North Central U.S. Monthly Climate and Drought Summary and Outlook

August 15, 2019

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General Information

- **Regional climate services for the North Central U.S., including the Great Plains and Midwest, are provided through collaboration among federal, regional, and state partners:**
  - NOAA NCEI/NWS/OAR/NIDIS/
  - 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**
  - September 19, 2019 (1 PM CDT) – Presented by Adnan Akyuz – North Dakota State Climatologist and AASC President

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

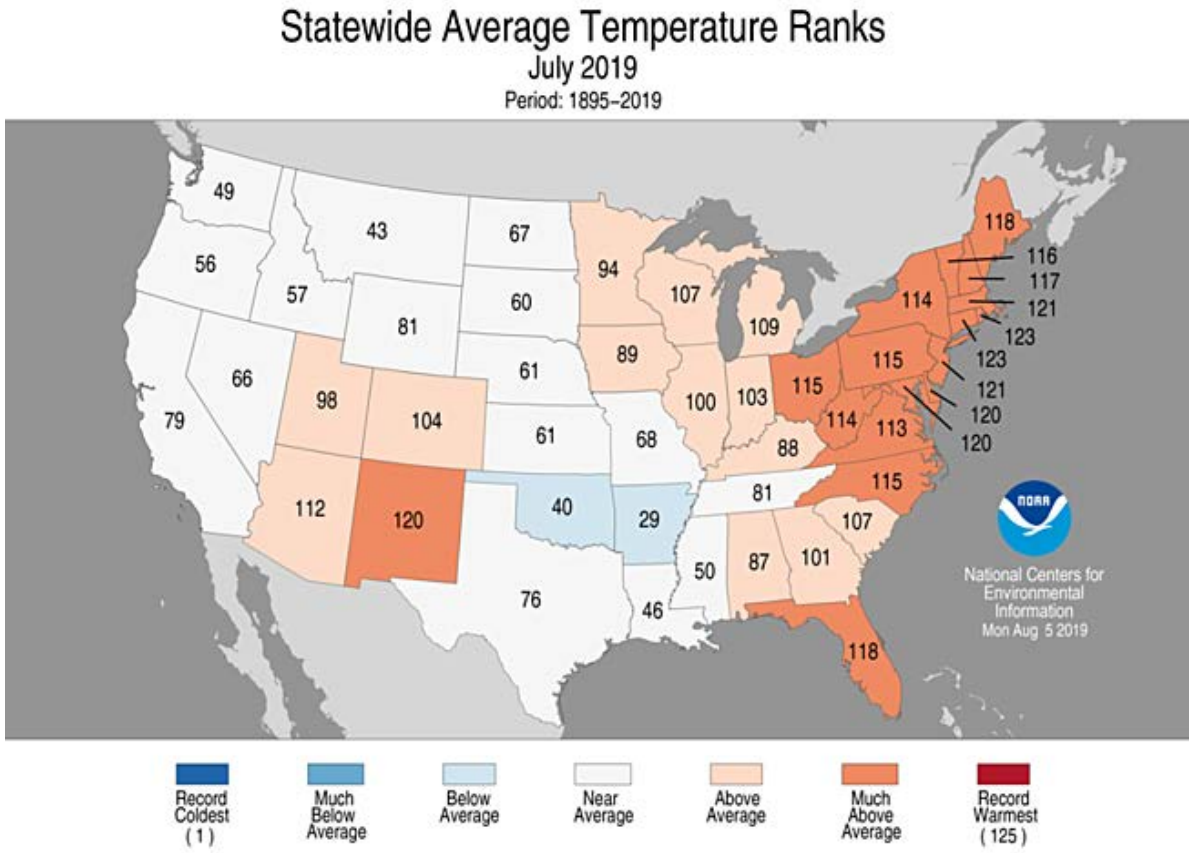
- **Open for questions at the end**

Agenda

- Current Climate Conditions in Historical Context
- Impacts (Ag, Water, Others)
- Climate Outlooks (El Niño Conditions; Harvest Season)

July Temperature Recap

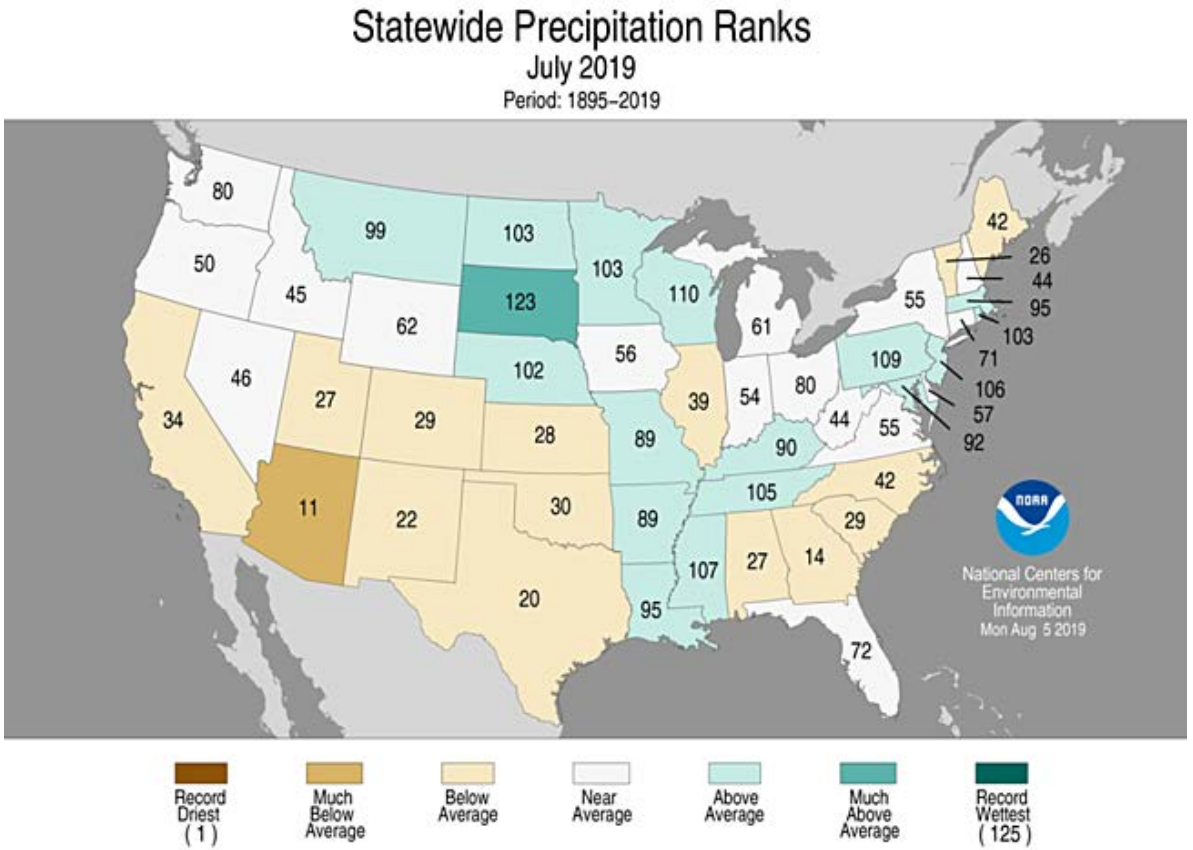
- Contiguous U.S. had 27th warmest May on record
- Above average across much of eastern Midwest
- Near average for central-northern Plains



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

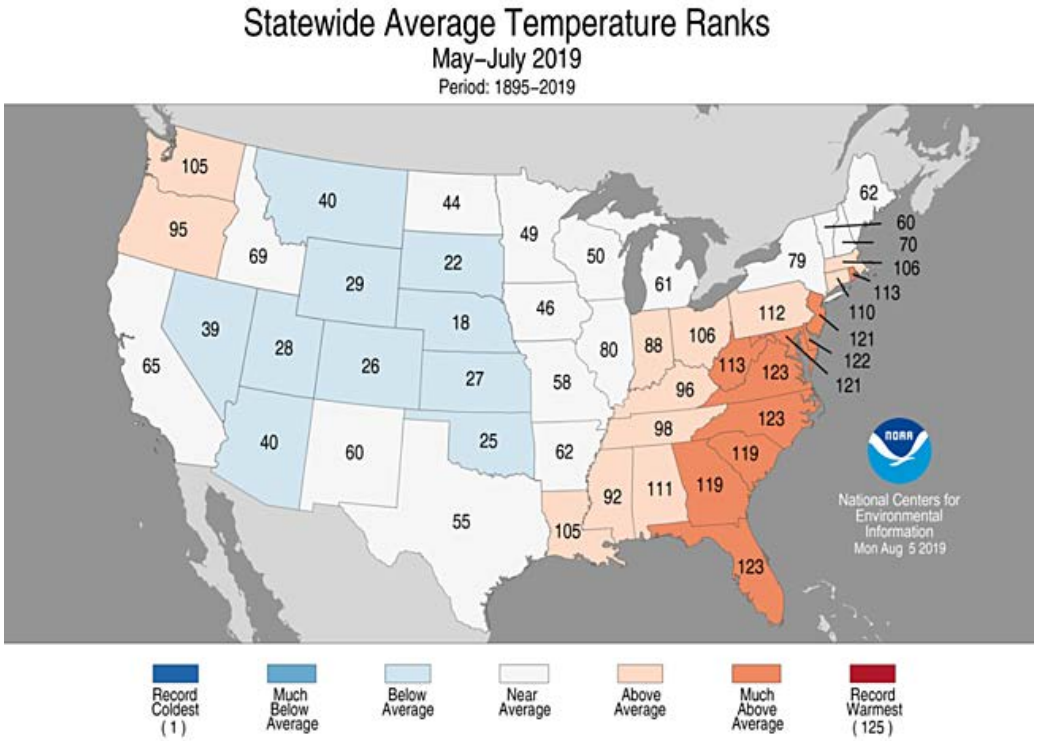
July Precipitation Recap

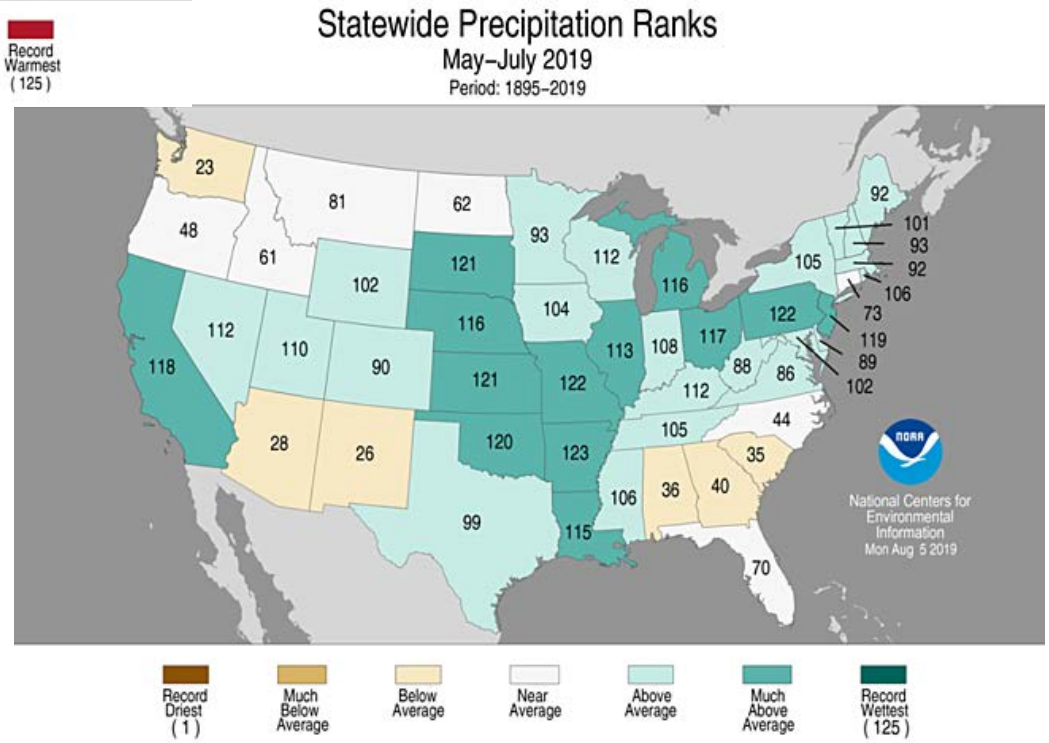
- Contiguous U.S. had slightly below average precipitation in the middle-third tier
- Wet for many of the Midwest and Great Plains states, especically so in SD
- Below average in Illinois and Kansas



