

Midwest/Great Plains Climate-Drought Outlook

September 17, 2020

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



NATIONAL DROUGHT
MITIGATION CENTER
UNIVERSITY OF NEBRASKA

September 17, 2020

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**

- 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



Smokey sun in Iowa from Dennis Today



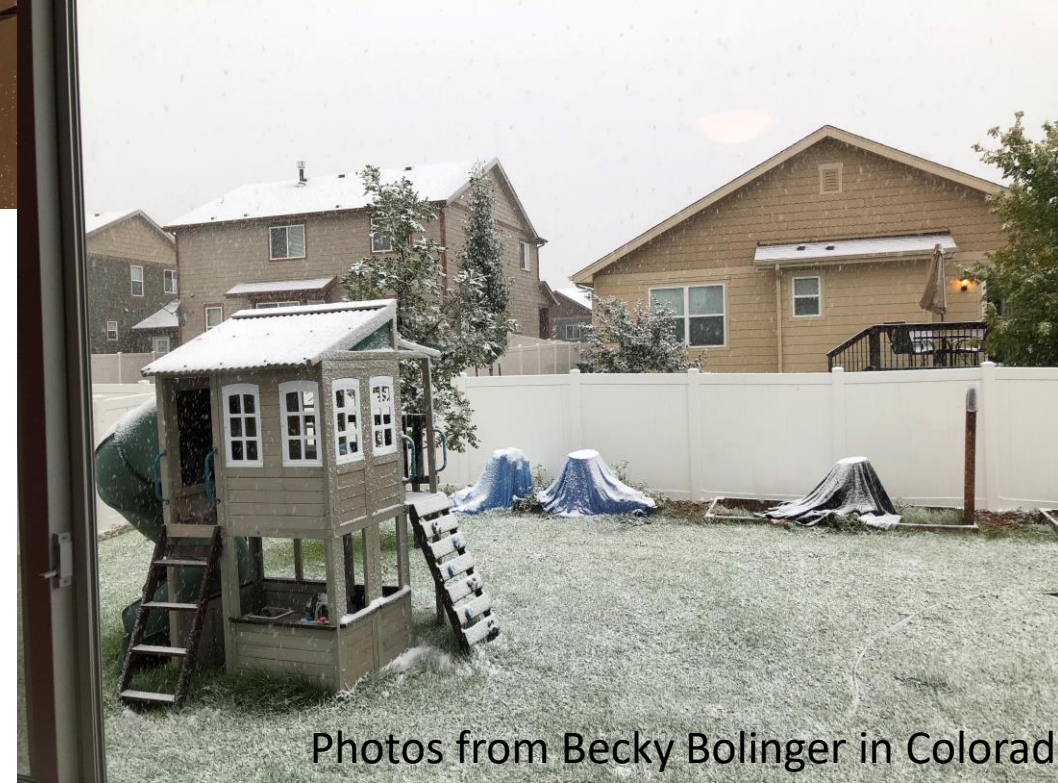
United States Department of Agriculture
Midwest Climate Hub





