Midwest/Great Plains Climate-Drought Outlook

September 17, 2020

Brian Fuchs
National Drought Mitigation Center
University of Nebraska-Lincoln
School of Natural Resources

NDMC

NATIONAL DROUGHT MITIGATION CENTER
UNIVERSITY OF NEBRASKA

General Information

Smokey sun in Iowa from Dennis Todey

- **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**
  - October 15, 2020 (1 PM CST) with **Laura Edwards**, South Dakota State Climatologist and **Brad Rippey**, USDA

- **Access to Future Climate Webinars and Related Information**
- www.drought.gov/drought/content/regional-programs/regional-drought-webinars
- **Access to Past Climate Webinars**
- *mrcc.isws.illinois.edu/multimedia/webinars.jsp*
- *www.hprcc.unl.edu/webinars.php*

NATIONAL DROUGHT MITIGATION CENTER NDMC UNIVERSITY OF NEBRASKA

USDA United States Department of Agriculture Midwest Climate Hub

AASC AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION U.S. DEPARTMENT OF COMMERCE

REGIONAL CLIMATE CENTERS

Agenda

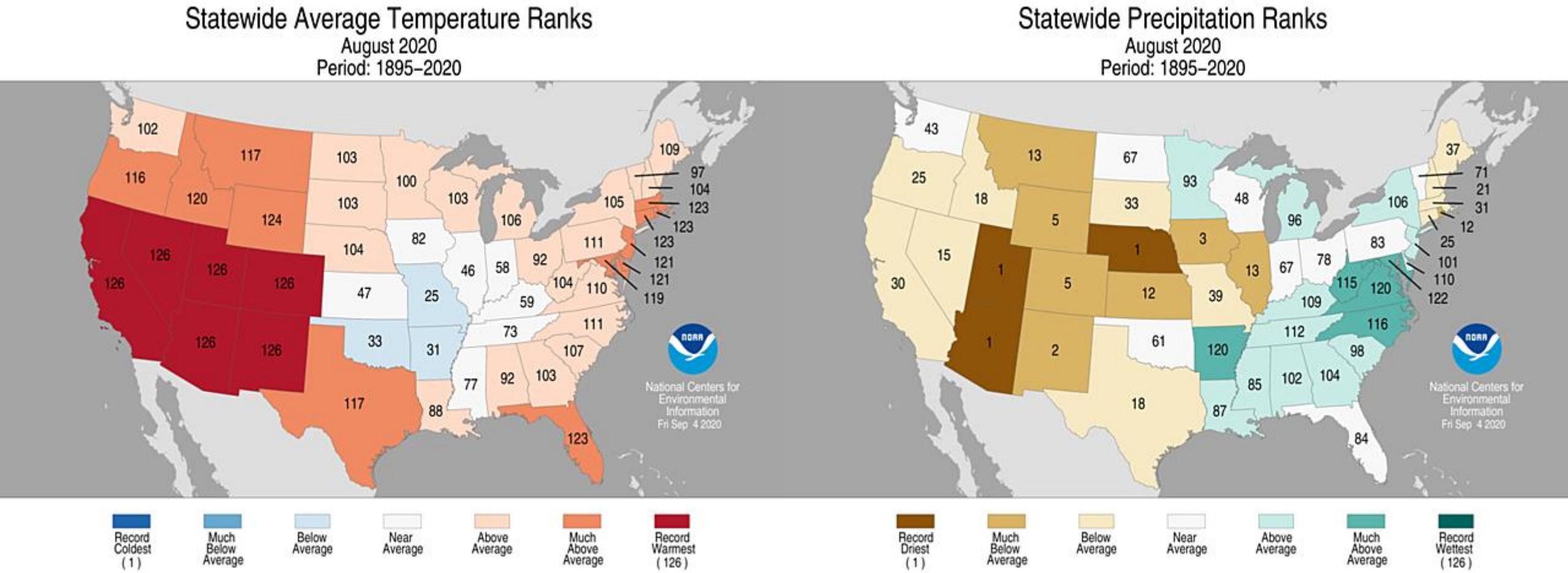
- Current/Recent Past Conditions
- Regional Impacts
  - General
  - Hydrological
  - Agricultural
- Outlooks
- Questions

Photos from Becky Bolinger in Colorado

Current Conditions

Smoke over flowers in Minnesota from Pete Boulay

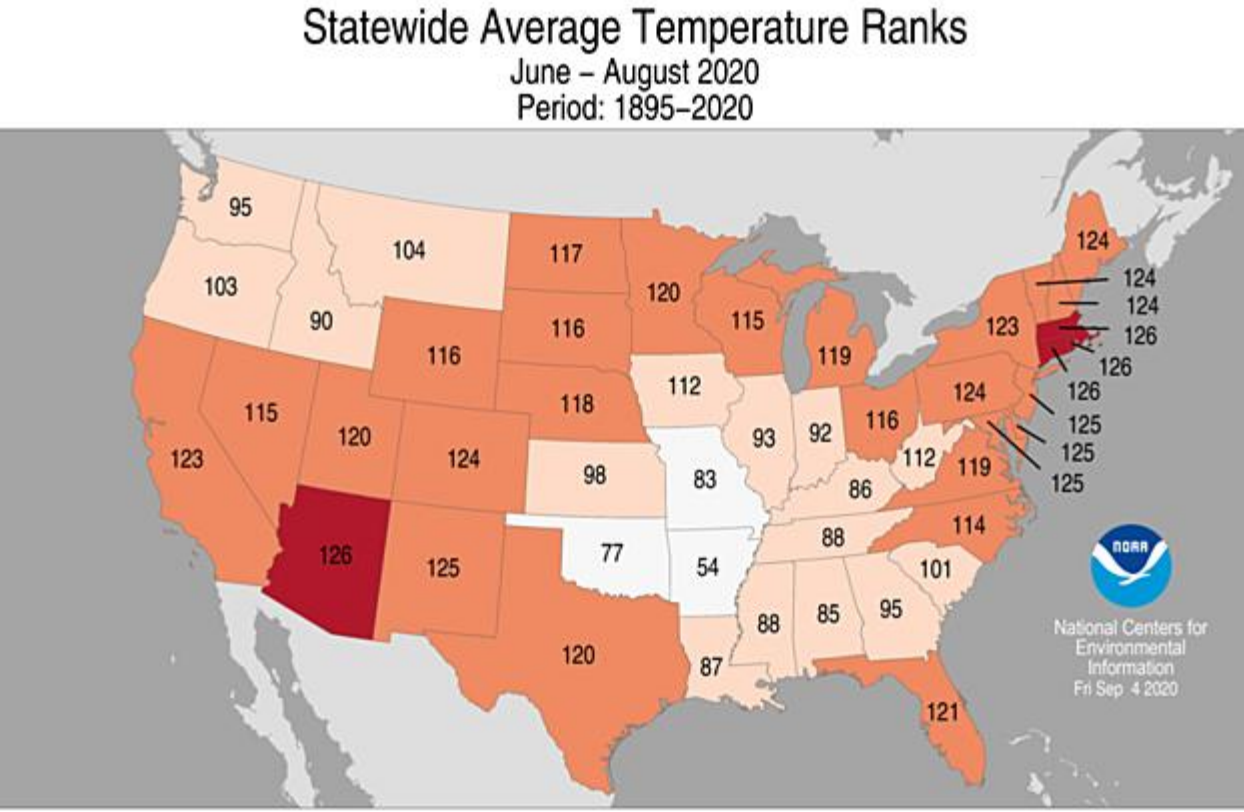
August Climatology from NCEI

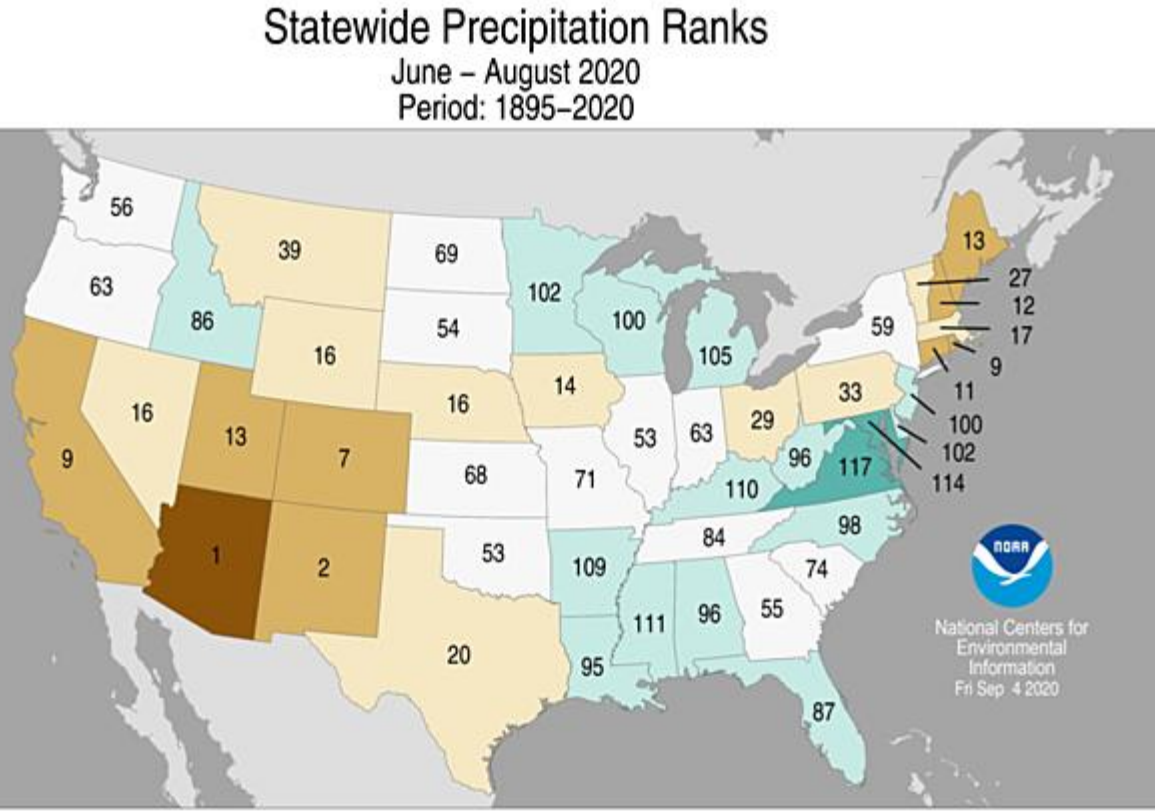


https://www.ncdc.noaa.gov/sotc/

Summer Climatology from NCEI

The contiguous United States had its 4th warmest summer on record

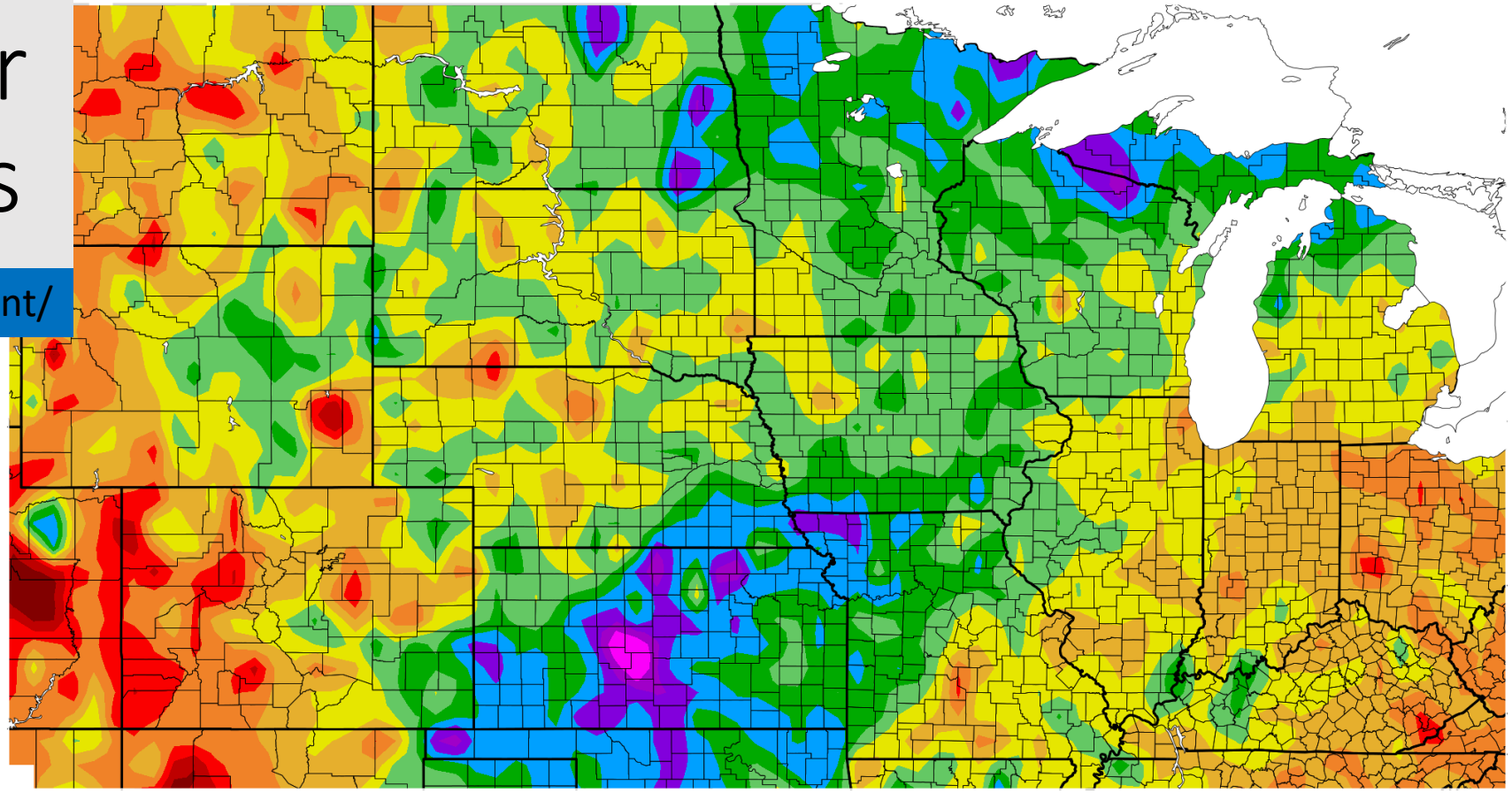




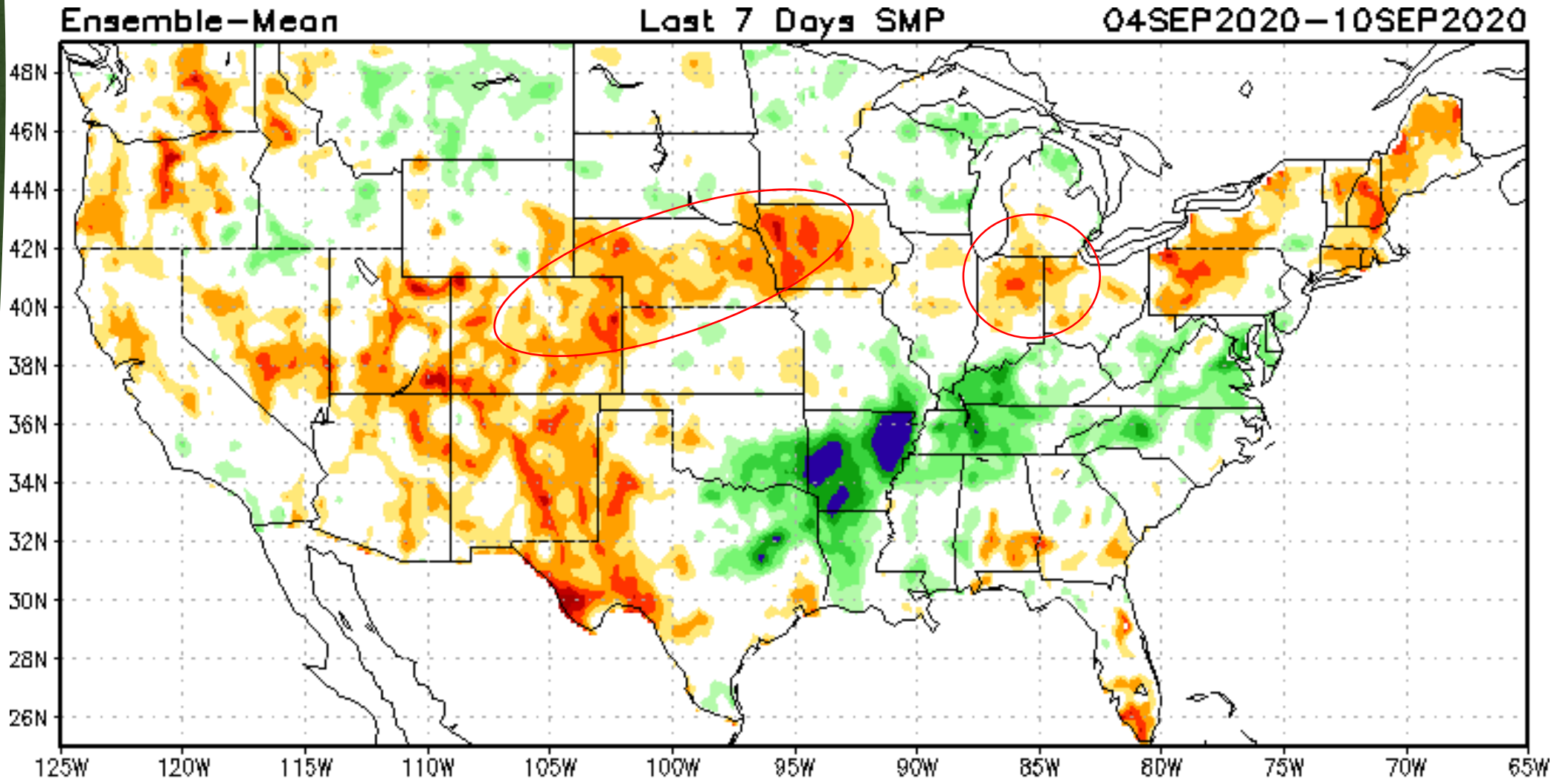
https://www.ncdc.noaa.gov/sotc/

Temperature departures over the last 30 Days

http://www.hprcc.unl.edu/maps/current/



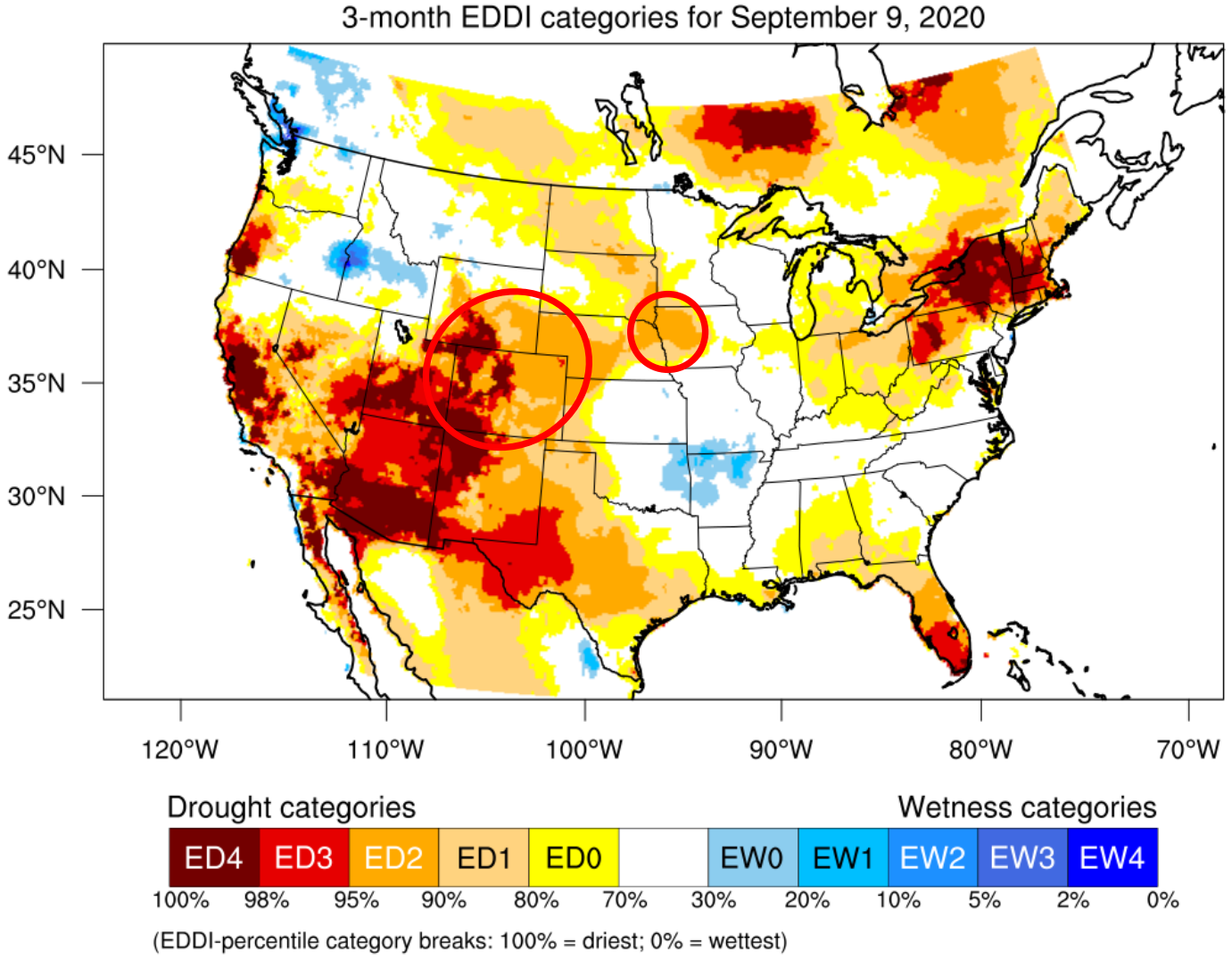
Current Soil Moisture Anomaly



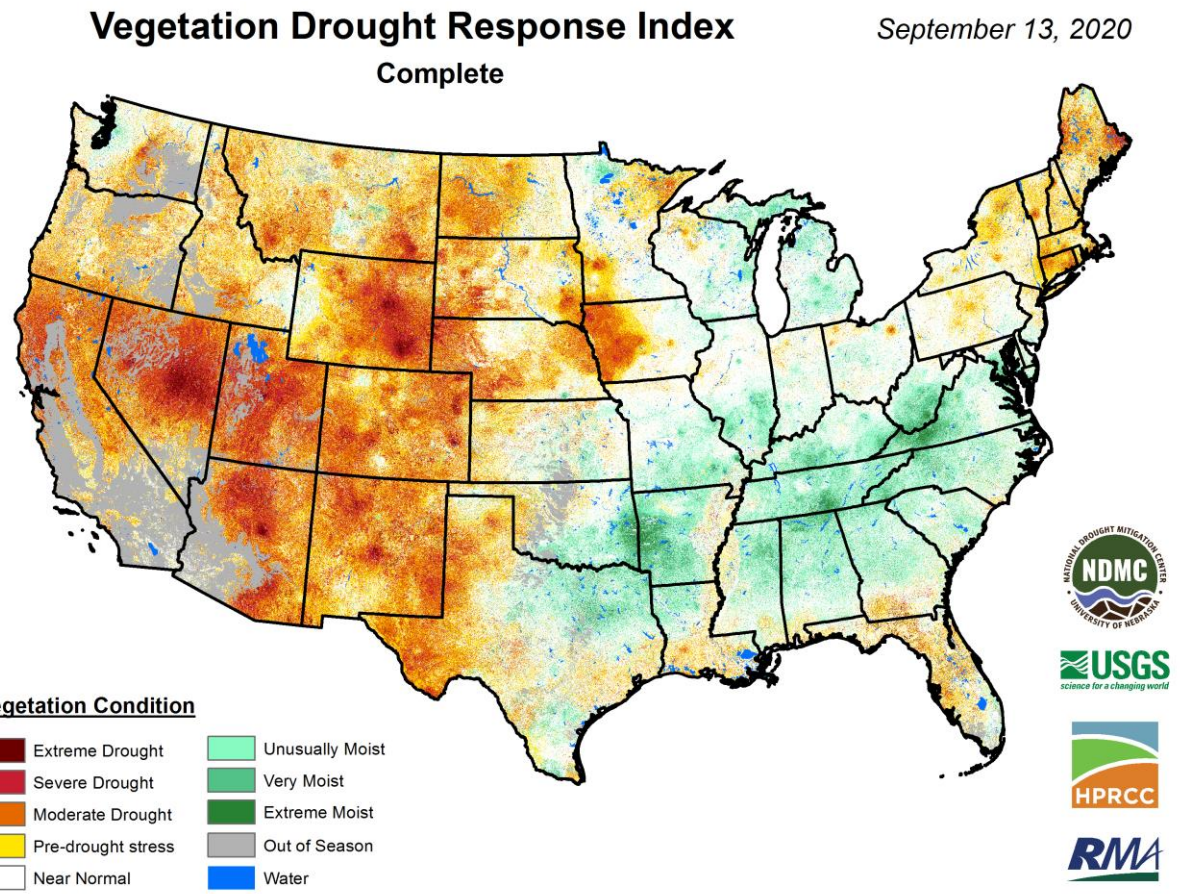
https://www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp_new.shtml#

