North Central U.S. Climate Summary and Outlook Webinar
July 18, 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
- State Climatologists/American Association of State Climatologists
- Midwestern Regional Climate Center and High Plains Regional Climate Center
- USDA Climate Hubs
- National Drought Mitigation Center

❑ Next webinar

- August 15, 2019, presented by Aaron Wilson, State Climate Office of Ohio

❑ Archive of past webinars

- http://mrcc.isws.illinois.edu/multimedia/webinars.jsp
- http://www.hprcc.unl.edu/webinars.php
- https://www.drought.gov/drought/calendar/webinars

Planting Dates Varied Due to Field Conditions

April 4, 2019

May 9, 2019

July 17, 2019

July 17, 2019

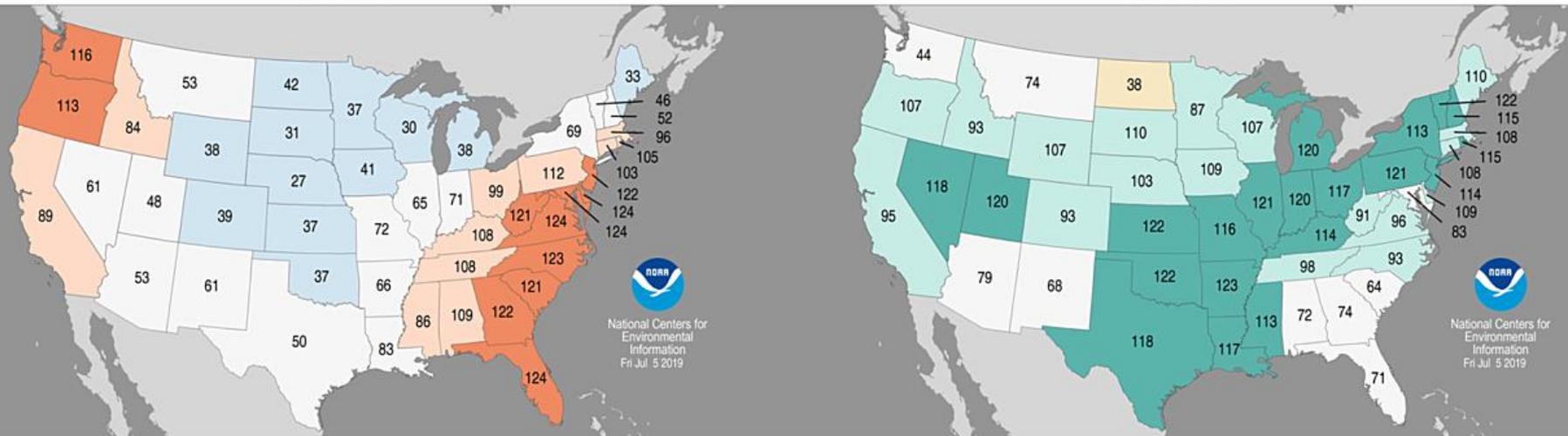Photos from Fulton and Henderson counties in Kentucky. Photos courtesy of the Kentucky Mesonet.

Agenda

- Current climate conditions in historical context
- Current and prospective climate impacts
- Climate outlooks
- Questions, answers, and further discussion

Statewide Ranks
12-month

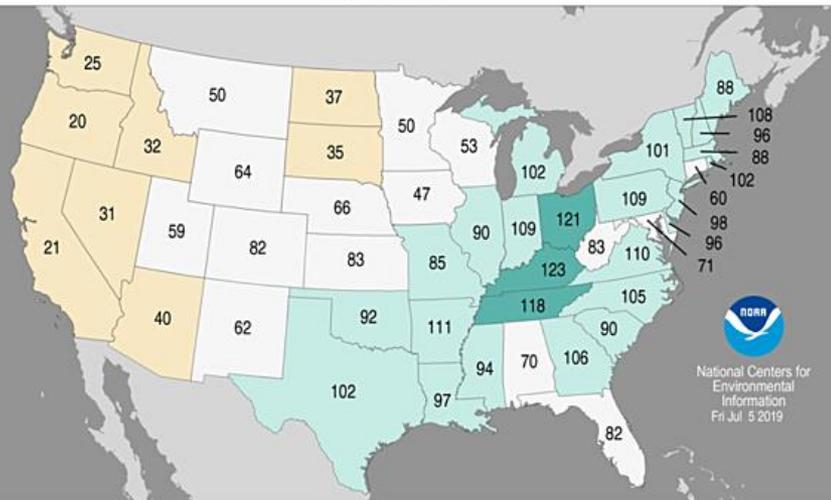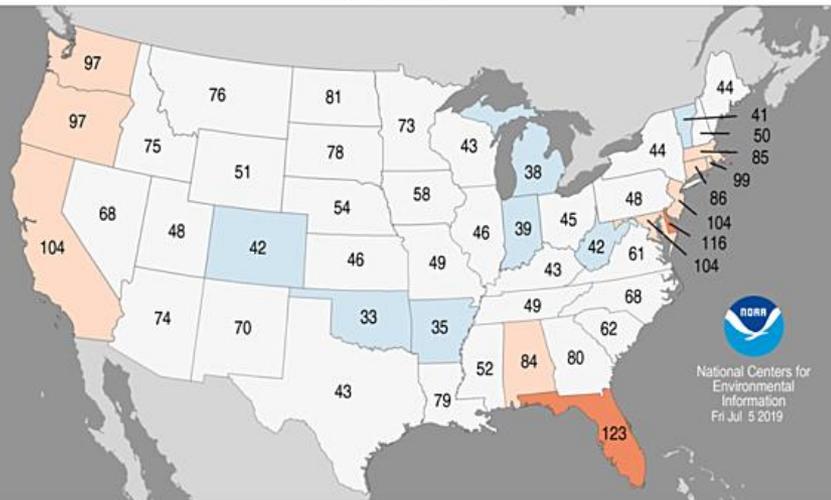**Statewide Average Temperature Ranks**
July 2018–June 2019
Period: 1895–2019

Statewide Precipitation Ranks
July 2018–June 2019
Period: 1895–2019

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

Statewide Ranks
3-month

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

Statewide Ranks
1-month

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

Average Temperature Departure from Mean

Past 30 Days

Average Temperature (°F): Departure from Mean
June 18, 2019 to July 17, 2019
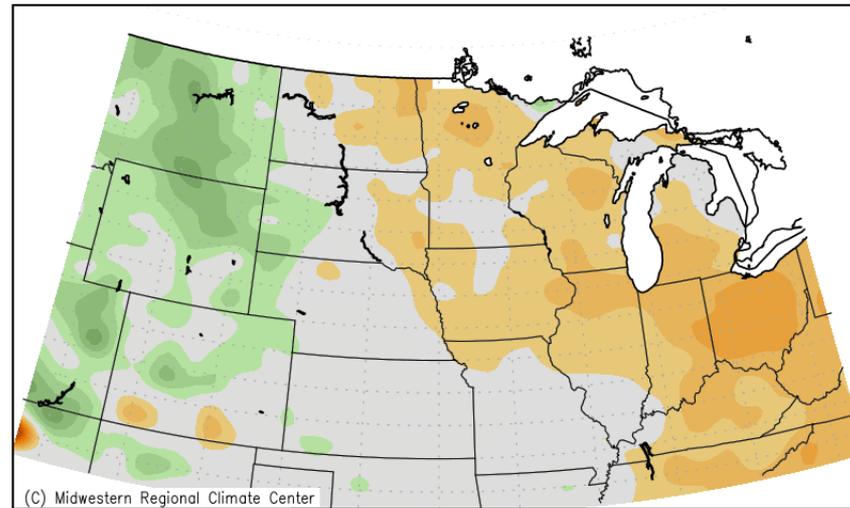
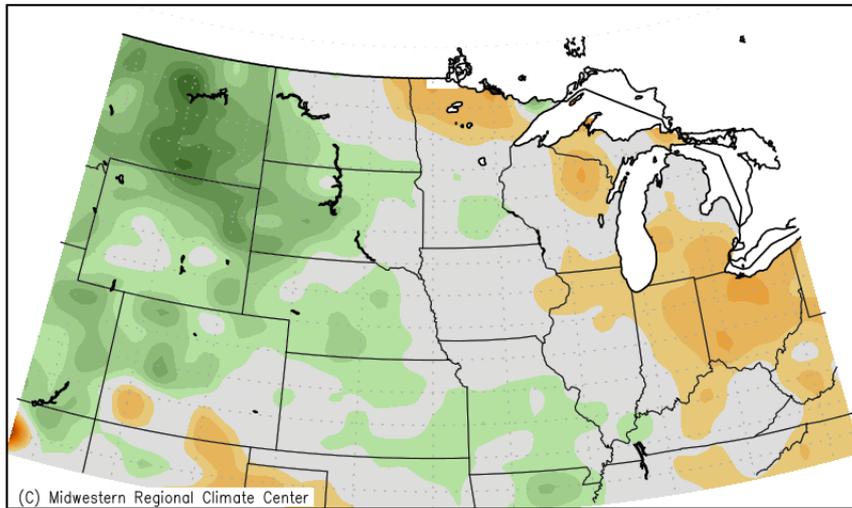# Average Temperature Departure from Maximum and Minimum

Past 30 Days

Average Maximum Temp. (°F): Departure from Mean
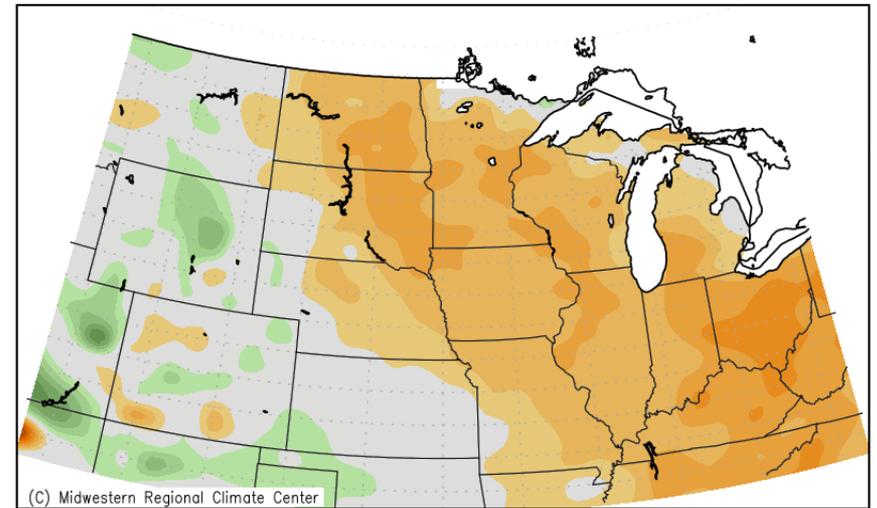June 18, 2019 to July 17, 2019