Agenda

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



Photos from Becky Bolinger in Colorado

Current Conditions

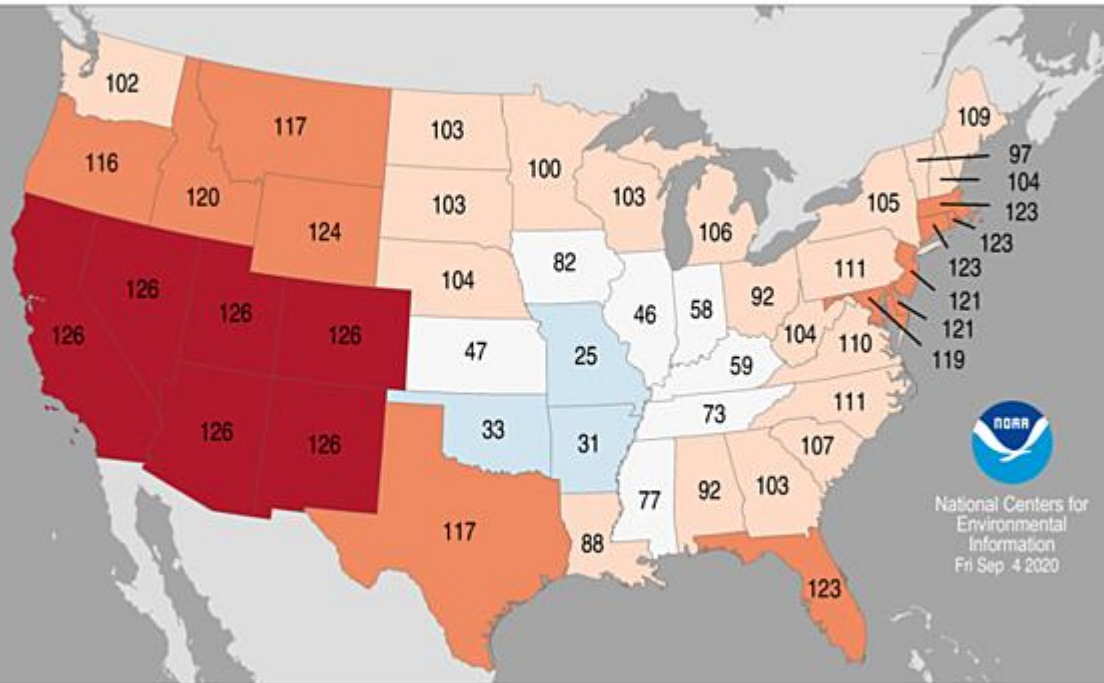


Smoke over flowers in Minnesota from Pete Boulay

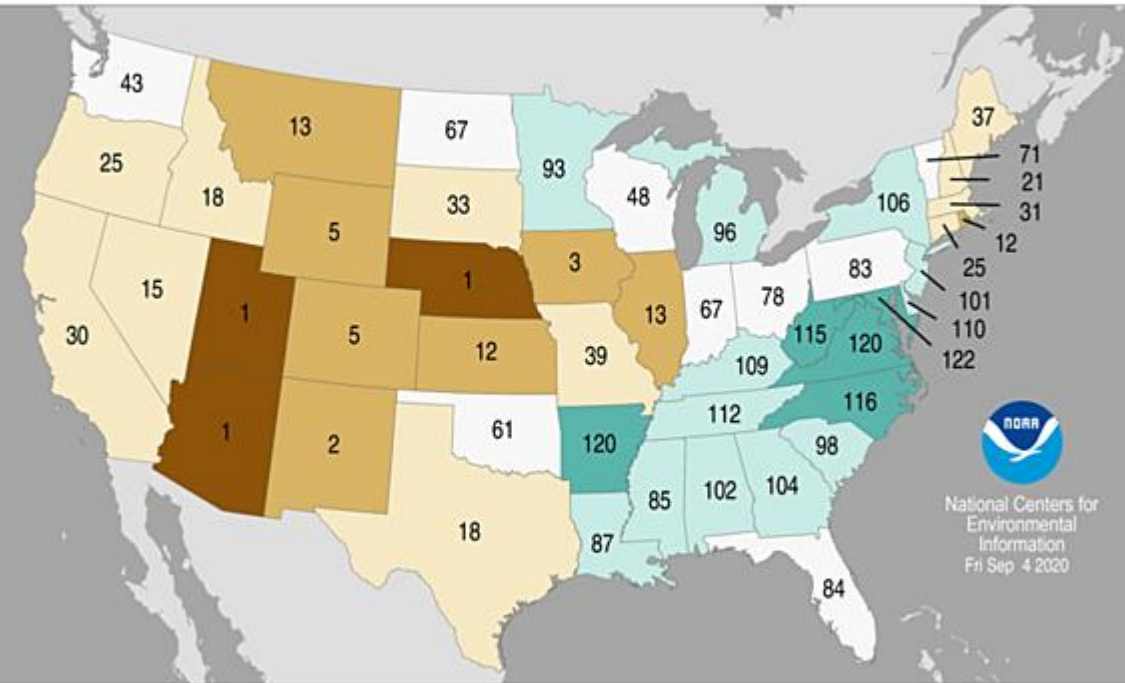


August Climatology from NCEI

Statewide Average Temperature Ranks
August 2020
Period: 1895–2020



Statewide Precipitation Ranks
August 2020
Period: 1895–2020



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

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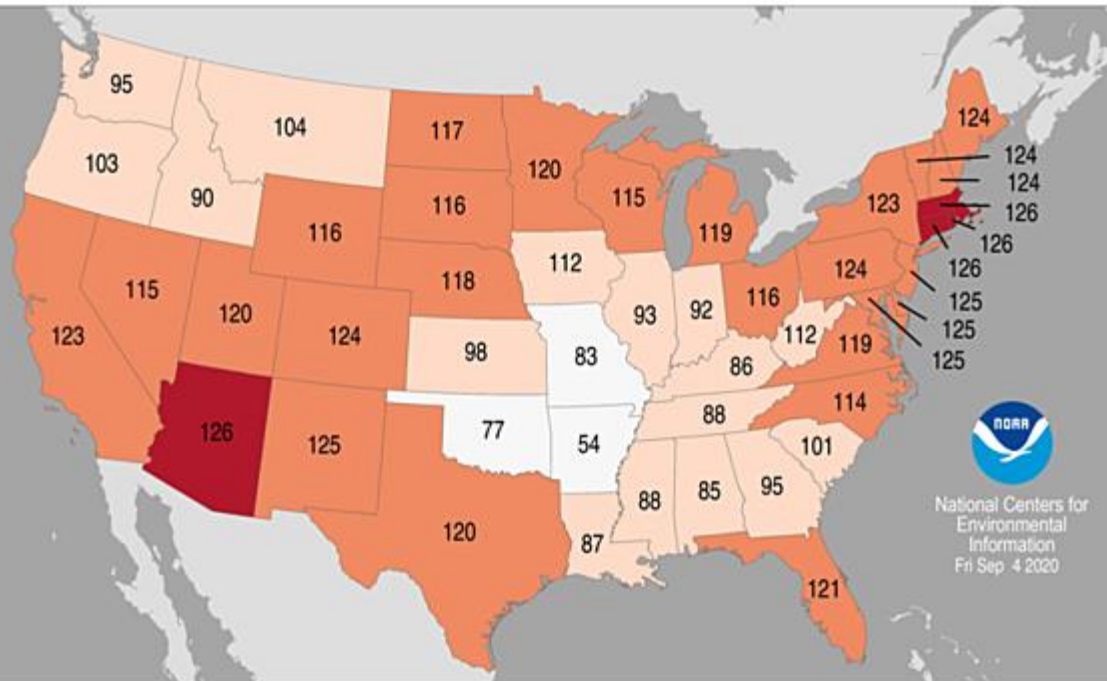
