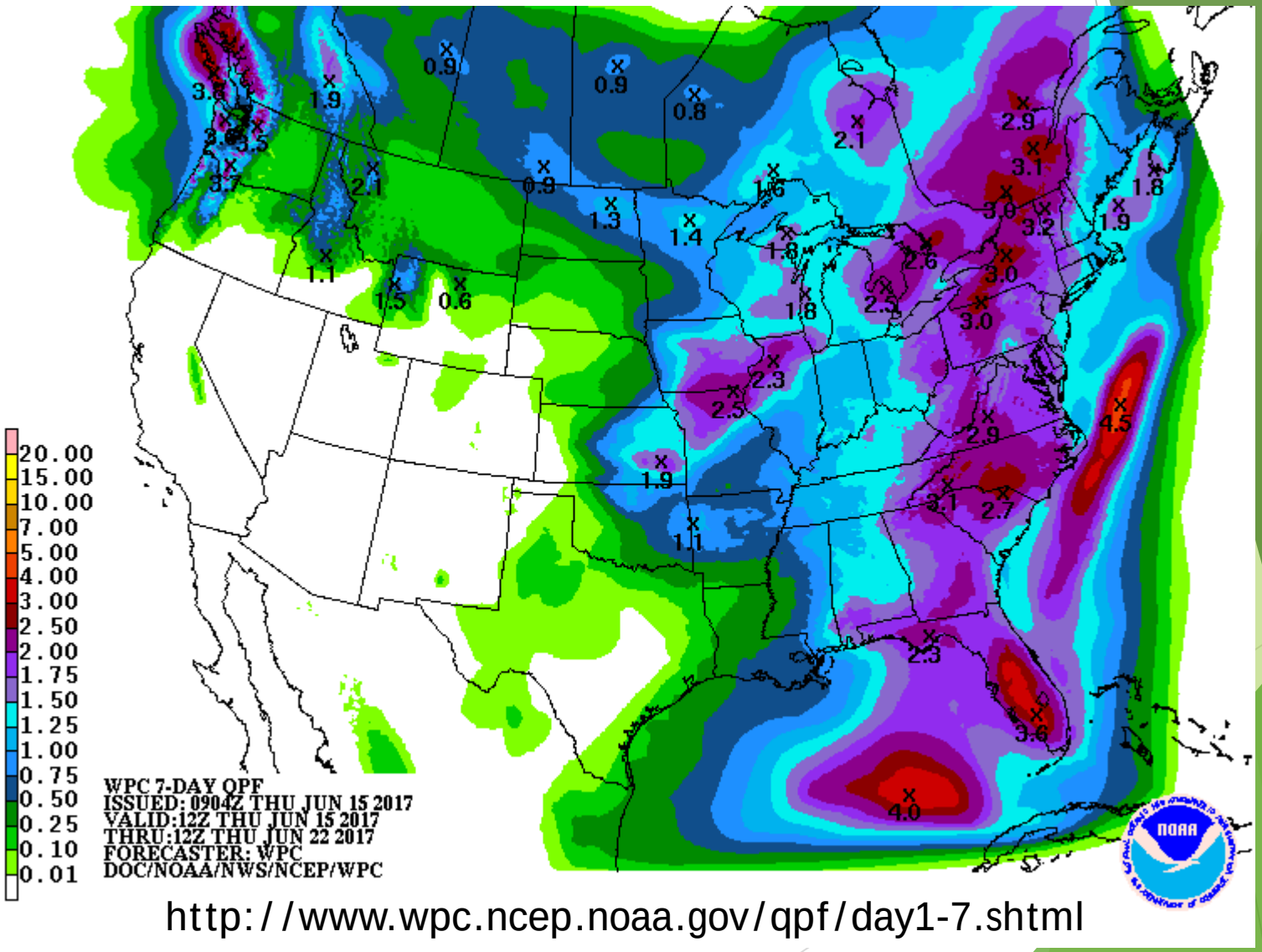
Outlooks

Climate Outlooks

- 7-day precipitation forecast
- Significant River Flood Outlook
- 8-14 day outlook
- ENSO Predictions
- July Temperature and Precipitation
- 3-Month (JAS) Temperature and Precipitation
- Drought Outlook