Average Minimum Temp. (°F): Departure from Mean
June 18, 2019 to July 17, 2019

Accumulated Precipitation: Percent of Mean
June 18, 2019 to July 17, 2019

Past 30 Days

Mean period is 1981–2010.
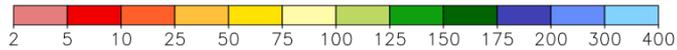
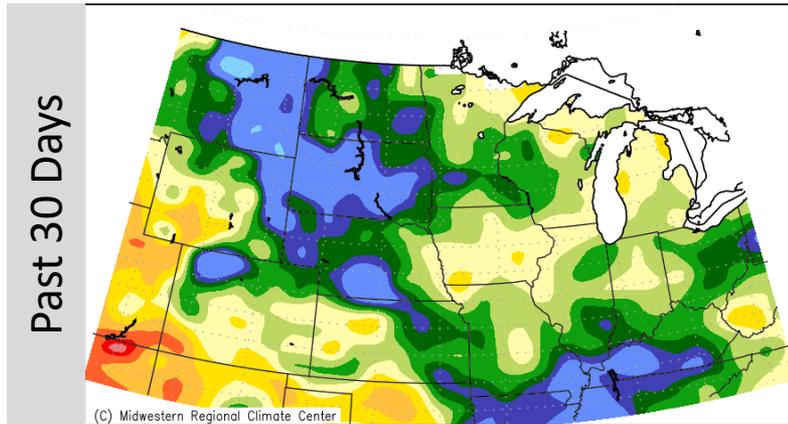2 5 10 25 50 75 100 125 150 175 200 300 400

Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana–Champaign

Accumulated Precipitation: Percent of Mean
April 19, 2019 to July 17, 2019
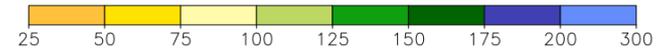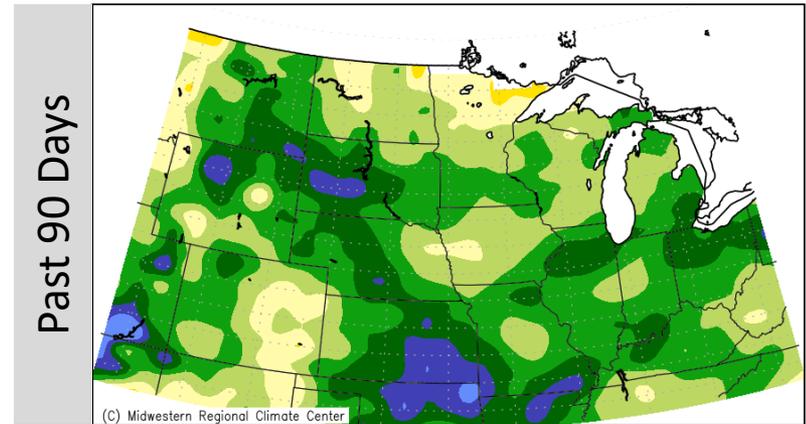
Past 90 Days

Mean period is 1981–2010.

25 50 75 100 125 150 175 200 300

Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana–Champaign

Accumulated Precipitation: Percent of Mean
January 1, 2019 to July 17, 2019

Year to Date

Mean period is 1981–2010.
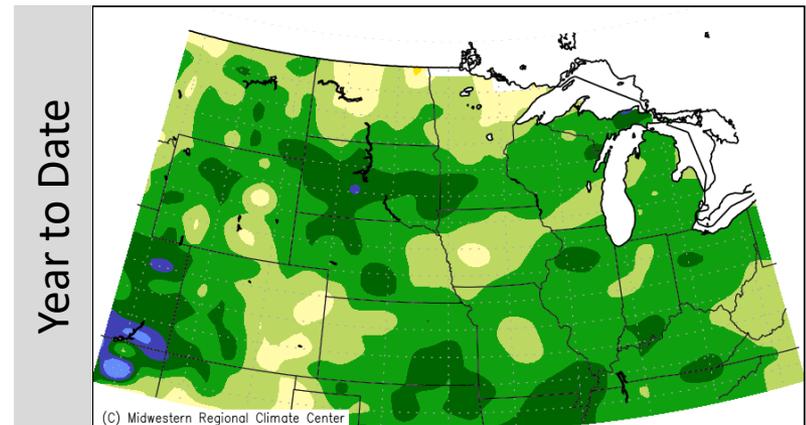
50 75 100 125 150 175 200 300

Midwestern Regional Climate Center
Illinois State Water Survey, Prairie Research Institute
University of Illinois at Urbana–Champaign
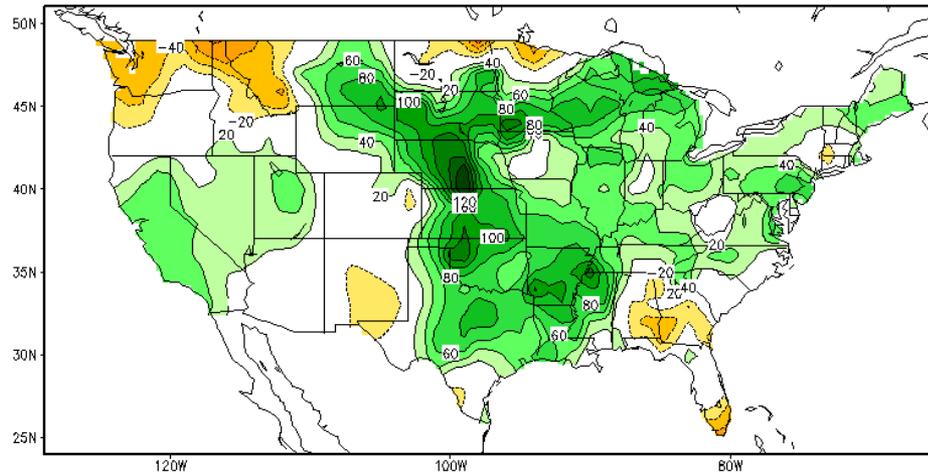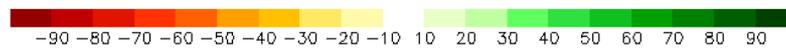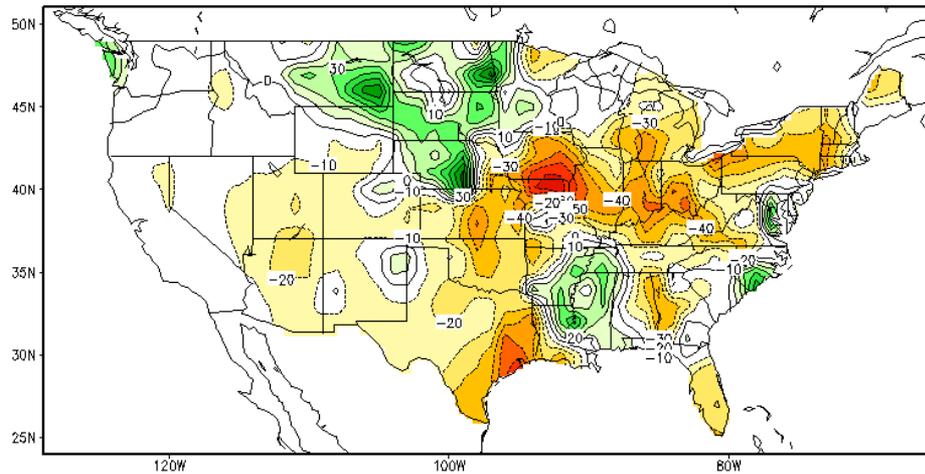
Windows on Precipitation

- Unusually wet conditions over much of the Central Region year-to-date.

- Recent shift to drier conditions across portions of the Midwest with wet conditions across much of the northern Great Plains.