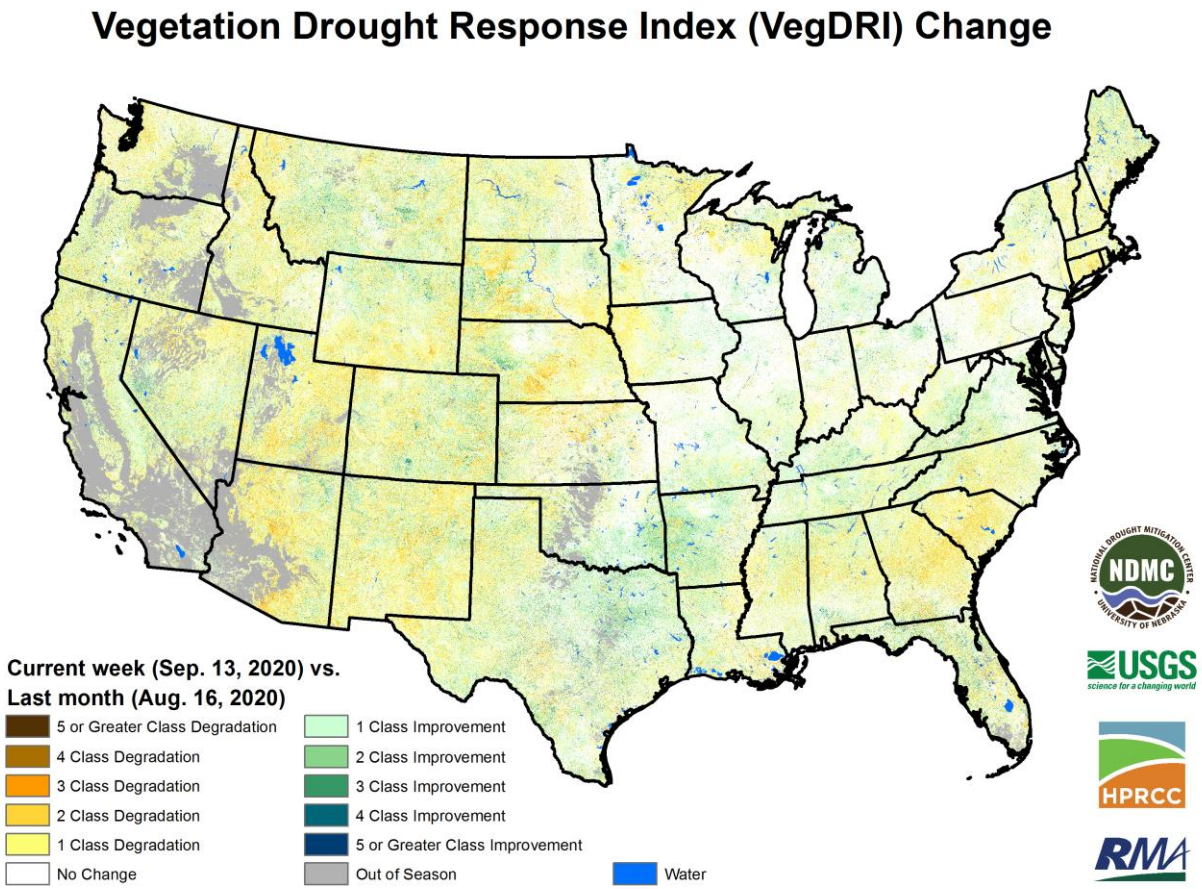
Evaporative Demand Drought Index (EDDI)

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



Vegetation Drought Response Index (VegDRI)

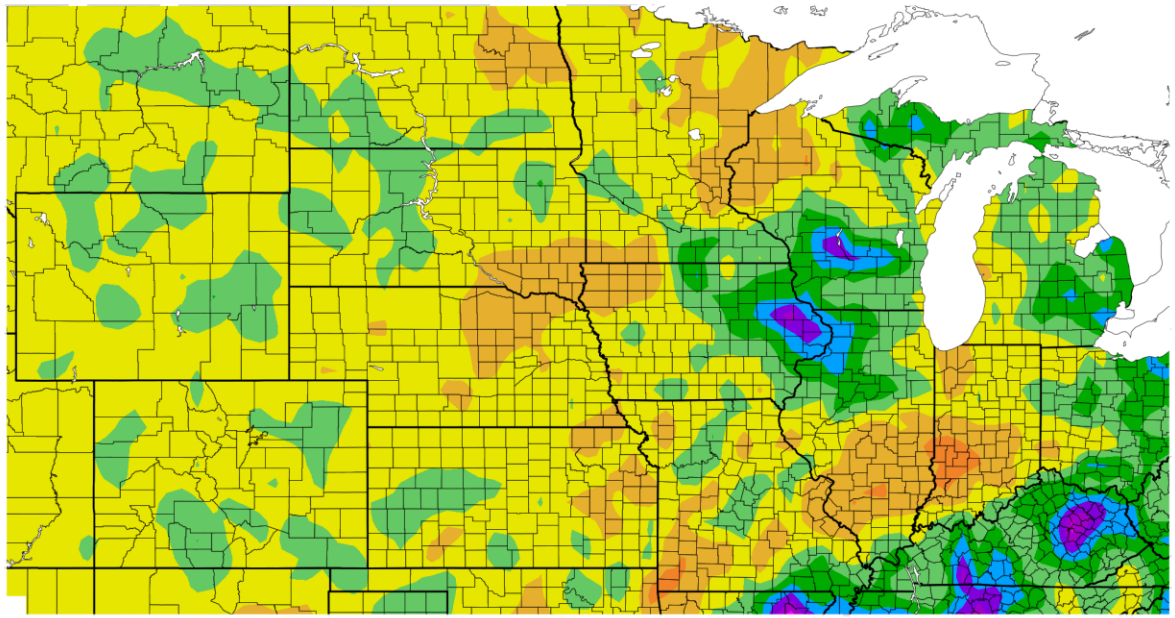




https://vegdri.unl.edu/

Precipitation over the last 30 Days

Departure from Normal Precipitation (in)
8/16/2020 – 9/14/2020

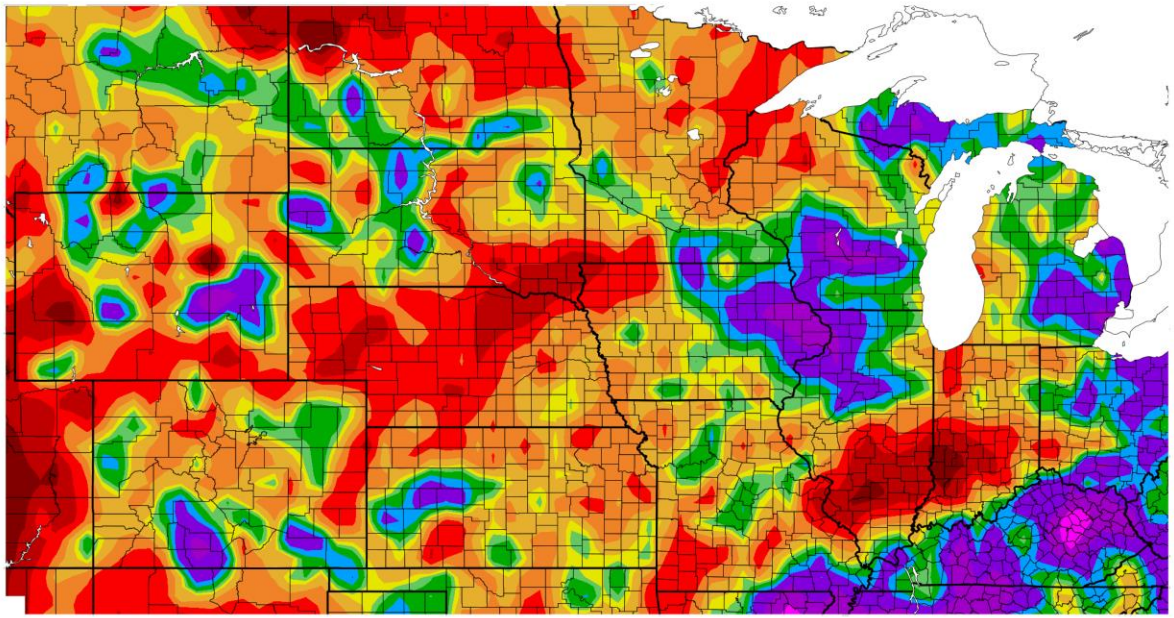


−7.5 −6 −4.5 −3 −1.5 0 1.5 3 4.5 6 7.5

Generated 9/15/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
8/16/2020 – 9/14/2020



5 25 50 70 90 100 110 130 150 200 300

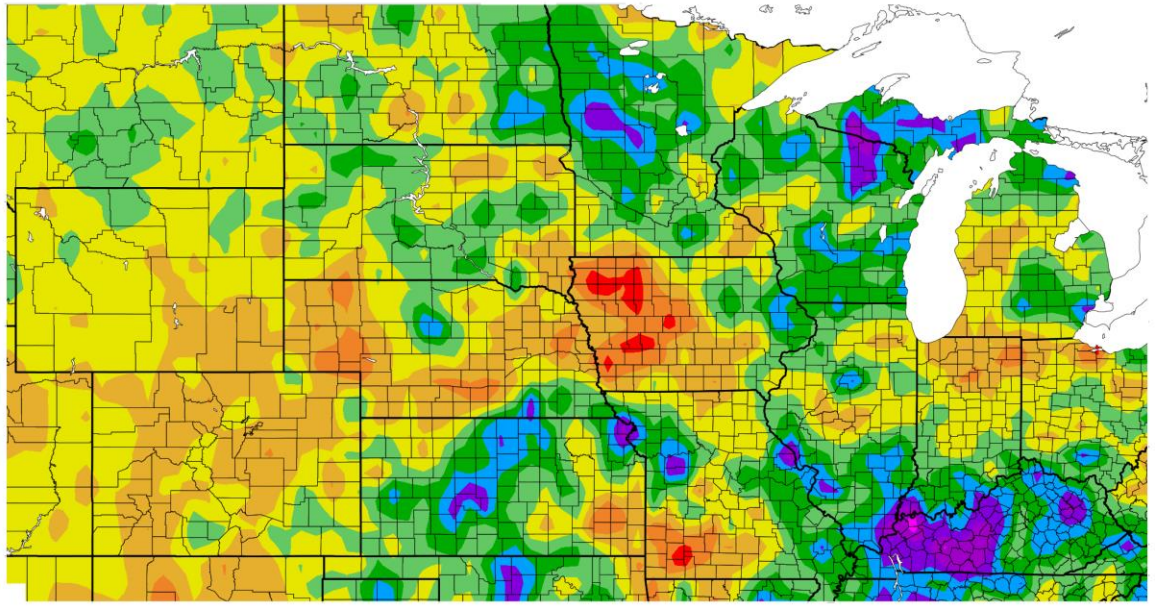
Generated 9/15/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

http://www.hprcc.unl.edu/maps/current/

Precipitation over the last 90 Days

Departure from Normal Precipitation (in)
6/17/2020 – 9/14/2020

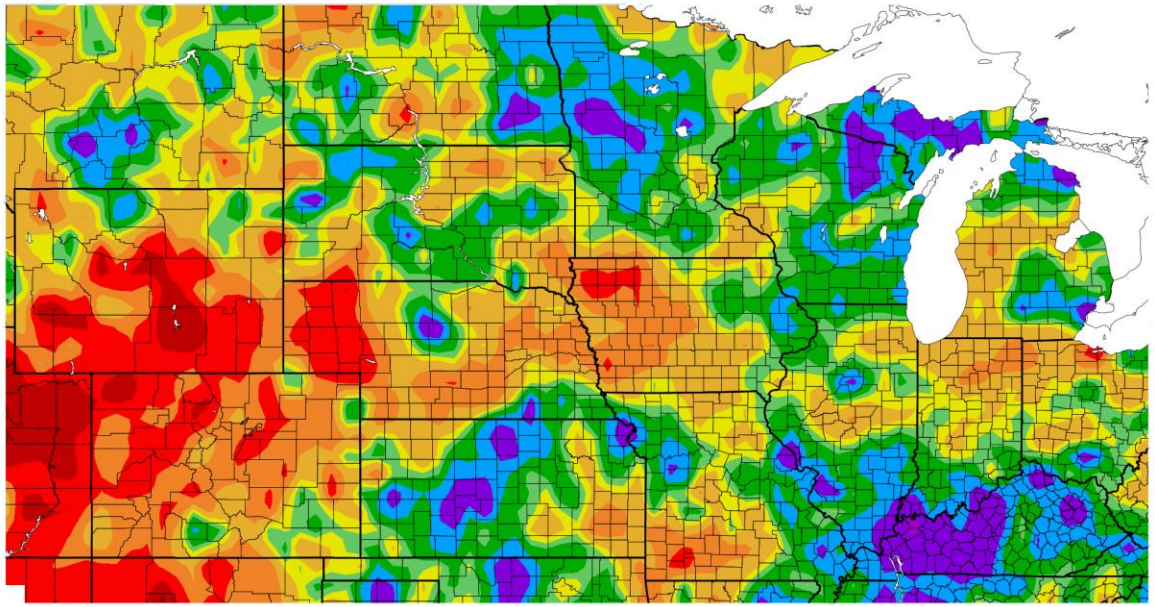


−10 −8 −6 −4 −2 0 2 4 6 8 10

Generated 9/15/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
6/17/2020 – 9/14/2020



5 25 50 70 90 100 110 130 150 200 300

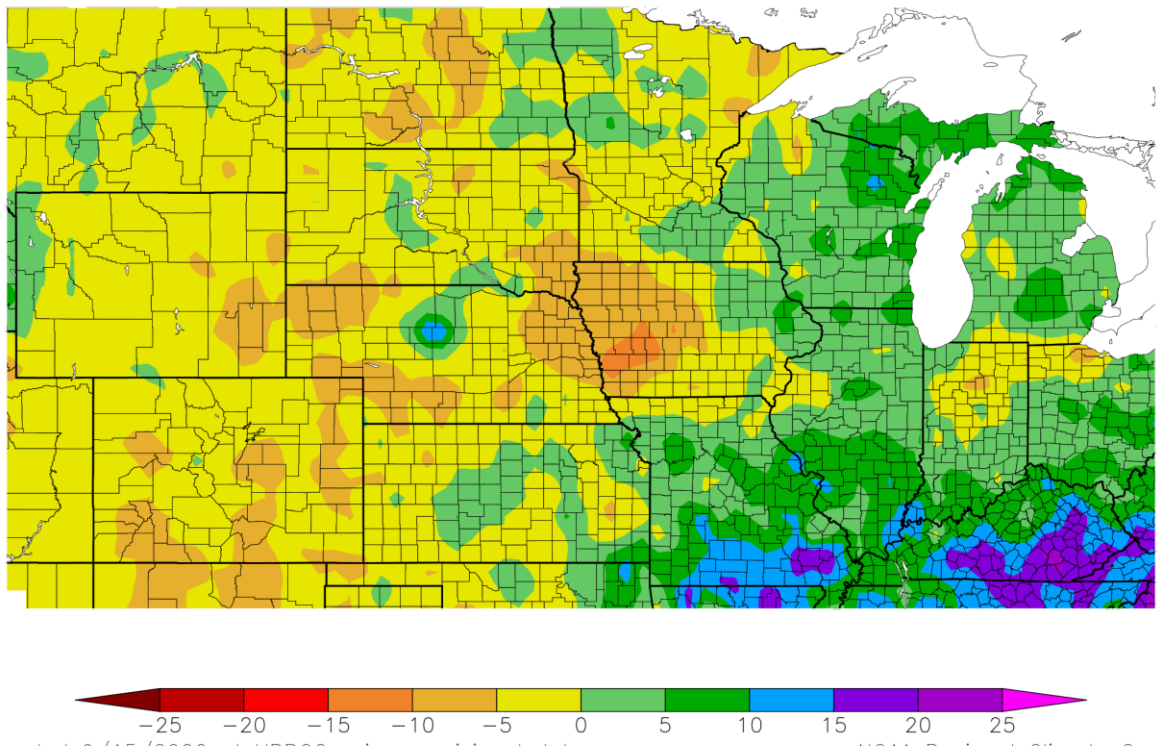
Generated 9/15/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

http://www.hprcc.unl.edu/maps/current/

Calendar Year Precipitation

Departure from Normal Precipitation (in)
1/1/2020 – 9/14/2020

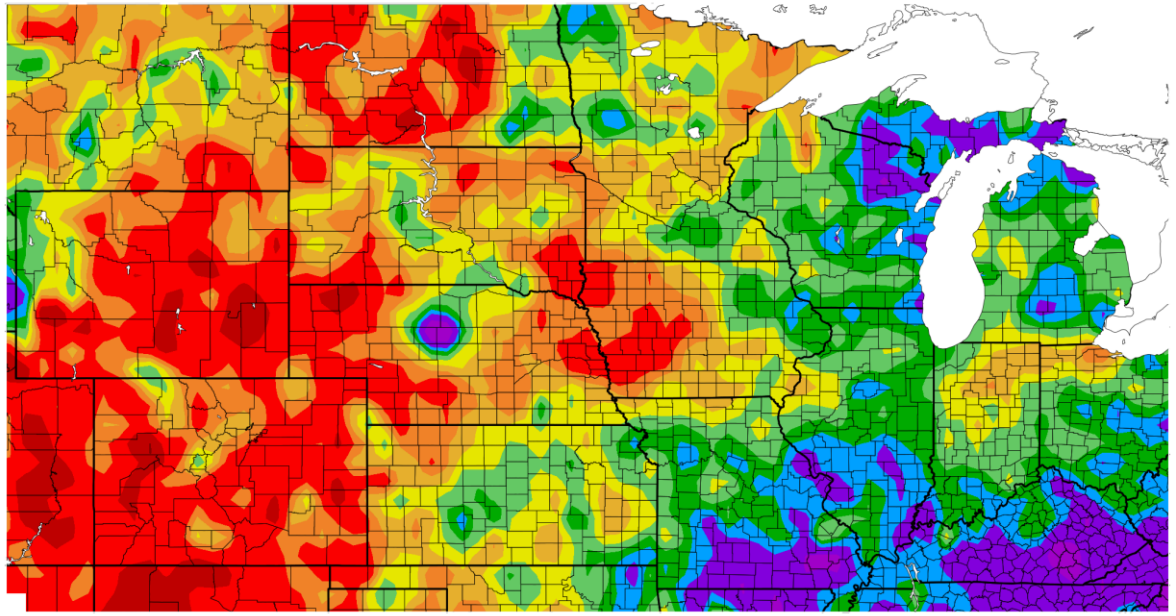


−25 −20 −15 −10 −5 0 5 10 15 20 25

Generated 9/15/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
1/1/2020 – 9/14/2020