7-day Quantitative Precipitation Forecast

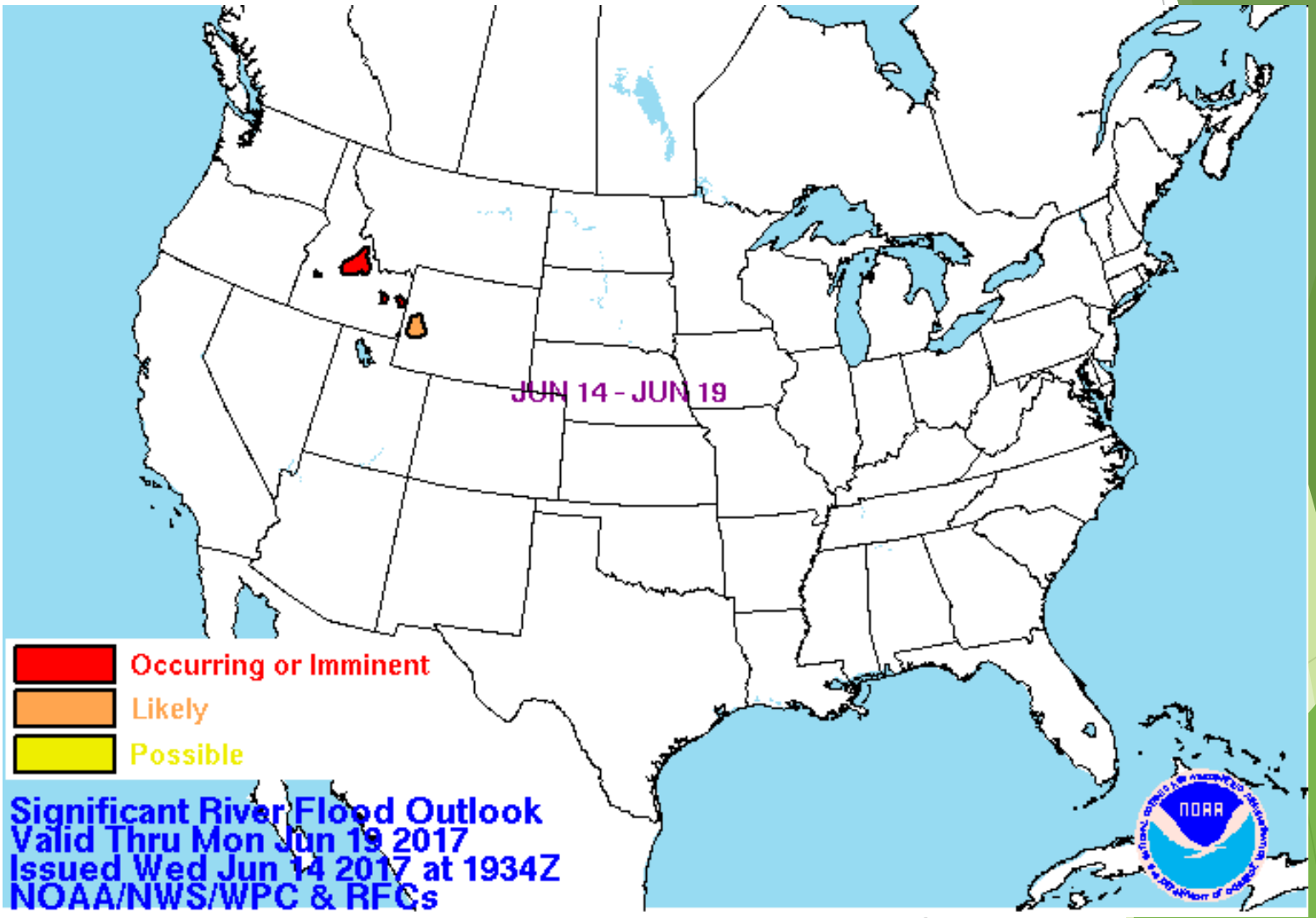
Valid: 8 AM Thu 15 Jun. – 8 AM Thu 22 Jun.