Calculated Soil Moisture Anomaly (mm)
JUL 17, 2019

Calculated Soil Moisture Anomaly Change
JUL 17, 2019 from JUN.30

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

Vegetation Health Index
As of: Thursday, July 18, 2019

VHI Value
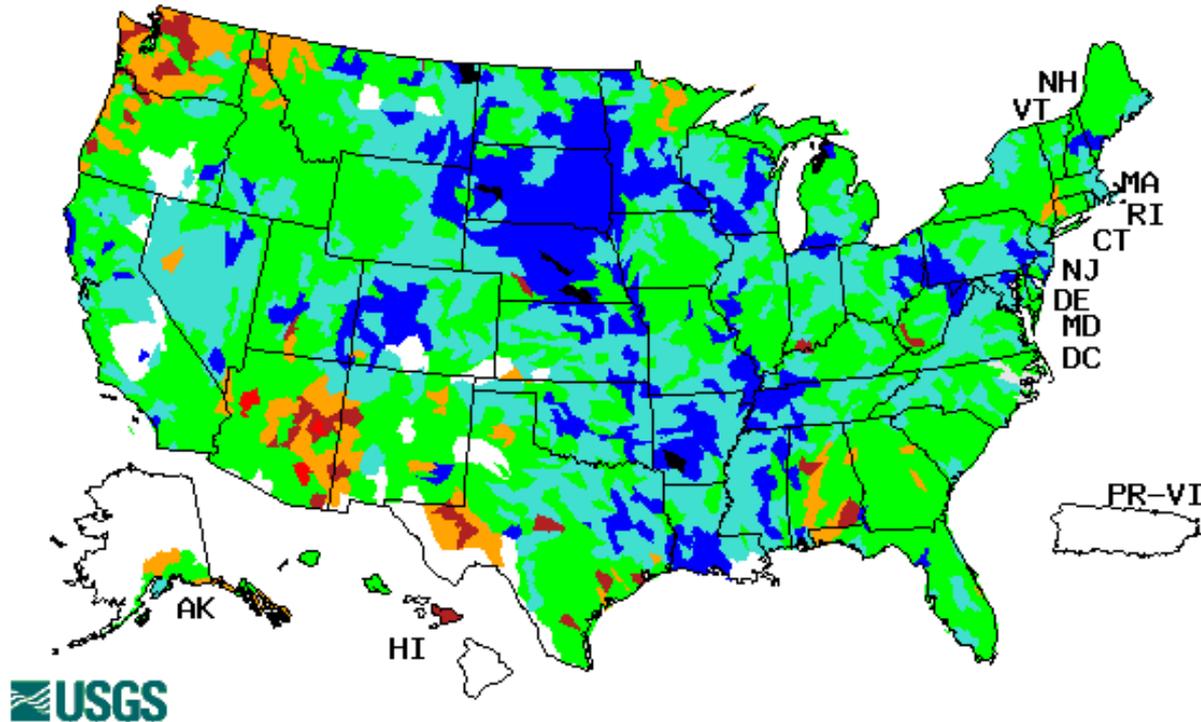
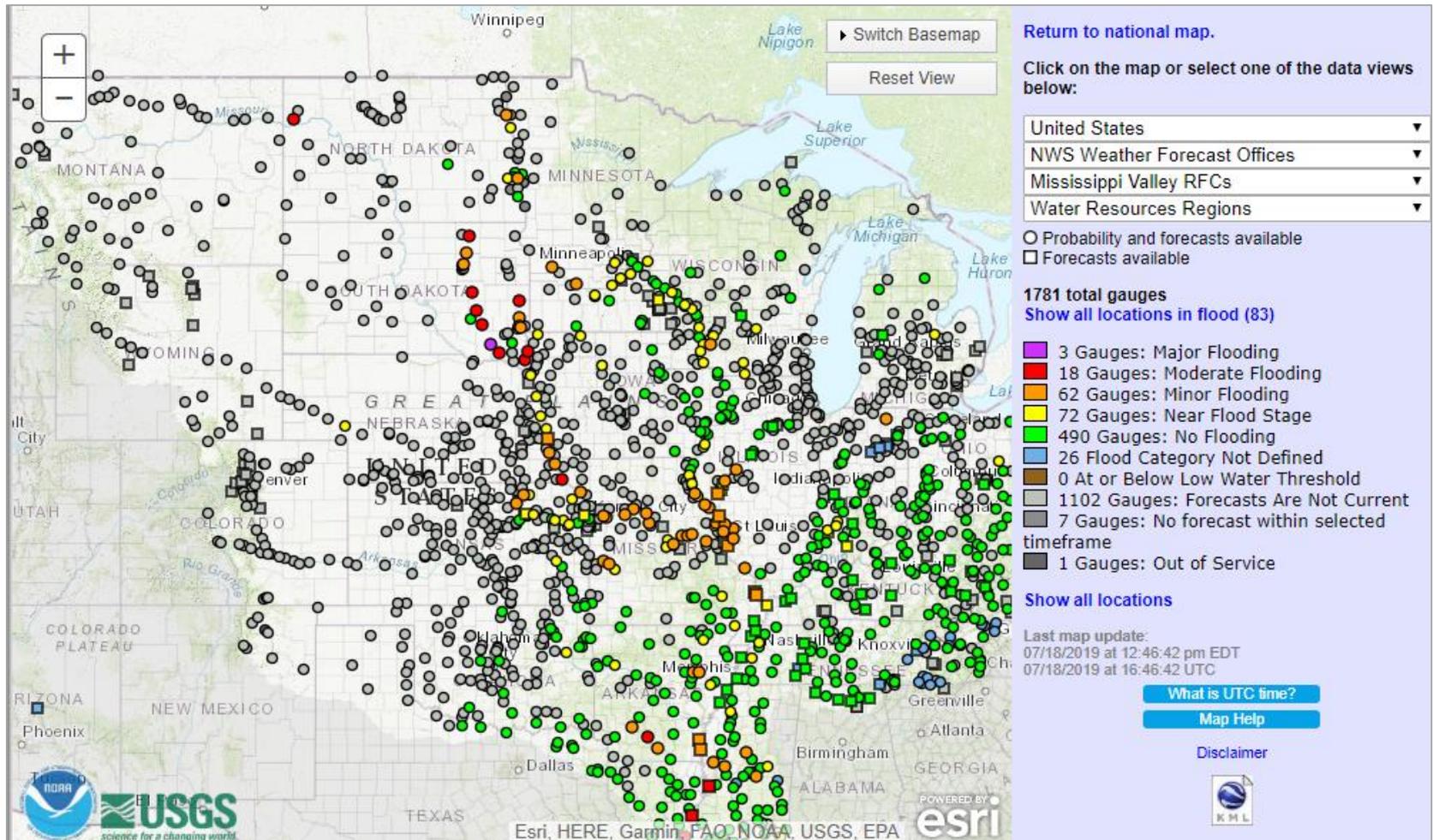| Color	Range	
	85 - 100	Better
	73 - 84	
	61 - 72	
	49 - 60	
	37 - 48	
	25 - 36	
	13 - 24	
	7 - 12	
	1 - 6	Worse
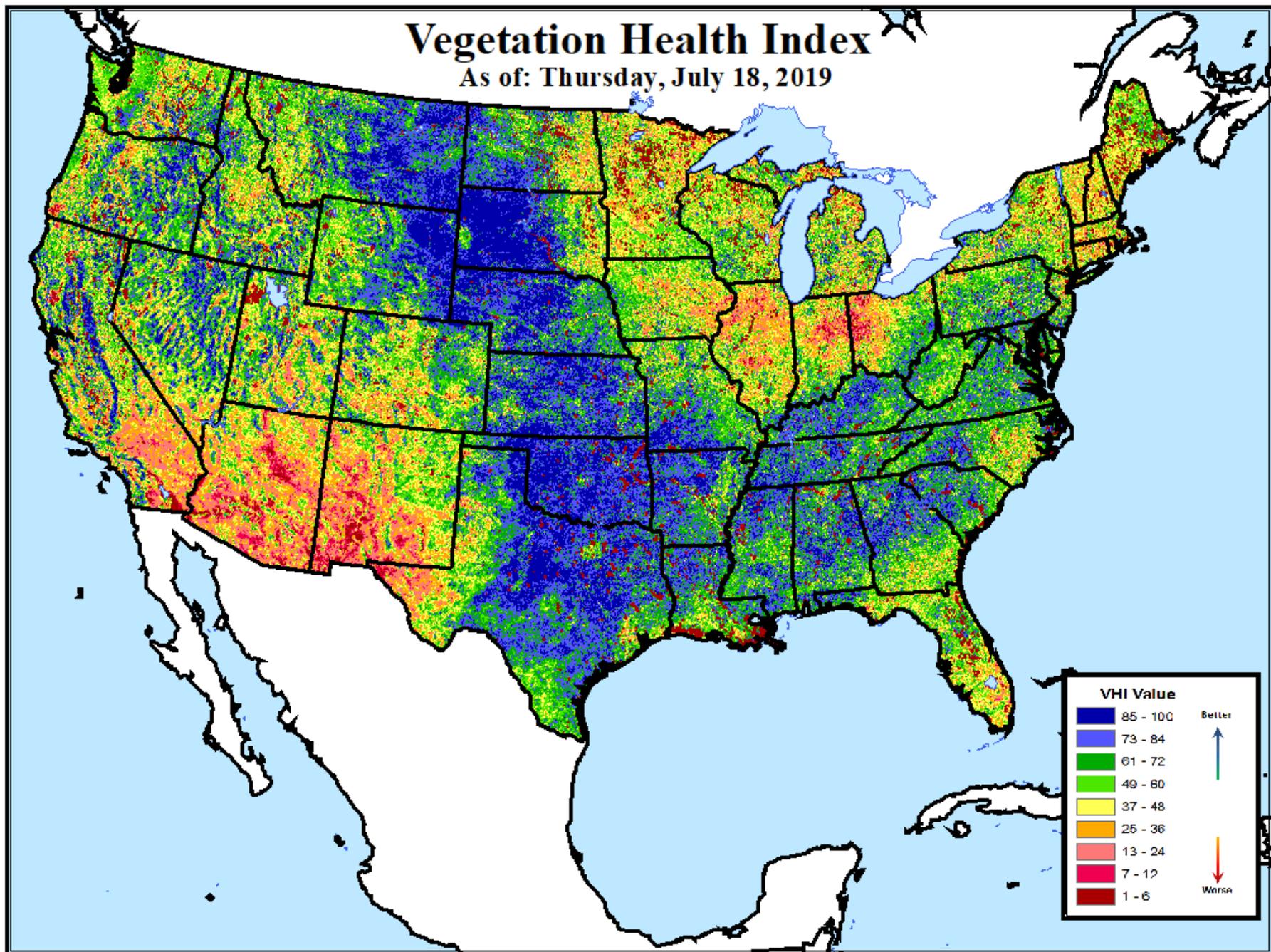
7-day Average Streamflow
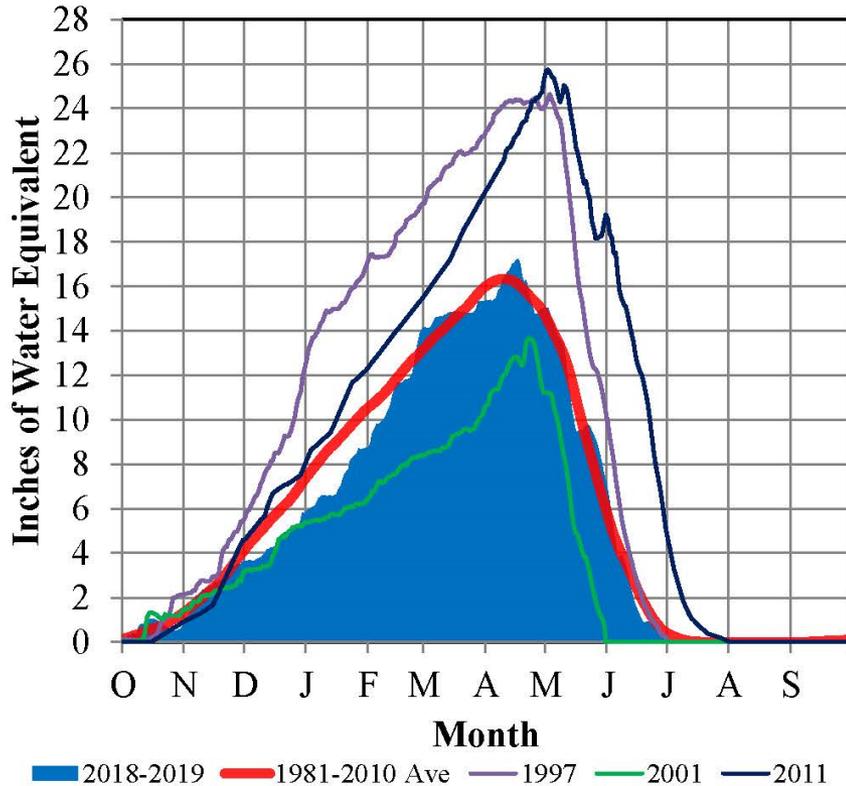# in Historical Context for Date