25 50 70 80 90 100 110 120 130 150 175

Generated 9/15/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

http://www.hprcc.unl.edu/maps/current/

Regional Impacts

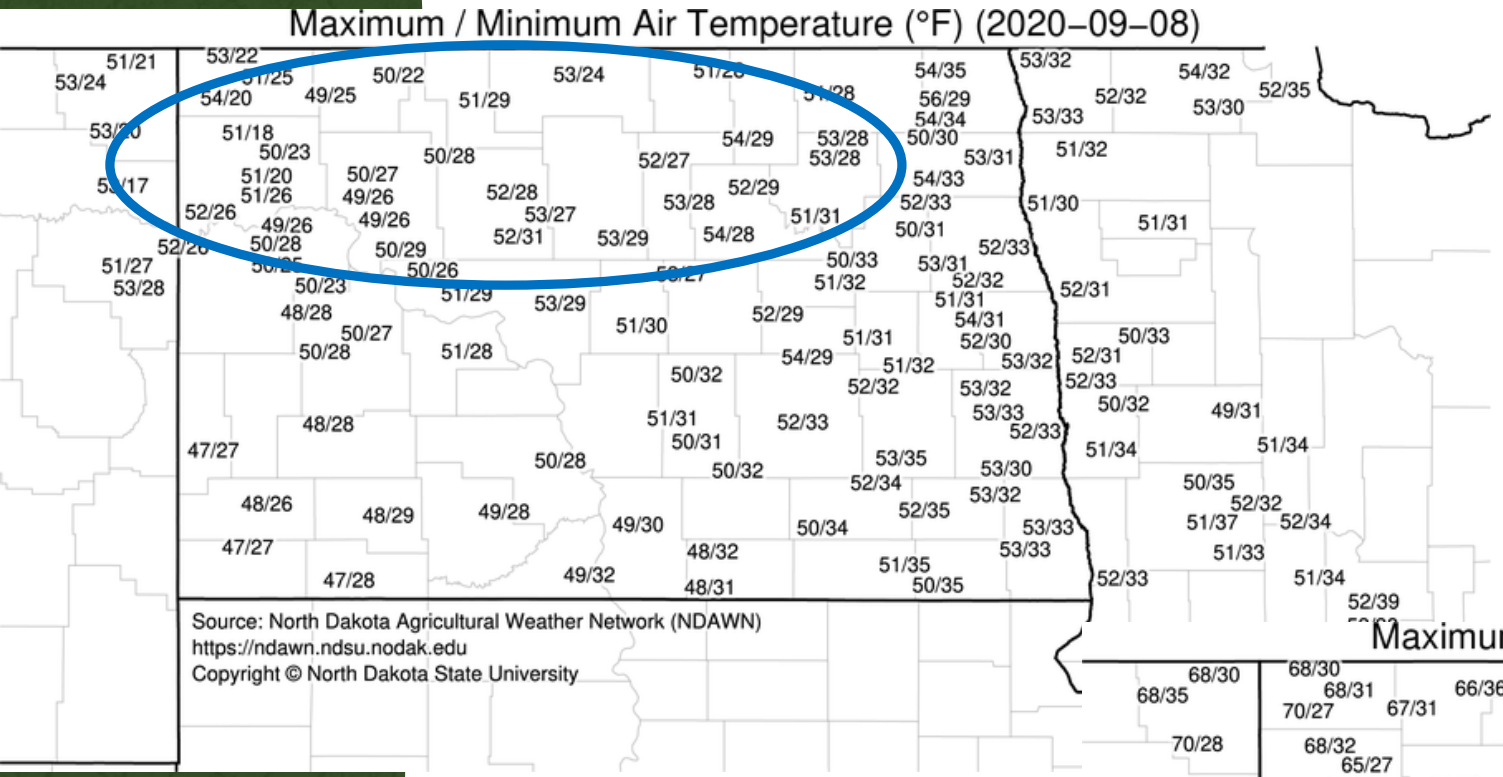

Natalie Umphlett

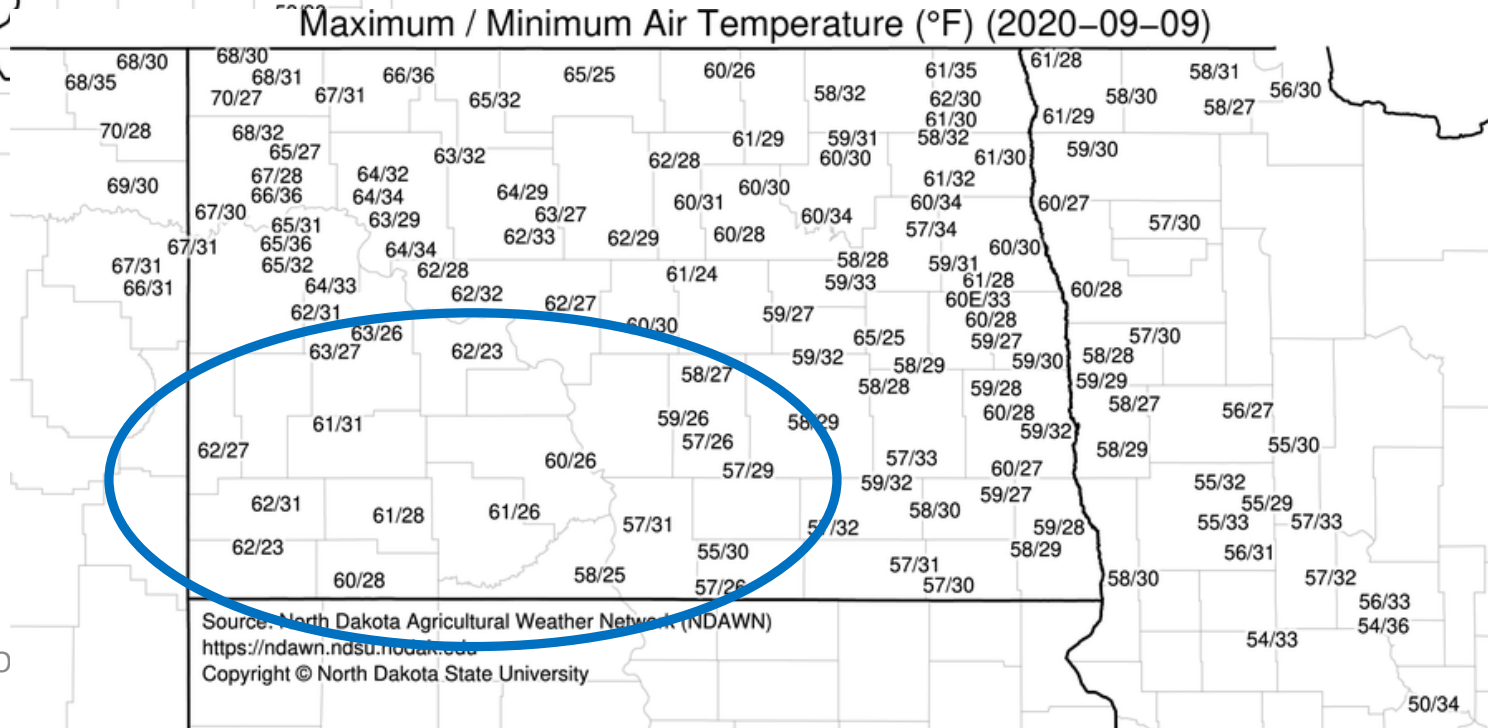

Natalie Umphlett


Natalie Umphlett


Doug Kluck

Early Freeze in North Dakota



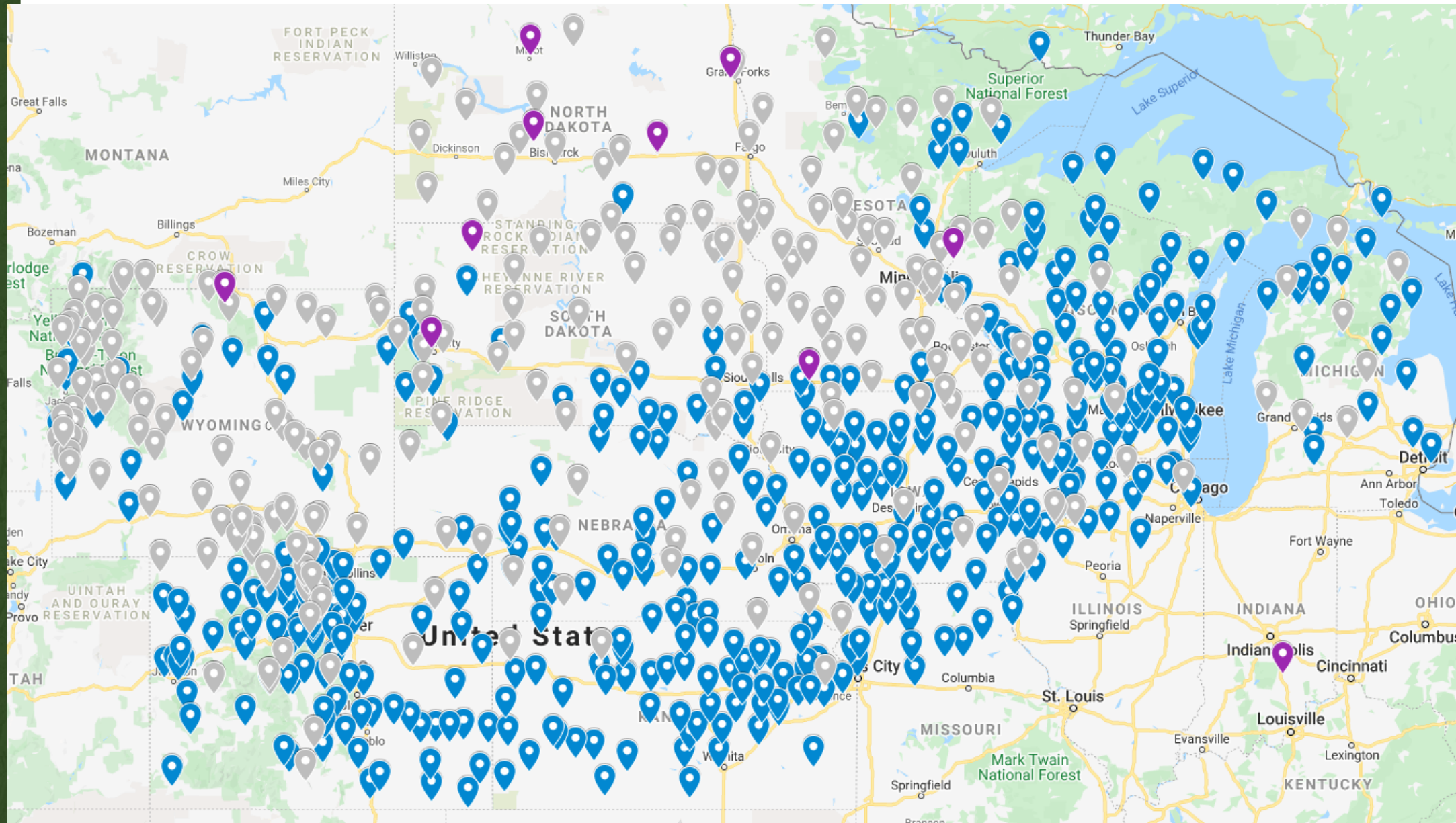


NATIO

Record Low Maximum Temperatures for September 7-9, 2020

(courtesy of the Midwest Regional Climate Center)

https://www.google.com/maps/d/embed?mid=1zljBVf_76KTvNekCuxvoHqWZ7kRVa2Za

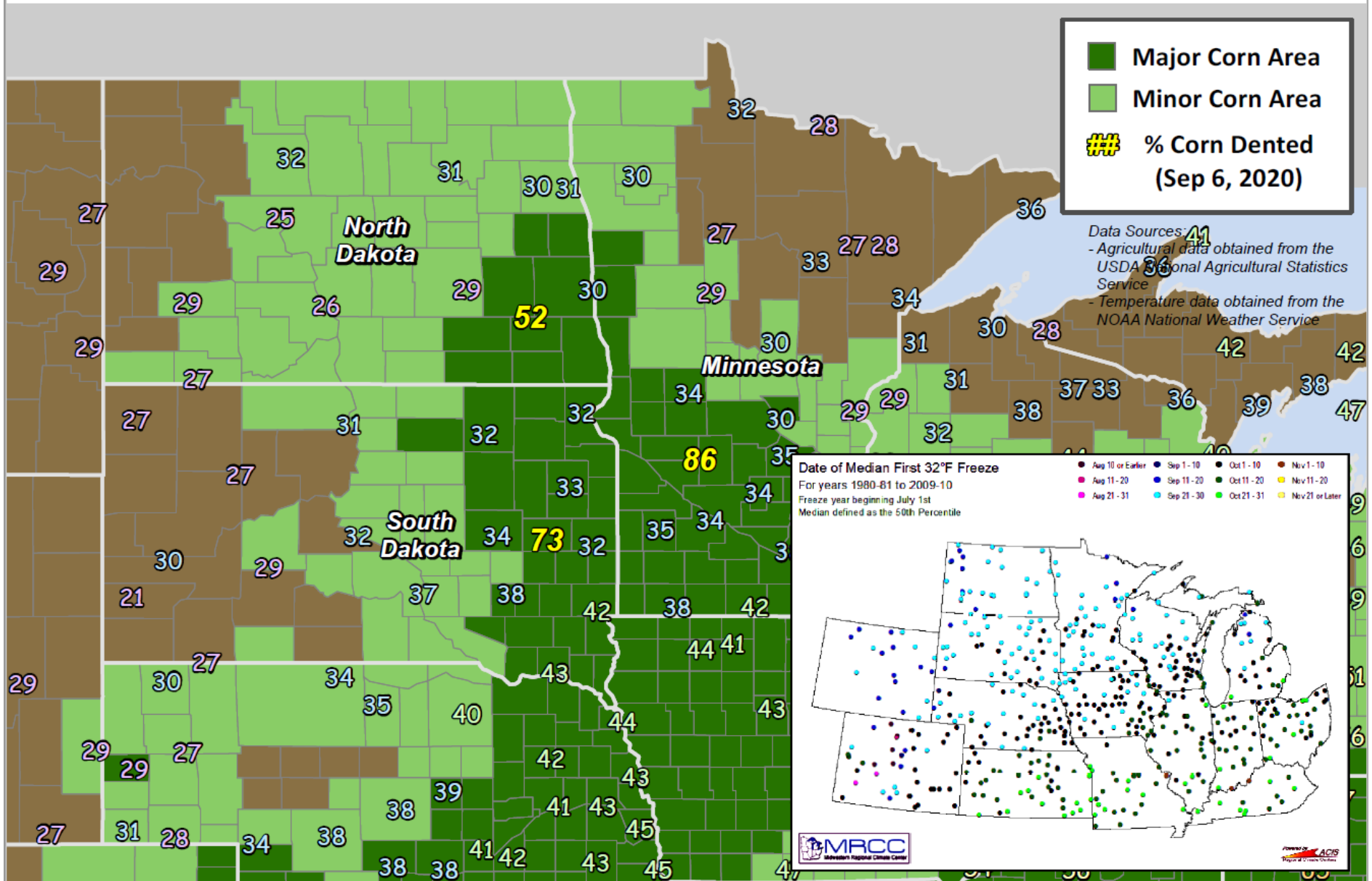


United States Department of Agriculture

This product was prepared by the USDA Office of the Chief Economist (OCE) World Agricultural Outlook Board (WAOB)

Red River Valley Freeze
Extreme Minimum Temperatures (°F)
September 8-10, 2020

(Updated - Sep 10, 2020)



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Red River Valley Freeze

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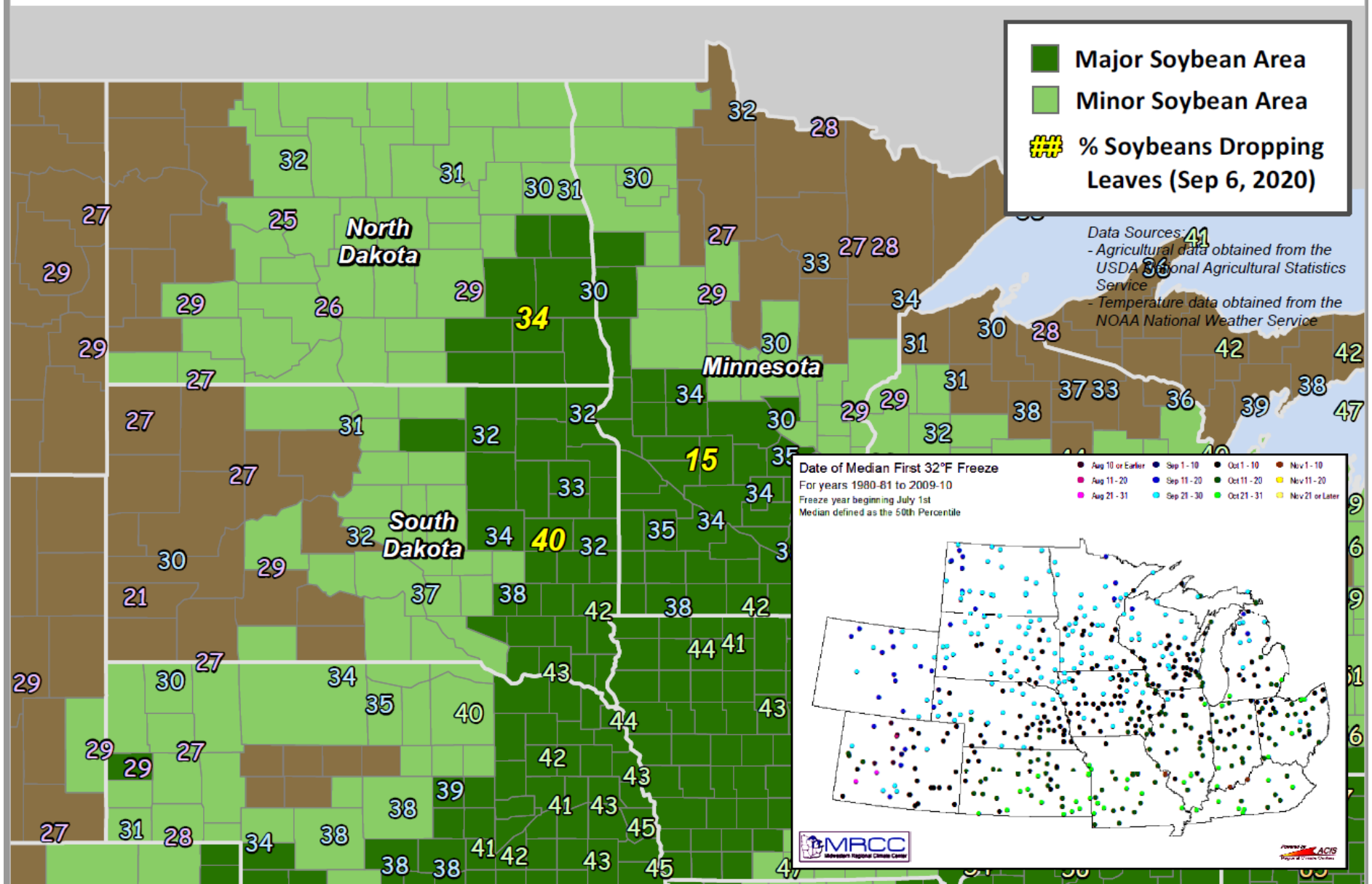

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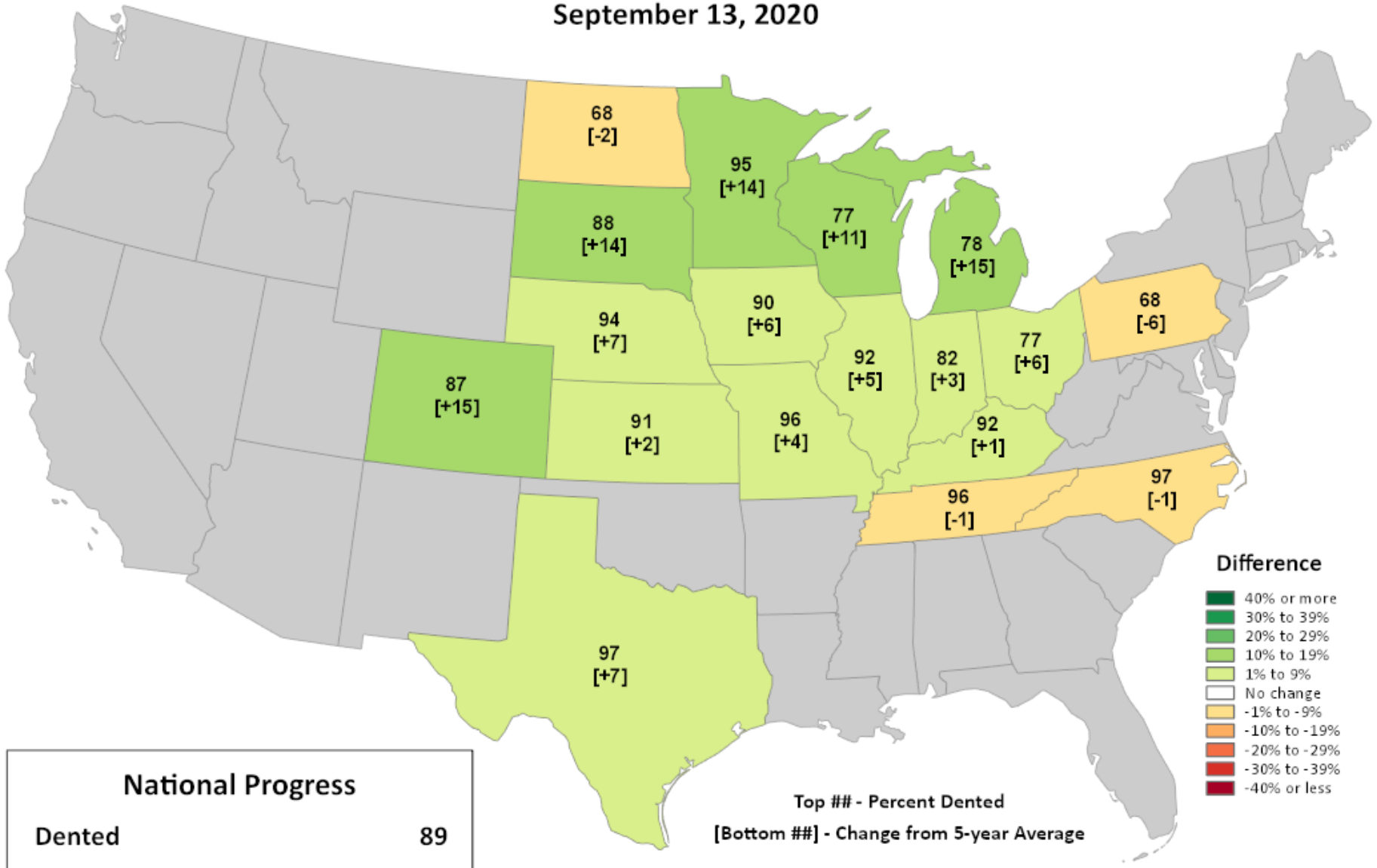
Corn Progress