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

May – July Ranks

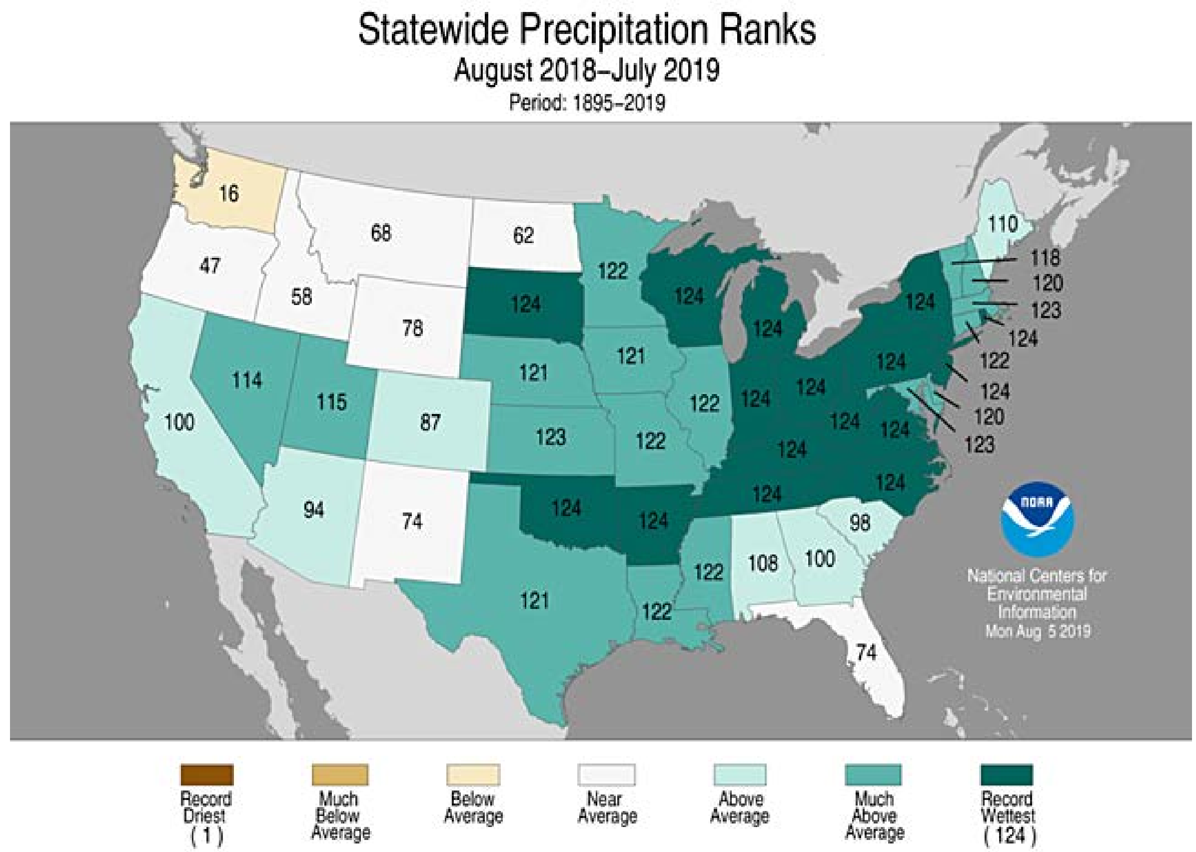




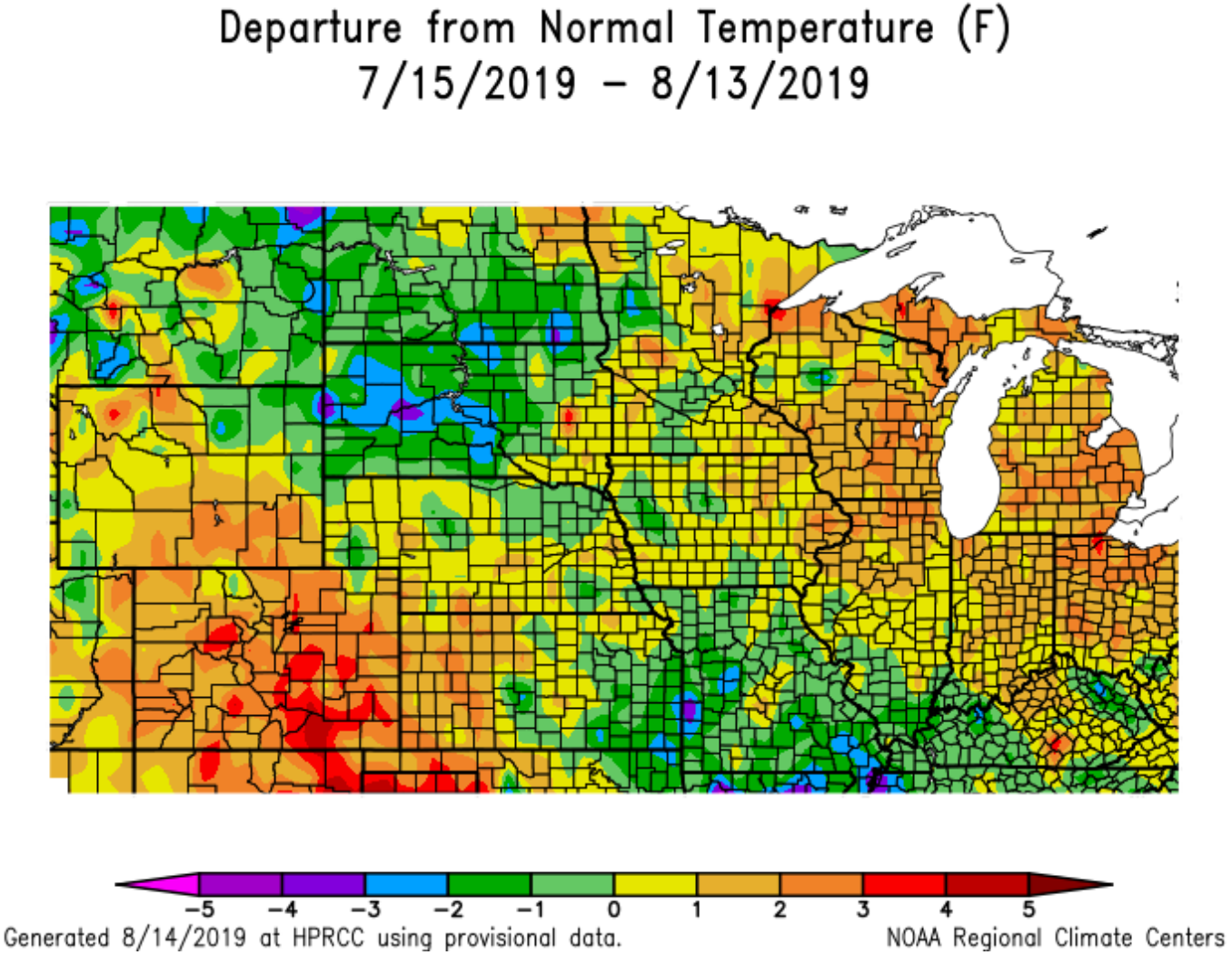
- West: Below average temperatures
- East: Above average temperatures
- Precipitation above to much above across the entire region (except ND and MT)
- Illustrates the switch in regime for some states (e.g., eastern corn belt and Kansas)

12-month Precipitation Recap

- ❑ Many state much above to record wettest 12-month period
- ❑ Continues the streak of wettest or close to wettest 12-month periods over the last several months



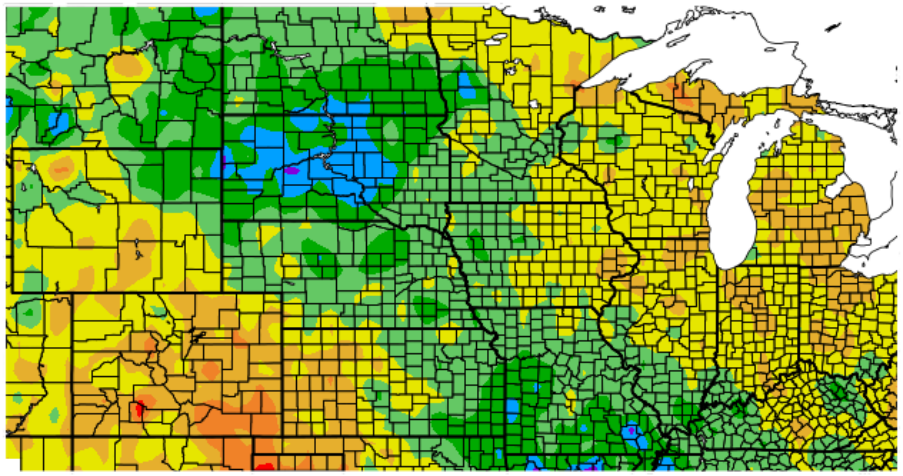
Average Temperature Departure from Mean



https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

Average Temperature Departures (Max and Min)

Departure from Normal Average Maximum Temperature (F)
7/15/2019 – 8/13/2019

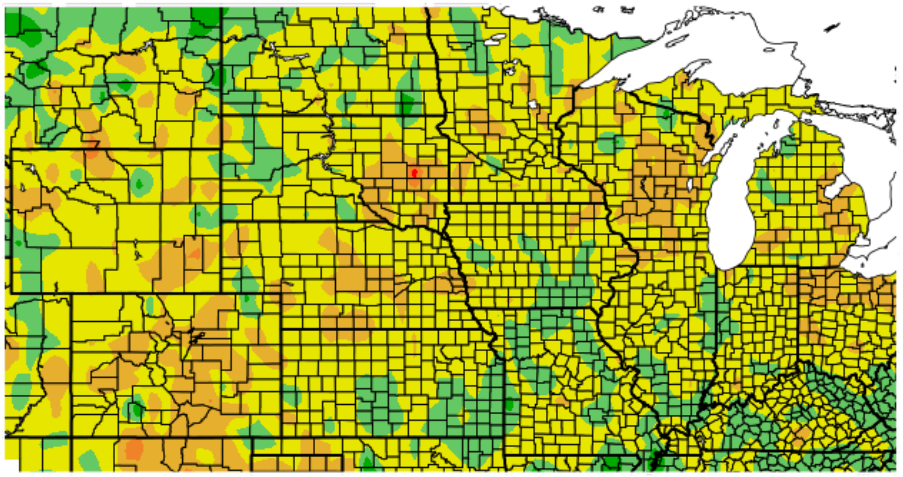


Generated 8/14/2019 at HPRCC using provisional data. NOAA Regional Climate Ce

- Distinctly cool highs in Dakotas southeast toward Missouri
- Above average highs in the CO/WY and the Great Lakes Region
- Mostly warmer than average overnight lows across the region

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

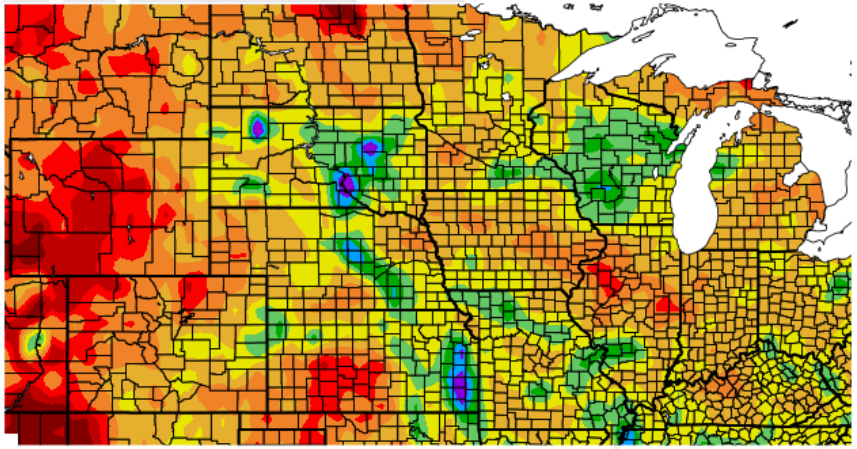
Departure from Normal Average Minimum Temperature (F)
7/15/2019 – 8/13/2019



Generated 8/14/2019 at HPRCC using provisional data. NOAA Regional Climate Centers

Precipitation Total and Percent of Normal

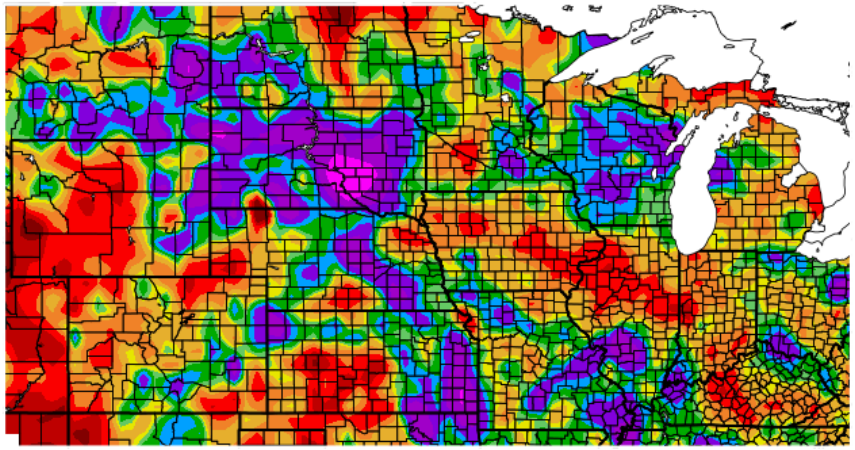
Precipitation (in)
7/15/2019 – 8/13/2019



0.1 0.5 1 2 3.5 5 6.5 8 9.5 11 12.5

Generated 8/14/2019 at HPRCC using provisional data. NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
7/15/2019 – 8/13/2019

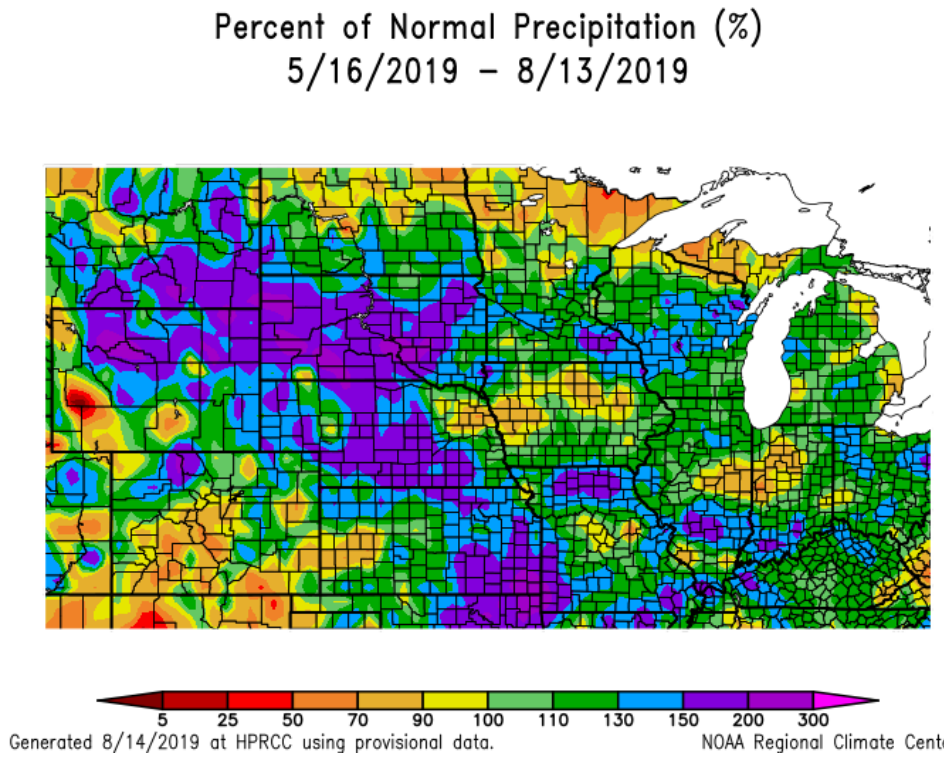


5 25 50 70 90 100 110 130 150 200 300

Generated 8/14/2019 at HPRCC using provisional data. NOAA Regional Climate Centers

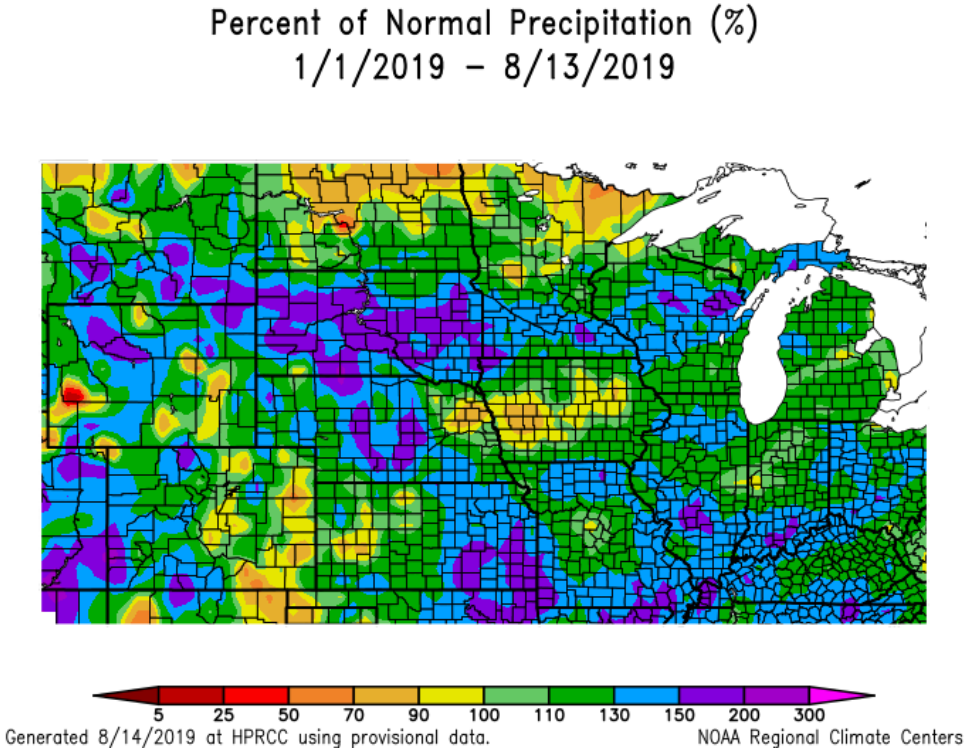
https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

Precipitation (90-day and TYD)

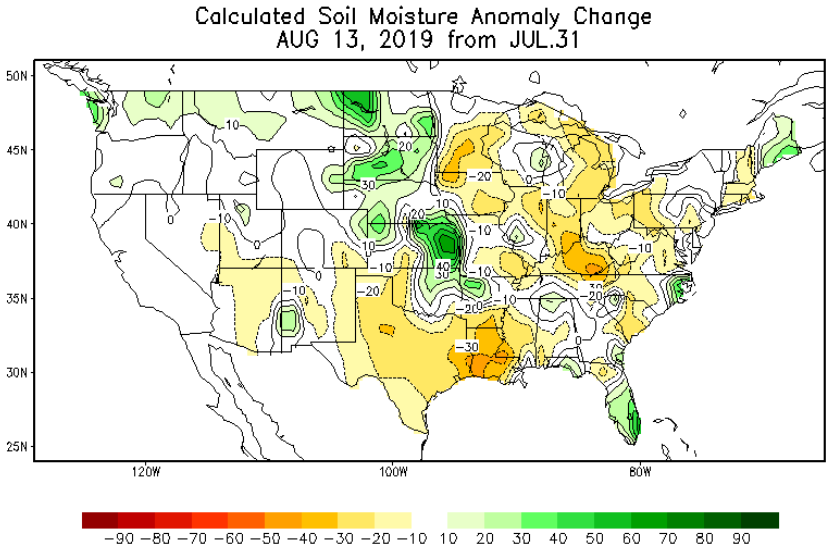


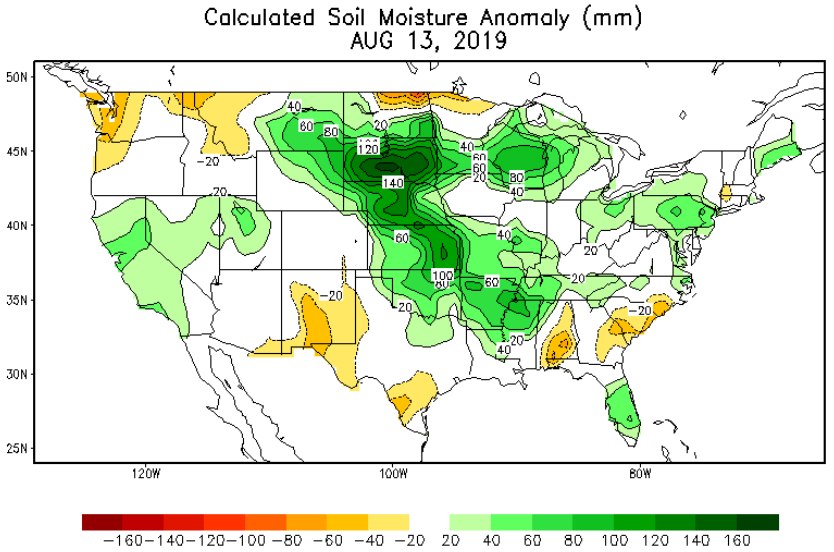
- Western portion of Central Region much above average for both 90-day and YTD precipitation
- Persistently dry across parts of eastern NE and SE Iowa
- Despite recent dry conditions, still above average across most of the eastern corn belt