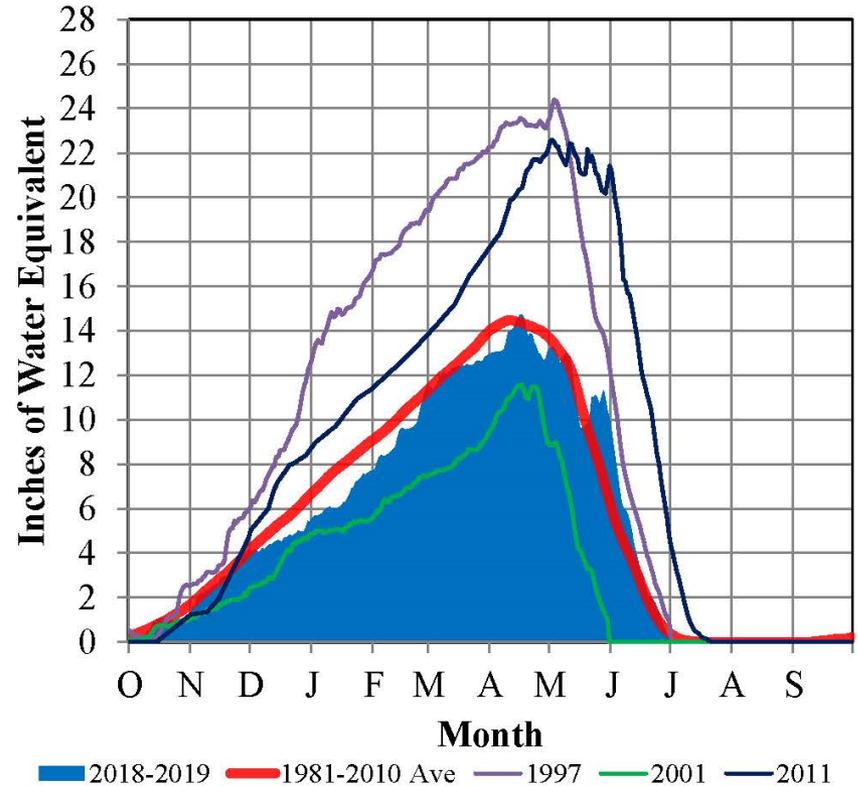Wednesday, July 17, 2019

Current Flooding

Missouri River Basin – Mountain Snowpack Water Content 2018-2019 with comparison plots from 1997*, 2001*, and 2011

8-Jul-2019

Total above Fort Peck

Total Fort Peck to Garrison

The Missouri River Basin mountain snowpack normally peaks near April 15. On July 8, the mountain Snow Water Equivalent (SWE) in the "Total above Fort Peck" reach has melted. The "Total above Fort Peck" reach peaked at 17.2" on April 18, 105% of the normal April 15 peak. On July 8, the mountain Snow Water Equivalent (SWE) in the "Total Fort Peck to Garrison" reach has melted. The snowpack in the "Total Fort Peck to Garrison" reach peaked at 14.9" on April 17, 104% of the normal April 15 peak.
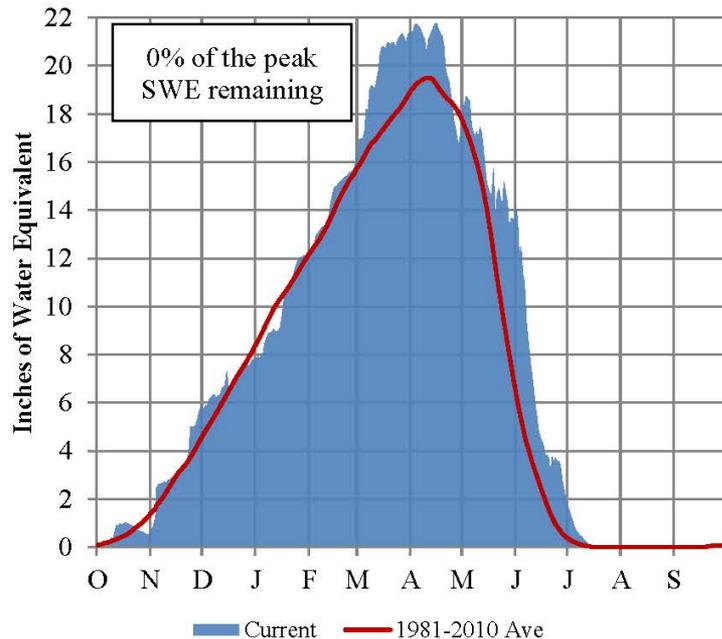
*Generally considered the high and low year of the last 20-year period, respectively   Provisional data. Subject to revision.
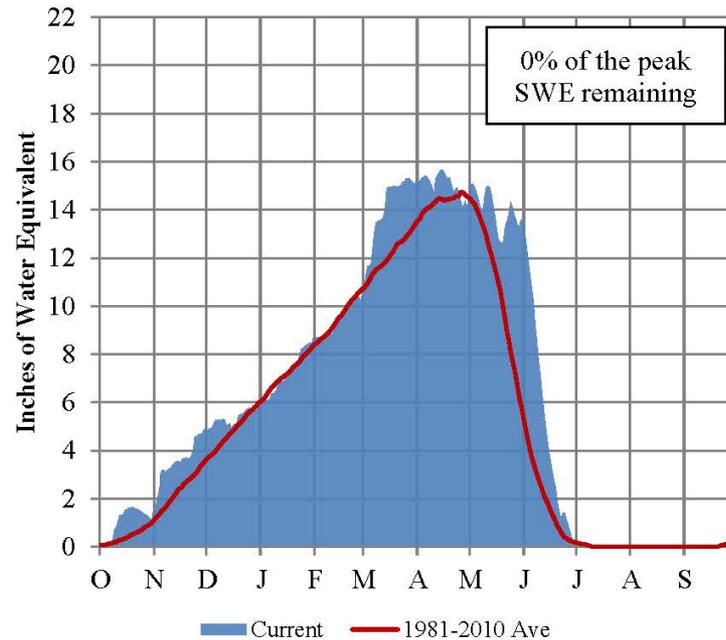
Platte River Basin - Mountain Snowpack Water Content
Water Year 2018-2019
July 17, 2019

Total North Platte

0% of the peak SWE remaining

Inches of Water Equivalent

O N D J F M A M J J A S

■ Current ━ 1981-2010 Ave

Total South Platte

0% of the peak SWE remaining

Inches of Water Equivalent

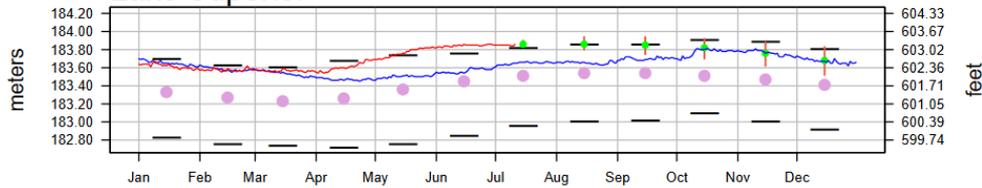O N D J F M A M J J A S

■ Current ━ 1981-2010 Ave

The North and South Platte River Basin mountain snowpacks normally peak near April 15 and the end of April, respectively. As of July 16, 2019, the mountain snowpack SWE in the "Total North Platte" reach peaked at 21.8" and currently has 0% of the peak SWE remaining. The mountain snowpack SWE in the "Total South Platte" reach peaked at 15.7" and currently has 0% of the peak SWE remaining.
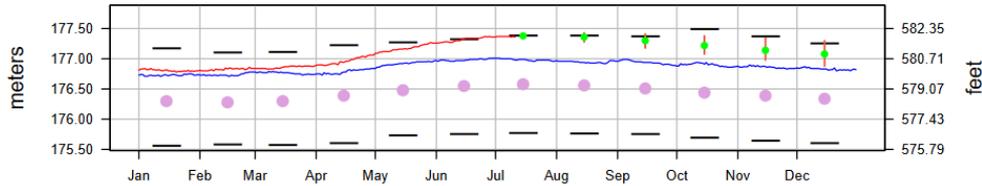
Great Lakes Water Levels

- Lake Superior, Lake St. Clair, Lake Erie, and Lake Ontario set record high water levels for the month of June, with levels 31-35 inches above monthly averages.

- Lake Michigan-Huron rose to within one inch of the record high water level for the month of June, with level 14 inches above monthly average.