Percent Dented

September 13, 2020



National Progress	
Dented	89
Change from 5-year Average	+7

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

National Drought Mitigation Center, University of Nebraska

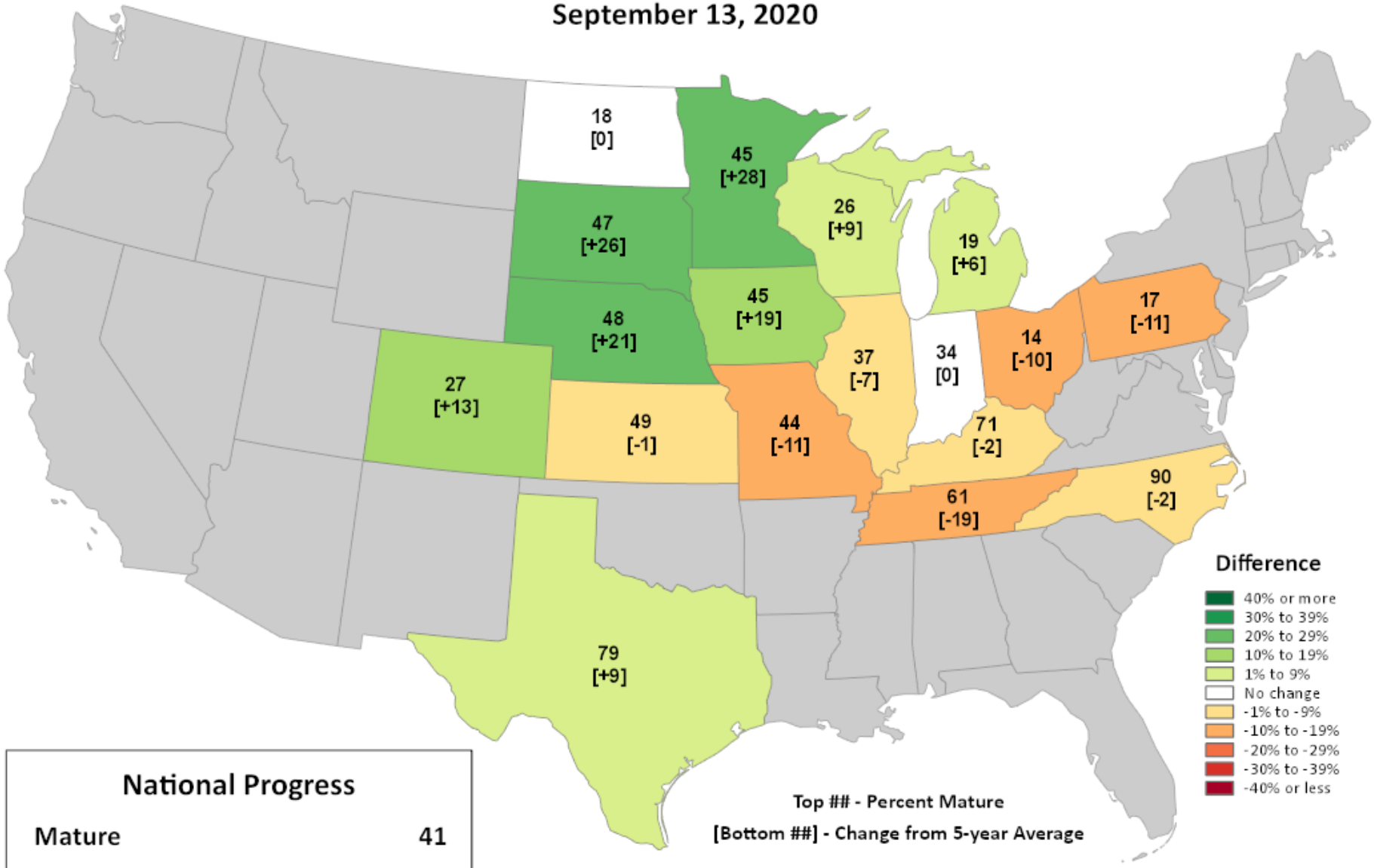
United States Department of Agriculture

This product was prepared by the USDA Office of the Chief Economist (OCE) World Agricultural Outlook Board (WAOB)

Corn Progress

Percent Mature

September 13, 2020



National Progress	
Mature	41
Change from 5-year Average	+9

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

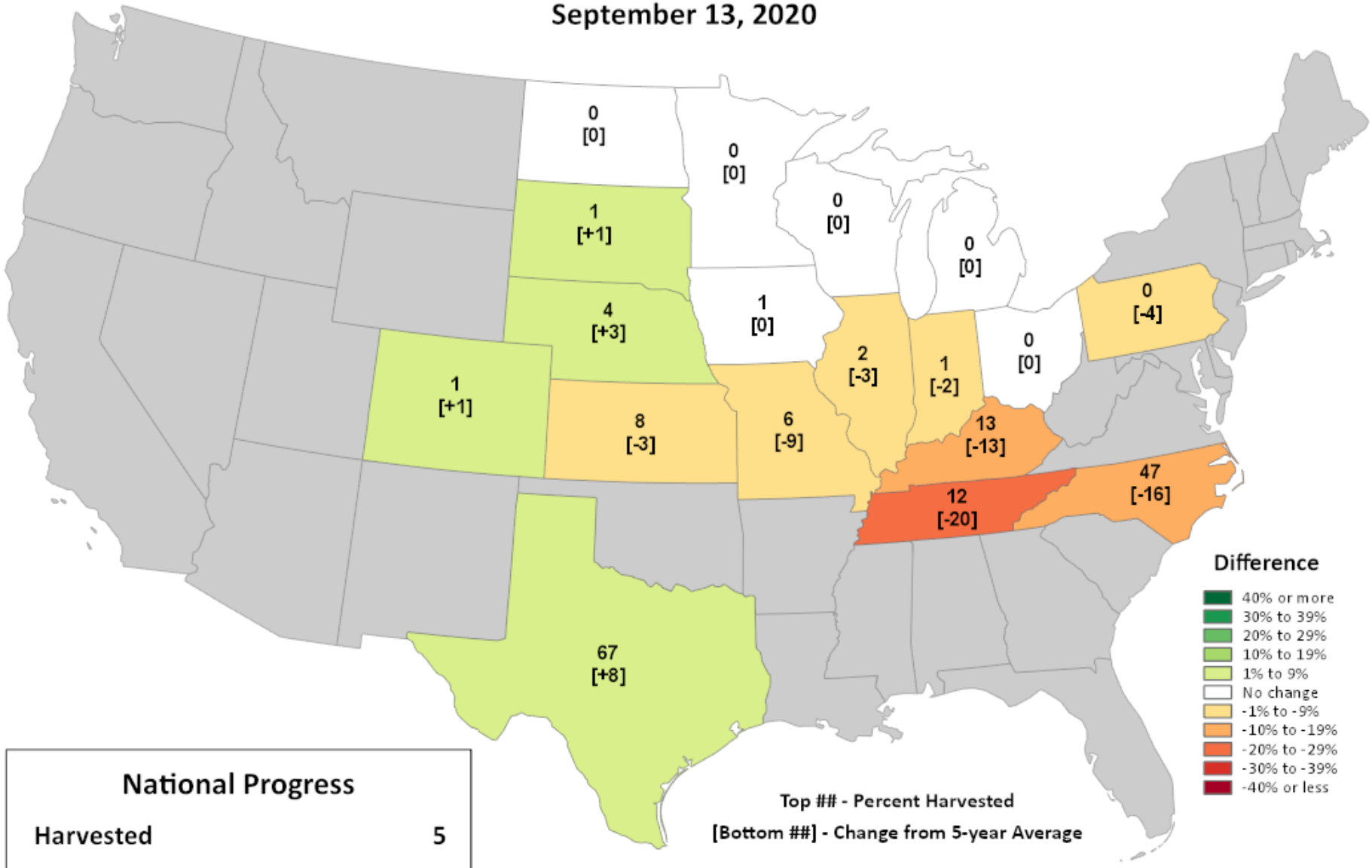
United States Department of Agriculture

This product was prepared by the USDA Office of the Chief Economist (OCE) World Agricultural Outlook Board (WAOB)

Corn Progress

Percent Harvested

September 13, 2020



National Progress	
Harvested	5
Change from 5-year Average	0

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

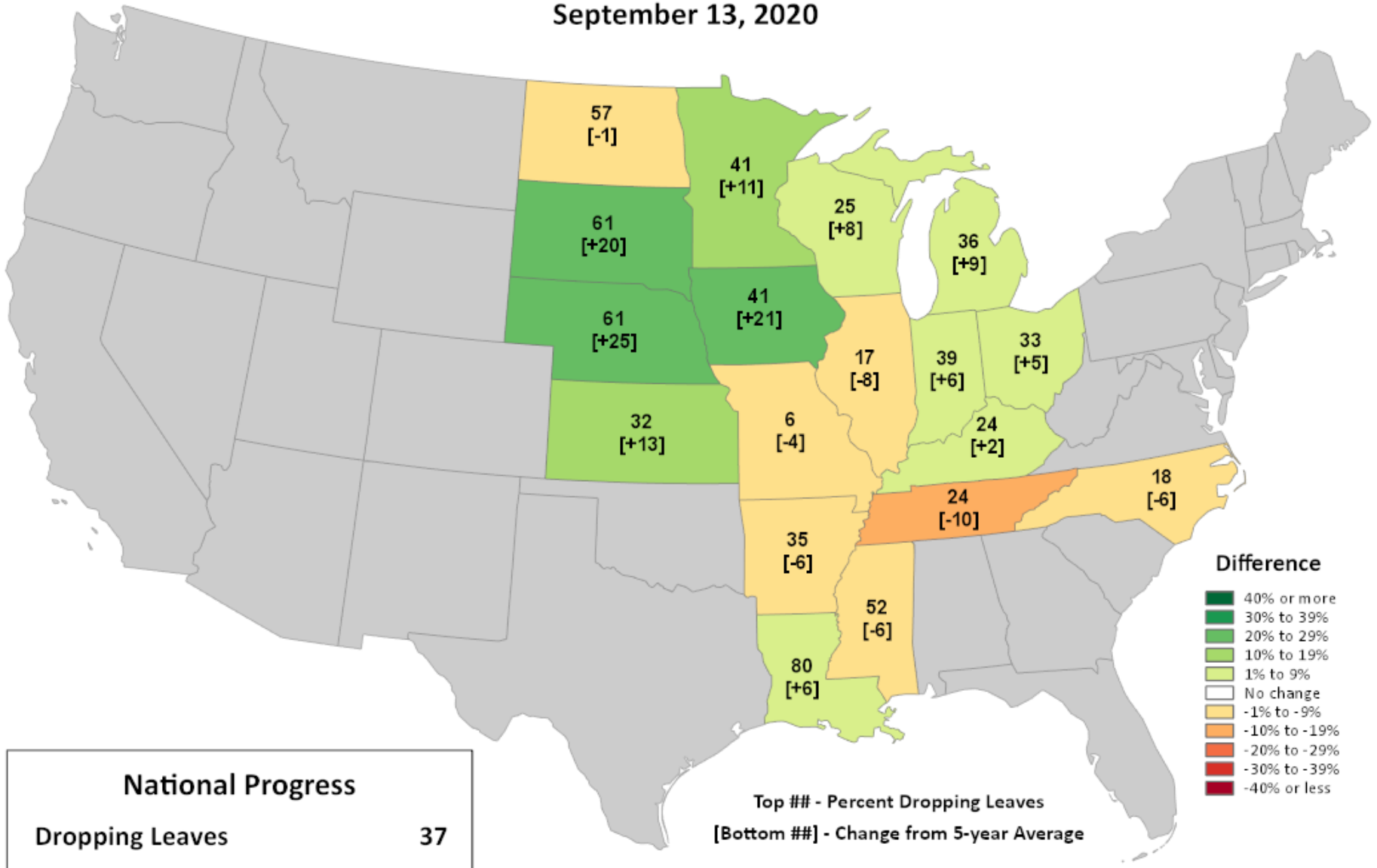
United States Department of Agriculture

This product was prepared by the USDA Office of the Chief Economist (OCE) World Agricultural Outlook Board (WAOB)

Soybeans Progress

Percent Dropping Leaves

September 13, 2020



National Progress	
Dropping Leaves	37
Change from 5-year Average	+6

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

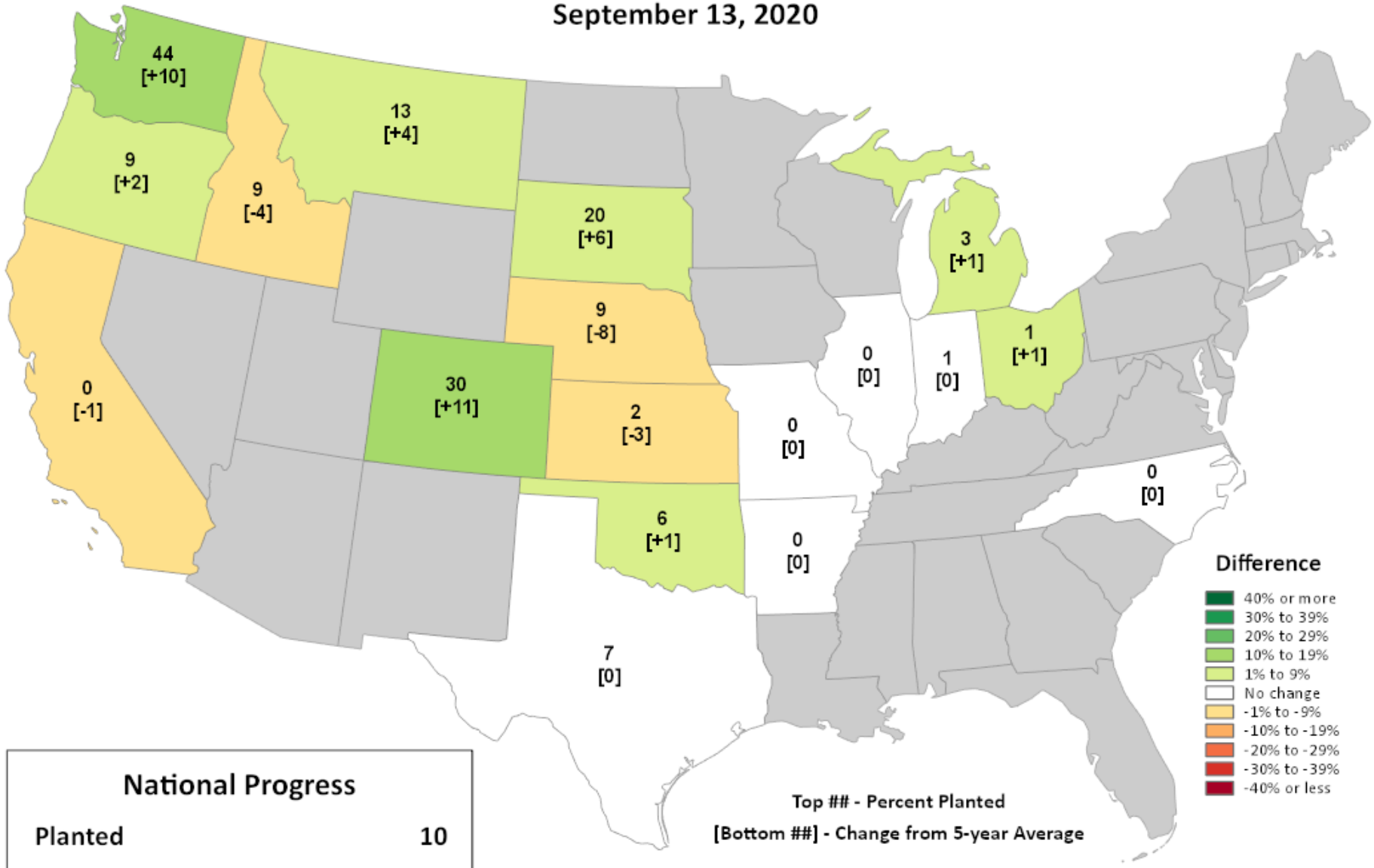
United States Department of Agriculture

This product was prepared by the USDA Office of the Chief Economist (OCE) World Agricultural Outlook Board (WAOB)

Winter Wheat Progress

Percent Planted

September 13, 2020



National Progress	
Planted	10
Change from 5-year Average	+2

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

National Drought Mitigation Center, University of Nebraska

USDA United States Department of Agriculture

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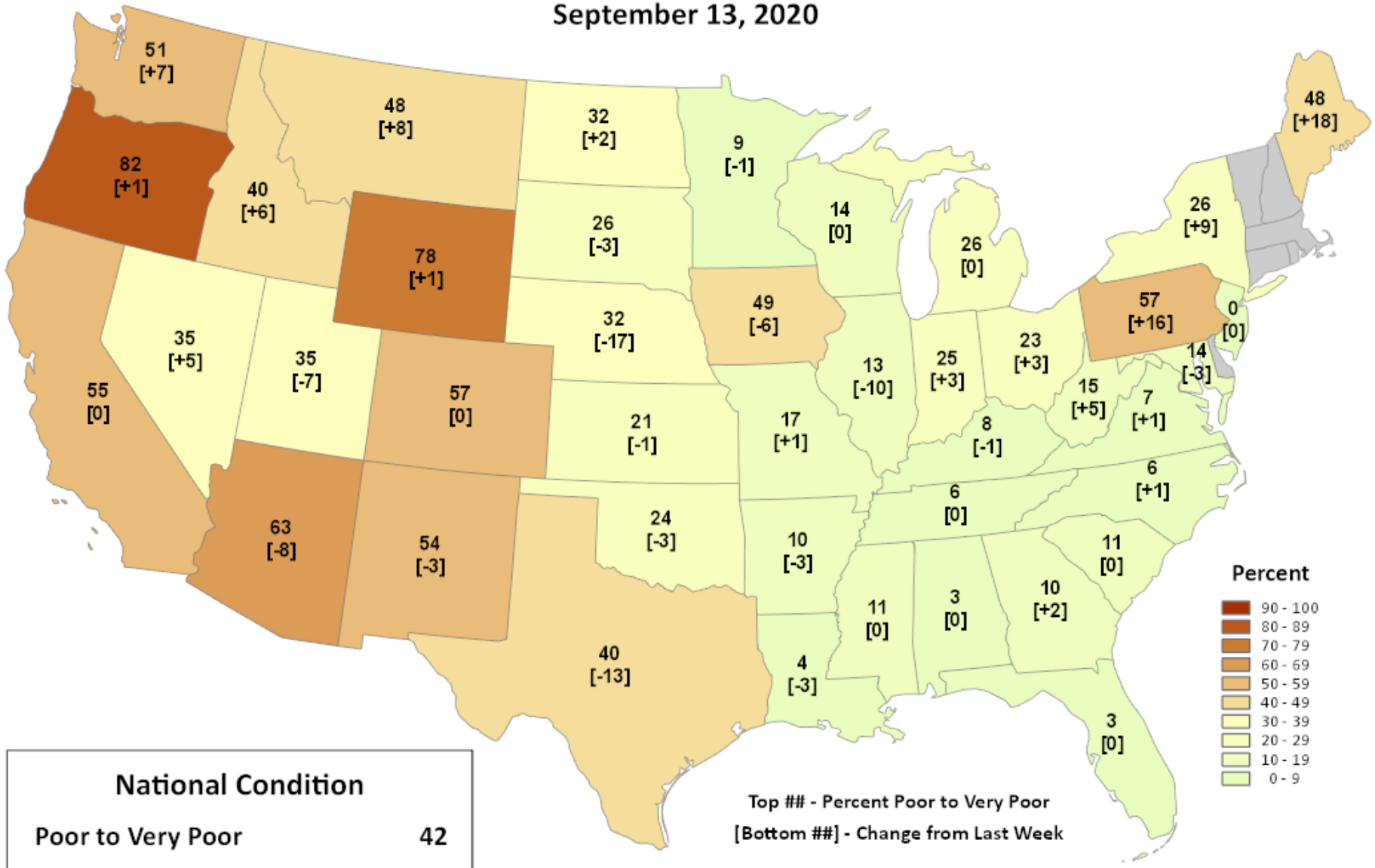
Pasture and Range Conditions

Percent Poor to Very Poor

September 13, 2020



National Condition	
Poor to Very Poor	42
Change from Last Week	-4

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

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Missouri River Basin

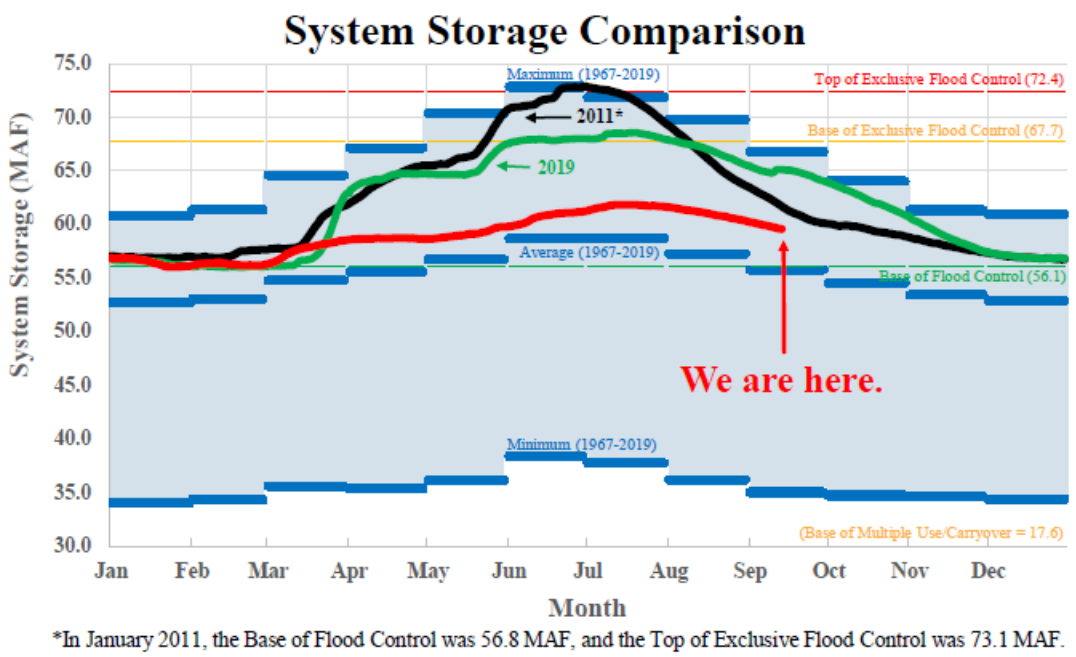
http://www.nwd-mr.usace.army.mil/rcc/reports/pdfs/weeklyupdate.pdf

Missouri River Basin – Update – 15 September 2020

Mainstem Reservoir Status:

- System storage is 59.5 MAF (upper right quadrant).
- Warmer temperatures and very little precipitation are being forecast for the remainder of September over the Missouri River Basin (lower right quadrant).
- The September 1 System storage check indicates that Gavins Point winter releases will be no less than 17,000 cfs.
- 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 is currently 32,500 cfs. Releases will be adjusted as needed to meet downstream navigation targets. The schedule and forecasted Missouri River flows and stages can be found here:

Click Here for Missouri River releases, flows & stages



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

August precipitation was well-below normal in the Missouri River Basin, particularly in the western and far northern portions, which received less than 25% of normal precipitation.