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

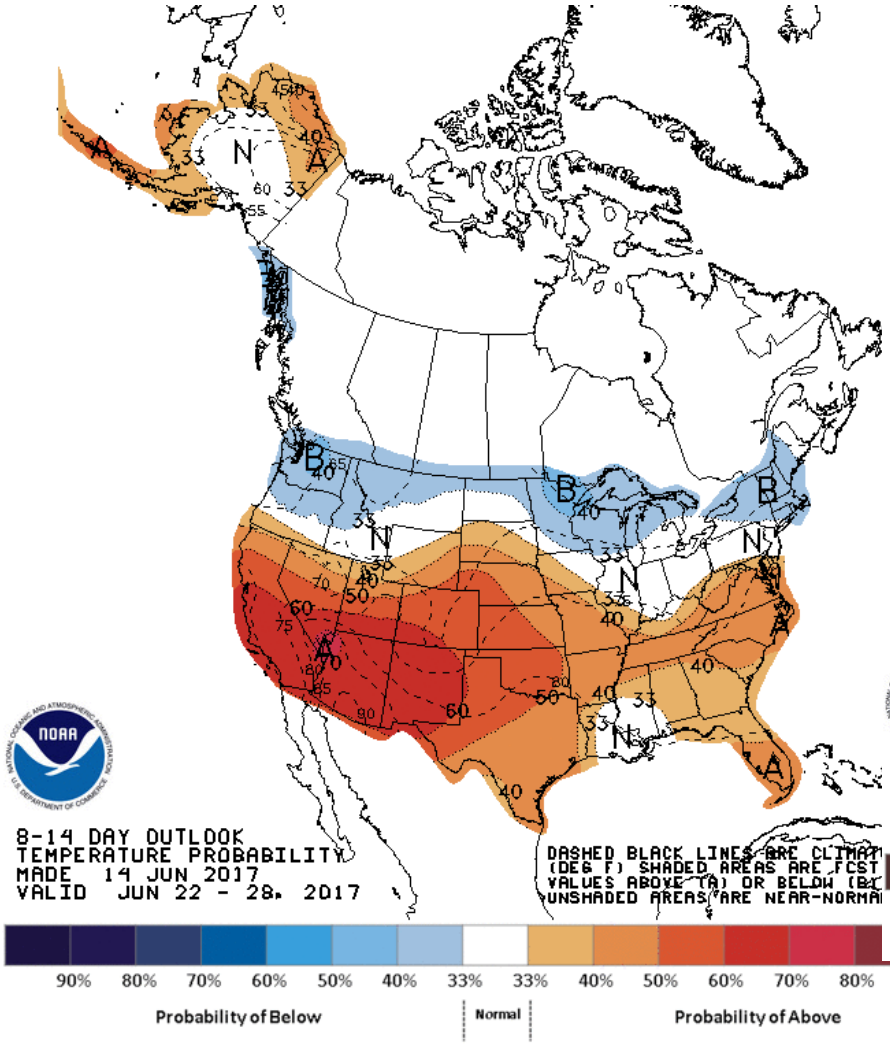
Significant River Flood Outlook