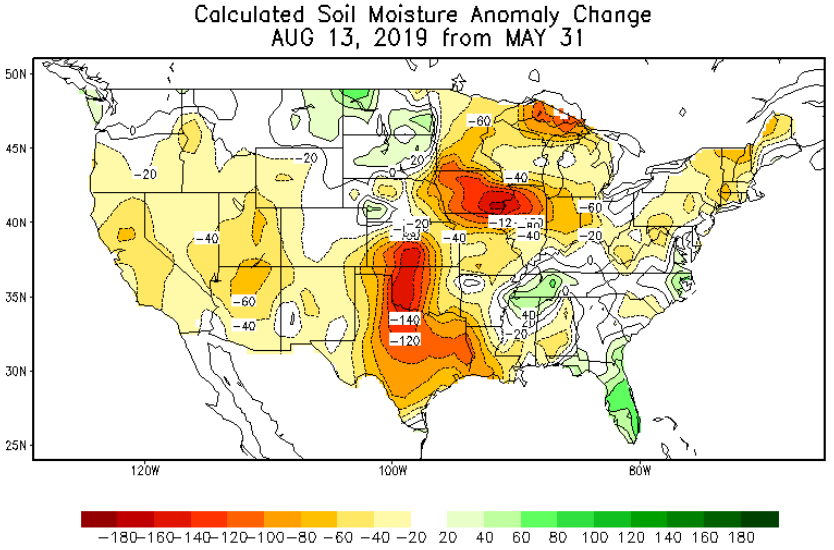
https://hprcc.unl.edu/maps.php?map=ACISClimateMaps



Soil Moisture



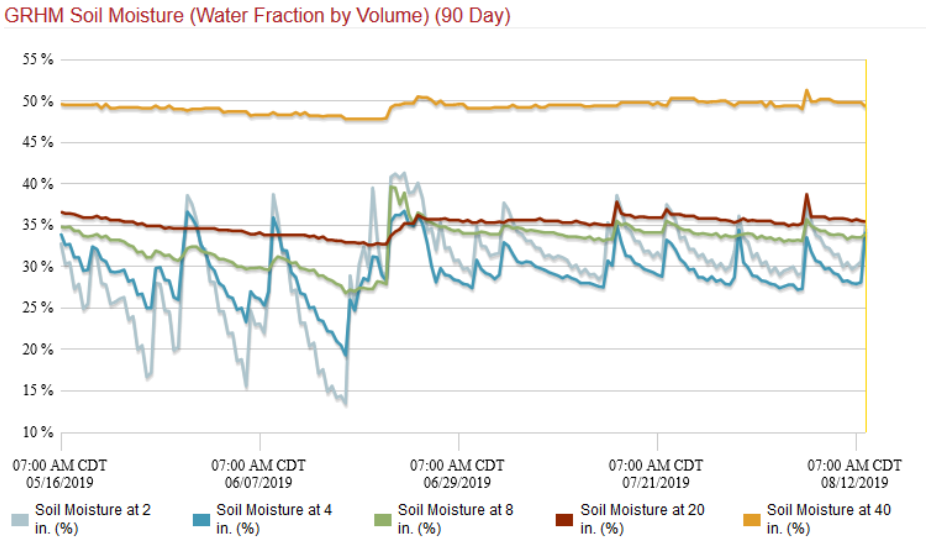




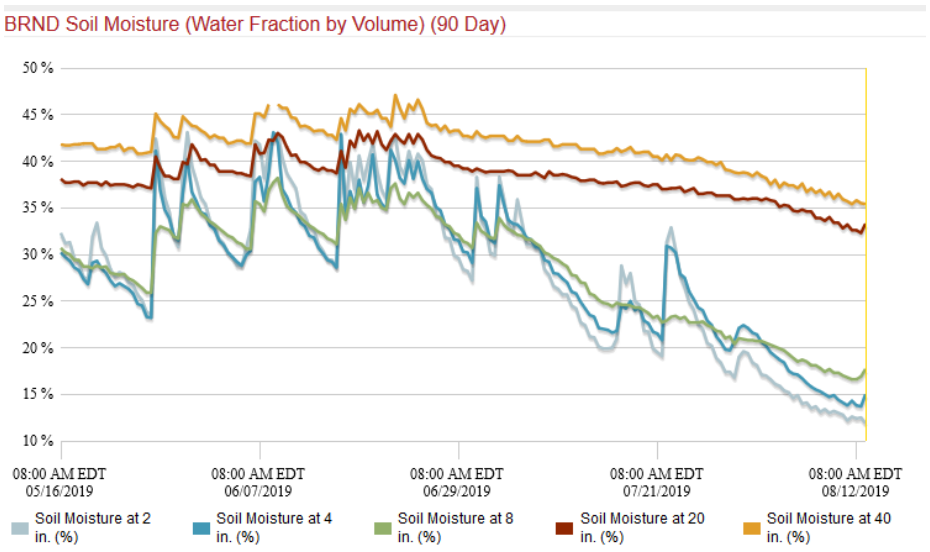
https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

Comparative Soil Moisture Graphs for Locations in Kentucky

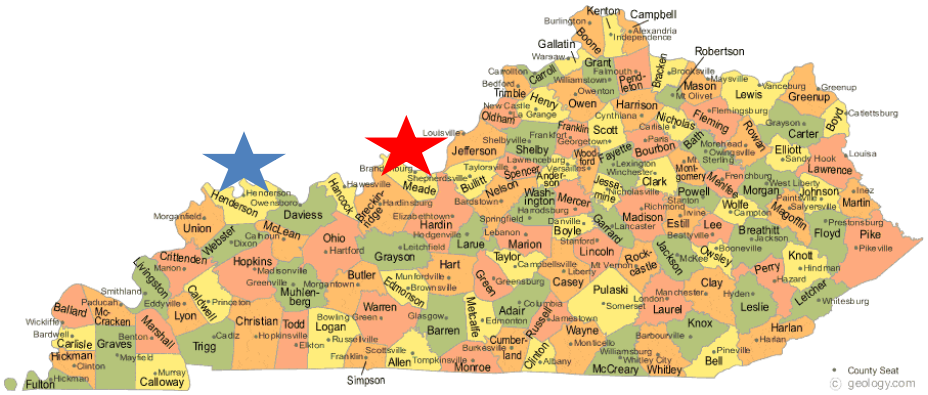
Henderson County, KY



Meade County, KY

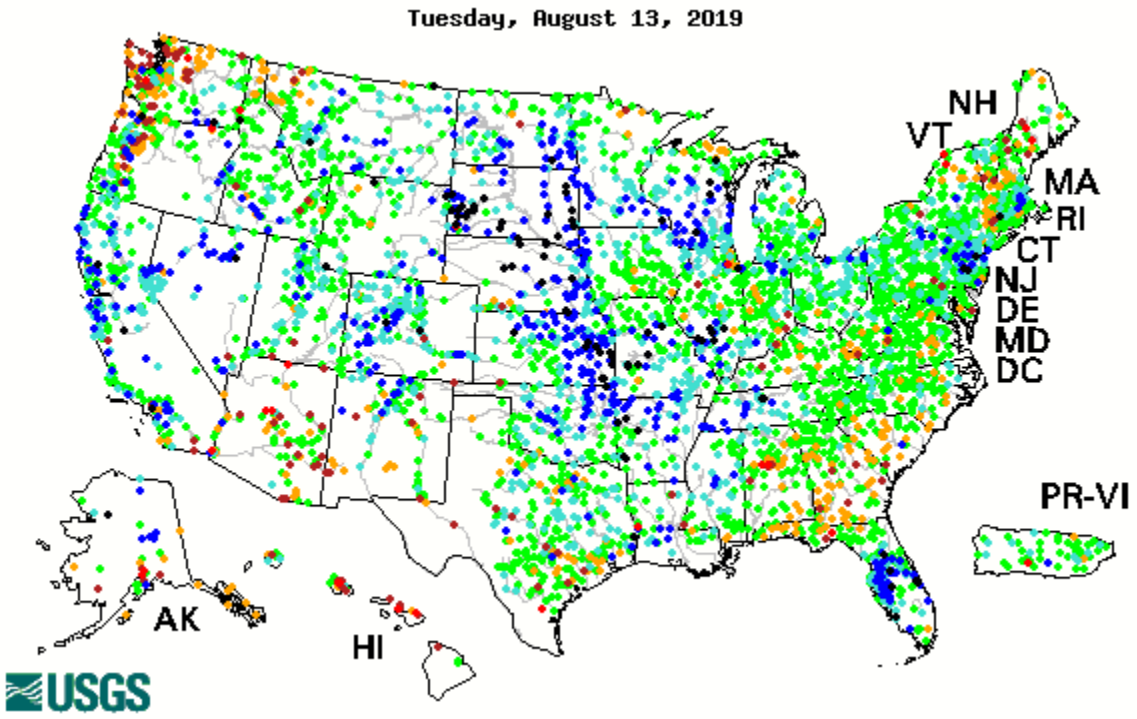


- Parts of the eastern corn belt, and other locations throughout the central region – scattered thunderstorms keeping some locations wet enough while others lack in soil moisture



7-Day Average Streamflows

- Above to much above stream flows across the Dakotas, NE and KS, southern MN and WI
- Record high flows across SD, NE, eastern KS, central MO, and south-central IL
- Localized low stream flows where it's been dry (IA, IL IN, KY)



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=pa07d

Current Flooding

Iowa side of the Missouri – flooding into casino parking lot in Council Bluffs: Courtesy of Dennis Todey

- No problems for Upper Mississippi and Ohio River Basins
- Much above average precipitation in the Missouri Basin hindering major reservoir evacuations of water

Missouri River Basin

http://www.nwd-mr.usace.army.mil/rcc/reports/pdfs/weeklyupdate.pdf

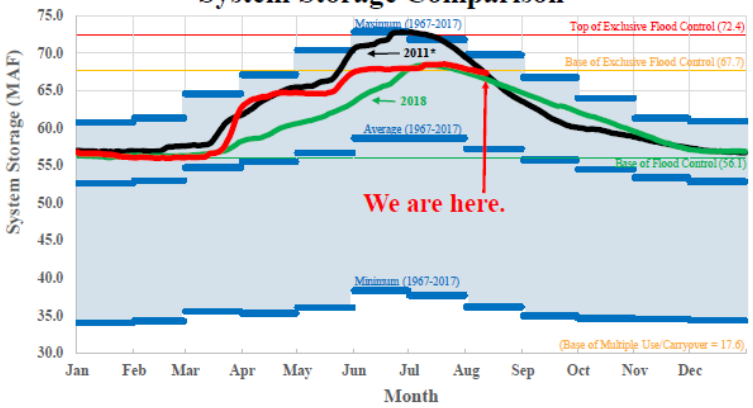
Missouri River Basin – Update – 13 August 2019

Mainstem Reservoir Status:

- System storage is 67.4 MAF; 11.3 MAF of the 16.3 MAF of flood control storage is occupied. About 31% of the flood control storage remains available to store runoff. System storage peaked at 68.5 MAF on July 20.
- Soils are still very wet across much of the Basin (lower right graphic).
- Gavins Point releases are currently 70,000 cfs. Our latest reservoir studies indicate holding the 70,000 cfs release through September.
- Refer to the 3-Week Forecast (click here) for the most up-to-date System information – pool levels, inflows and releases.
- The Gavins Point release schedule and forecasted Missouri River flows and stages can be found here:

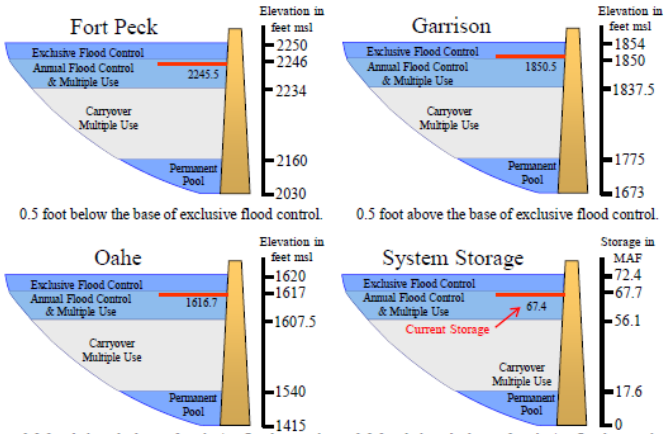
Click Here for Missouri River releases, flows & stages

System Storage Comparison



*In January 2011, the Base of Flood Control was 56.8 MAF, and the Top of Exclusive Flood Control was 73.1 MAF.

Current Reservoir Levels



0.5 foot below the base of exclusive flood control.

0.5 foot above the base of exclusive flood control.

0.3 foot below the base of exclusive flood control.

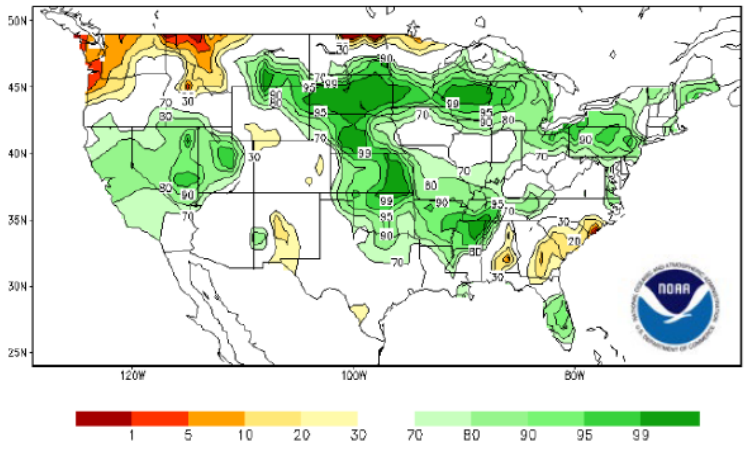
0.3 foot below the base of exclusive flood control.