The lack of precipitation and dry soil conditions resulted in 74% of average August runoff in the Missouri River Basin above Sioux City, Iowa (upper Basin). The 2020 calendar year forecast for the upper Basin, updated on Sept. 1, is 30.6 million acre-feet (MAF), 119% of average. Average annual runoff for the upper Basin is 25.8 MAF. Runoff in the upper Basin during the remainder of 2020 is forecast to be below average.

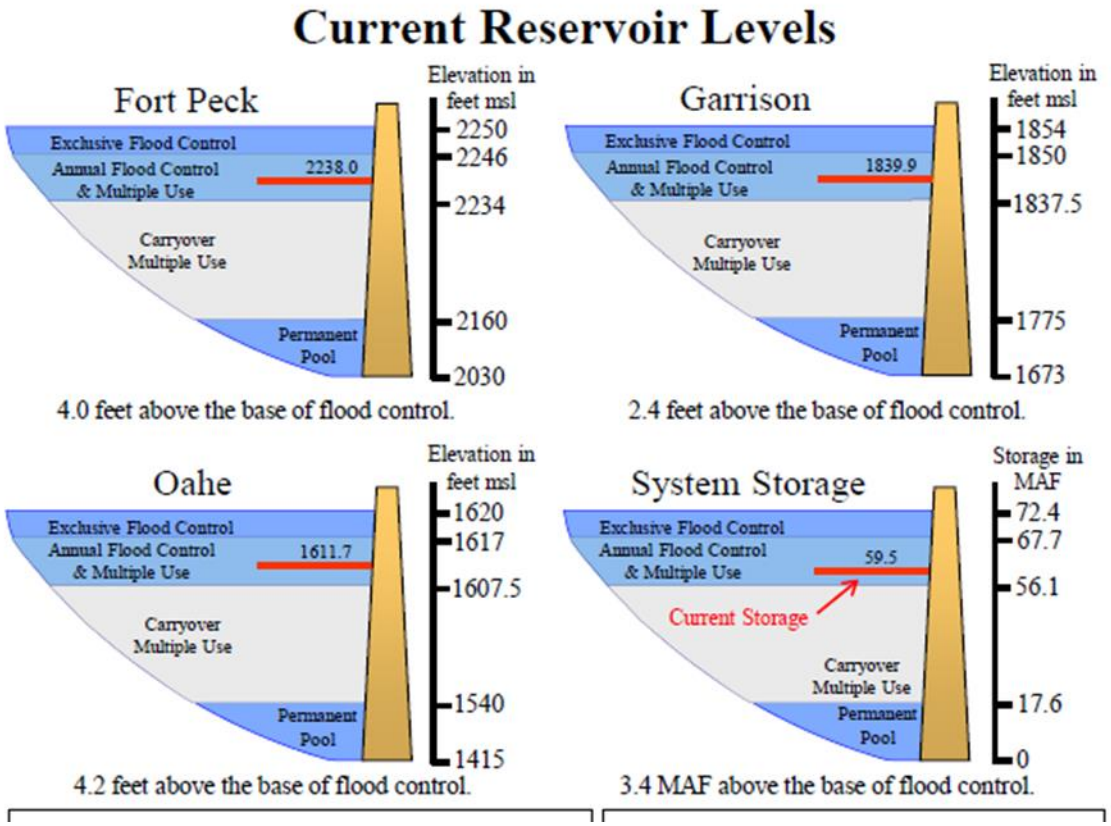
We've have to increase releases from Gavins Point Dam from 30,000 cfs to 32,500 cfs in order to meet downstream navigation targets at Nebraska City (37,000 cfs) and Kansas City (41,000 cfs). Really seeing how the lower basin is really drying up and not providing much incremental runoff. The rain we received these last couple days helped. Upper basin is also drying up, especially in MT and ND.

Kevin Grode, P.E.

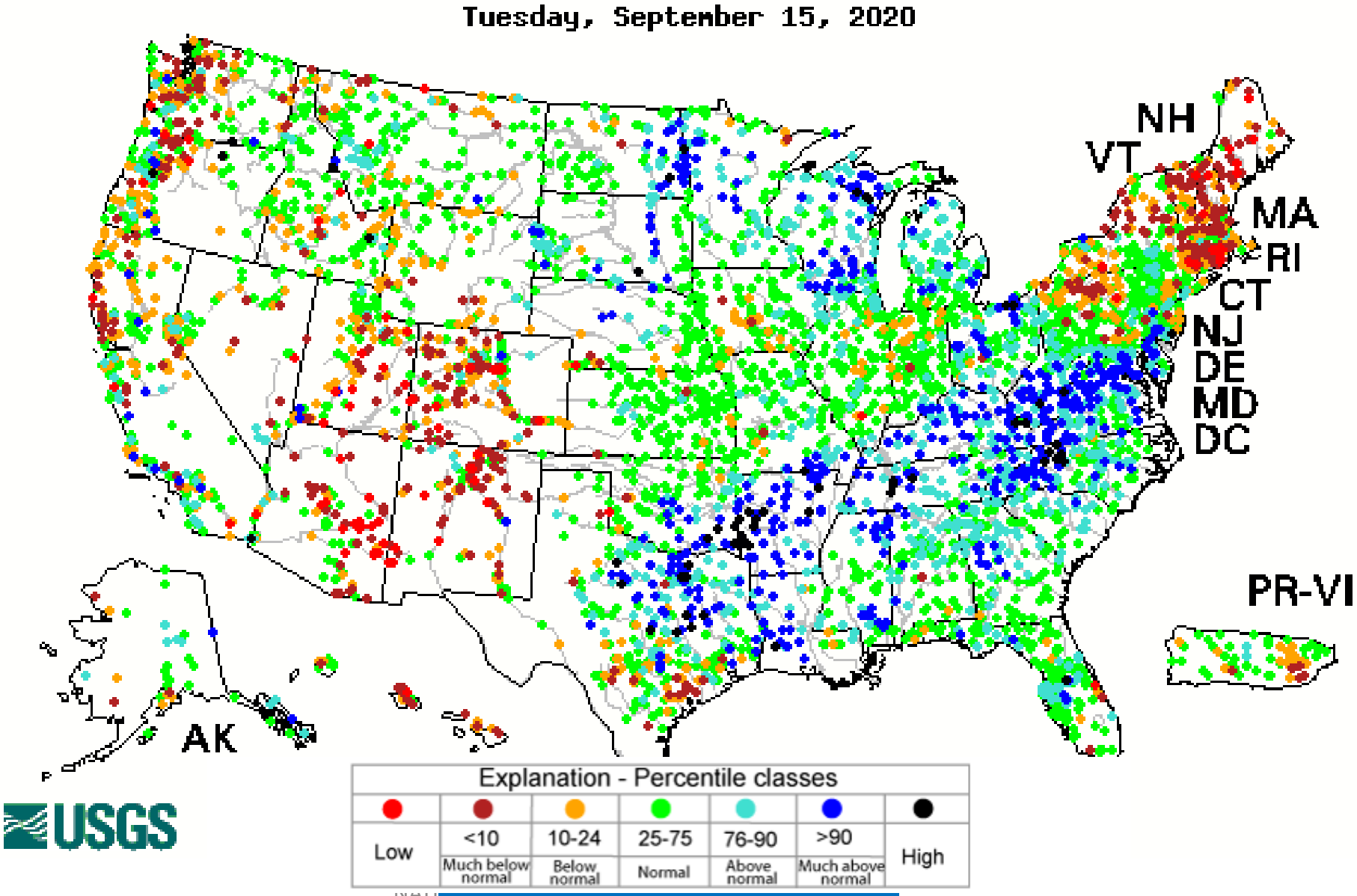
Dry. And it has helped, and hurt.

As of about a week ago, we are now down to just one location remaining in flood along the James River. That is Stratford SD. The James River has been in flood, somewhere along it's South Dakota length, since March 2019. But on the flip side, for the past couple of weeks, we have been providing WFO Glasgow, in support of the City of Sidney, MT, low flow forecasts for the Yellowstone River at Sidney. Intakes are being affected.

Kevin Low, MBRFC

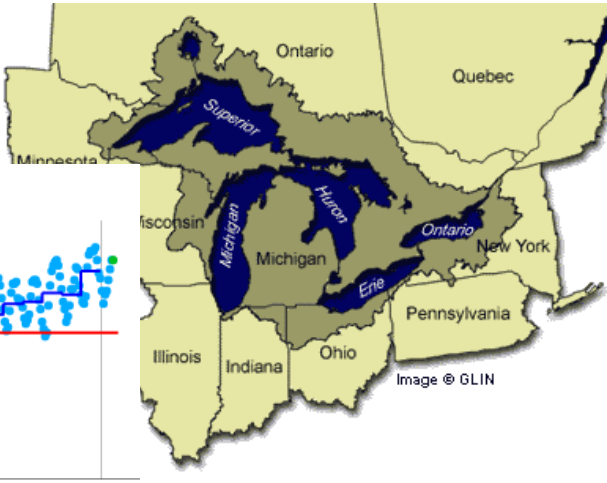


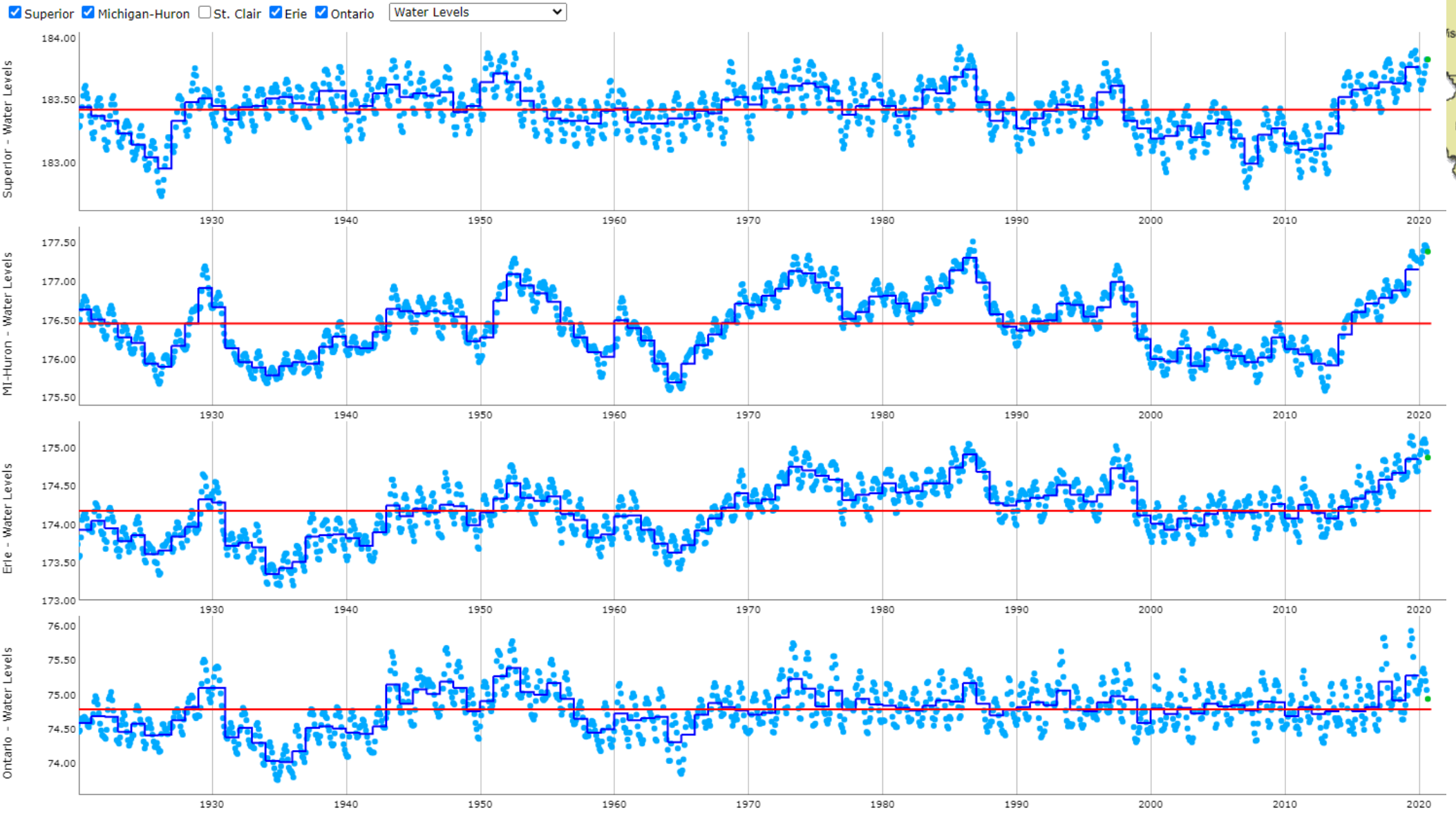
28-Day Average Streamflow



http://waterwatch.usgs.gov/

Great Lakes Water Levels





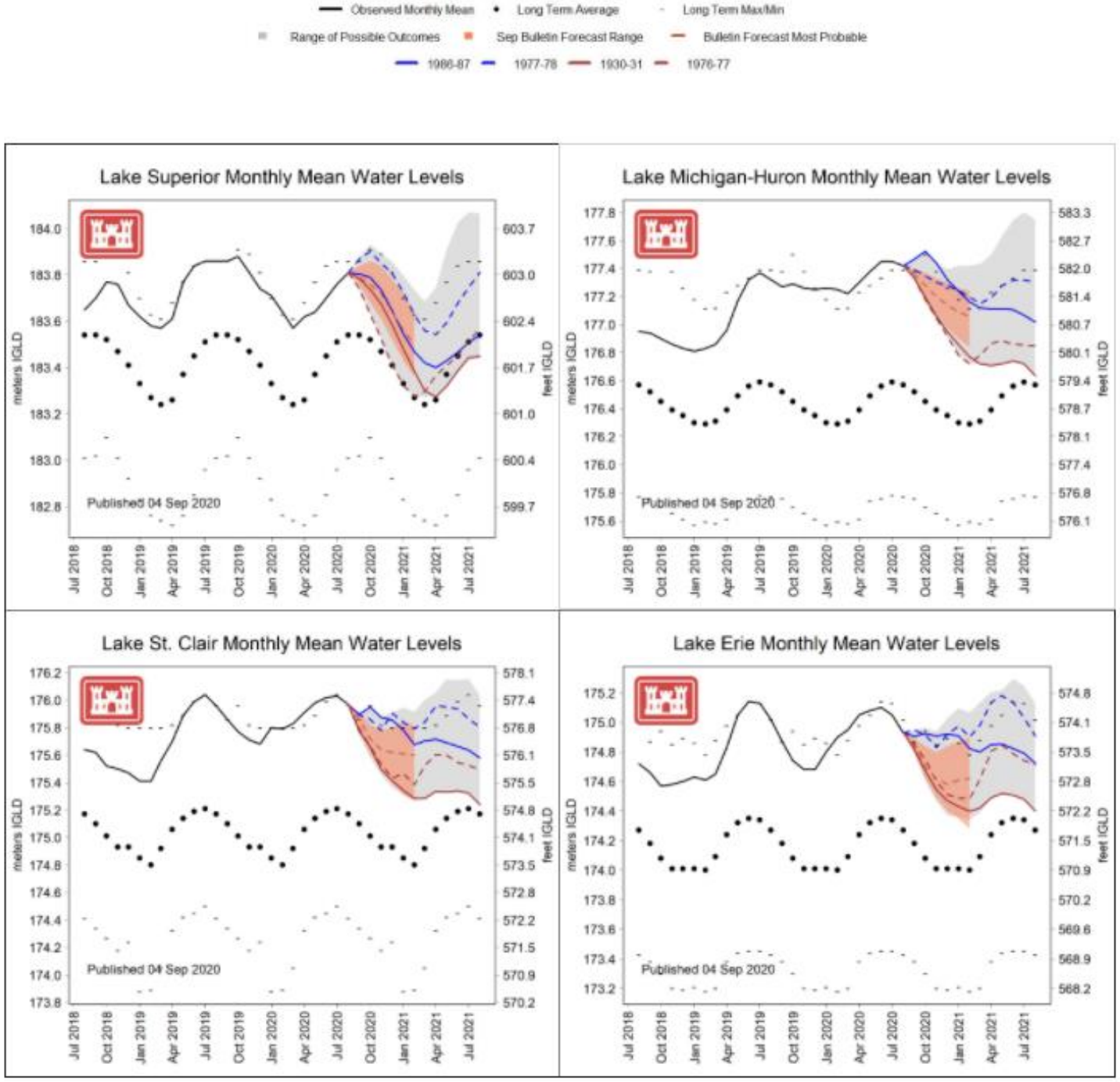
http://www.glerl.noaa.gov/

Great Lakes Water Level Outlook- July 2020 Edition - September Update

Outlook Summary:

This product is not an official forecast of Great Lakes water levels. Rather, this product is meant to illustrate outcomes that would occur under historical weather and water supply condition, with scenarios chosen based on similarities to recent conditions. For the official forecast, please see our Monthly Bulletin of Great Lakes Water Levels.

Near or above record high water levels continue on some of the Great Lakes. Water levels follow a seasonal cycle where water levels rise in the spring due to increased precipitation and enhanced runoff from snowmelt. In the fall, the lakes generally decline due to an increase in evaporation as temperatures decline and cold air moves over the relatively warm lake waters. We refer to the combined effect of precipitation over the lake, evaporation from the lake, and runoff to the lake as Net Basin Supply (NBS). This edition of the Water Level Outlook compares years that experienced very wet or very dry conditions over the next 3 months (July – Sept.). Two years that had significantly wetter than average conditions over the next 3 months were 1986 and 1977 (blue lines). Two years that had significantly drier than average conditions from July to September were 1930 and 1976 (brown lines). This publication of the Water Level Outlook incorporates the projection of water levels if the NBS over the next 12 months is similar to what occurred in 1986-87, 1977-78, 1930-31, and 1976-77. The most recent coordinated 6-month forecast is also shown for comparison.



https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Water-Levels/Water-Level-Forecast/Water-Level-Outlook/

Drought Update

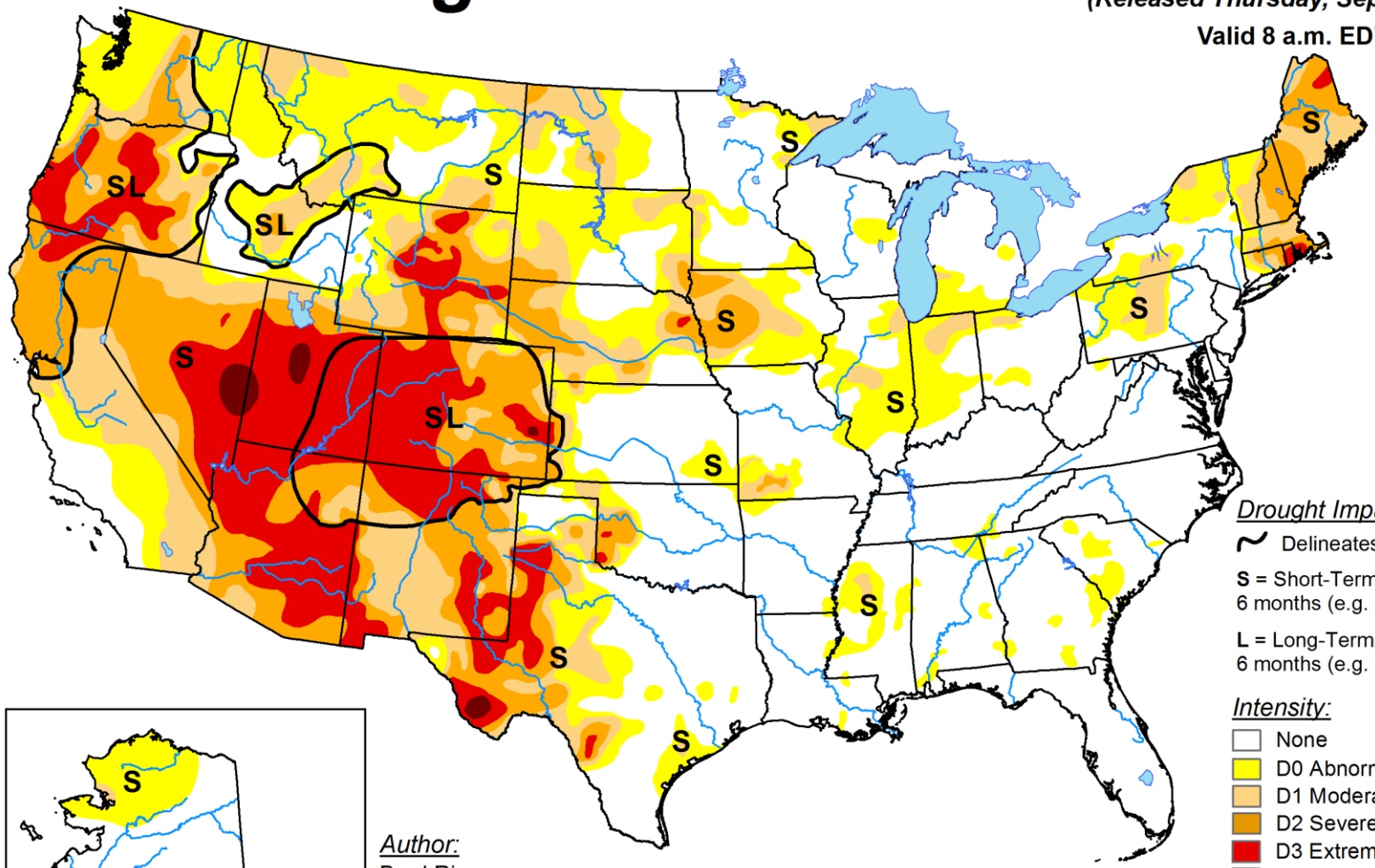
Photo from Becky Bolinger in Colorado

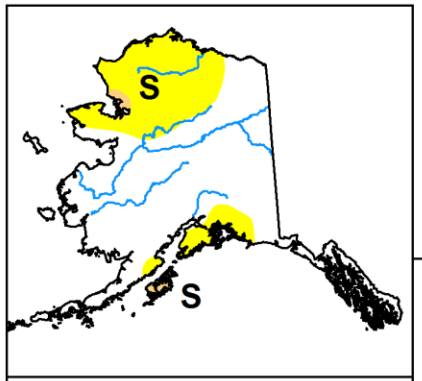
U.S. Drought Monitor

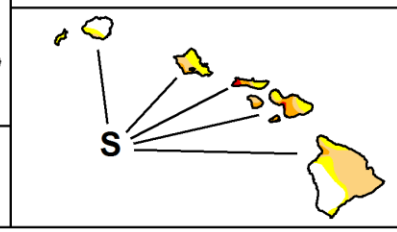
September 15, 2020

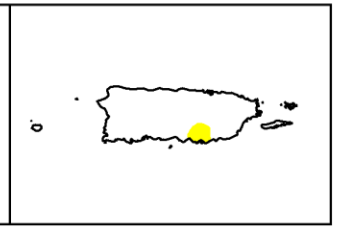
(Released Thursday, Sep. 17, 2020)