Impacts of High Water Levels

Photos courtesy of Aaron Wilson, State Climate Office of Ohio
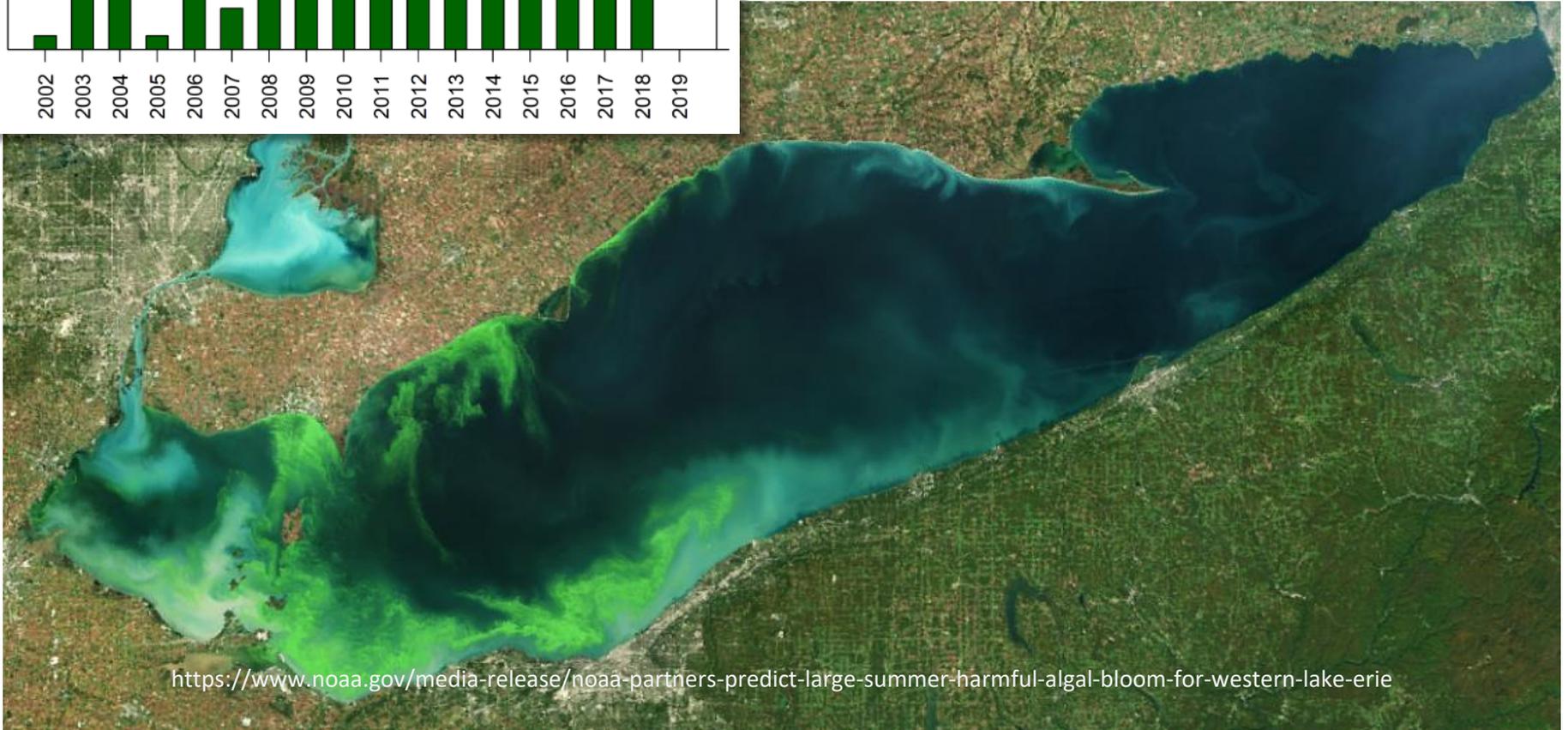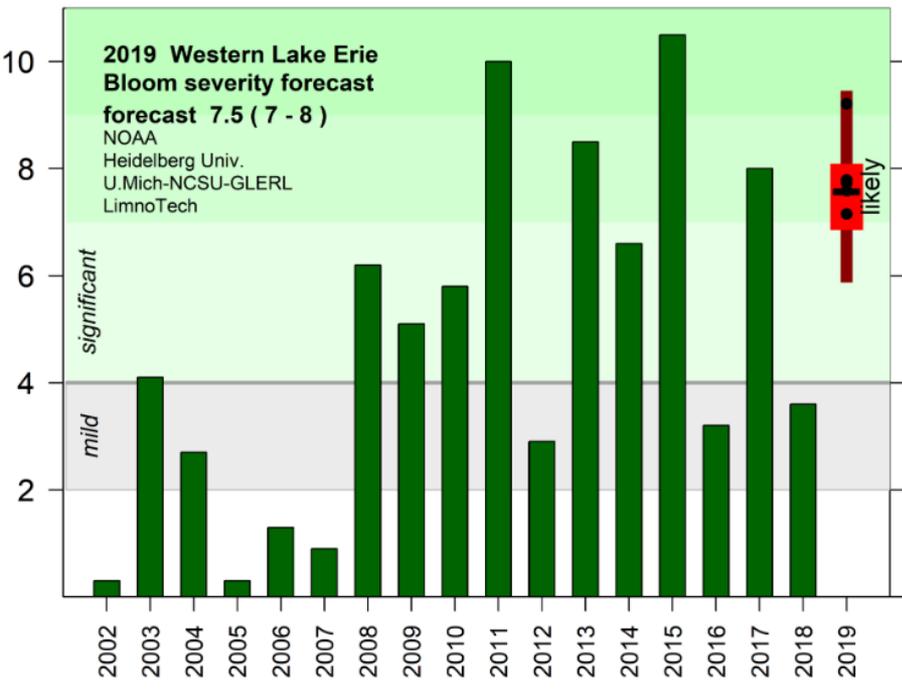
- Coastal erosion

- Damage to property and infrastructure

- Economic impacts to tourism

- While lake levels are projected to drop, wind-related flooding concerns will remain

HAB Forecast

2019 Western Lake Erie
Bloom severity forecast
forecast 7.5 (7 - 8)
NOAA
Heidelberg Univ.
U.Mich-NCSU-GLERL
LimnoTech

- Forecast for harmful algae bloom on western Lake Erie

U.S. Drought Monitor
NWS Central Region

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	95.54	4.46	0.70	0.06	0.00	0.00
Last Week 07-09-2019	93.72	6.28	1.11	0.20	0.00	0.00
3 Months Ago 04-16-2019	95.40	4.60	0.77	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 07-17-2018	71.92	28.08	16.48	8.98	4.70	1.23

Intensity:

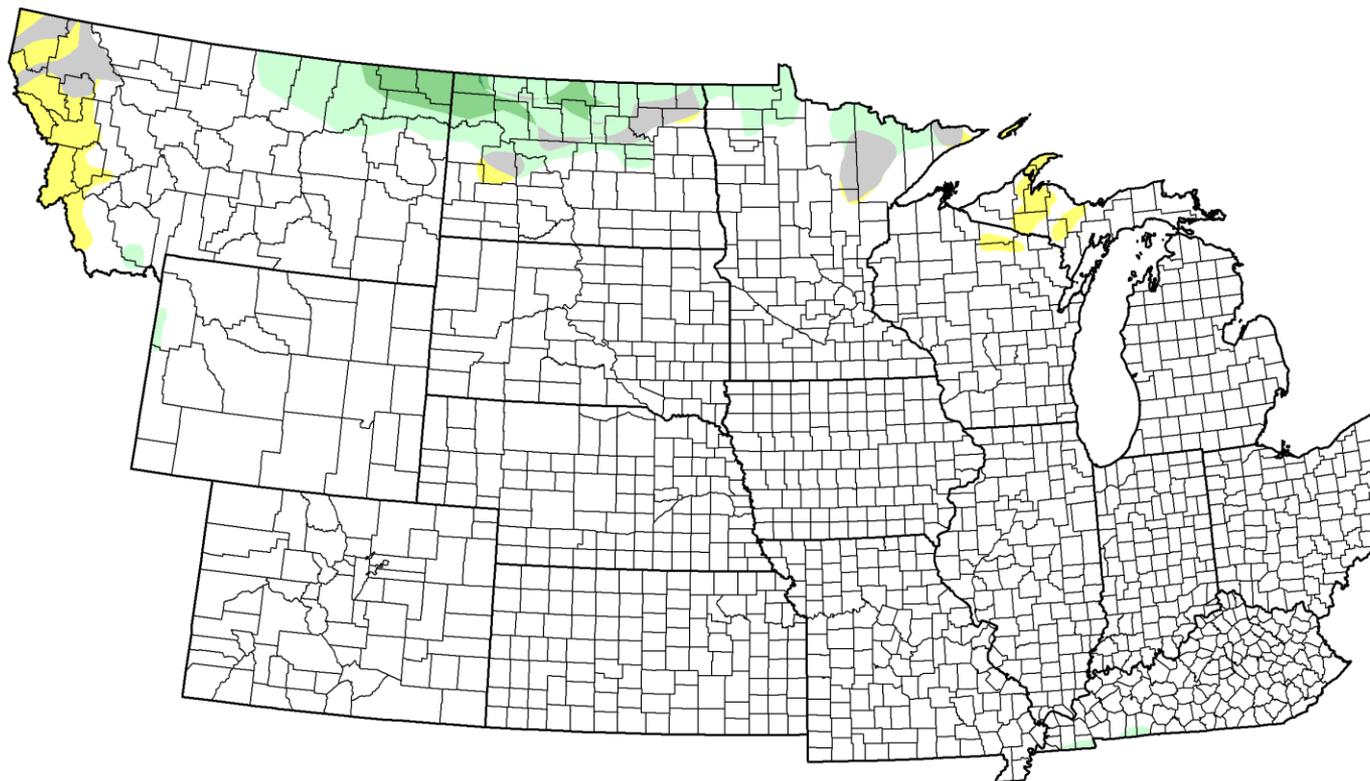| None | D2 Severe Drought |
| D0 Abnormally Dry | D3 Extreme Drought |
| D1 Moderate Drought | D4 Exceptional Drought |
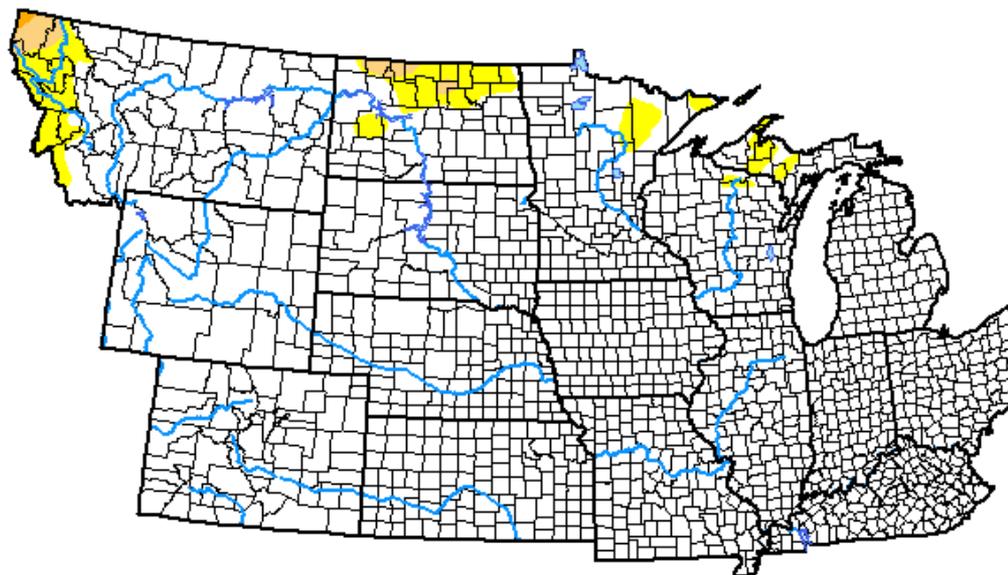
The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.