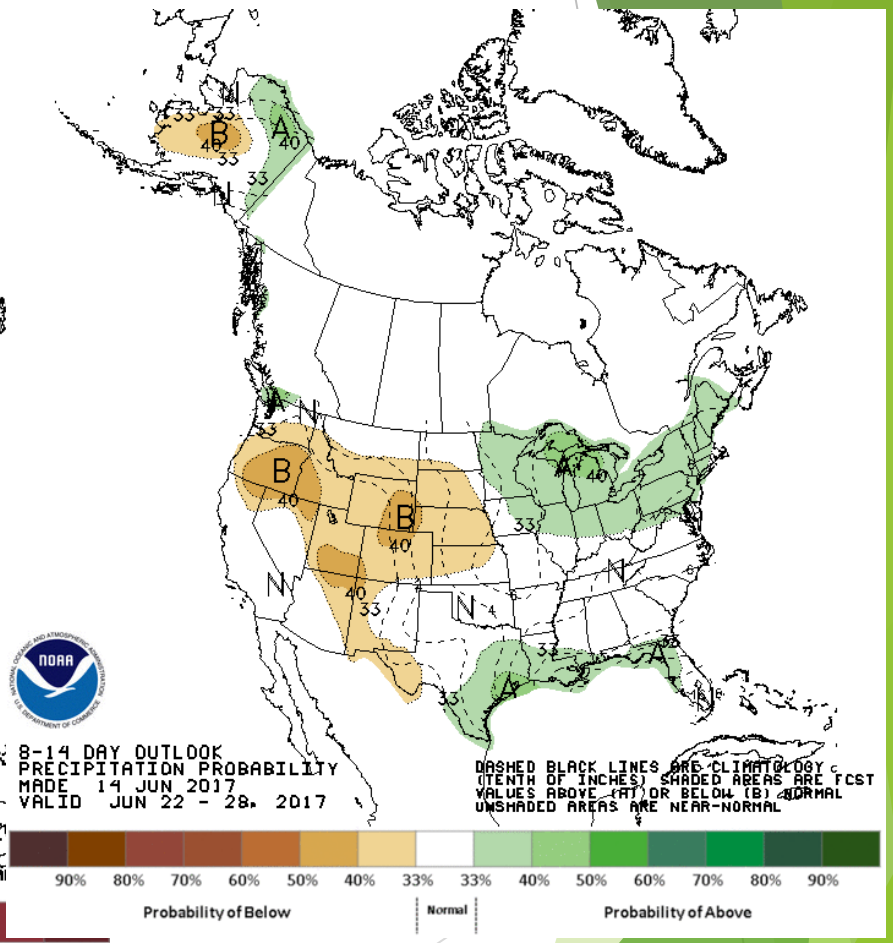
Issued Wed. June 14, 2017 and valid thru Mon, June 19, 2017