Click Here for Latest 3-Week Forecast

Click Here for Comparison Plots

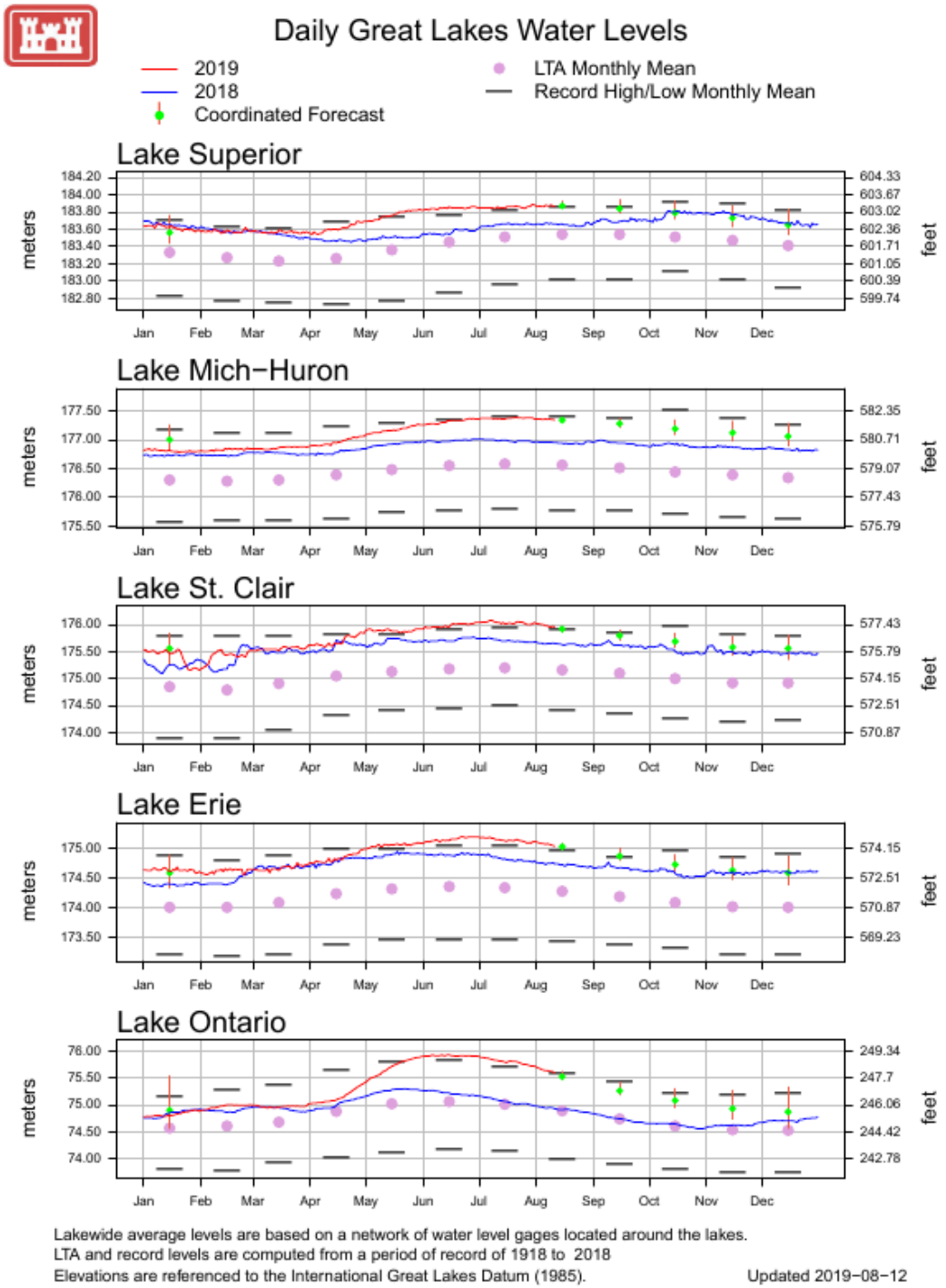
Calculated Soil Moisture Ranking Percentile

August 11, 2019

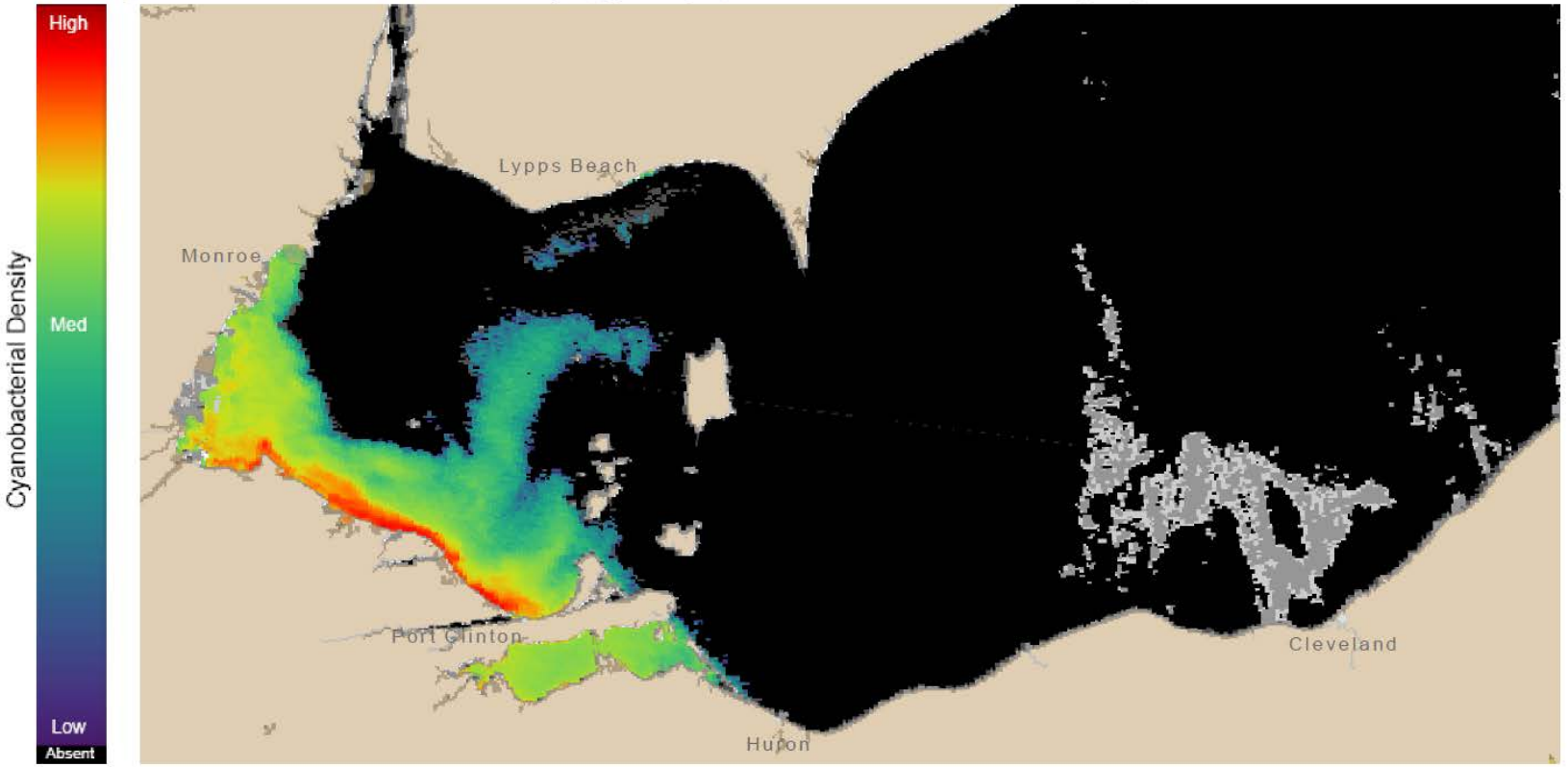


Great Lakes Water Levels

- Lakes Superior (1950), St. Clair (1936), Erie (1918), and Ontario (1918) all set new record high levels for the month of July (previous record)
- Lake Mich-Huron was within 1” of its record (1986)
- Erie and Ontario levels dropped from June



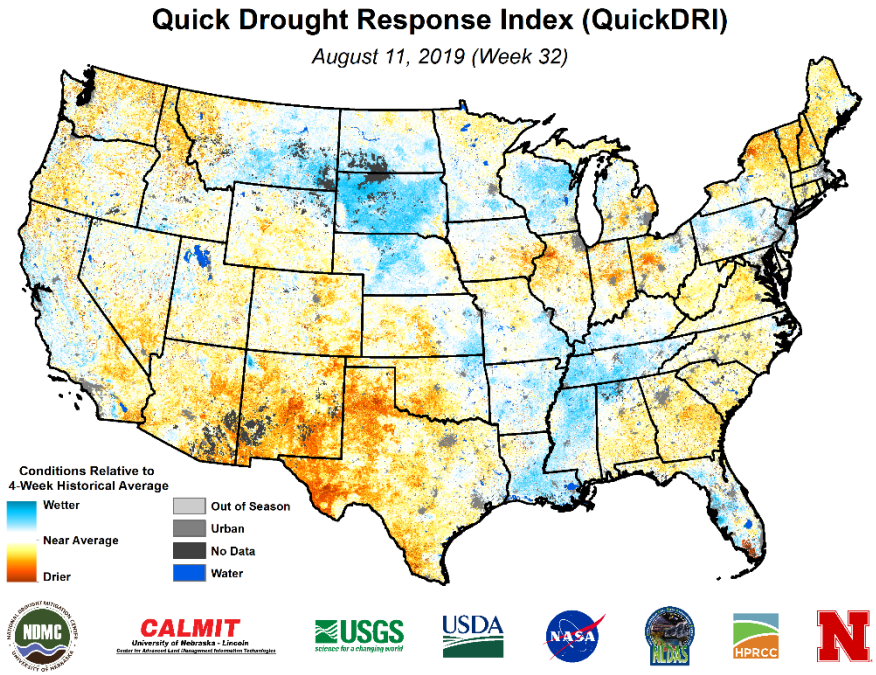
Lake Erie Harmful Algal Bloom



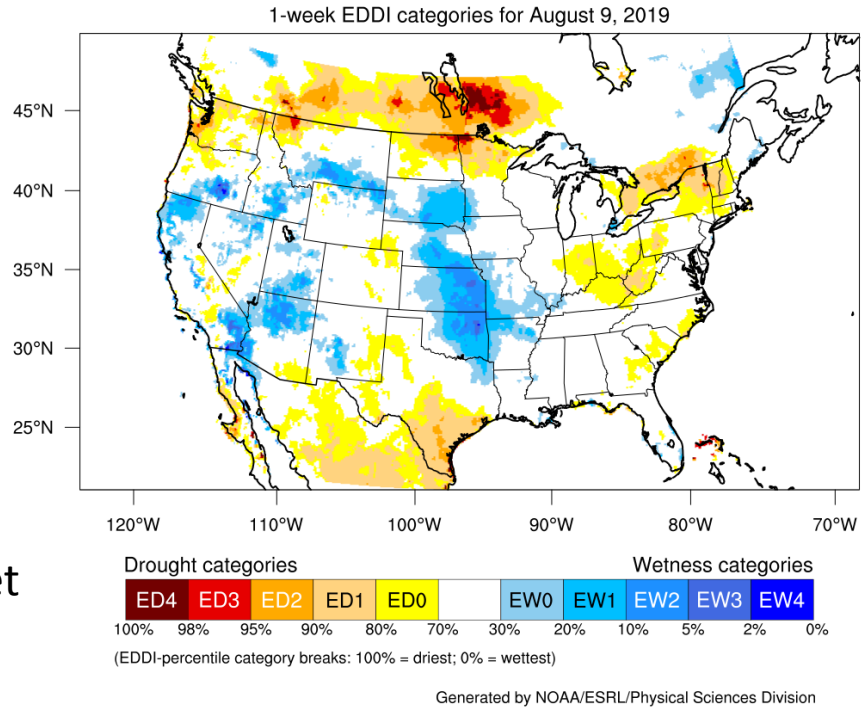
https://tidesandcurrents.noaa.gov/hab/lakeerie_bulletins/HAB20190812_2019013_LE.pdf

- Microsystis cyanobacteria extend from Maumee Bay north along the Michigan coast to Brest Bay, east along the Ohio coast to the Marblehead Peninsula; and offshore up to 3 miles west of Pelee Island

Drought Tools



https://quickdri.unl.edu/data/weekly_maps/png/20190811/qdri_20190811_conus_text.png



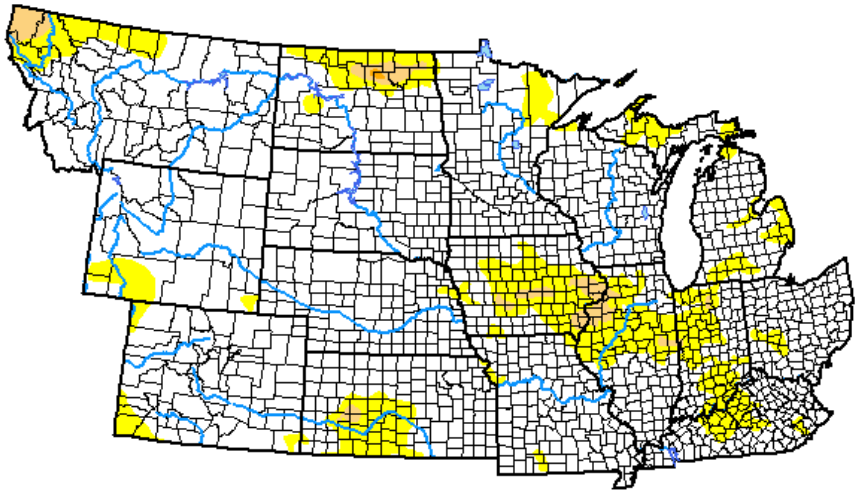
- ❑ Not all Drought Indicators lining up harmoniously
- ❑ QuickDRI: snapshot of anomalously dry or wet conditions over the past 4 weeks
- ❑ Evaporative Demand Drougt Index: “thirst of the atmosphere”

https://www.esrl.noaa.gov/psd/eddi/

US Drought Monitor

U.S. Drought Monitor

NWS Central Region



August 13, 2019

(Released Thursday, Aug. 15, 2019)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	83.56	16.44	1.74	0.04	0.00	0.00
Last Week *08-06-2019*	85.22	14.78	0.62	0.00	0.00	0.00
3 Months Ago *05-14-2019*	96.65	3.35	0.15	0.00	0.00	0.00
Start of Calendar Year *01-01-2019*	85.98	14.02	8.17	5.23	2.44	1.01
Start of Water Year *09-25-2018*	64.00	36.00	17.93	9.15	5.03	1.49
One Year Ago *08-14-2018*	53.93	46.07	22.31	12.07	6.48	1.28

Intensity:

- None
- 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:

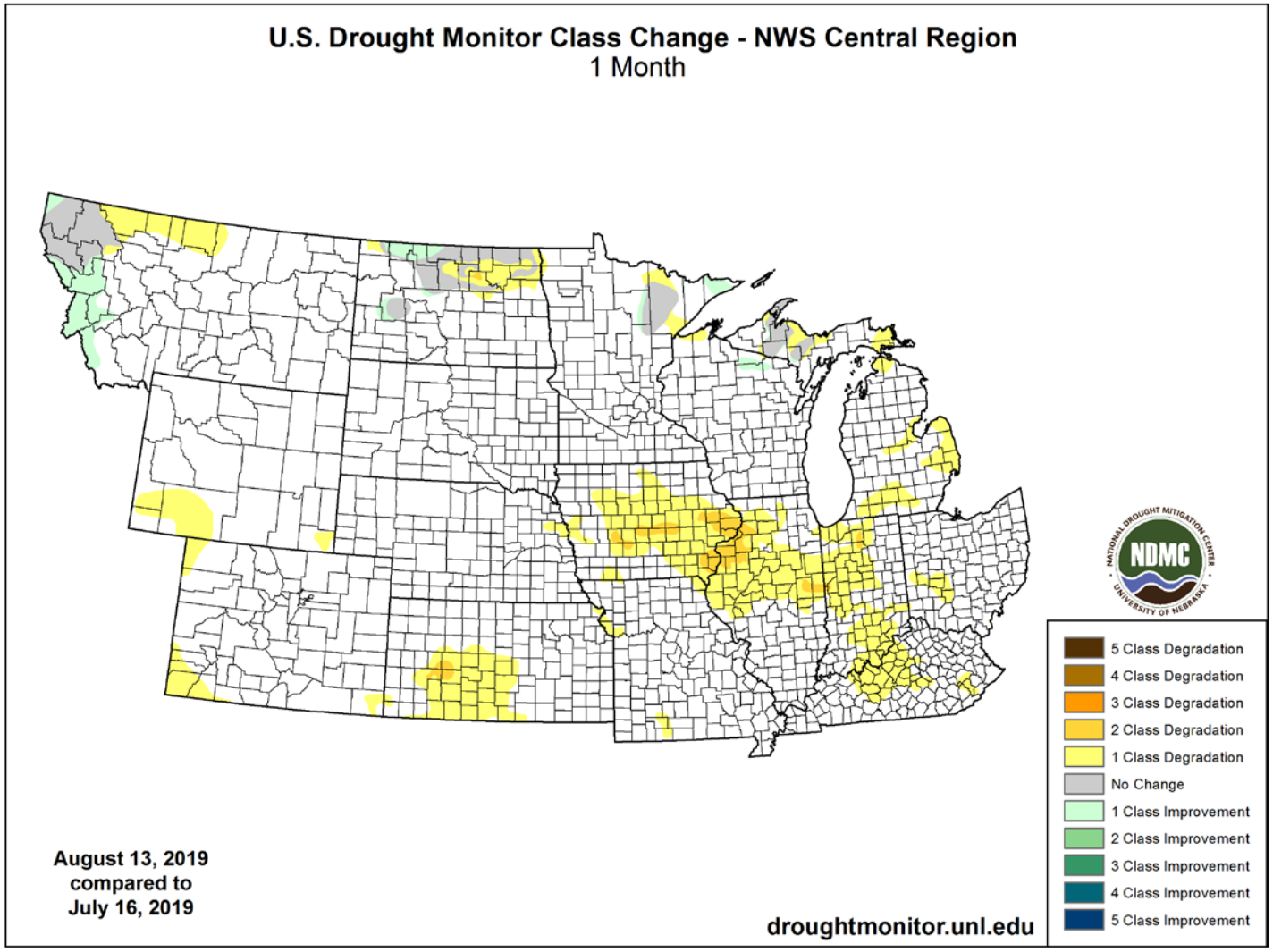
Richard Tinker

CPC/NOAA/NWS/NCEP

droughtmonitor.unl.edu

- ❑ Increases in area with at least D0, D1, and D2
- ❑ For the “Midwest” Region (MN to MO and points east) – breaks a streak of 31 weeks without at least D1 in the area