Valid 8 a.m. EDT









Drought Impact Types:

~ Delineates dominant impacts

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

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

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

Author:

Brad Rippey

U.S. Department of Agriculture

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

droughtmonitor.unl.edu

Statistics

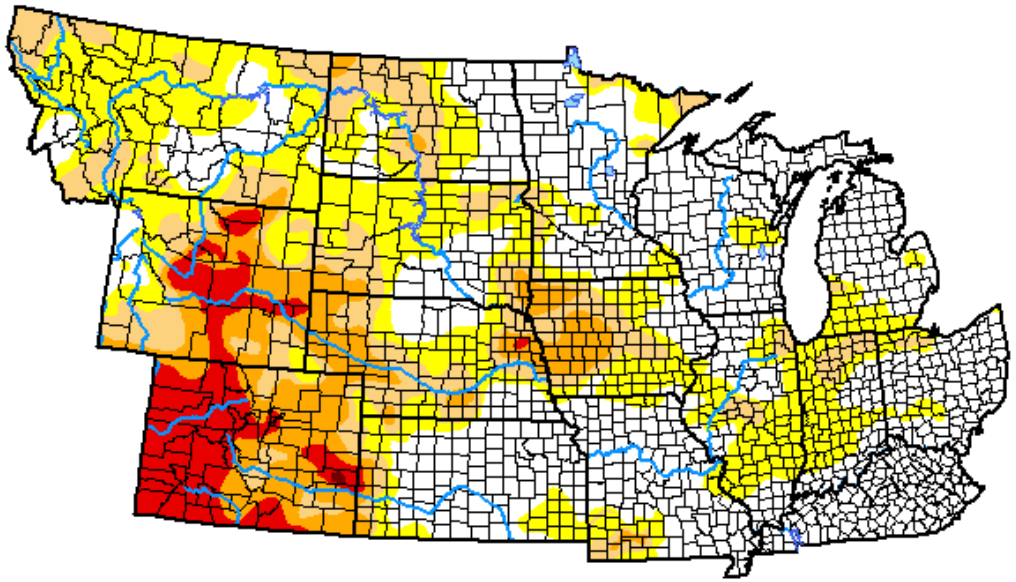
Statistics type: Traditional Percent Area | **Display:** Statistics | **Export table:** CSV XLS

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	2020-09-15	46.99	53.01	32.82	21.00	9.64	0.36	117
Last Week	2020-09-08	47.06	52.94	32.68	21.02	9.79	0.14	117
3 Months Ago	2020-06-16	63.27	36.73	19.61	8.31	1.90	0.00	67
Start of Calendar Year	2019-12-31	78.53	21.47	9.53	3.21	0.06	0.00	34
Start of Water Year	2019-10-01	65.15	34.85	16.96	5.30	0.80	0.00	58
One Year Ago	2019-09-17	67.47	32.53	13.72	3.90	0.51	0.00	51

As of 9/18/20 just under **65,000,000** people are being impacted by drought in the United States.

U.S. Drought Monitor

NWS Central Region



September 15, 2020

(Released Thursday, Sep. 17, 2020)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	42.86	57.14	30.09	15.83	6.23	0.03
Last Week *09-08-2020*	41.97	58.03	31.25	16.71	7.62	0.03
3 Months Ago *06-16-2020*	57.60	42.40	17.07	6.13	3.34	0.00
Start of Calendar Year *12-31-2019*	87.81	12.19	5.33	2.11	0.00	0.00
Start of Water Year *10-01-2019*	79.05	20.95	8.02	2.19	0.14	0.00
One Year Ago *09-17-2019*	82.21	17.79	3.45	0.00	0.00	0.00

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. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

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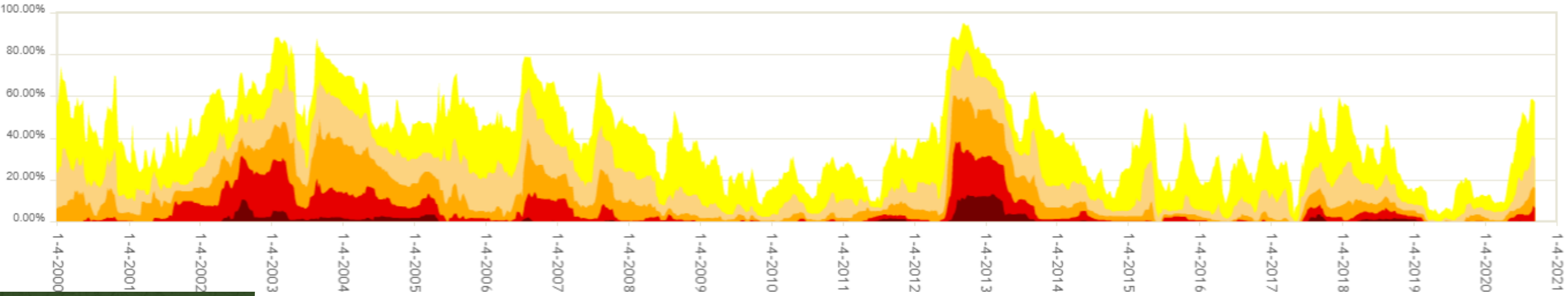
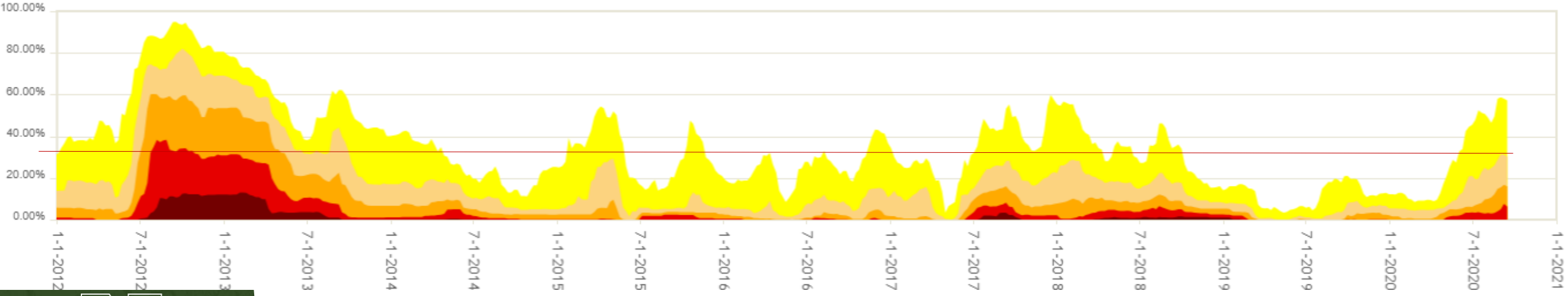
U.S. Department of Agriculture

droughtmonitor.unl.edu

NWS Central Region Percent Area



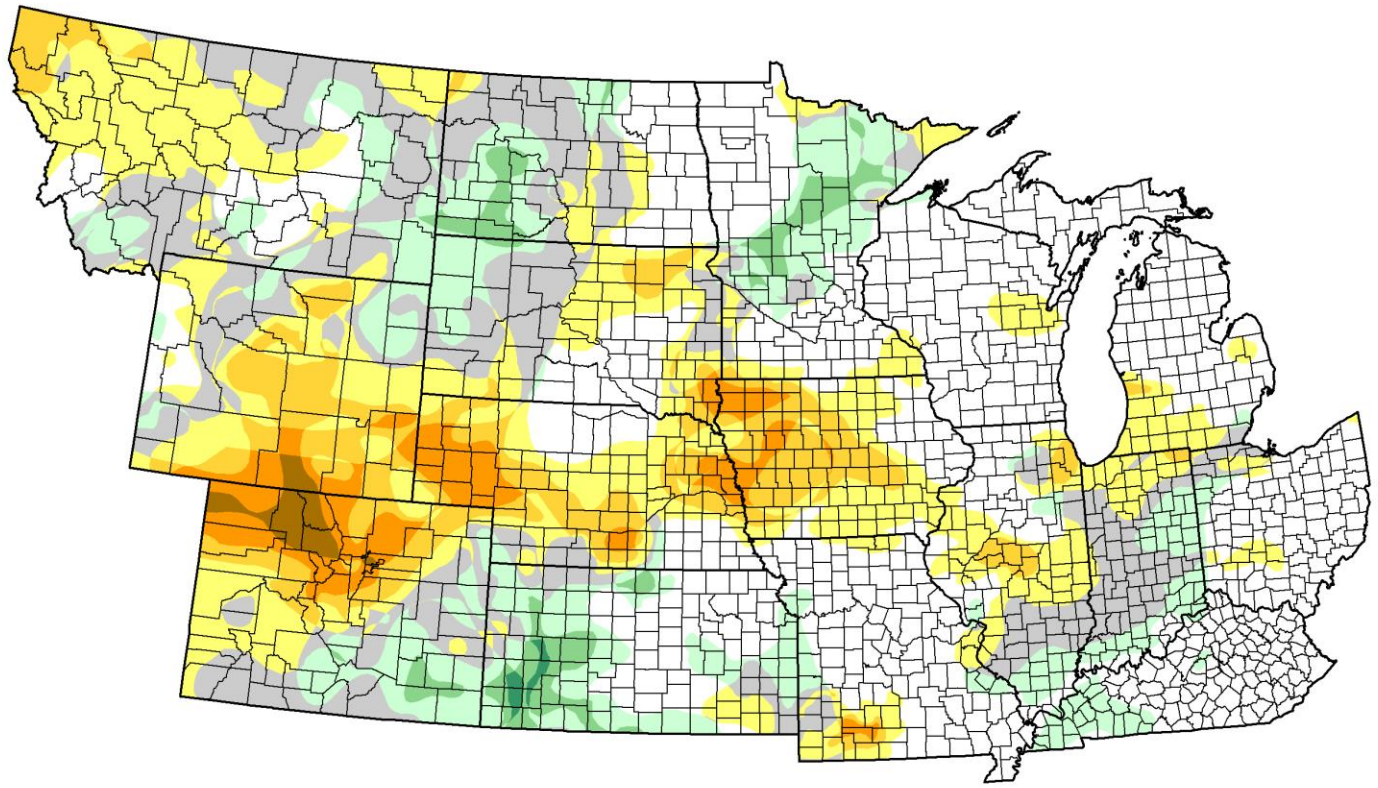
NWS Central Region Percent Area



https://droughtmonitor.unl.edu/Data/Timeseries.aspx

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

3 Months



- 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

September 15, 2020
compared to
June 23, 2020

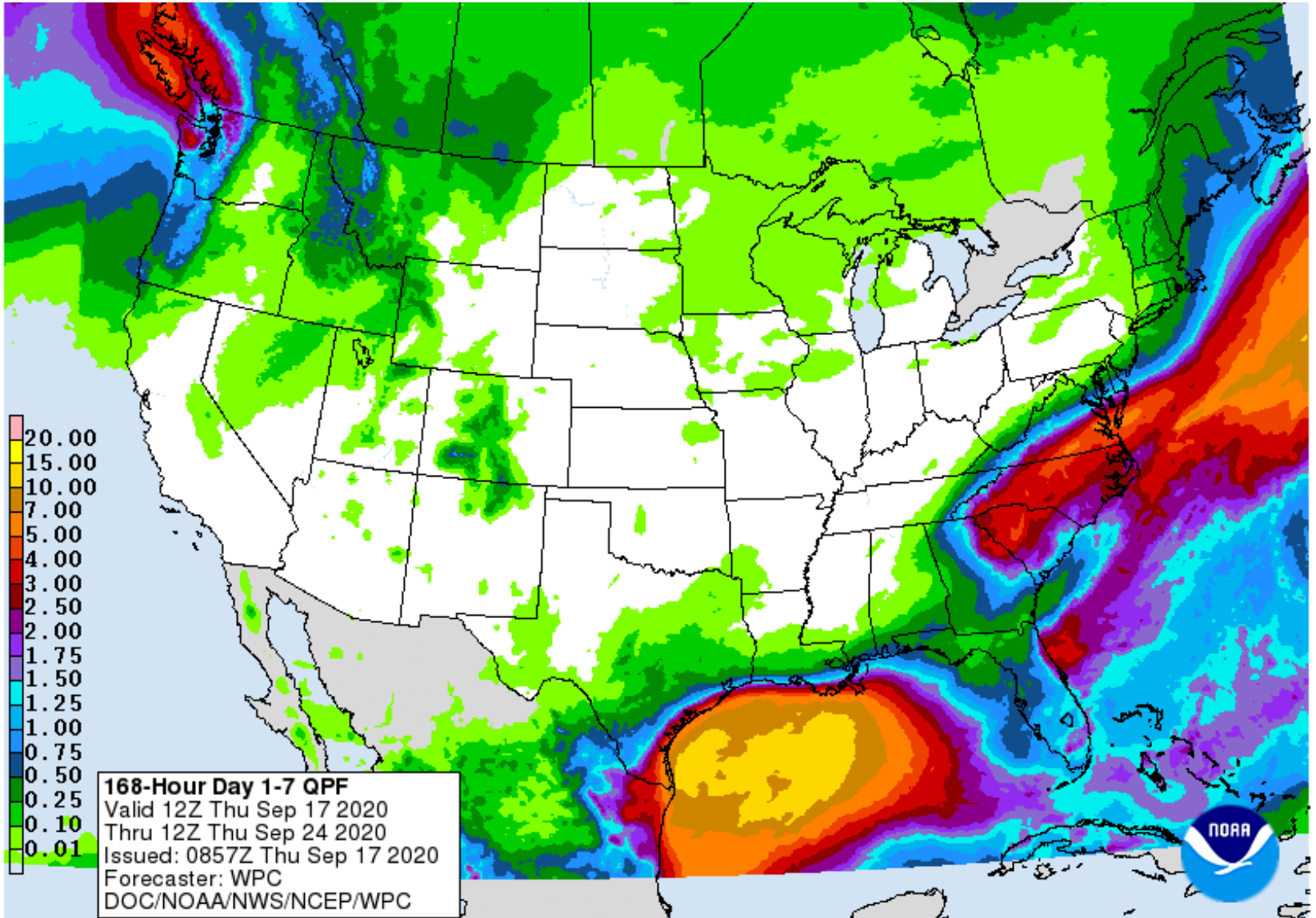
droughtmonitor.unl.edu

Climate Outlooks

- 7-day precipitation forecast
- 8-14 day outlook
- Monthly Outlook
- Autumn Outlook (Sep-Nov)
- Winter Outlook (Dec-Feb)
- Seasonal Drought Outlook

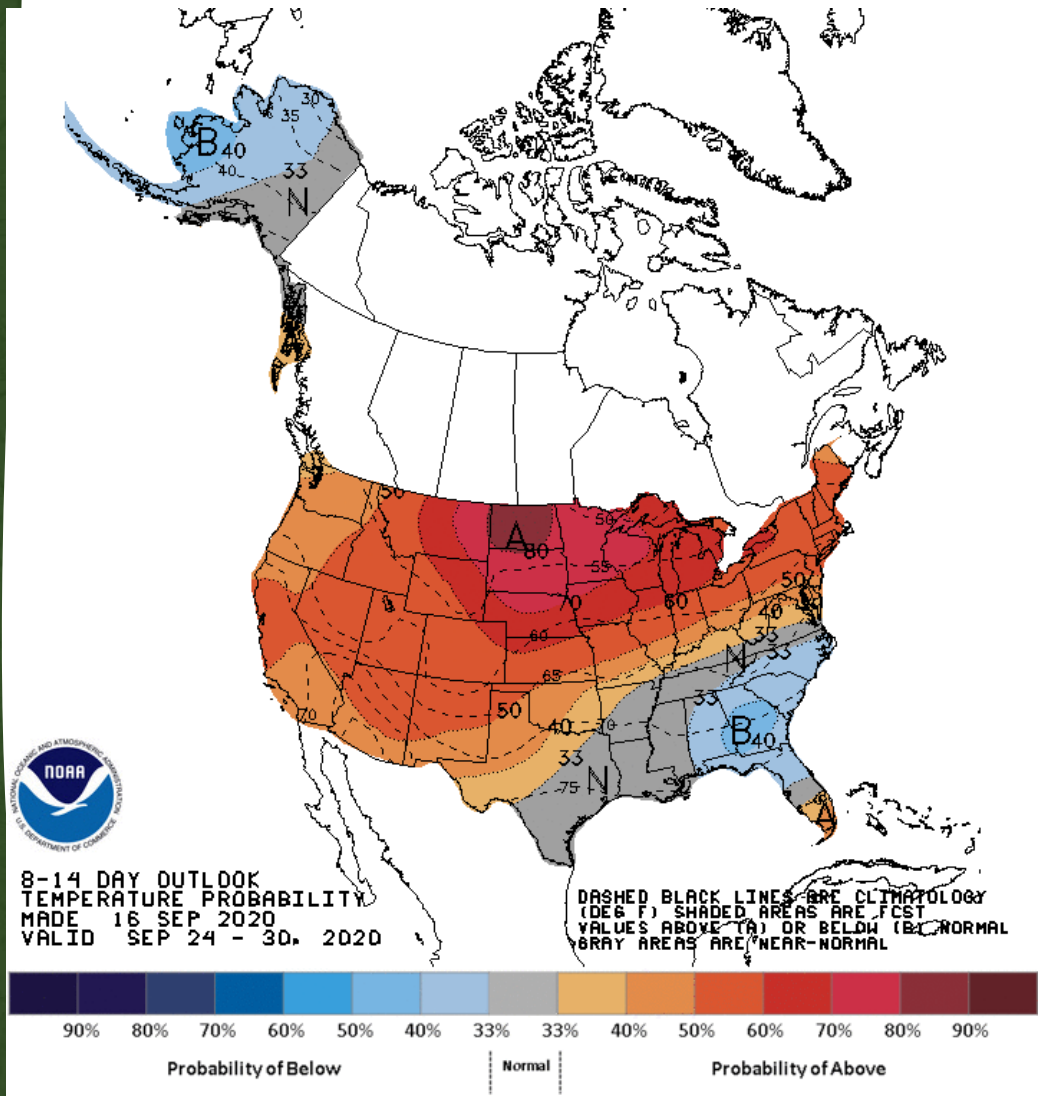
7 Day QPF valid from September 17-24, 2020

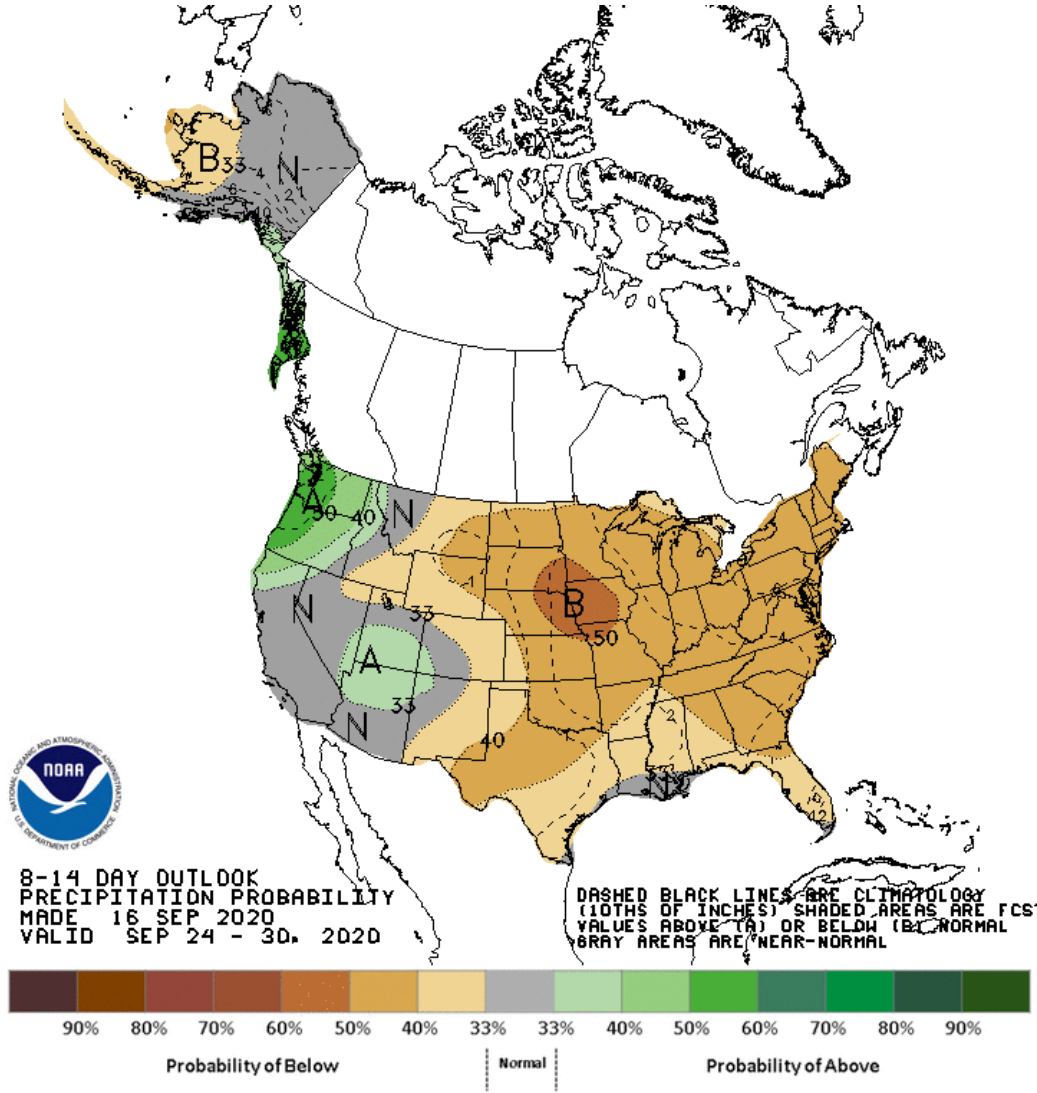
https://www.wpc.ncep.noaa.gov/qpf/p168i.gif?1600350574