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

8-14 Day Temperature and Precipitation Probabilities for June 22-28, 2017





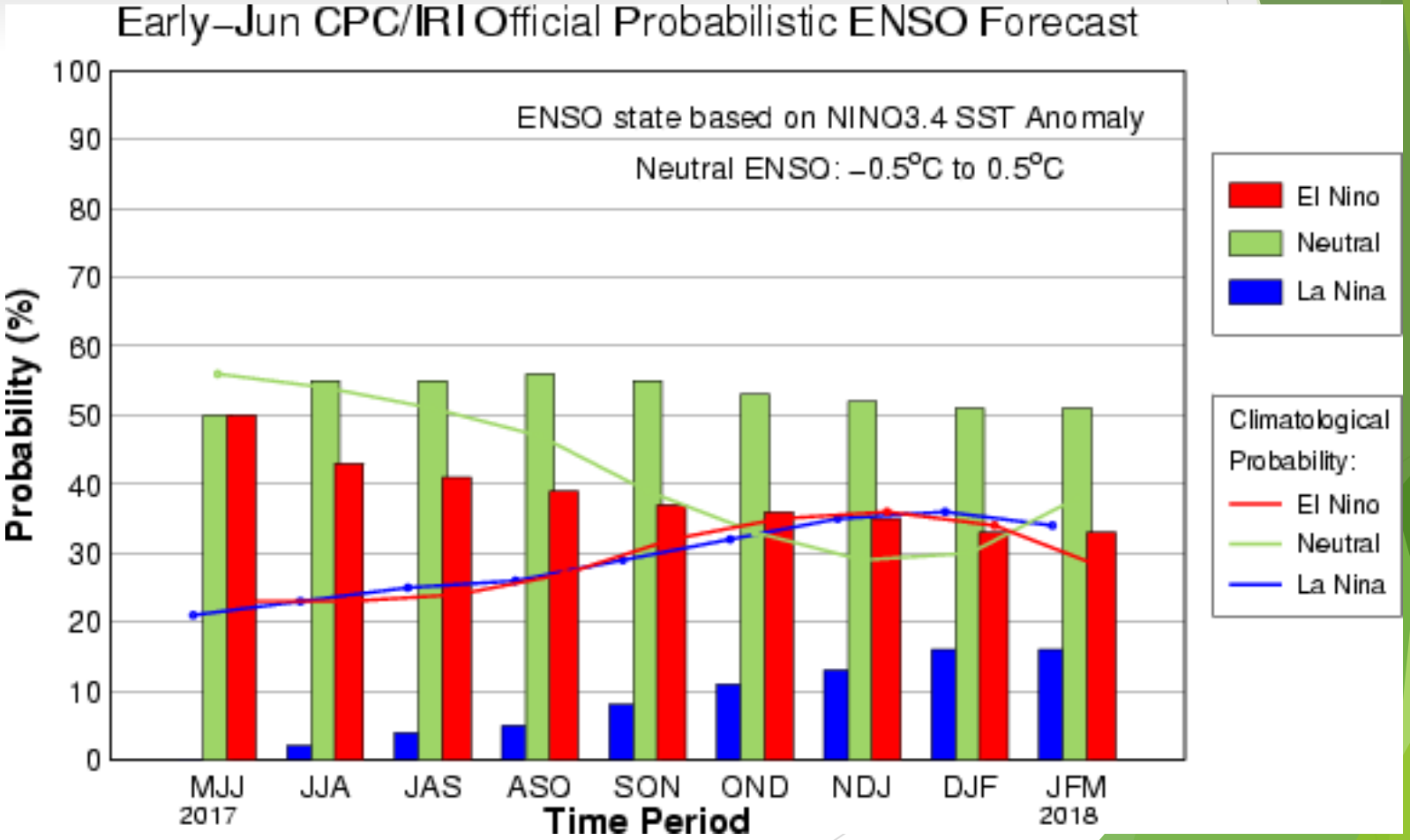
Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php