US Drought Monitor (1-month Change)

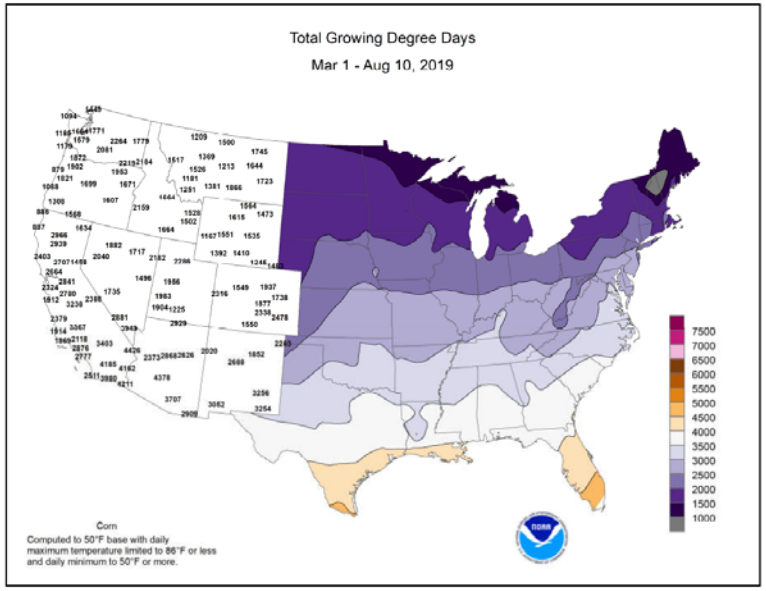


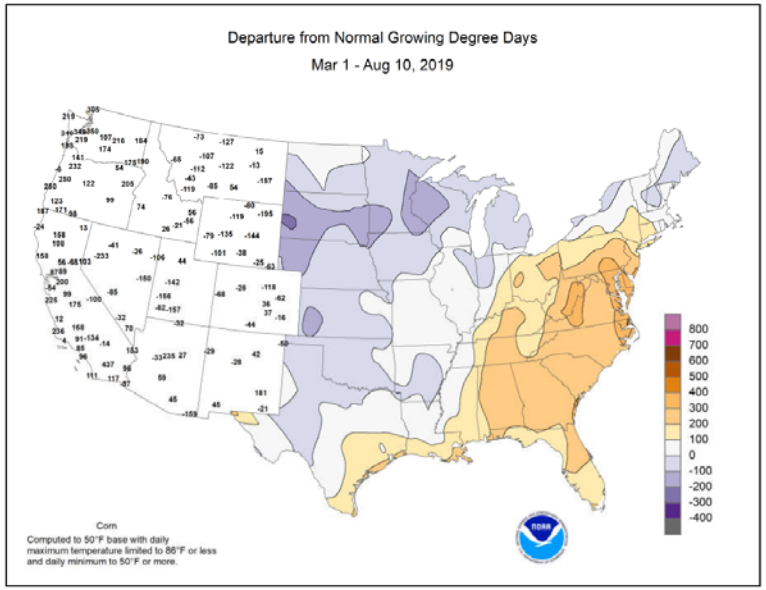
Ag: Walking the Tightrope of Growing Degree Days

- Growing degree days (GDDs) across the region range from ~1000-1500 across the far northern reaches of the Central Region (N. MN and WI) to ~2500-3000 across the southern portions

- There is a west to east gradient compared to normal with GDDs still lagging across the west; a little above average for OH and KY

- The rest of the season is really about getting being warm enough to accumulate GDDs and promote growth while not causing too much more stress to crops

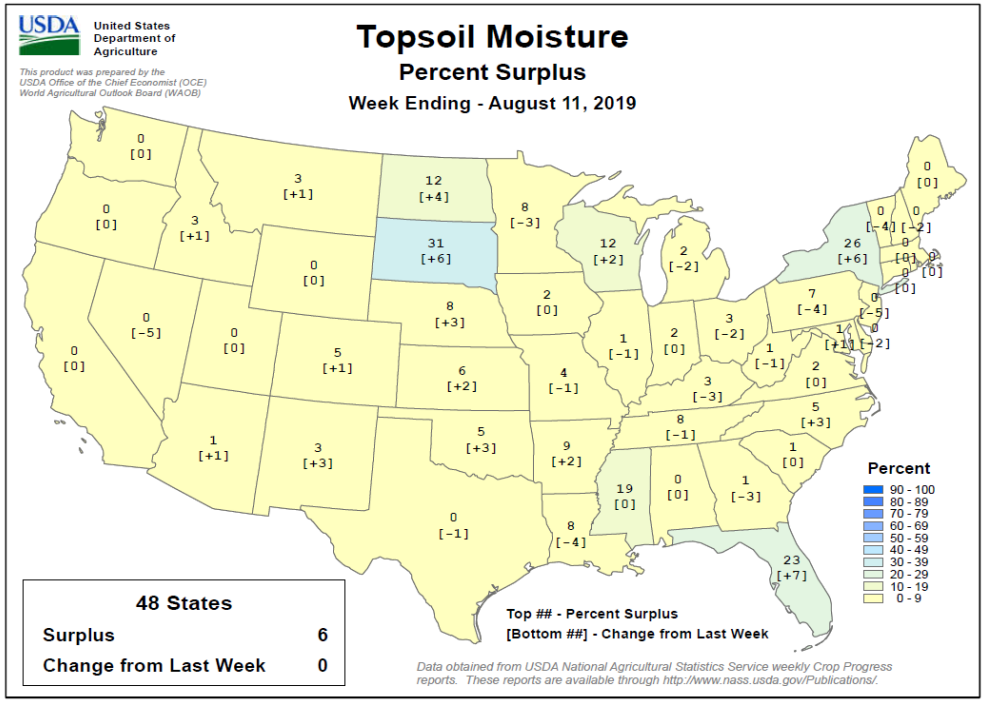


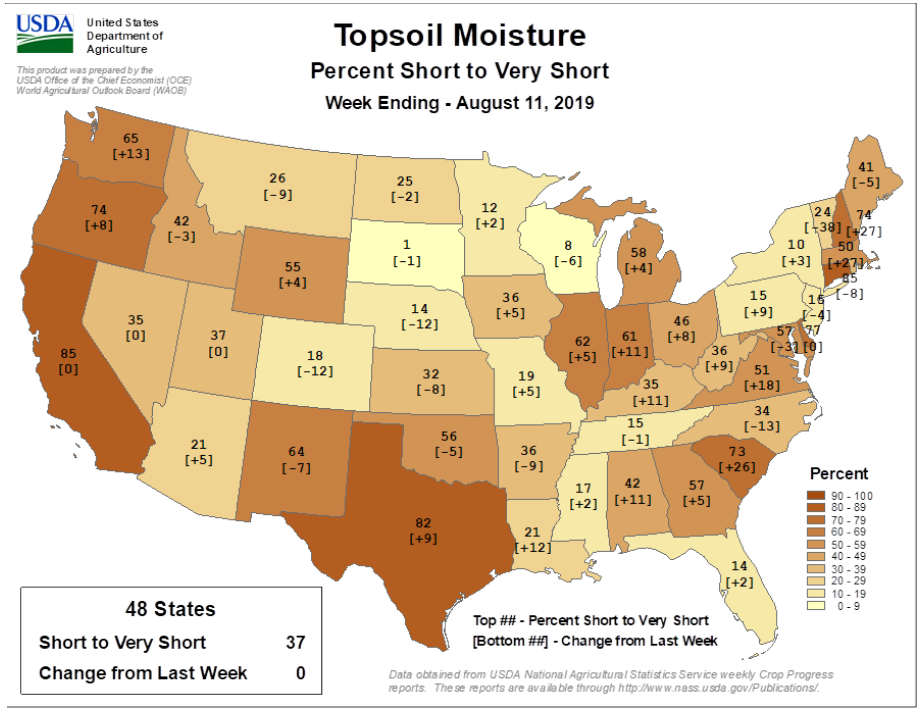


To check your specific situation, use U2U Corn GDD tool: https://mrcc.illinois.edu/U2U/gdd/

NASS Topsoil moisture

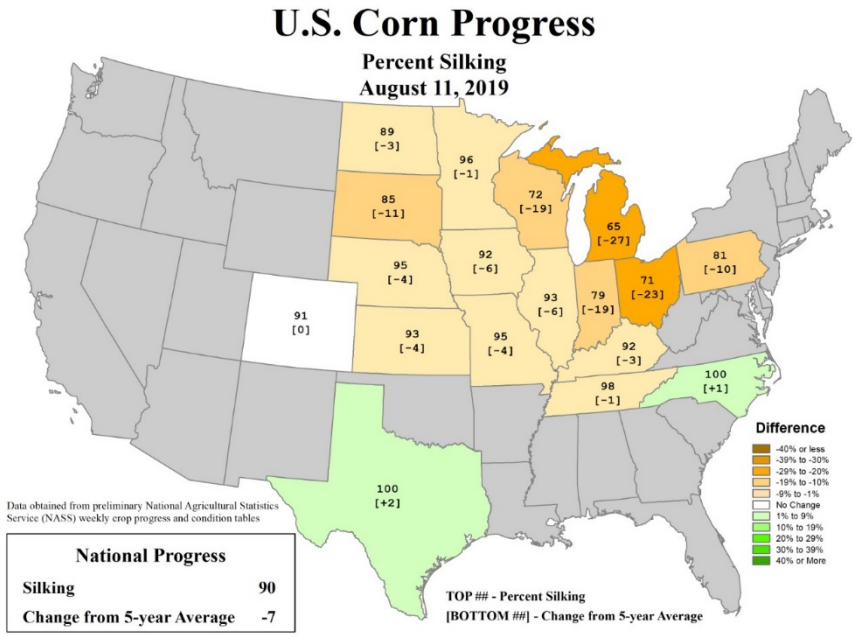
- South Dakota sticks out as frequent rains have increased surplus moisture
- From Iowa throughout eastern portion of the region shows increased in short to very short topsoil moisture – response to drying conditions there

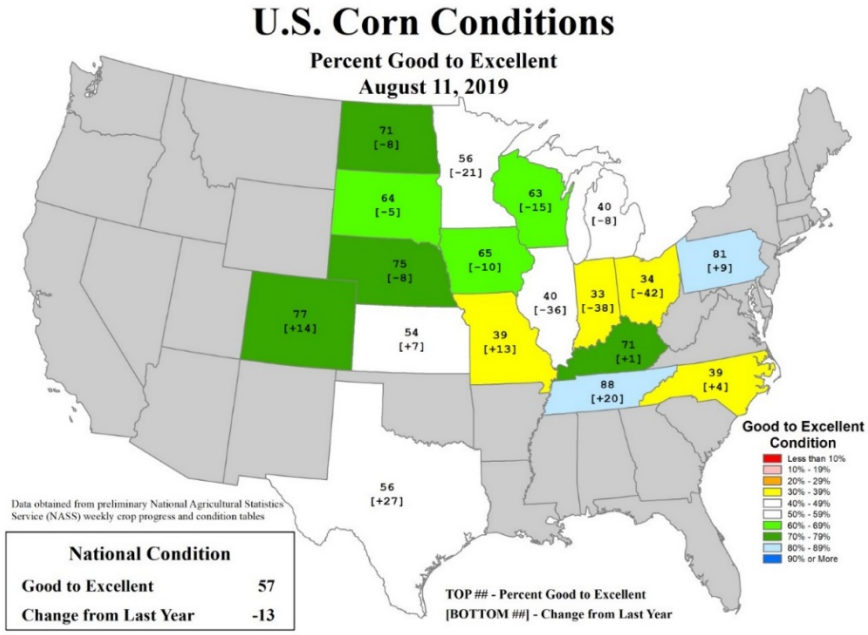




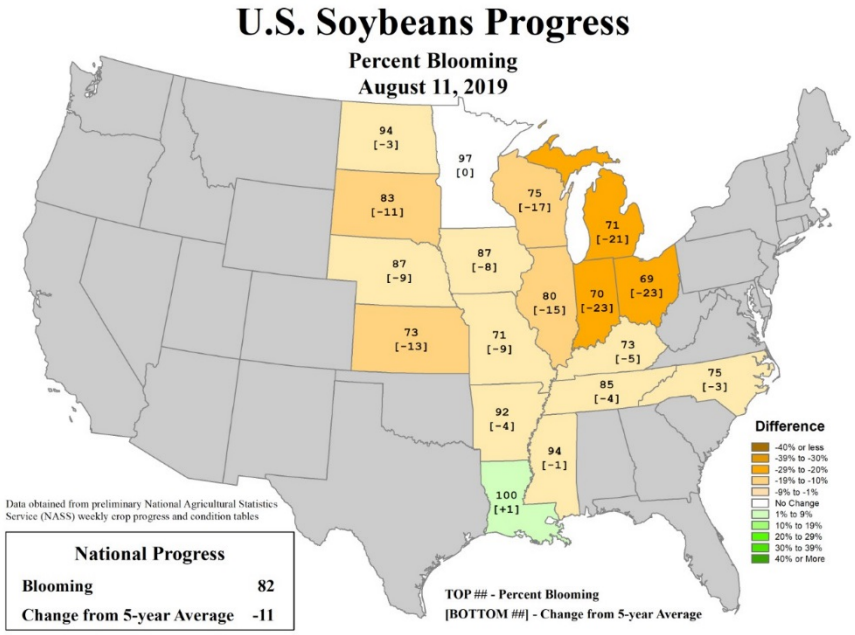
Ag: Corn

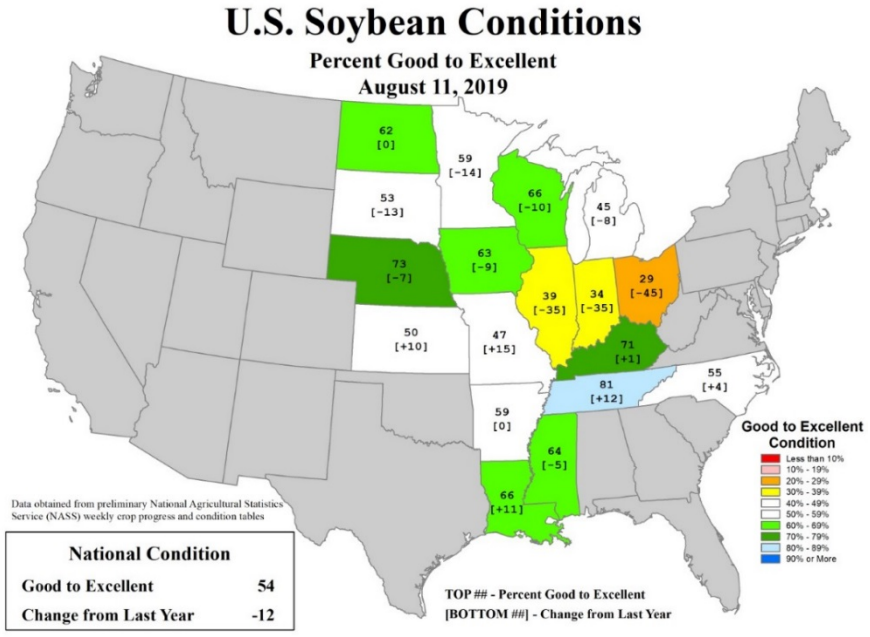
- Behind across the central region – greatest across OH, MI, WI, IN
- Good across the western areas; not so much from Missouri eastward through Ohio; large variation in crop size and stage within the same fields