Author:
Brad Rippey
U.S. Department of Agriculture

USDA   NDMC   NOAA

droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - NWS Central Region
1 Month

July 16, 2019 compared to June 18, 2019

droughtmonitor.unl.edu

NDMC
NATIONAL DROUGHT MITIGATION CENTER
UNIVERSITY OF NEBRASKA

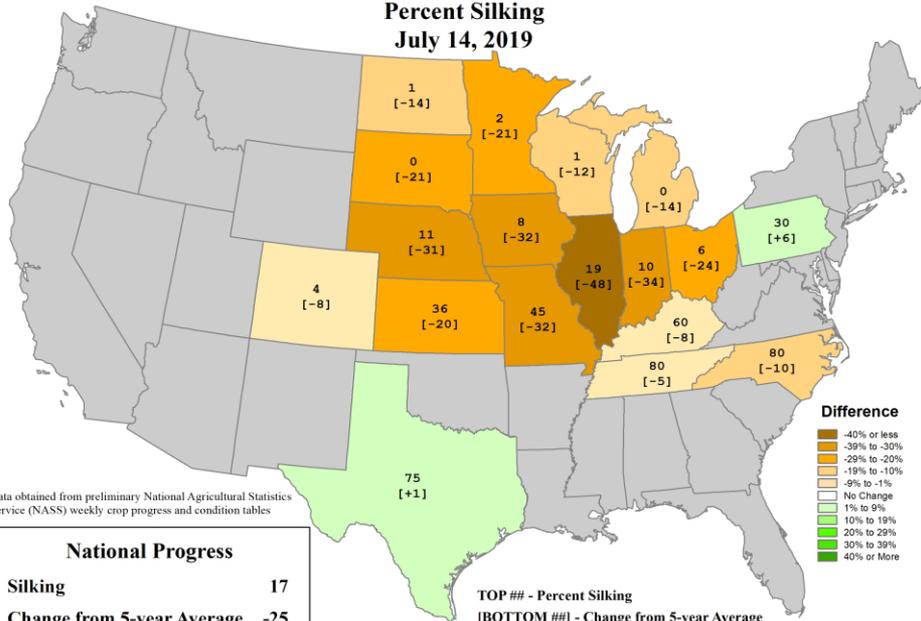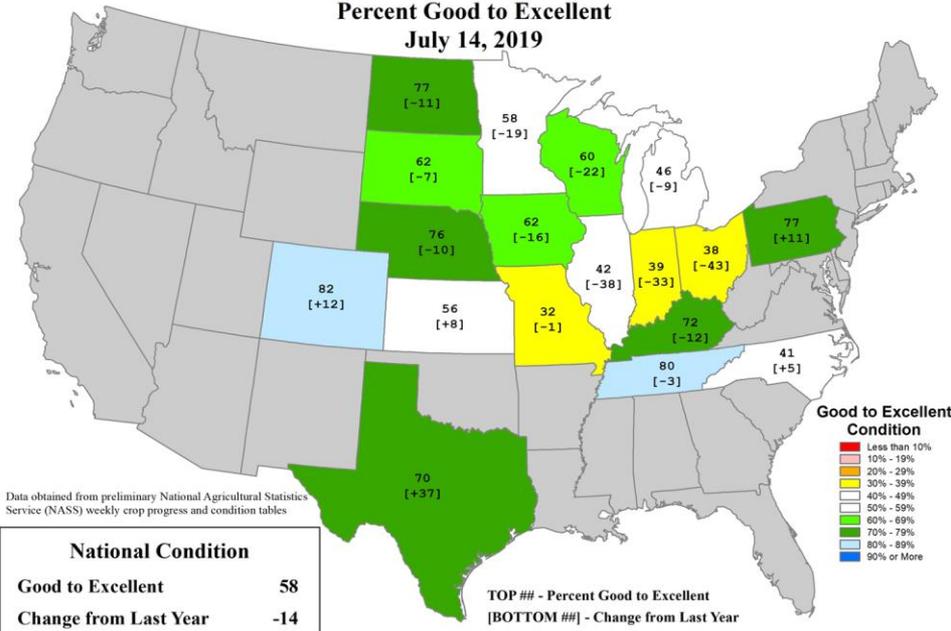| Legend |
|--------|
| 5 Class Degradation |
| 4 Class Degradation |
| 3 Class Degradation |
| 2 Class Degradation |
| 1 Class Degradation |
| No Change |
| 1 Class Improvement |
| 2 Class Improvement |
| 3 Class Improvement |
| 4 Class Improvement |
| 5 Class Improvement |

Impacts: Corn

U.S. Corn Progress
Percent Silking
July 14, 2019

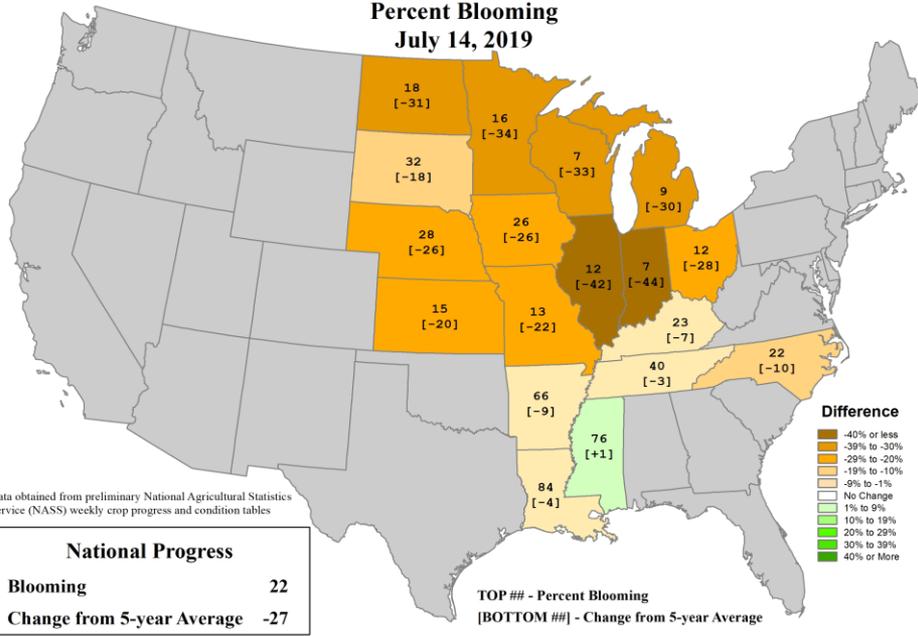**U.S. Corn Conditions**
Percent Good to Excellent
July 14, 2019

- Condition of corn is significantly related to planting date
- Wet conditions have resulted in poorly developed root systems in many areas, making plants particularly vulnerable to rapid depletion of near-surface soil moisture
- Late-planted corn will have an elevated risk of frost damage in the fall
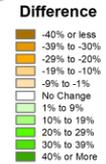
Impacts: Soybeans

U.S. Soybeans Progress — Percent Blooming July 14, 2019

U.S. Soybean Conditions — Percent Good to Excellent July 14, 2019

- Late-planted soybeans are not canopying, resulting in issues with weeds.
- Freeze risk is less of a concern with beans compare with corn

Impacts: Wheat

- Progressed was slowed by cool spring weather.
- Some delays in harvest due to wet conditions and late planting dates last fall.
- Impacts from hail in Kansas.