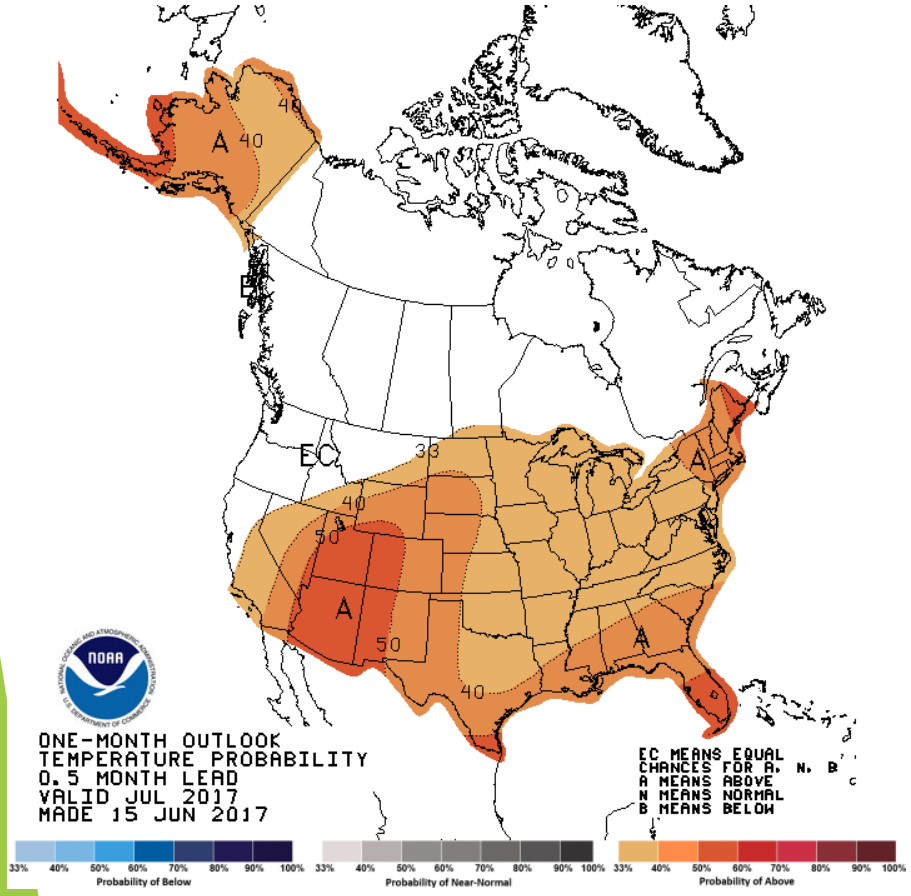
CPC/IRI Probabilistic ENSO Outlook

Updated: 8 June 2017

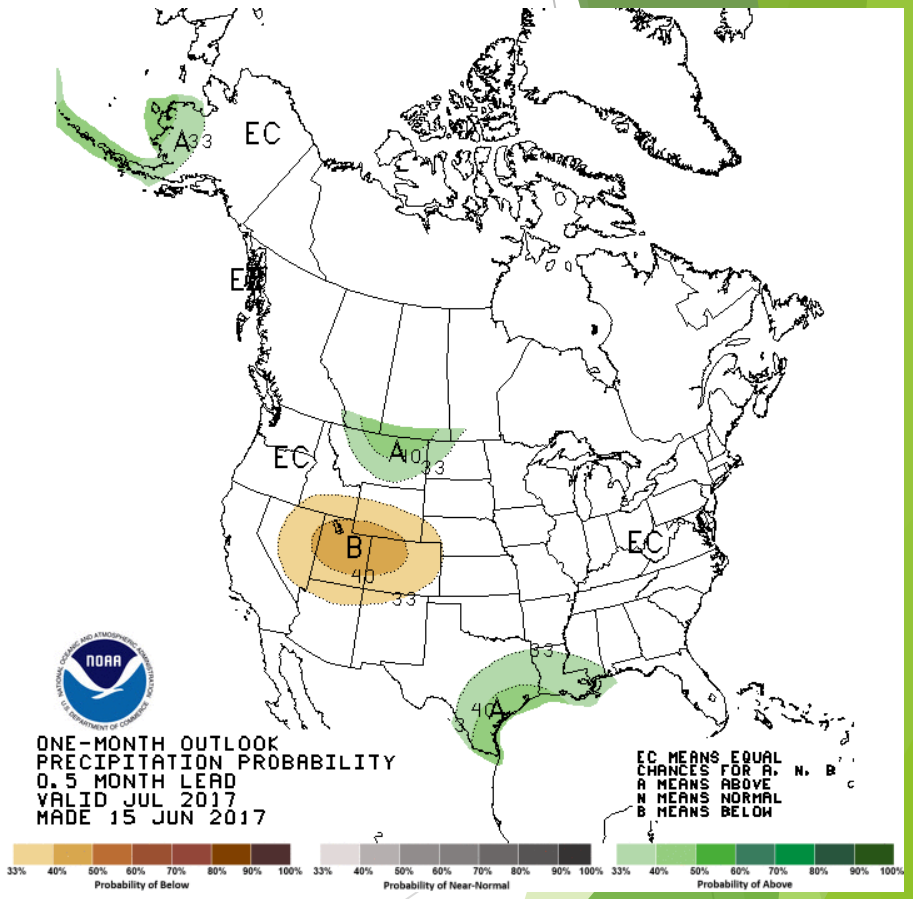
El Niño conditions not likely winter 2017-18.