Ag: Soybeans

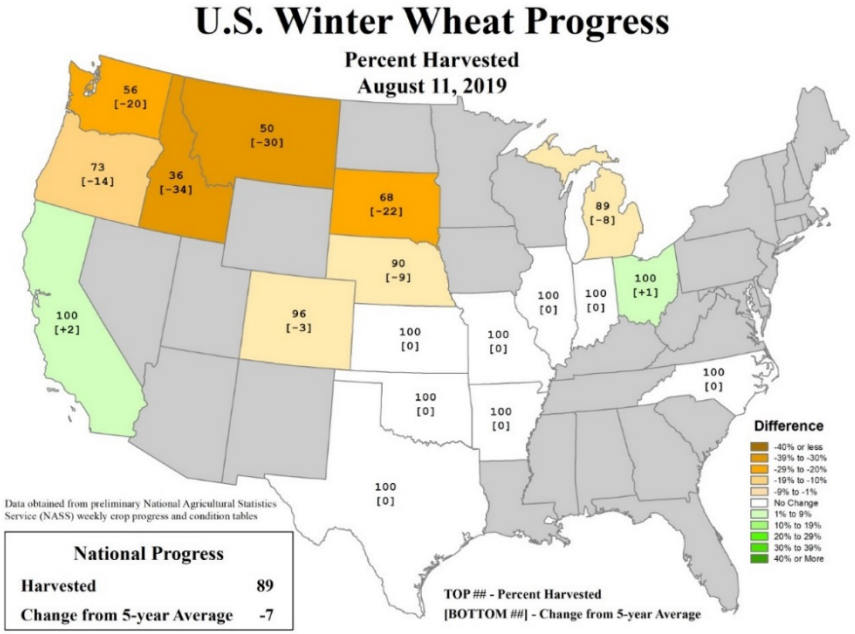


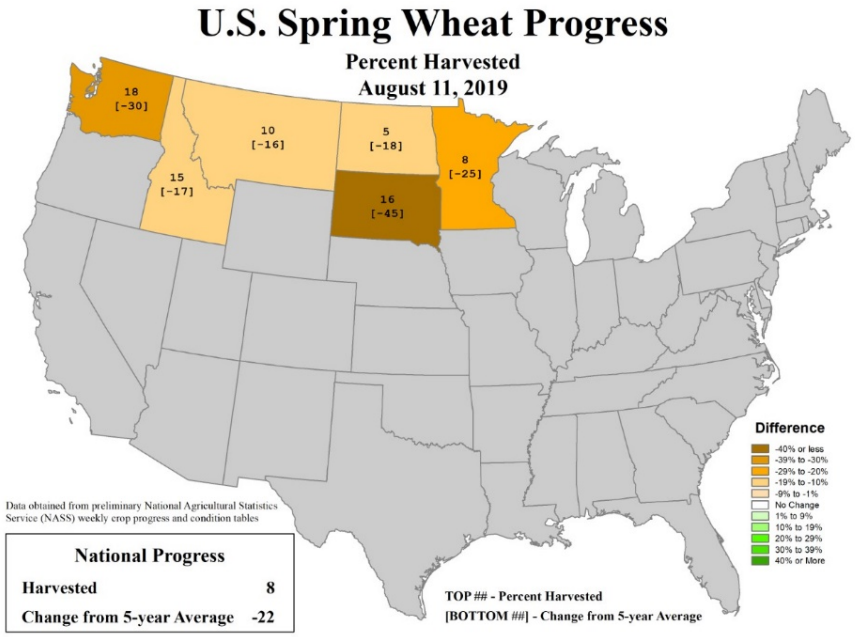


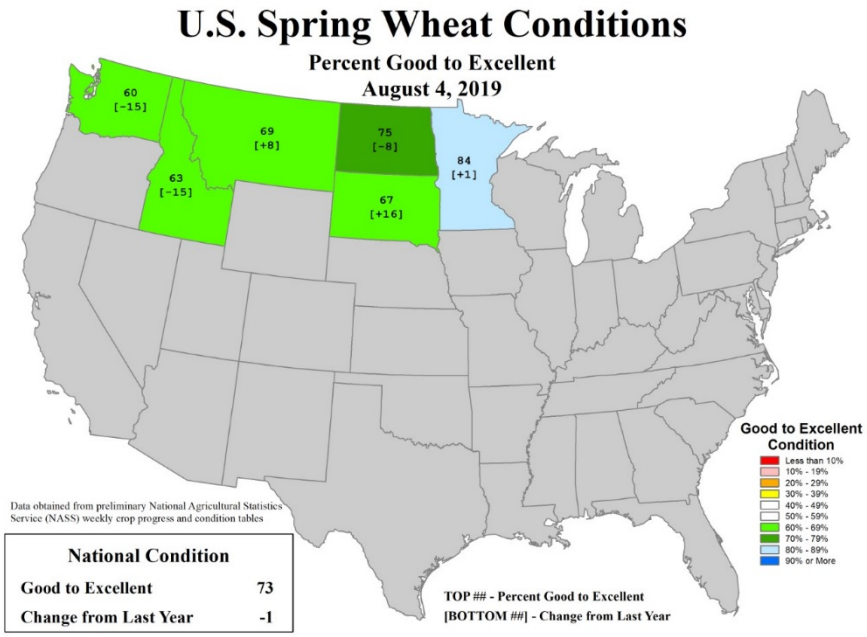
- ❑ Soybean progress is behind across the central region except Minnesota – blooming greatly behind in the eastern portions of the region
- ❑ Similar conditions geographically compared to corn
- ❑ Short crops; pods filling close to ground

Ag: Wheat

- Winter wheat wrapped up across the southern states
- Spring wheat across Northern Plains in good conditions; but high humidity and rain slowing harvest







Ag: Pasture & Range

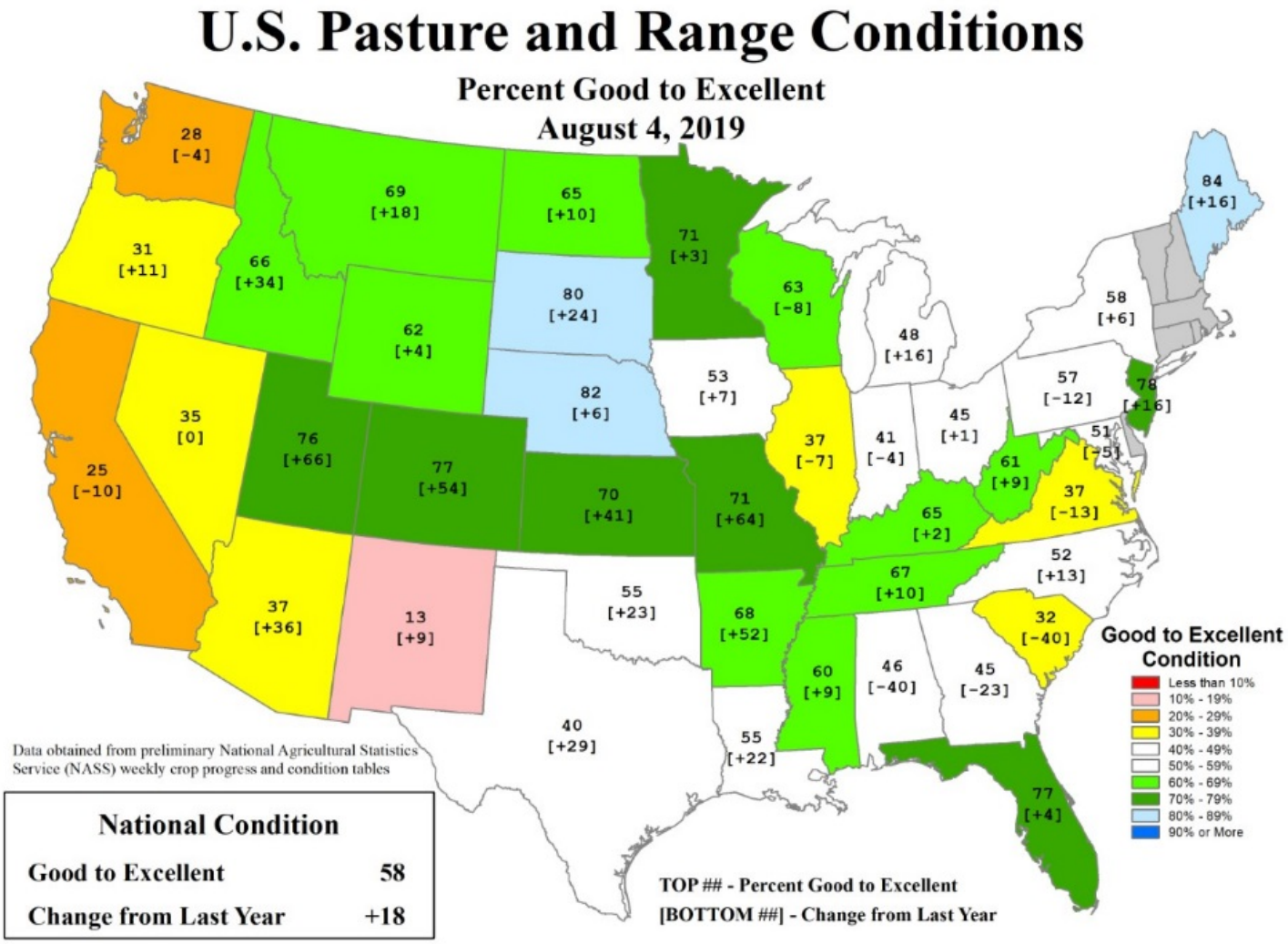


Photo credit: Sam Custer OSU Extension

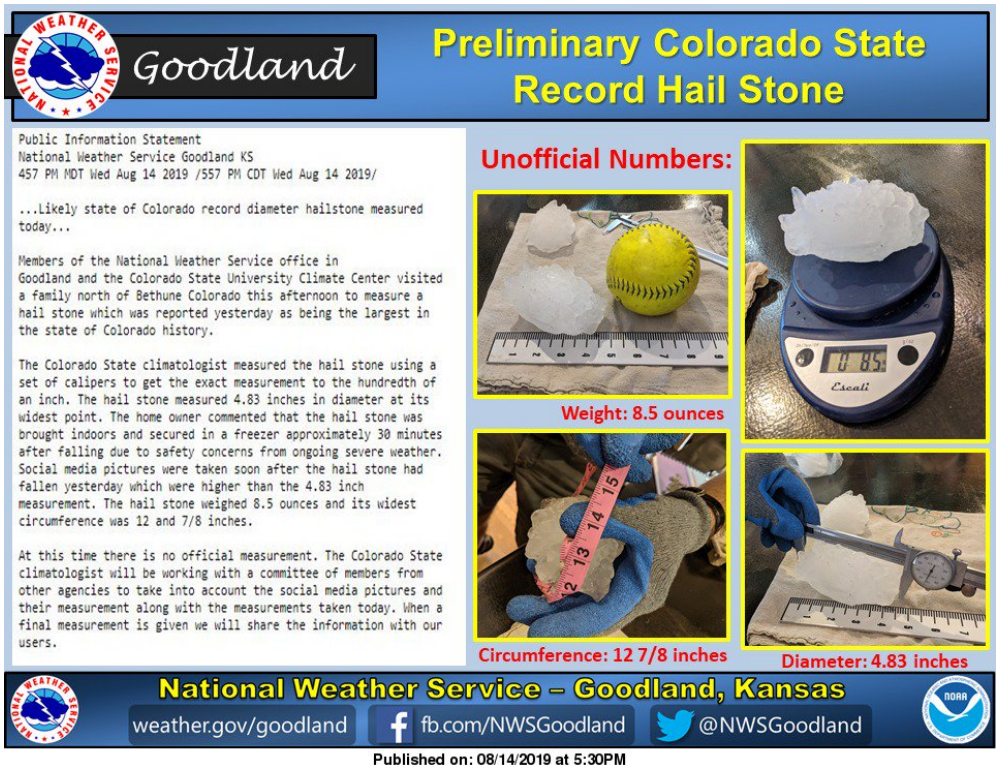
Various Ag Discussion Items

- On-going issues: delayed planting in many areas mean crops are still behind – many concerns about making it to black layer this year and bean pod fill
- Lot of on-going discussion on “beating” the hard-freeze
- Dryness reversal from Central Iowa toward the east means crop stress signs magnified by shallow root structure
- Corn and soybean acreage estimates down from June report; Lots of prevent plant acres (e.g., SD and OH); More than 1.5 million acres in Ohio that normally would be planted with crops are lying fallow this year
- Weed control is an issue in fields that have remained inaccessible for most of the season due to wet soils; reports of a lot of tillage in SD, OH due to limited control from herbicides; raises a lot of questions on management of prevent plant acres
- Minimal plant disease as of yet in many places
- Plenty of precipitation in the western 2/3 of NE means low irrigation demand

Other Water Issues

- High lake levels highly visible; loss of beach area and lakeshore flooding (MI, OH), loss of boat launch areas in South Dakota
- Laws/rules enforcing no wake zones in harbors and marinas on Great Lakes and other inland lakes in South Dakota (Lake Mitchell) and parts of Minnesota due the flooding caused by passing boats; Minneapolis meetings to decide what to do with high levels of lakes
- Algal bloom reports on popular SD recreational lakes (Aberdeen, Watertown), across Iowa, and many other inland water bodies
- South Dakota rail line (DSRC) not serving any stations west of the Missouri River

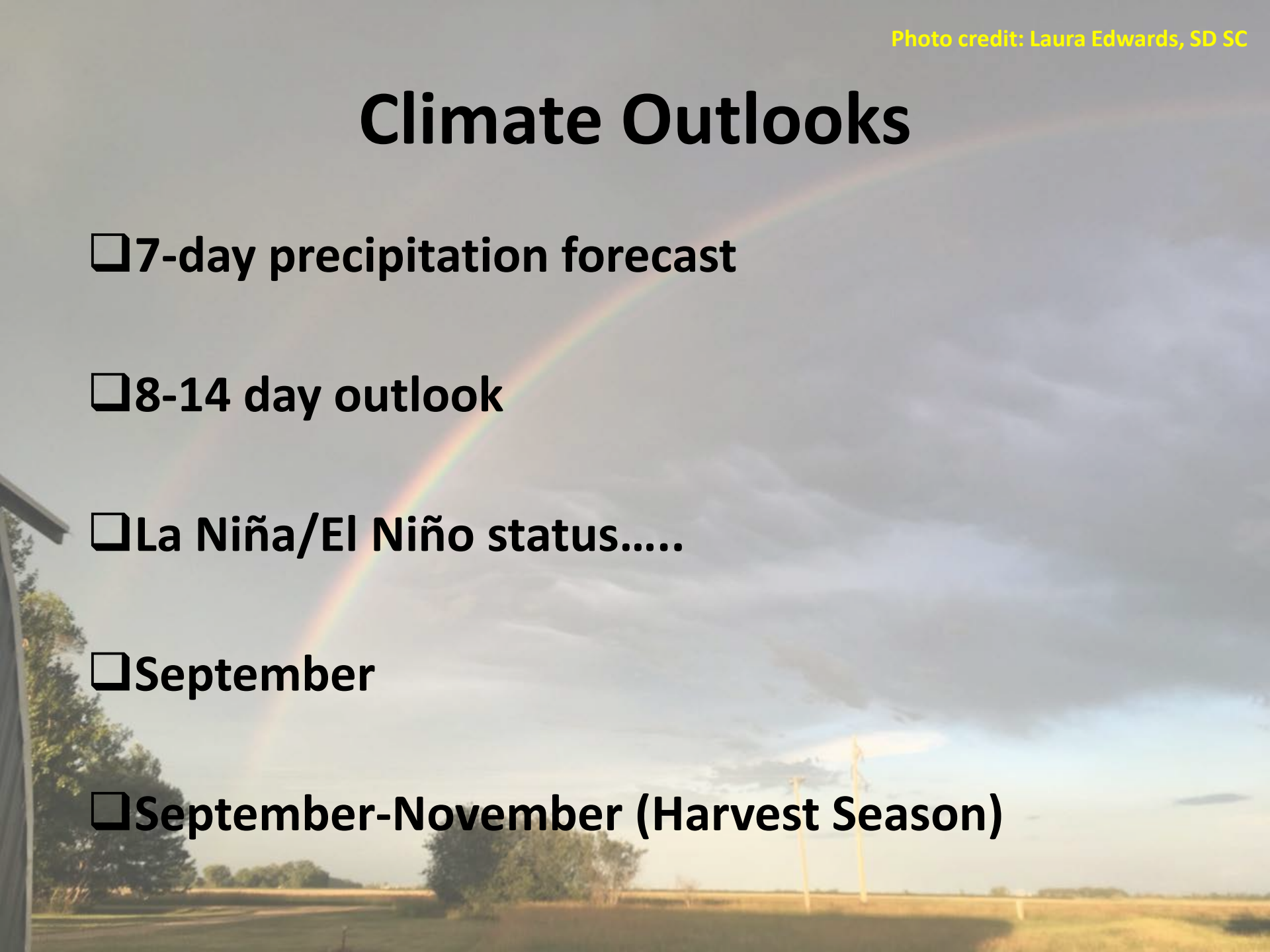
Other Major Events



- NW of Bethune, CO on Tuesday, 13 August. Max diameter was 4.83", which exceeds the long-standing state record of 4.5"