U.S. Pasture and Range Conditions

Percent Good to Excellent
July 14, 2019

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

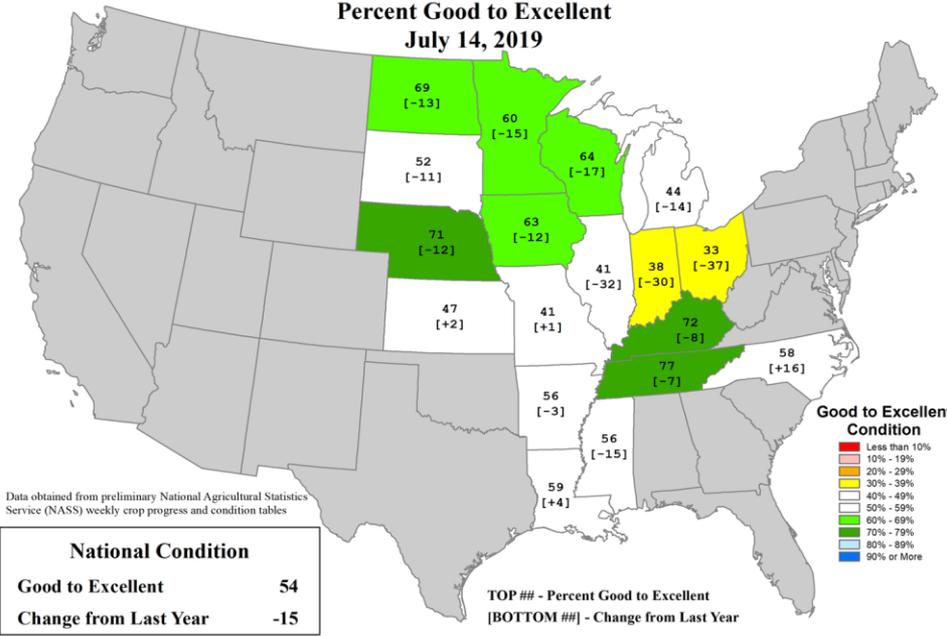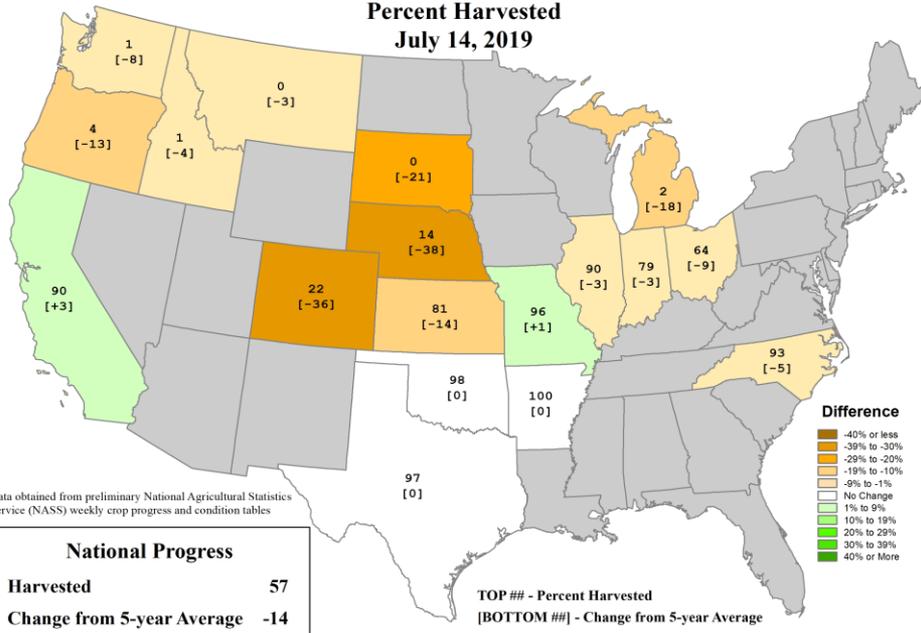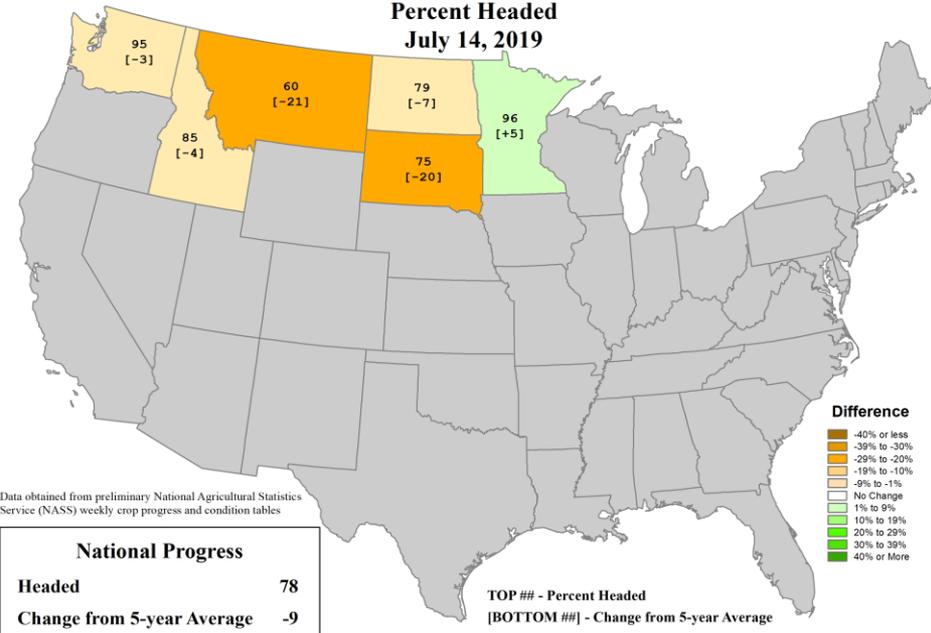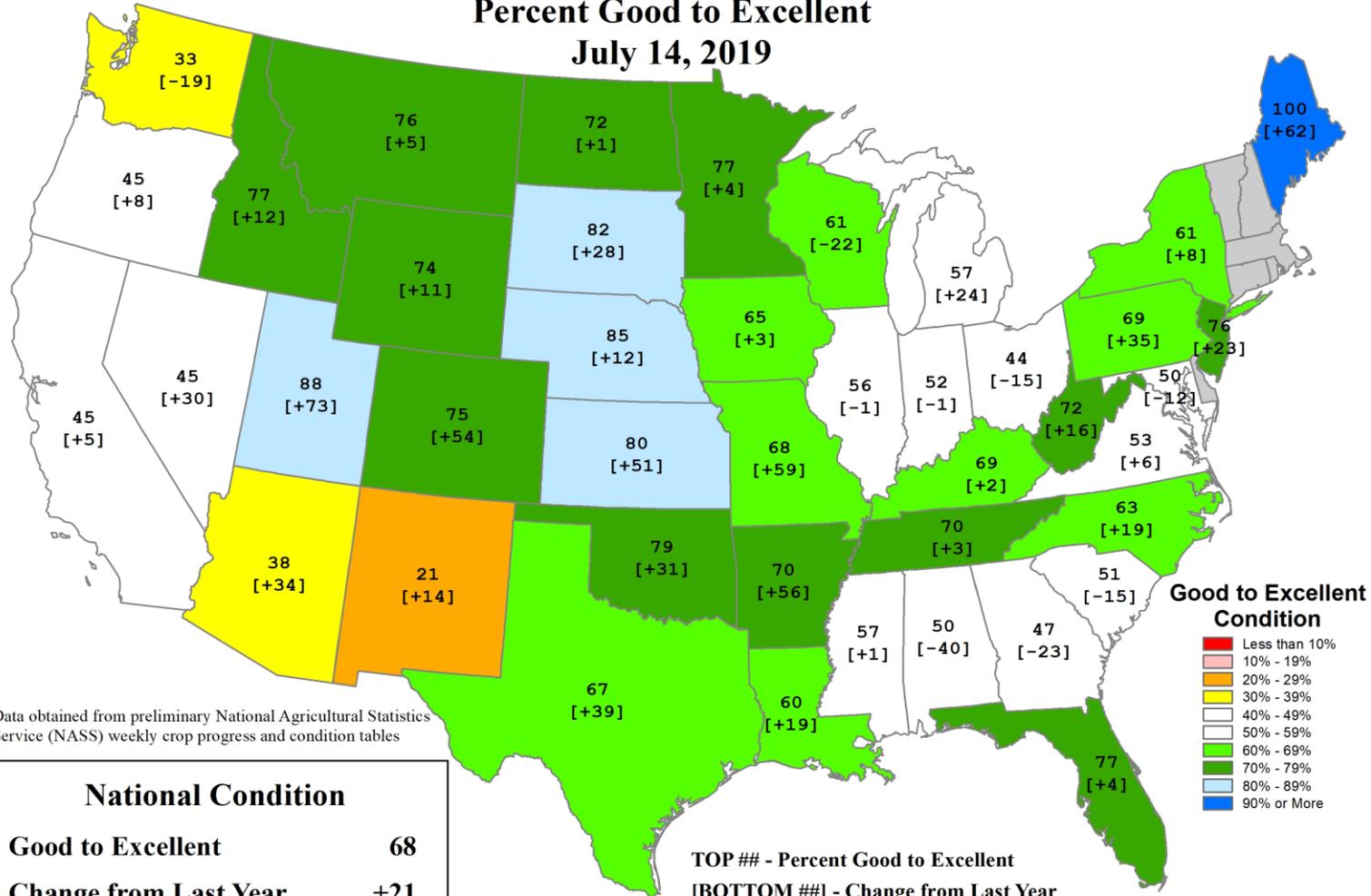| State values (Top ## - Percent Good to Excellent / [Bottom ##] - Change from Last Year) |
|---|
| 33 [−19] |
| 45 [+8] |
| 76 [+5] |
| 72 [+1] |
| 77 [+4] |
| 100 [+62] |
| 77 [+12] |
| 74 [+11] |
| 82 [+28] |
| 61 [−22] |
| 57 [+24] |
| 61 [+8] |
| 45 [+30] |
| 88 [+73] |
| 85 [+12] |
| 65 [+3] |
| 44 [−15] |
| 69 [+35] |
| 76 [+23] |
| 45 [+5] |
| 75 [+54] |
| 80 [+51] |
| 68 [+59] |
| 56 [−1] |
| 52 [−1] |
| 50 [−12] |
| 72 [+16] |
| 53 [+6] |
| 38 [+34] |
| 21 [+14] |
| 79 [+31] |
| 70 [+56] |
| 70 [+3] |
| 69 [+2] |
| 63 [+19] |
| 67 [+39] |
| 60 [+19] |
| 57 [+1] |
| 50 [−40] |
| 47 [−23] |
| 51 [−15] |
| 77 [+4] |

Good to Excellent Condition

Color	Range
Red	Less than 10%
Pink	10% - 19%
Orange	20% - 29%
Yellow	30% - 39%
White	40% - 49%
Gray	50% - 59%
Light Green	60% - 69%
Dark Green	70% - 79%
Light Blue	80% - 89%
Blue	90% or More

TOP ## - Percent Good to Excellent

[BOTTOM ##] - Change from Last Year

National Condition

Good to Excellent	68
Change from Last Year	+21

Prosper, Cass County (East Central ND), North Dakota, July 15 (Photo: Darin Eisinger, NDSU Crop and Pest Report, provided courtesy of Adnan Akyuz, NDSCO). "Even if flooding does not kill the plant, it may have a long-term negative impact on crop performance." According to Hans Kandel, NDSU Plant Scientist.


Yellow clover in western South Dakota. Photo courtesy of Laura Edwards, SDSCO.

Selected Impacts of Extraordinarily Wet Conditions

Flooding in south central Nebraska from 10-15 inches of rain in early July impacted communities along the Platte and Republican rivers. Harlan County Reservoir (photo courtesy of Al Dutcher). This highlights challenges faced by the Army Corps of Engineers in managing river systems under stress from extreme precipitation over an extended period.

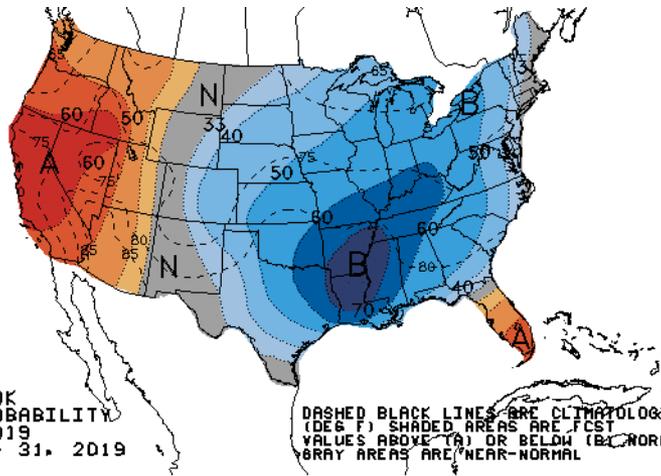# 7-day Quantitative Precipitation Forecast
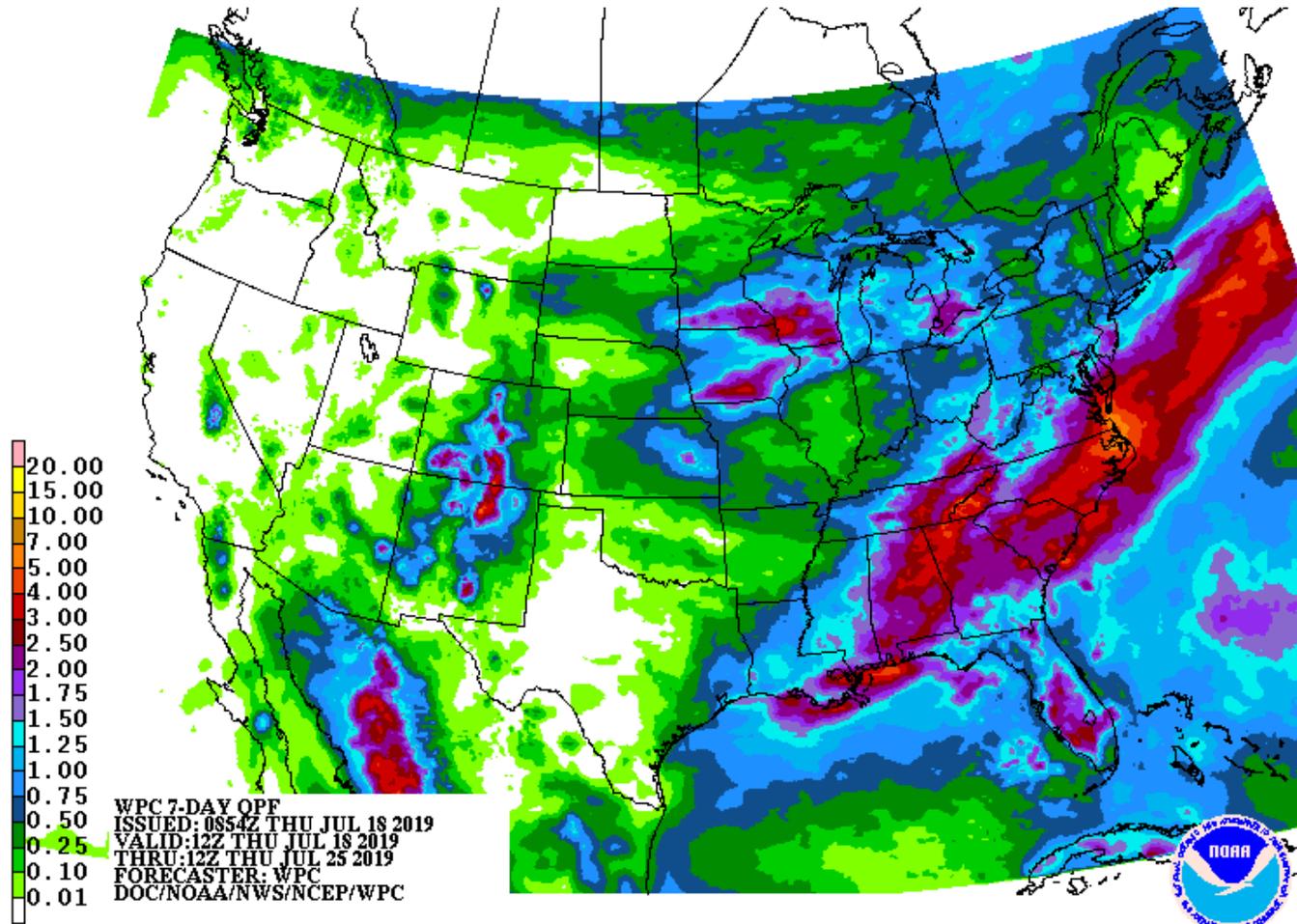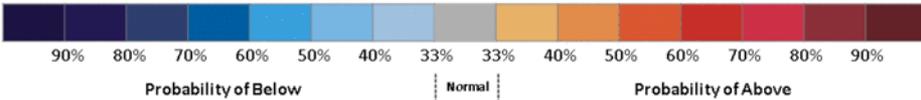
8-14 Day Outlook
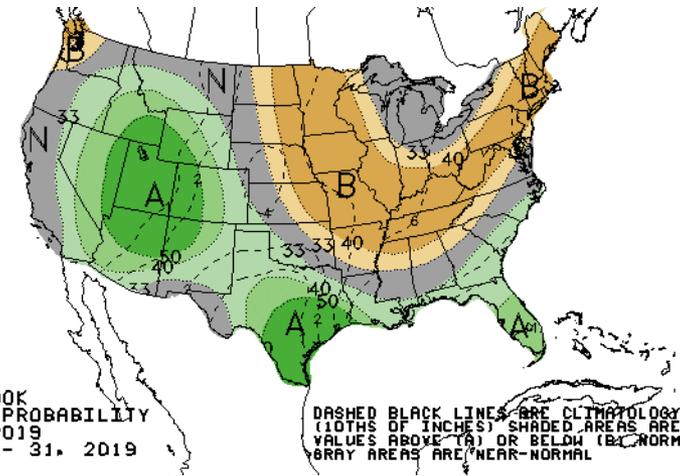## Jul 25 – Jul 31
Climate Prediction Center