July Temperature and Precipitation Probabilities



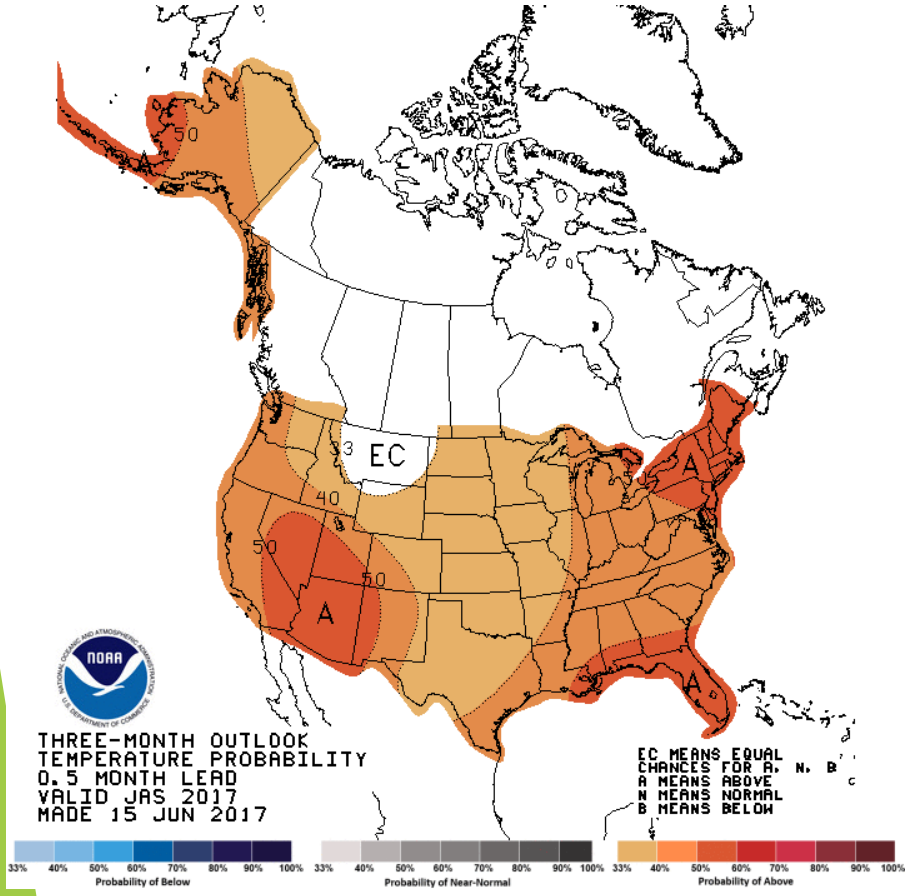
Temperature



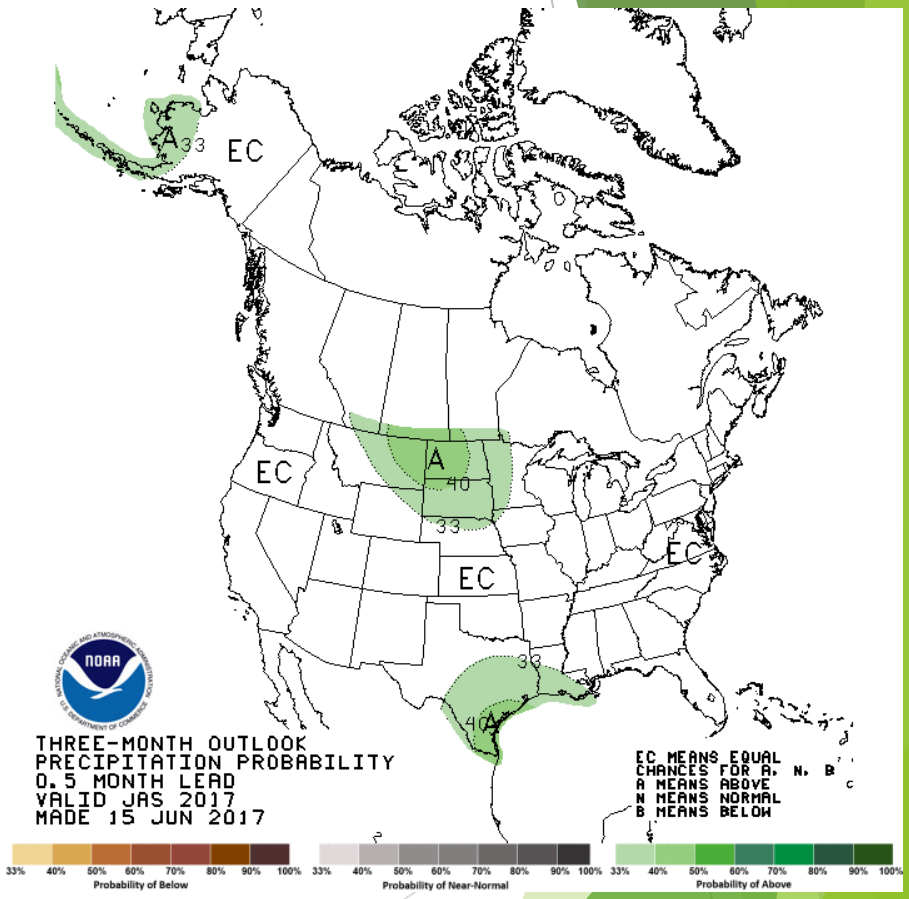
Precipitation

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

3-Month Temperature and Precipitation Probabilities (JAS)