https://www.dnr.state.mn.us/climate/journal/more-large-hail-august-5-2019.html

- August 5 Hail in Delano, Minnesota

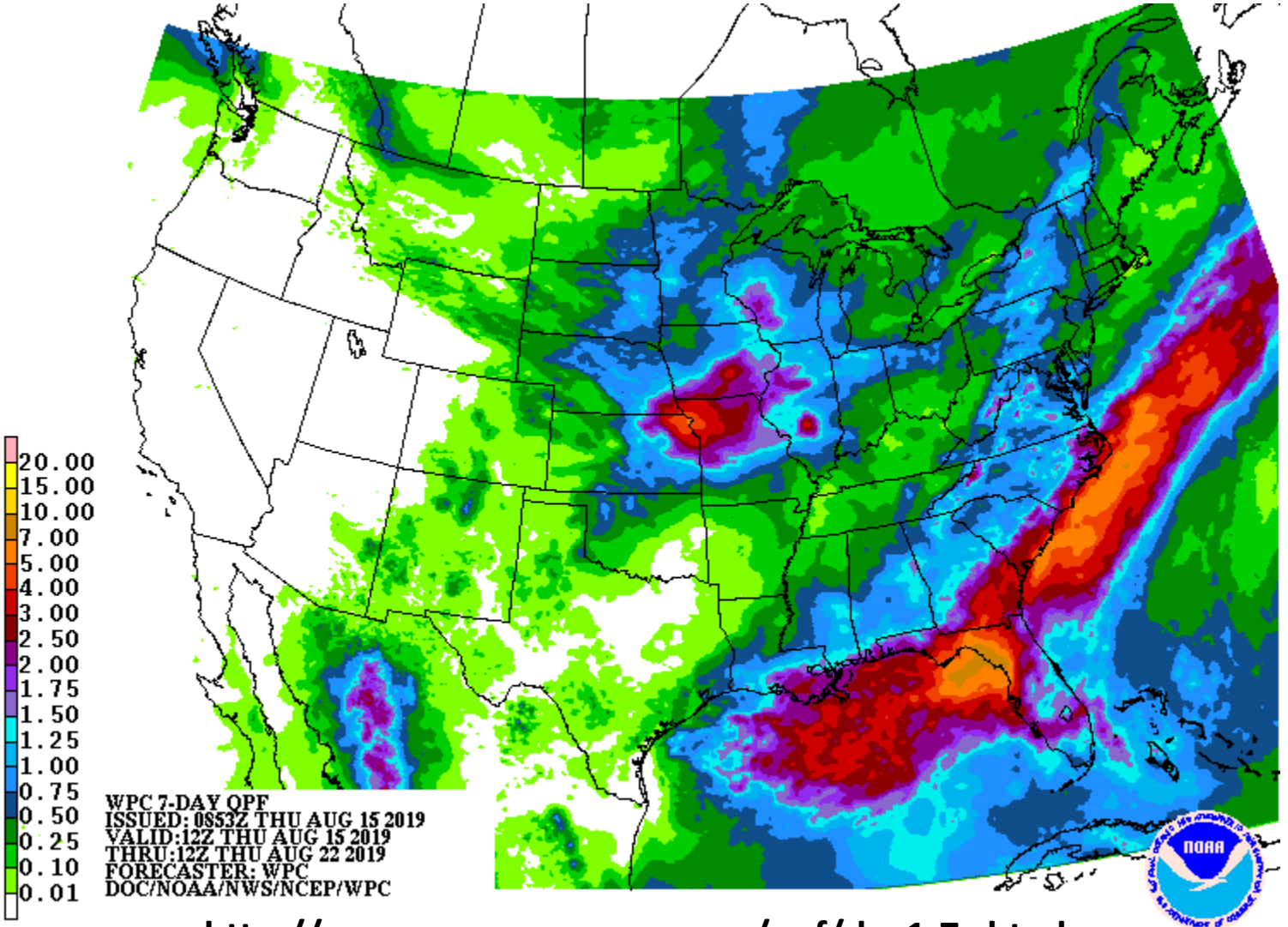


Climate Outlooks

- ❑7-day precipitation forecast
- ❑8-14 day outlook
- ❑La Niña/El Niño status…..
- ❑September
- ❑September-November (Harvest Season)

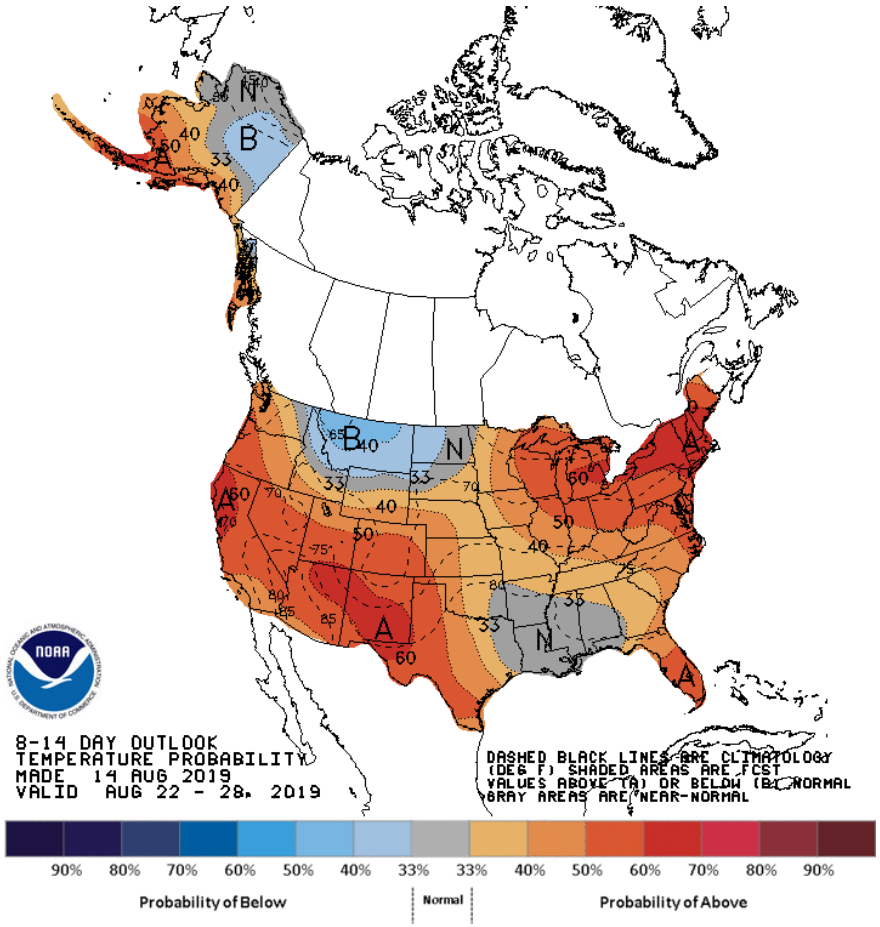
7-day Quantitative Precipitation Forecast

Valid: 7am (CDT) Thursday 15 Aug – 7am (CDT) Thursday 22 Aug

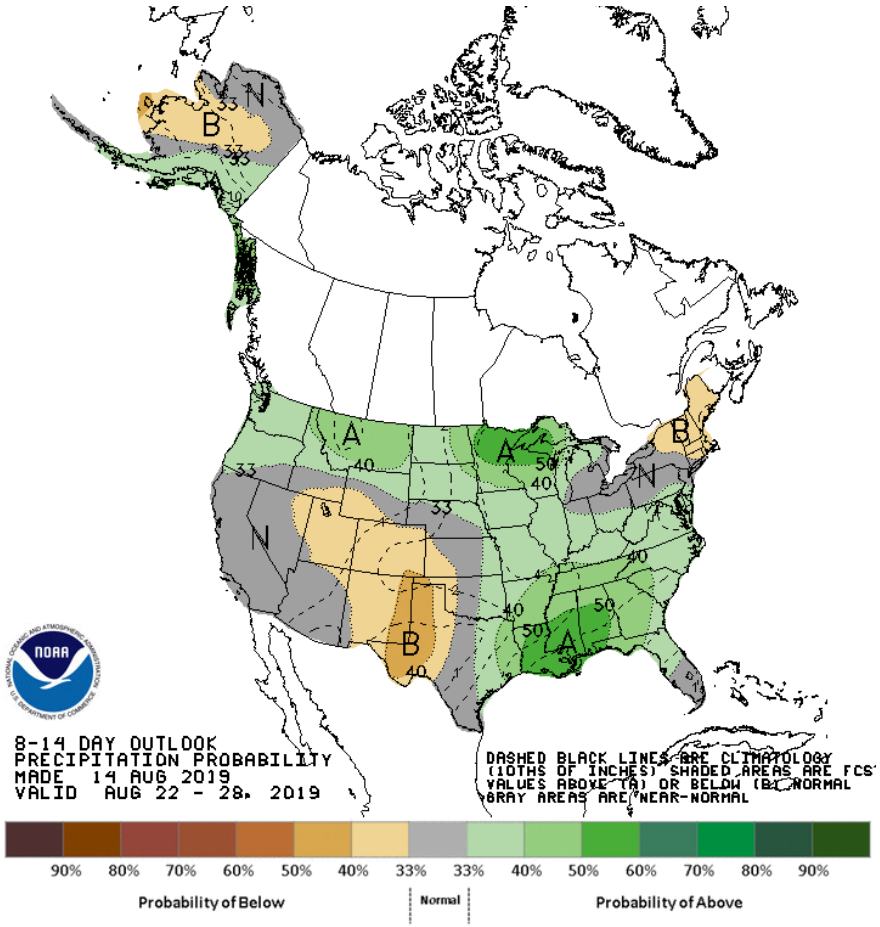


http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml

8-14 Day: Temperature and Precipitation Probabilities for 22 – 28 August 2019



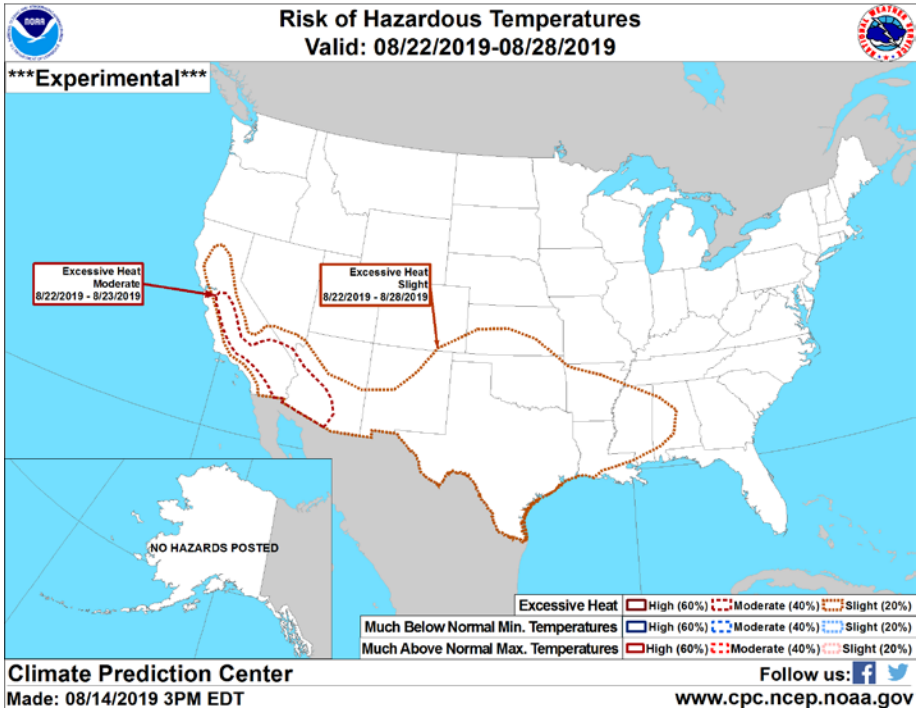
Temperature

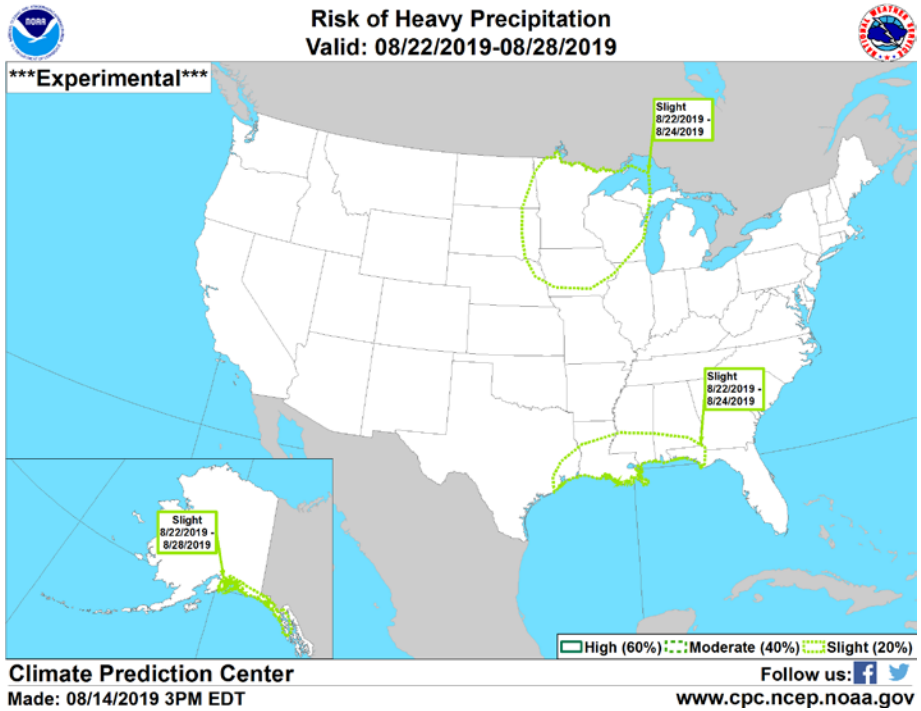


Precipitation

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

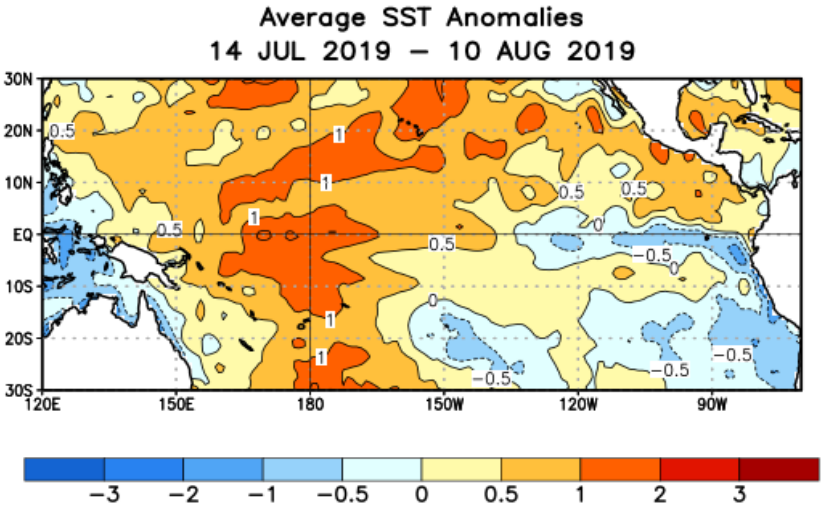
8-14 Day Hazard Risk: 22 – 28 August 2019