8-14 day outlook for September 24-30, 2020

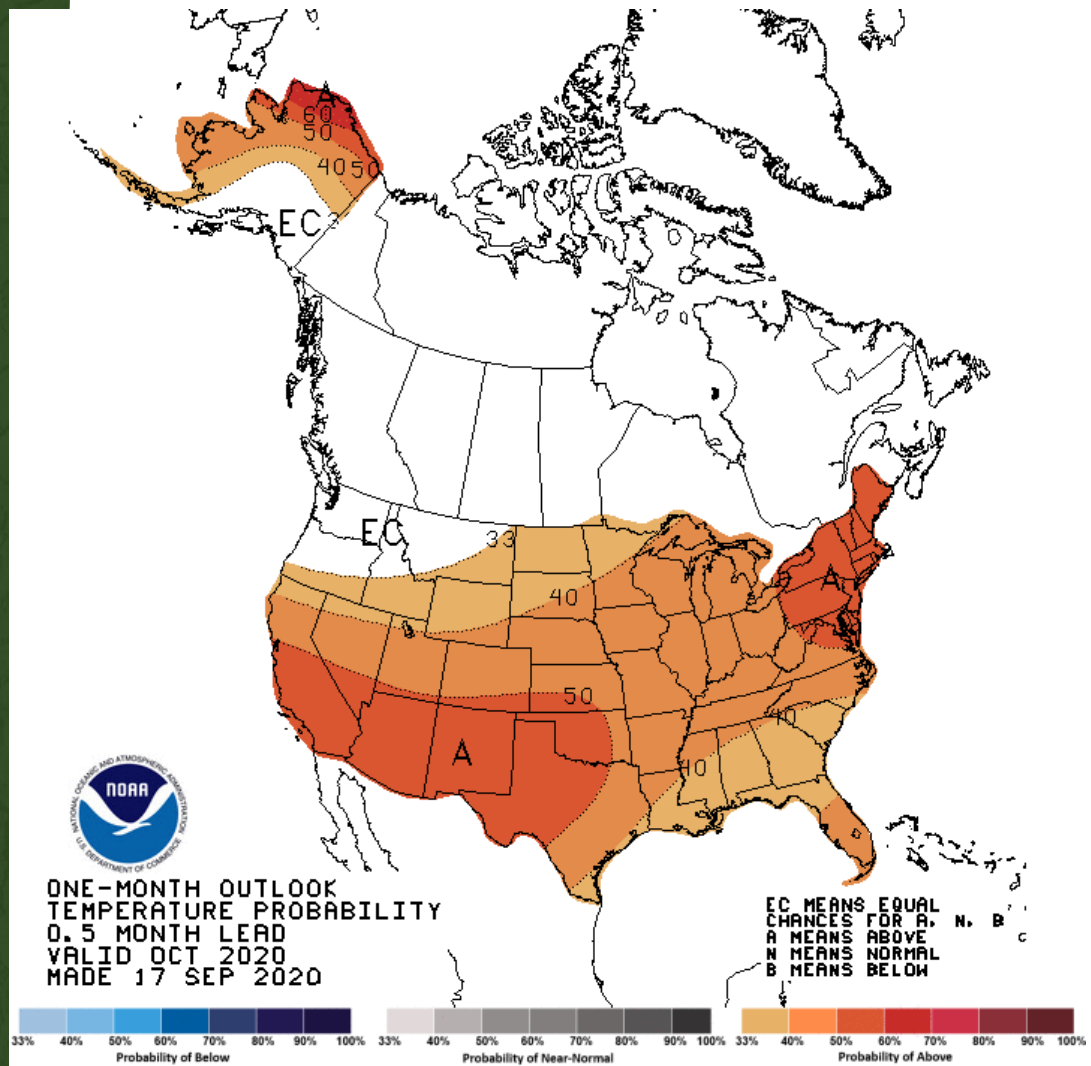
http://www.cpc.ncep.noaa.gov/products/predictions/814day/

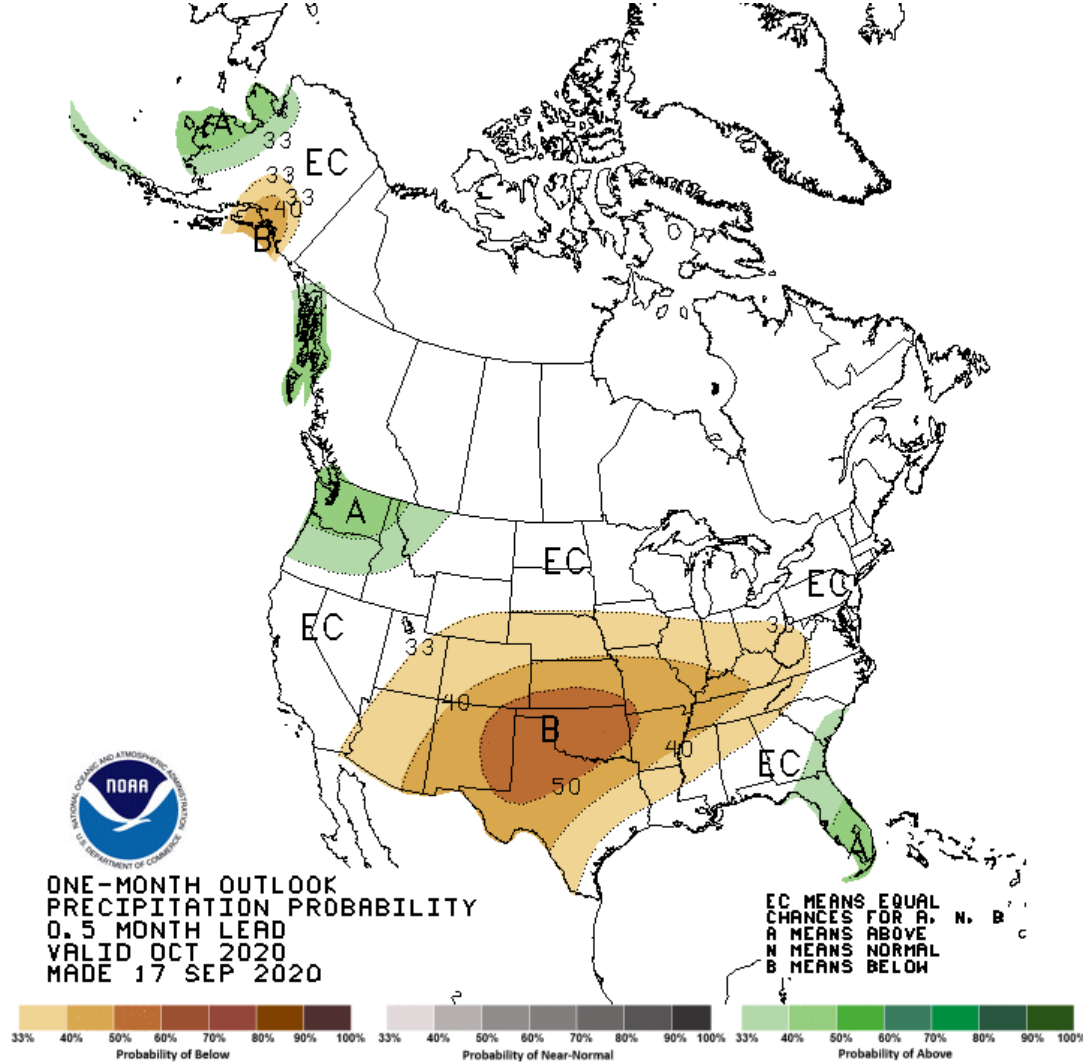




Monthly Outlook for October 2020

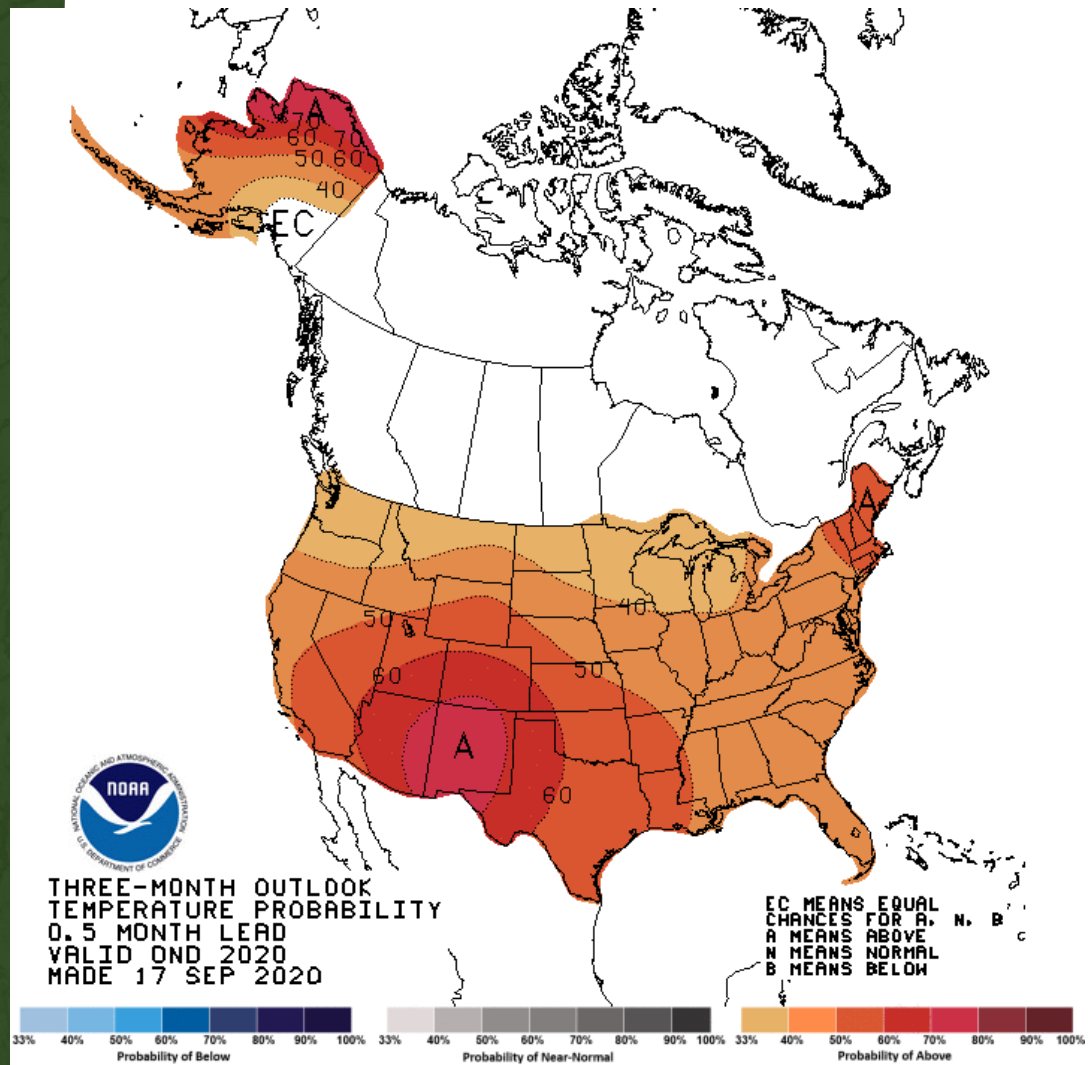
https://www.cpc.ncep.noaa.gov/products/predictions/90day/

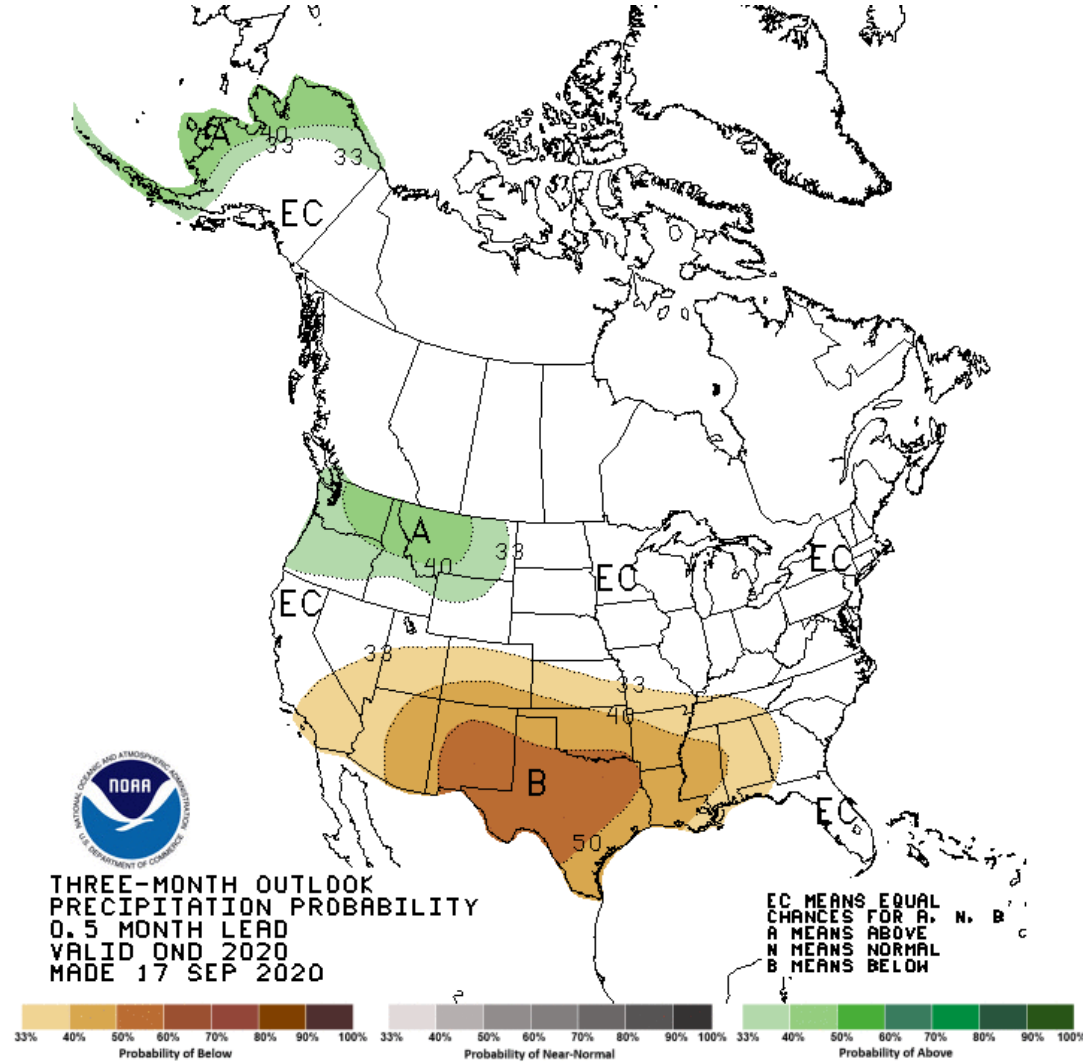




3-Month Outlook (October-December,2020)

https://www.cpc.ncep.noaa.gov/products/predictions/90day/





La Nina Advisory has been issued

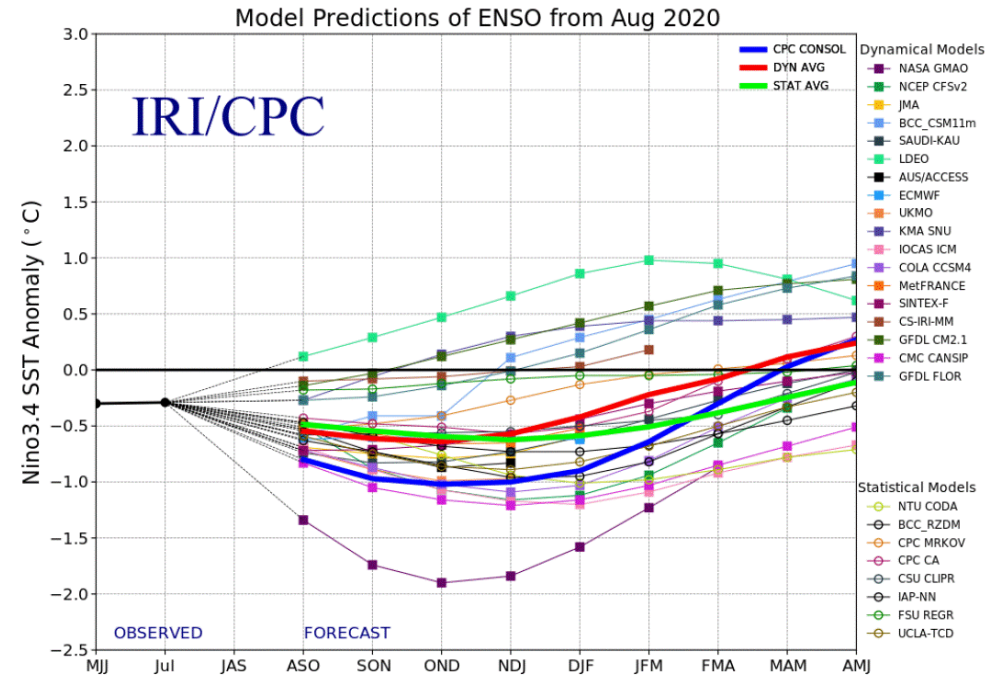
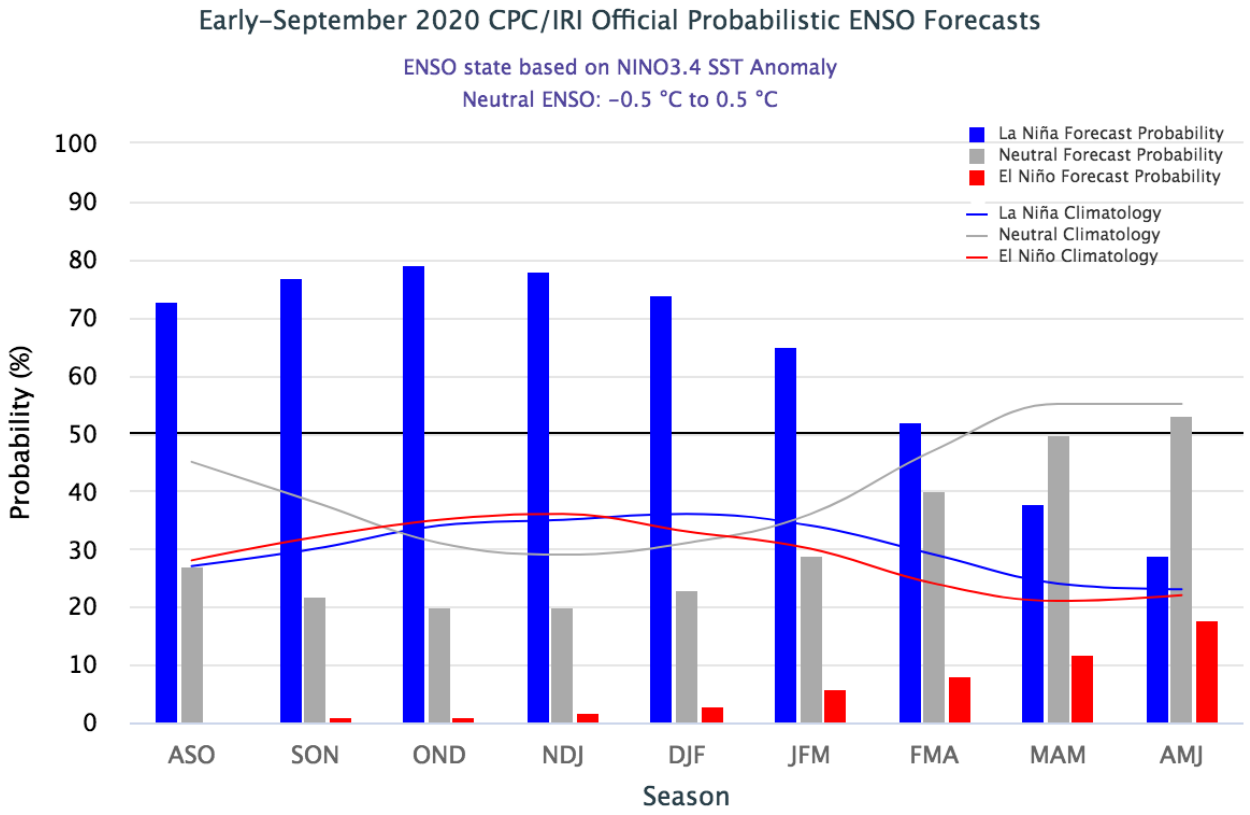
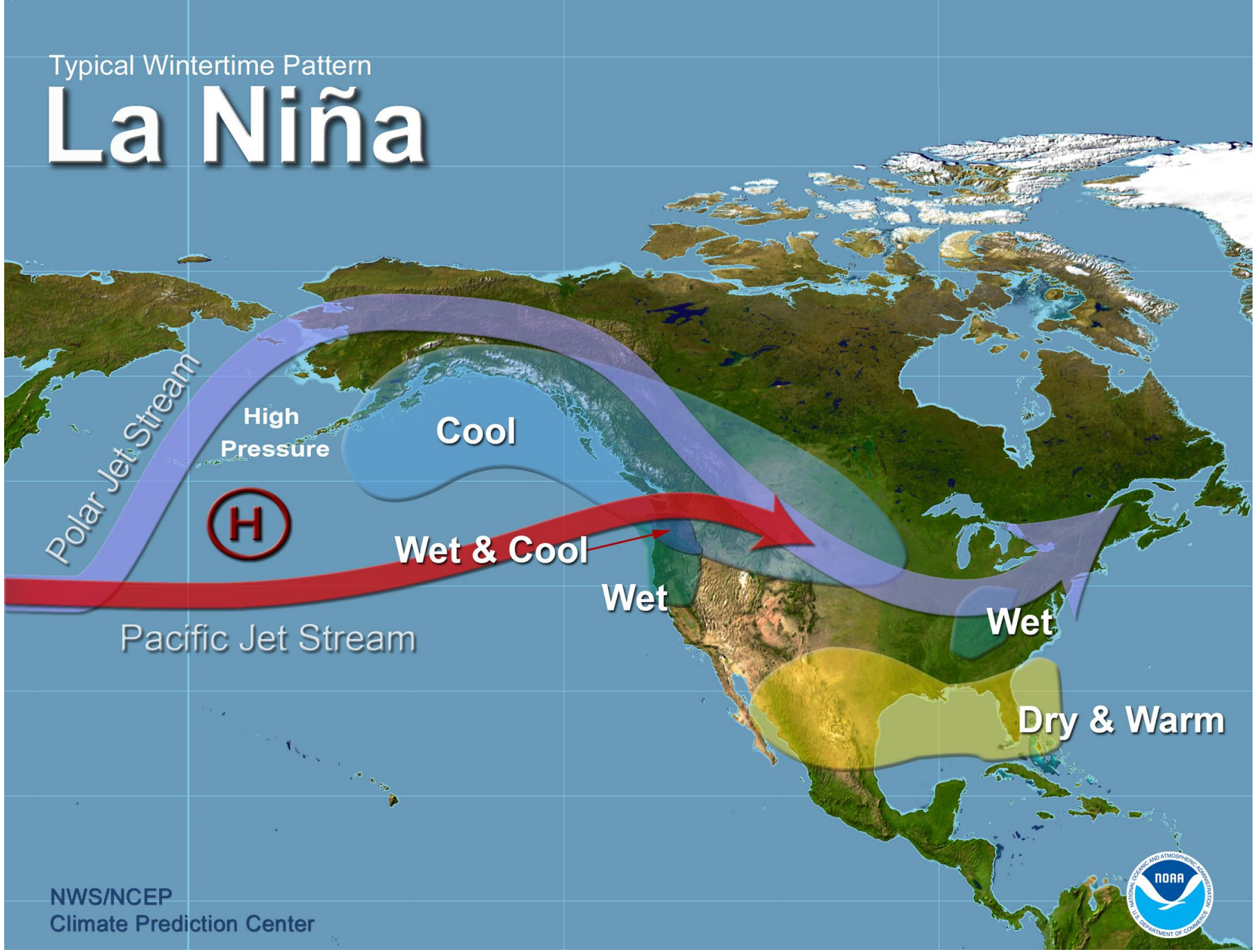