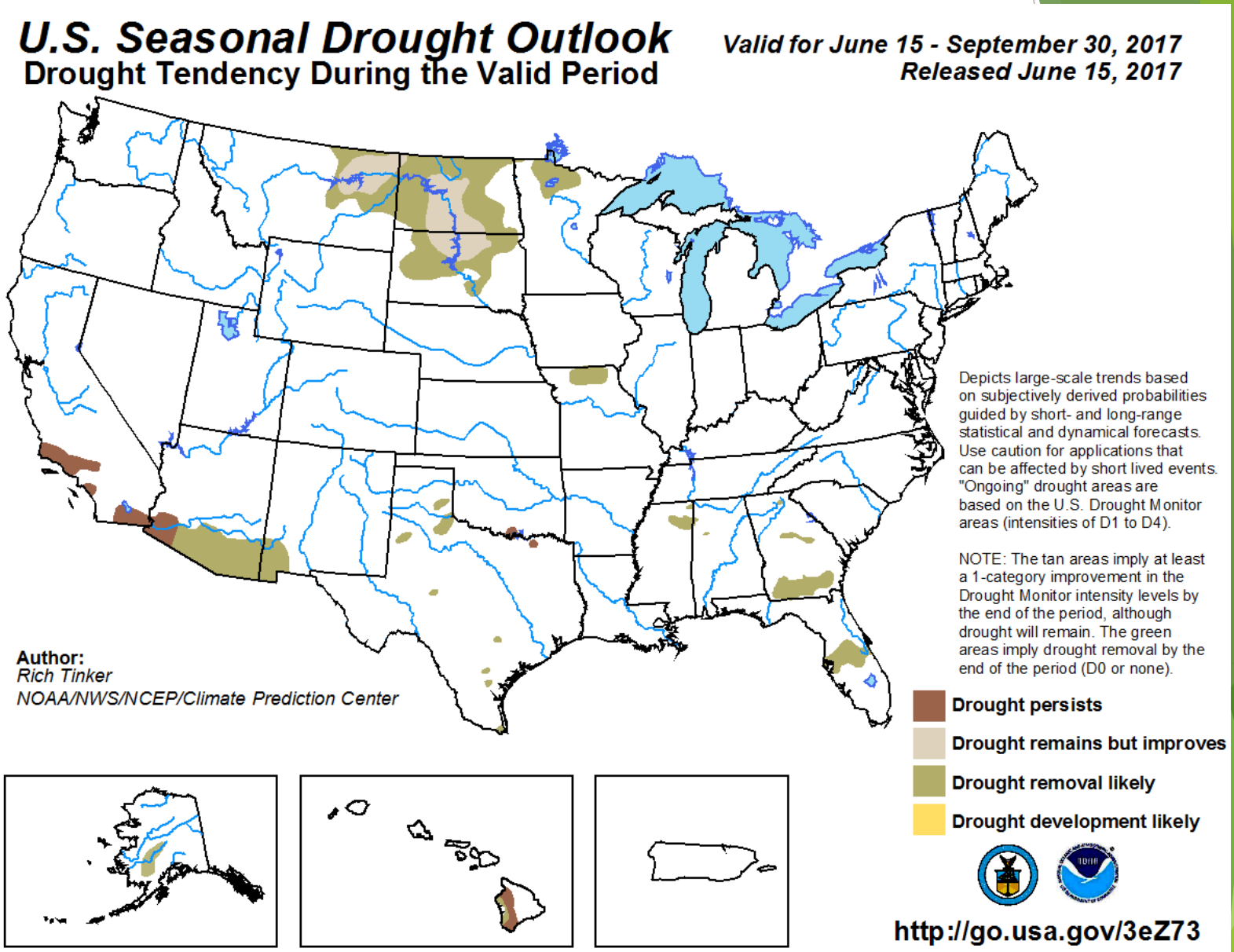
Temperature



Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=2

Drought Outlook



http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png

Summary - Conditions

- Rapid development of drought across the Northern Plains and NW Minnesota
  - Created numerous impacts including massive sale of cattle, poor pasture and spring wheat conditions
  - Some relief this week with precipitation

- Rapid transition from cool/wet to hot/dry conditions across the central and eastern cornbelt
  - Some issues with replanted crops – heat stress and emergence
  - Browning Turf
  - Emerging drought in SE Iowa, N. Missouri, through C. Illinois?

Summary - Outlooks

- Near-term precipitation may help alleviate developing dry conditions across Iowa, Missouri, Illinois, and S. Indiana if 7-day QPF verifies
- El Niño – not likely to occur through NH winter
- Warmer conditions likely for the whole region this summer
- July: Dry conditions possible in Colorado, Wyoming, and W. Nebraska
- Long-term Precipitation: Greatest probability of above normal precipitation nudging into the N. Plains and Upper Midwest – would be good news.

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 Center for Environmental Information: 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?

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