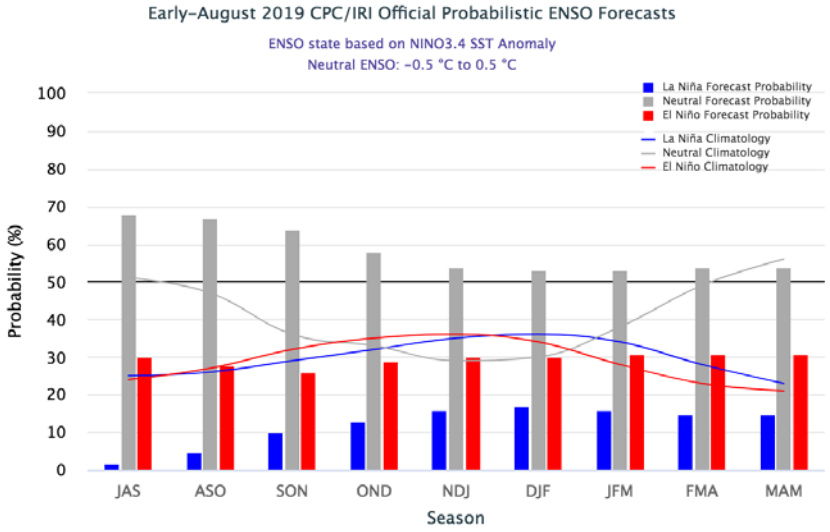




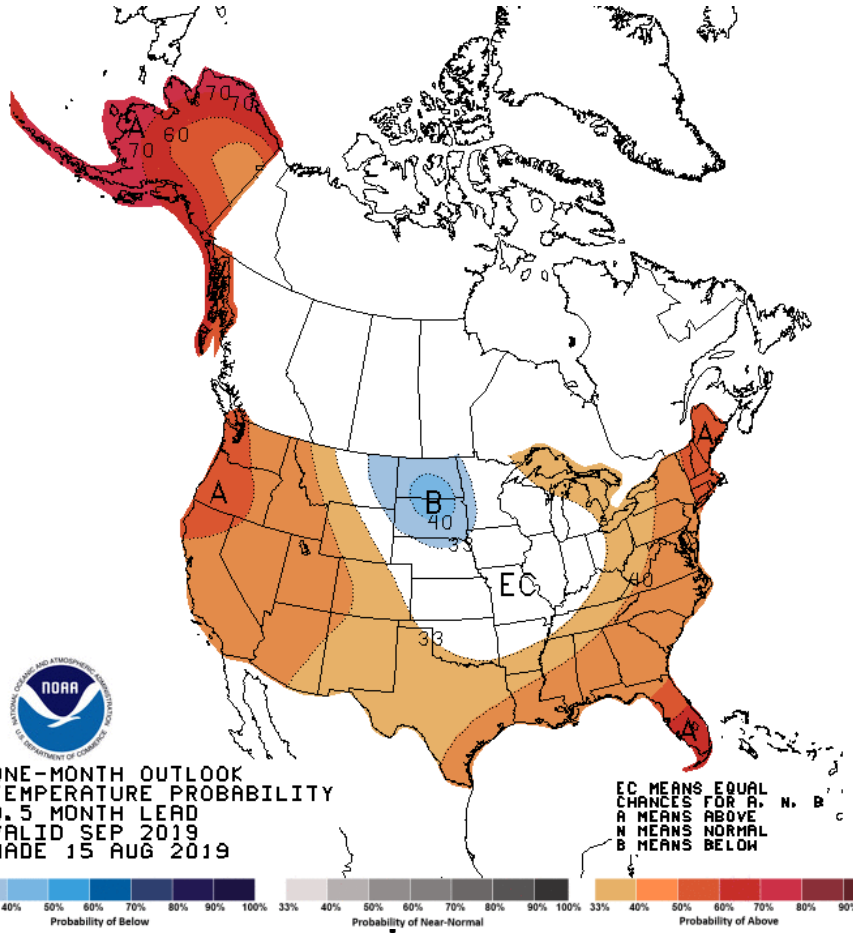
El Niño

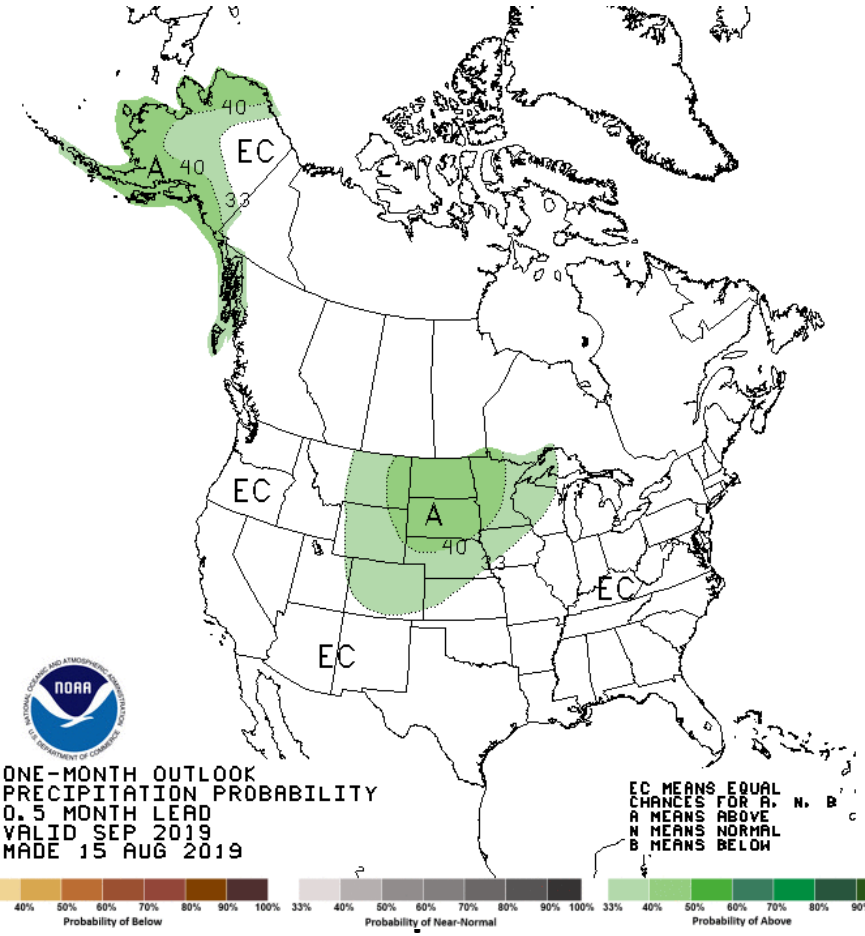
- As of August 12, CPC issued final El Niño Advisory
- The weak El Niño just experienced has waned; neutral conditions (see next bullet) are present.
- Equatorial sea surface temperatures (SSTs) are above average across the western and central Pacific Ocean and are below average in the eastern Pacific.
- ENSO-neutral is most likely to continue through Northern Hemisphere winter 2019-20 (50-55% chance).*





Temperature and Precipitation Probabilities for September 2019

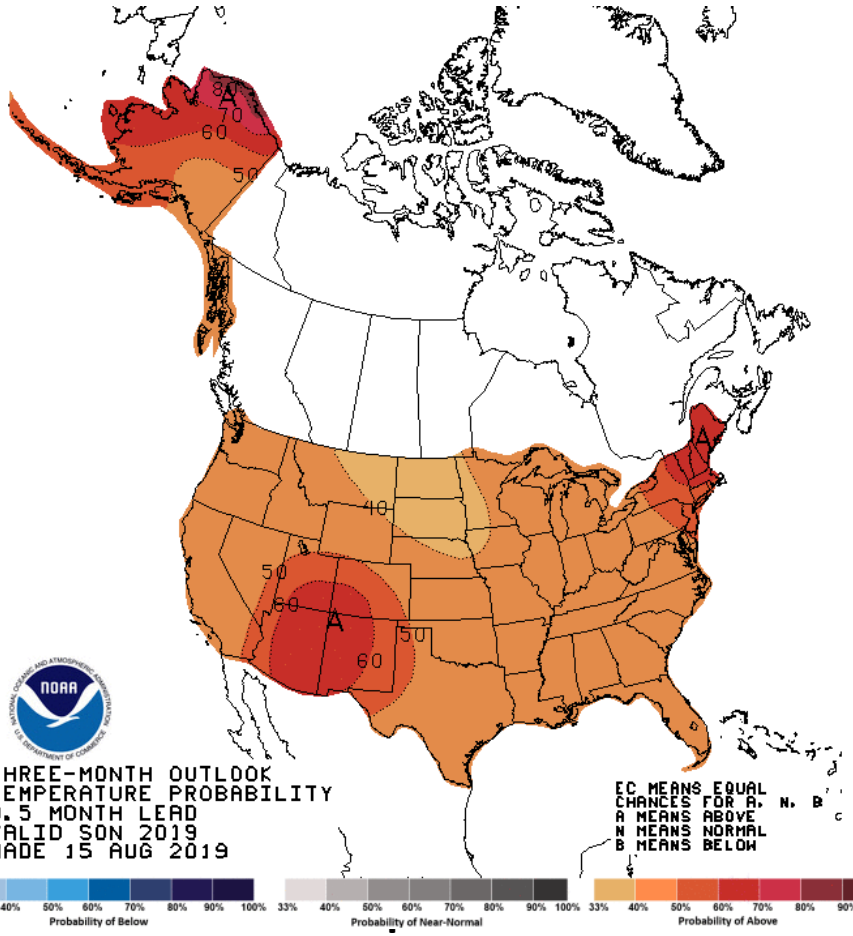


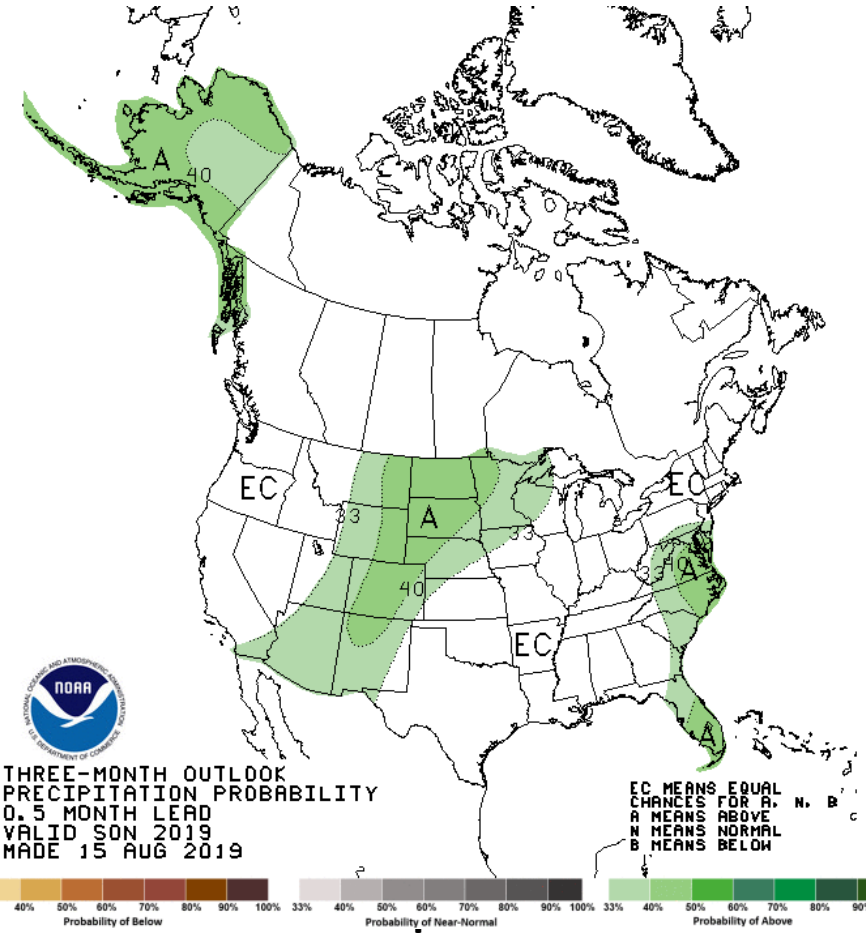


http://www.cpc.ncep.noaa.gov/products/predictions/30day/

Temperature and Precipitation Probabilities for

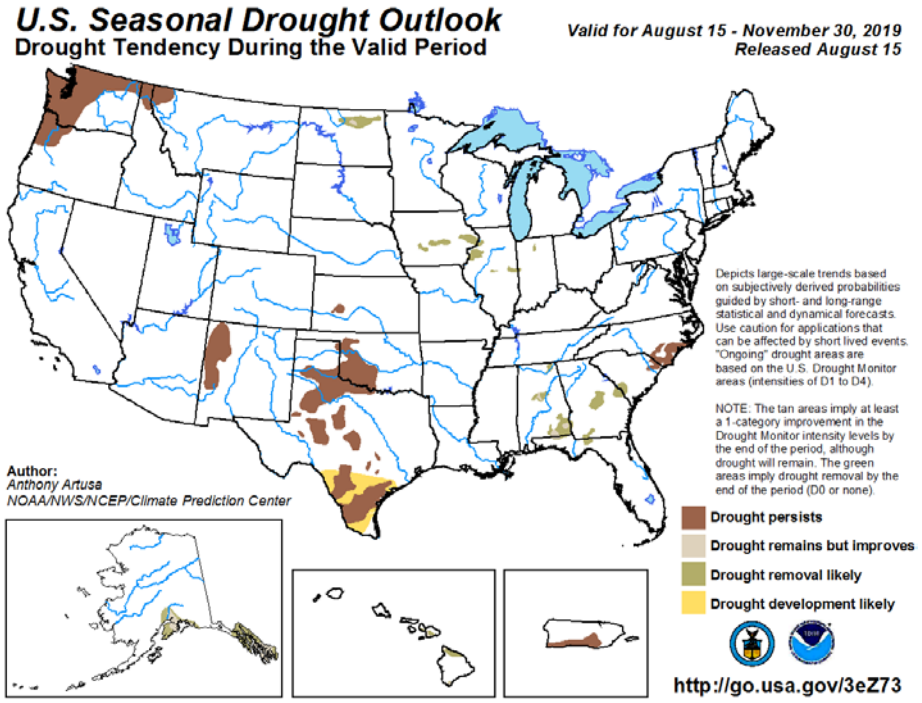
September - November 2019

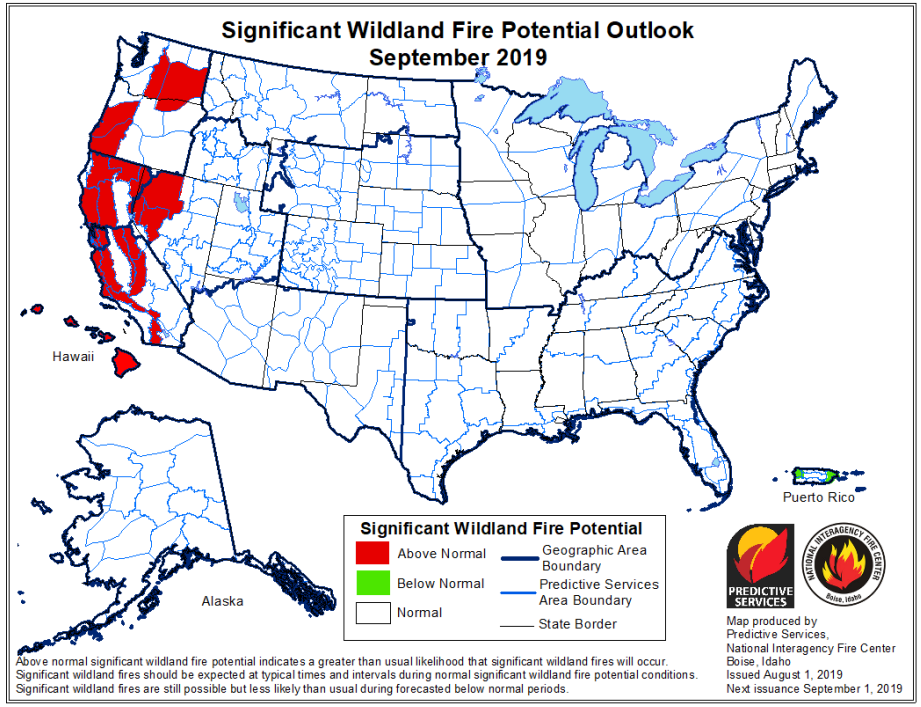




https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1

Drought & Fire Outlooks





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

https://www.predictiveservices.nifc.gov/outlooks/month2_outlook.png

Summary

- Near-average temperatures in the western portion of the central region; above average in the east
- Very wet conditions in parts of the Missouri Basin, South Dakota in particular – hindering the release efforts of water from upstream reservoirs and maintaining area flooding
- Dry conditions from Central Iowa through Ohio have stressed crops and introduced pockets of drought to the area
- Long-term effects on agriculture continue to be felt
- El Niño has abated to neutral conditions
- Near-term conditions look fairly warm across the region with continued opportunities for above average rainfall across the Great Plains
- Long-term trends dominate the outlooks for warmer than average across the region; hopefully this holds off the risk of an early-freeze

Further Information - Partners

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

Thank You and Questions?

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  - crhroc@noaa.gov