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure updated 19 August 2020.



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

What does a typical La Nina pattern mean?

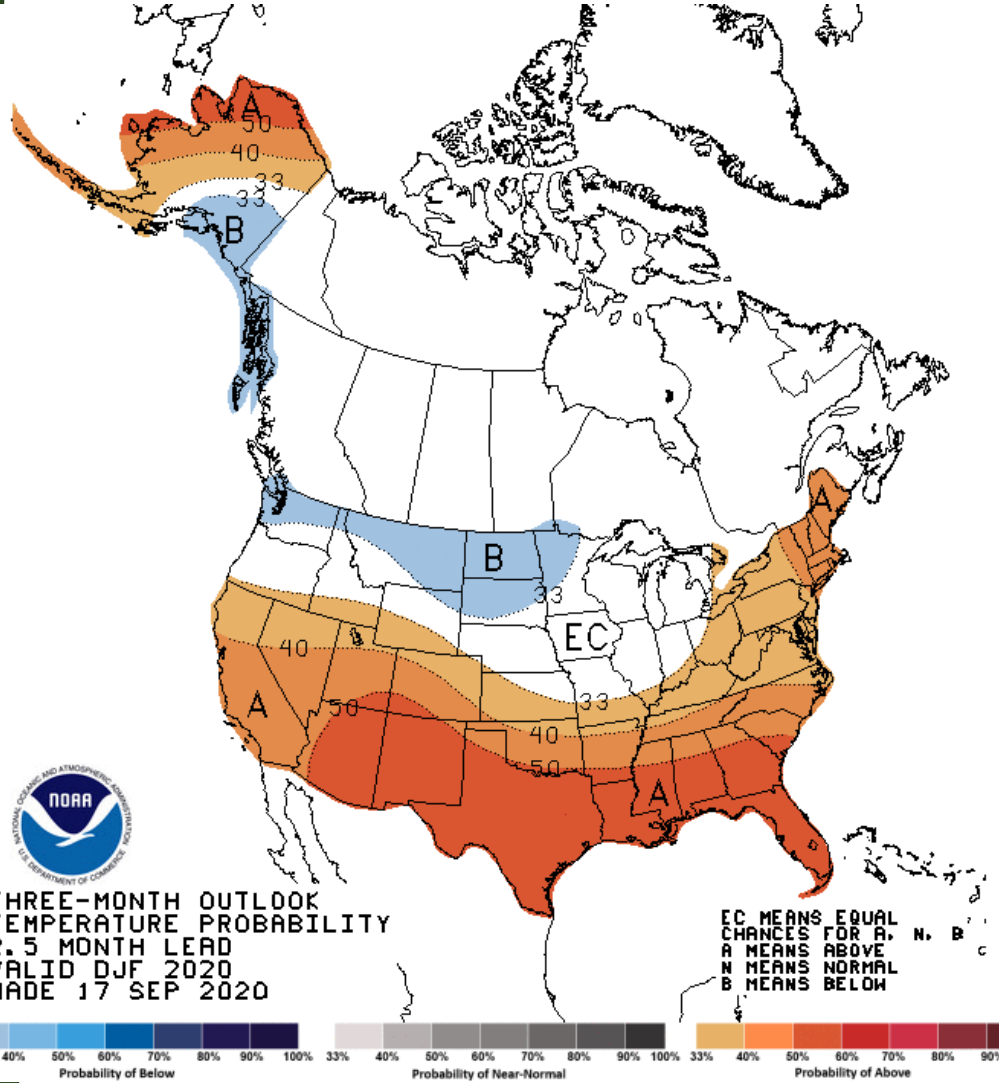


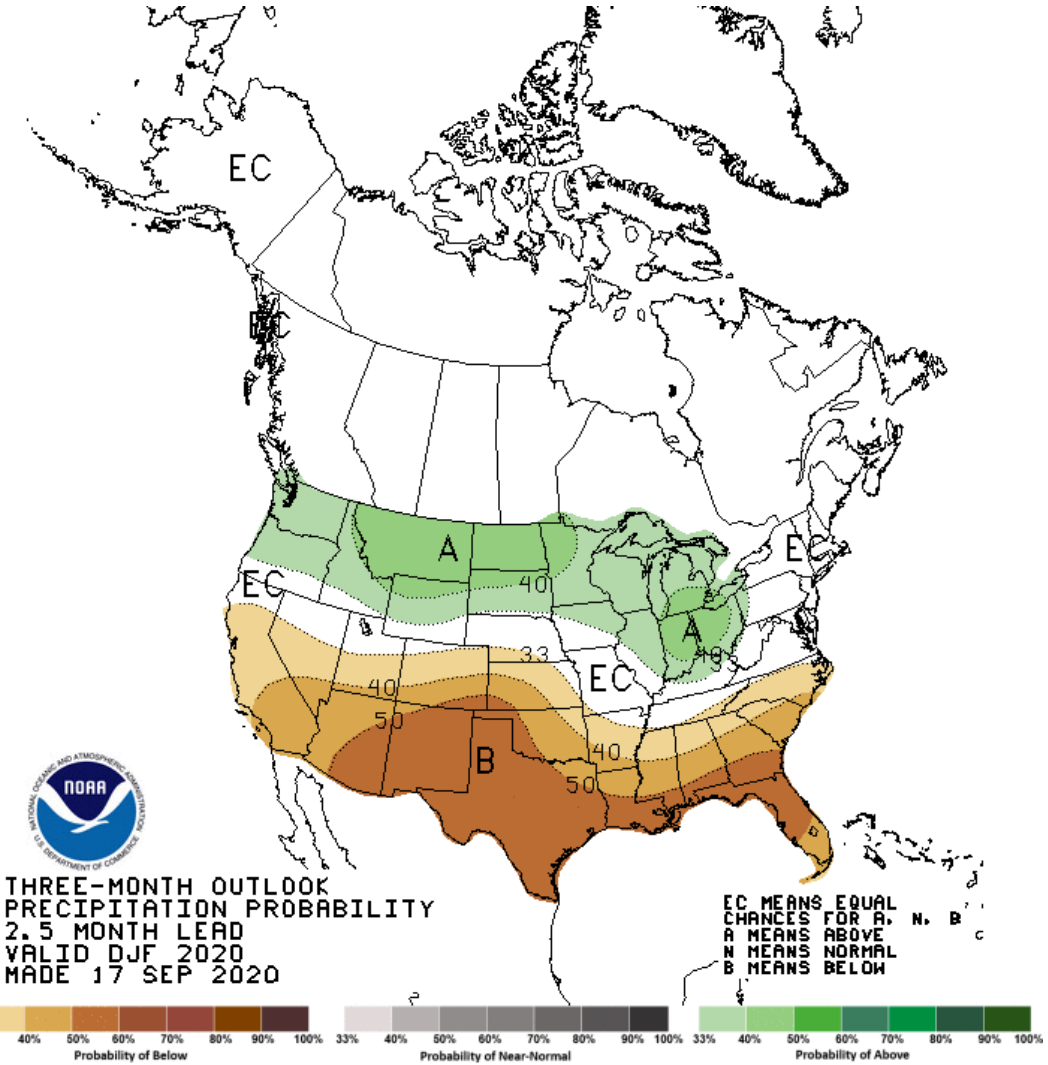
https://www.pmel.noaa.gov/elnino/sites/default/files/thumbnails/image/LaNina-Jet-Wintertime-Pattern.jpg

Winter Outlook (December-February, 2020-21)

https://www.cpc.ncep.noaa.gov/products/predictions/90day/

The official winter outlook will come out on 10/15/20 and will be discussed next month

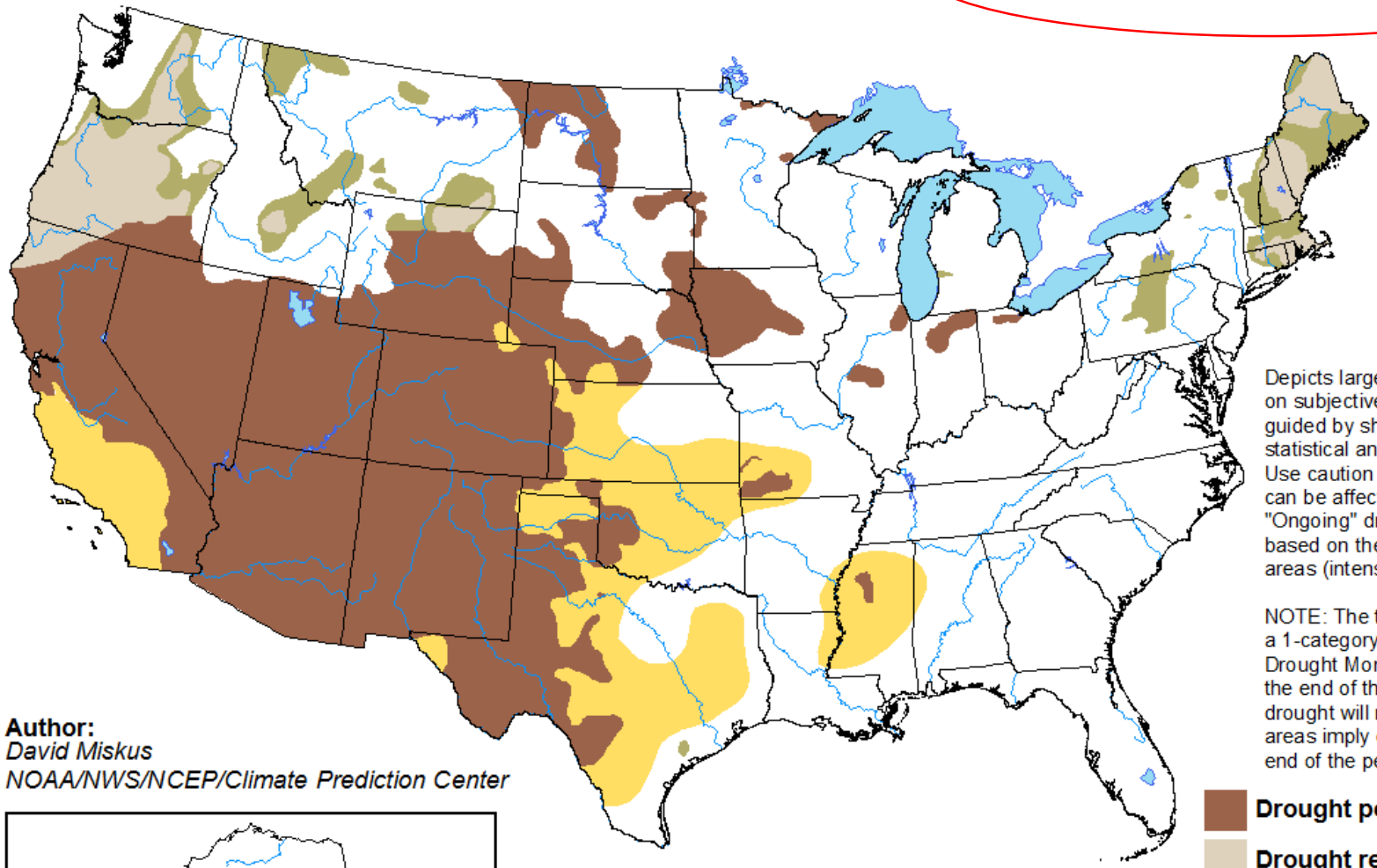


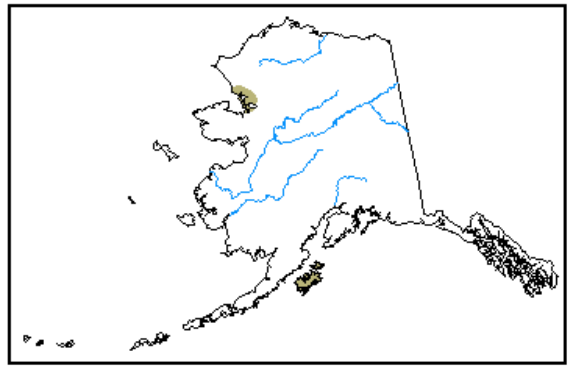


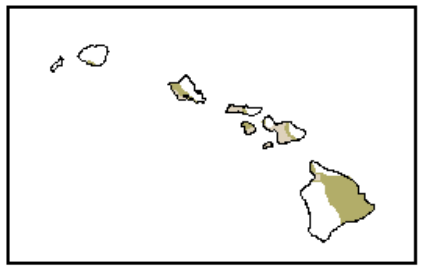
U.S. Seasonal Drought Outlook

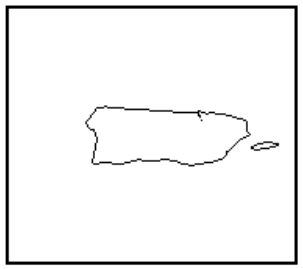
Drought Tendency During the Valid Period

Valid for September 17 - December 31, 2020
Released September 17









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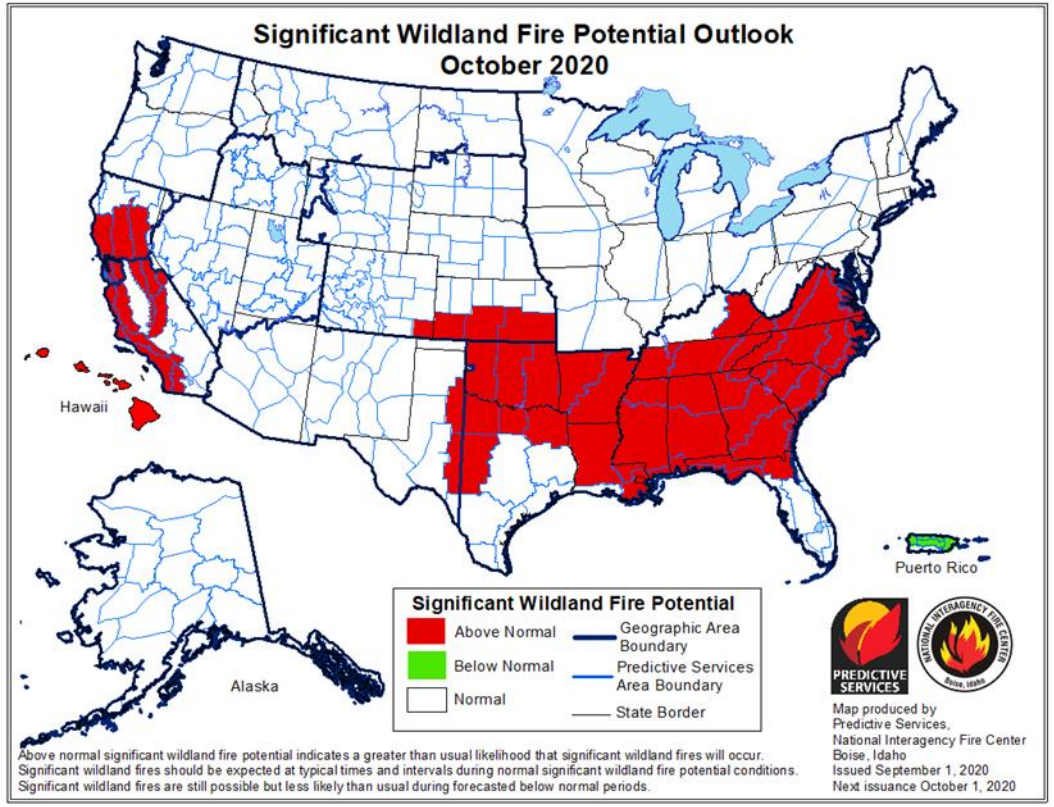
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

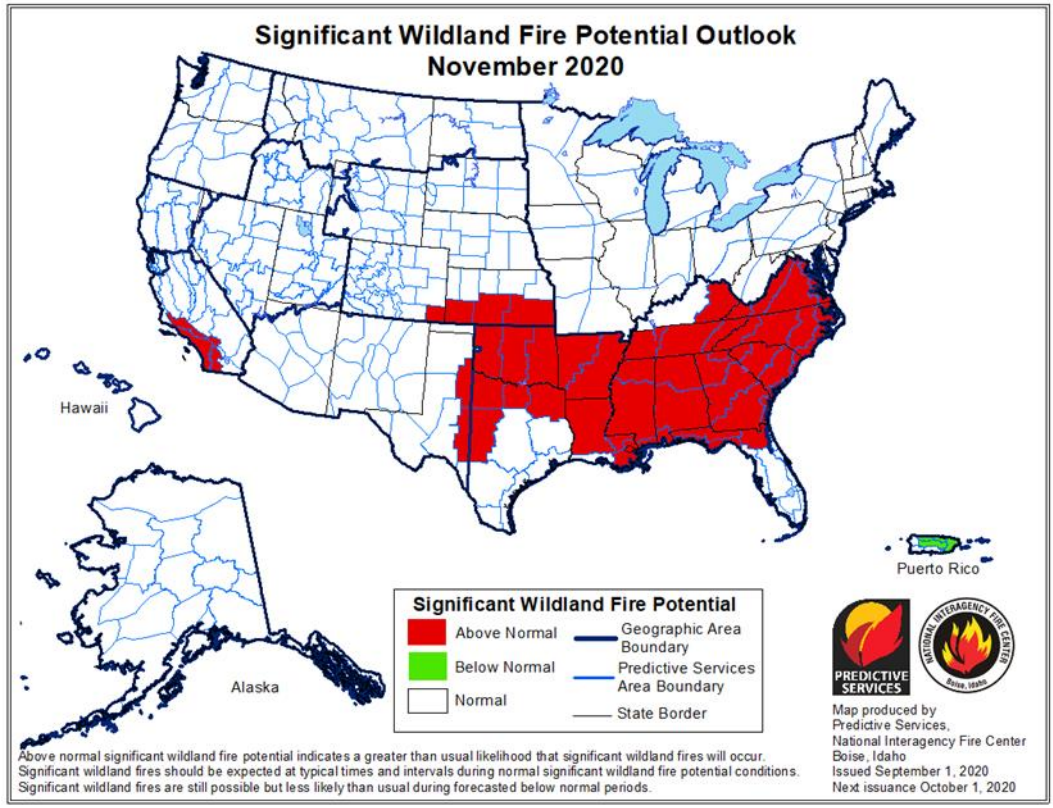
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

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

http://go.usa.gov/3eZ73

Significant Wildland Fire Potential Outlook





https://www.predictiveservices.nifc.gov/outlooks/outlooks.htm

FOR ADDITIONAL INFORMATION

Presentations Archive	http://www.hprcc.unl.edu https://mrcc.illinois.edu/multimedia/webinars.jsp
NOAA's National Centers for Environmental Information	www.ncdc.noaa.gov
Monthly Climate Reports	www.ncdc.noaa.gov/sotc/
NOAA's Climate Prediction Center	www.cpc.ncep.noaa.gov
U.S. Drought Portal	www.drought.gov
National Drought Mitigation Center	drought.unl.edu
State Climatologists	www.stateclimate.org
Regional Climate Centers	www.hprcc.unl.edu and mrcc.illinois.edu

Thank you !

Brian Fuchs

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