Probabilistic ENSO Forecast

Early–July 2019 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: –0.5 °C to 0.5 °C
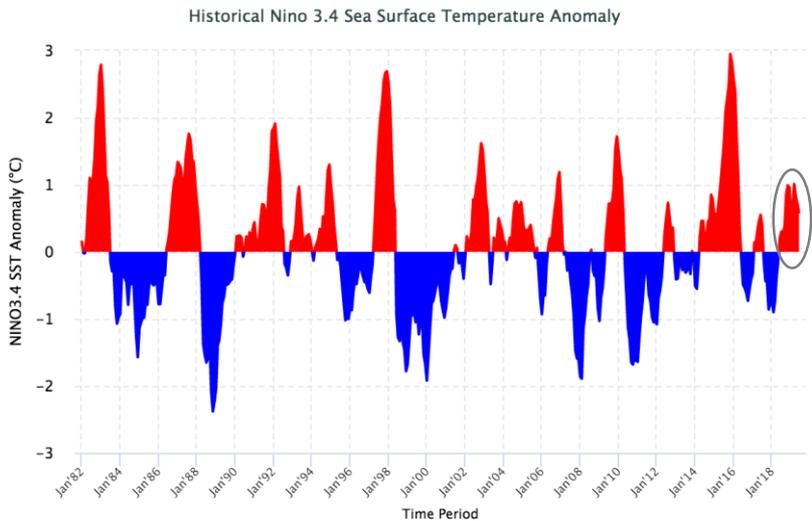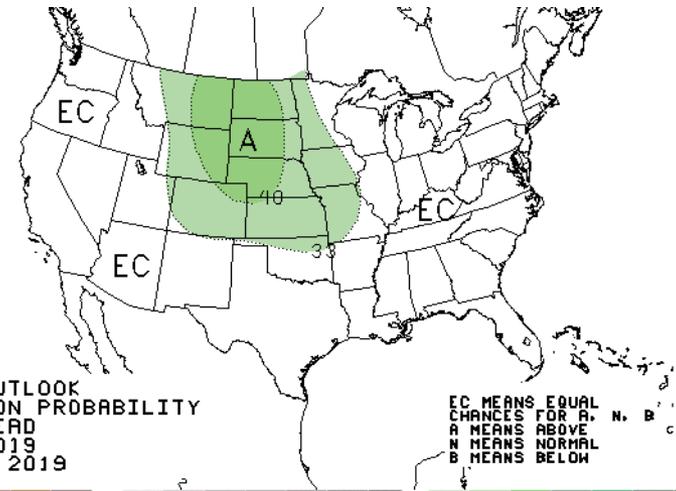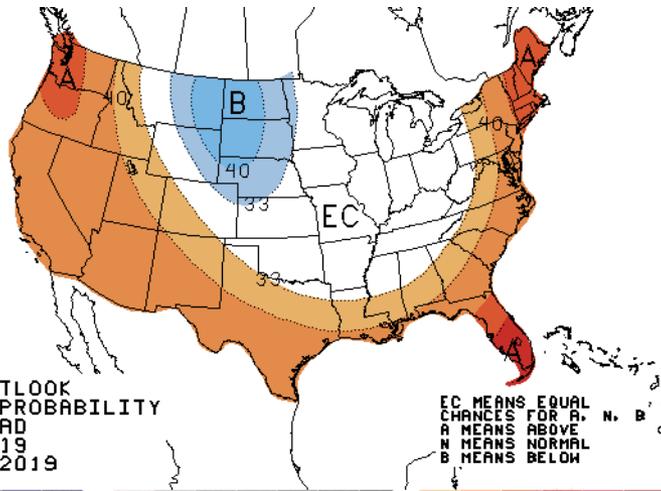
ENSO Event Tendencies

- Develop during the Apr-Jun period

- Peak during the Oct-Feb period

- Persist 9-12 months

- Recur every 2-7 years

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2010	1.5	1.3	0.9	0.4	-0.1	-0.6	-1.0	-1.4	-1.6	-1.7	-1.7	-1.6
2011	-1.4	-1.1	-0.8	-0.6	-0.5	-0.4	-0.5	-0.7	-0.9	-1.1	-1.1	-1.0
2012	-0.8	-0.6	-0.5	-0.4	-0.2	0.1	0.3	0.3	0.3	0.2	0.0	-0.2
2013	-0.4	-0.3	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.4	-0.2	0.1	0.3	0.2	0.1	0.0	0.2	0.4	0.6	0.7
2015	0.6	0.6	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.5	2.6
2016	2.5	2.2	1.7	1.0	0.5	0.0	-0.3	-0.6	-0.7	-0.7	-0.7	-0.6
2017	-0.3	-0.1	0.1	0.3	0.4	0.4	0.2	-0.1	-0.4	-0.7	-0.9	-1.0
2018	-0.9	-0.8	-0.6	-0.4	-0.1	0.1	0.1	0.2	0.4	0.7	0.9	0.8
2019	0.8	0.8	0.8	0.8	0.7							

Historical Nino 3.4 Sea Surface Temperature Anomaly

https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-quicklook

Monthly Outlook for August
Climate Prediction Center

ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID AUG 2019
MADE 18 JUL 2019

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID AUG 2019
MADE 18 JUL 2019

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

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

Seasonal Outlook for Aug-Sep-Oct

Climate Prediction Center
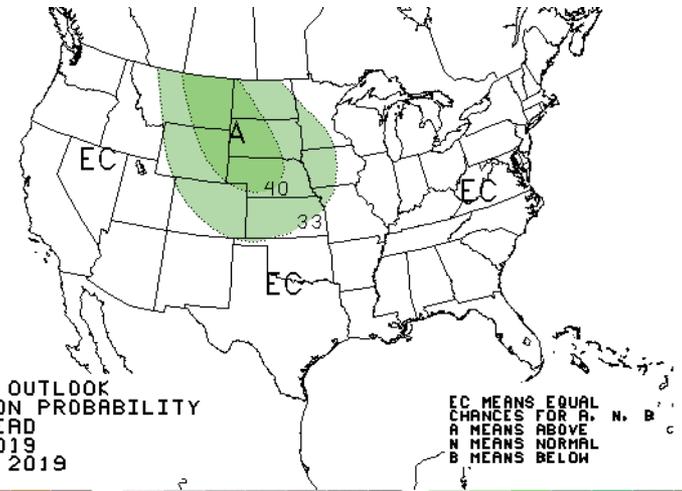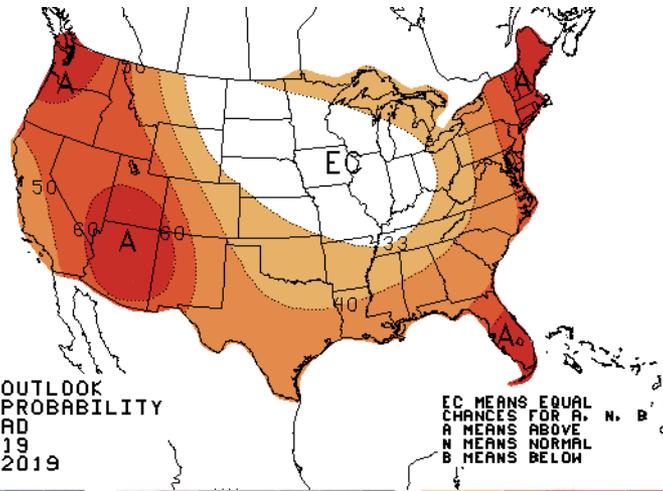
Outlook for Drought and Wildland Fire

Summary

- The effects of extraordinarily wet conditions across much of the region continue to be felt.

- With elevated soil moisture and stream flows, vulnerability to flooding and flash flooding remains.

- Pockets of dryness are becoming noticeable in some areas, though improvement in drought conditions are evident across the northern tier.

- El Niño is likely to diminish with a return to neutral conditions likely.

- Wet conditions are favored over the next month and season, particularly in the Great Plains, but crops have heightened vulnerability to flash drought.

Additional Information

❑ 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 for your participation!