Summer Climatology from NCEI

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

Statewide Average Temperature Ranks

June – August 2020

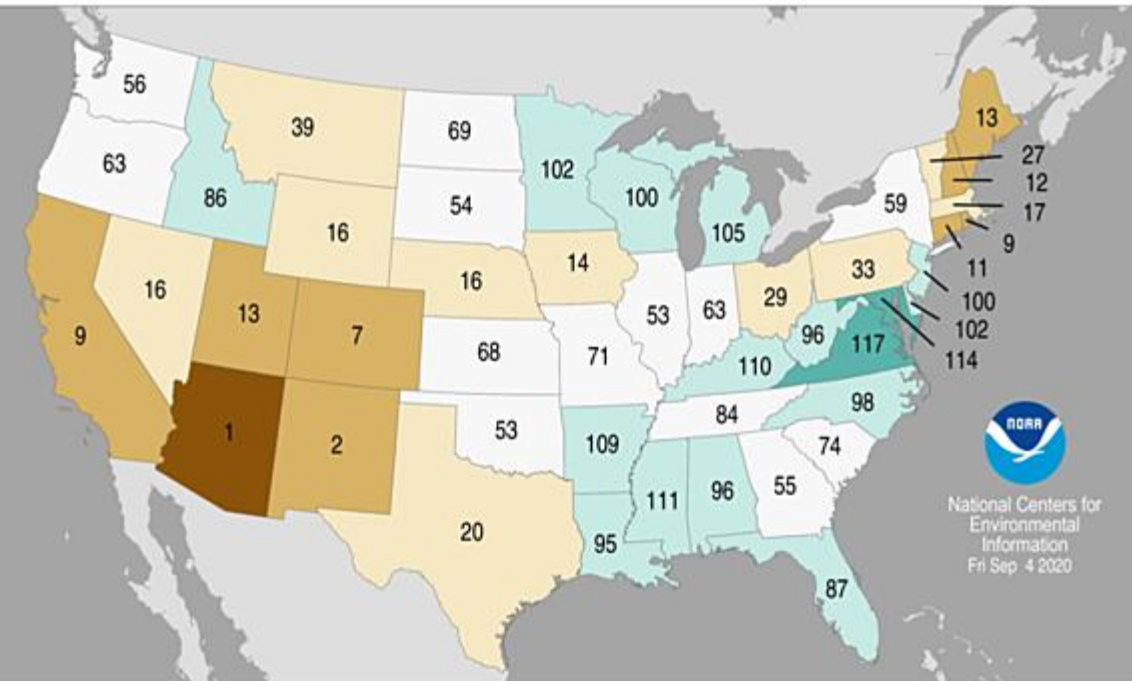
Period: 1895–2020



Statewide Precipitation Ranks

June – August 2020

Period: 1895–2020



Record
Coldest
(1)

Much
Below
Average

Below
Average

Near
Average

Above
Average

Much
Above
Average

Record
Warmest
(126)

Record
Driest
(1)

Much
Below
Average

Below
Average

Near
Average

Above
Average

Much
Above
Average

Record
Wettest
(126)



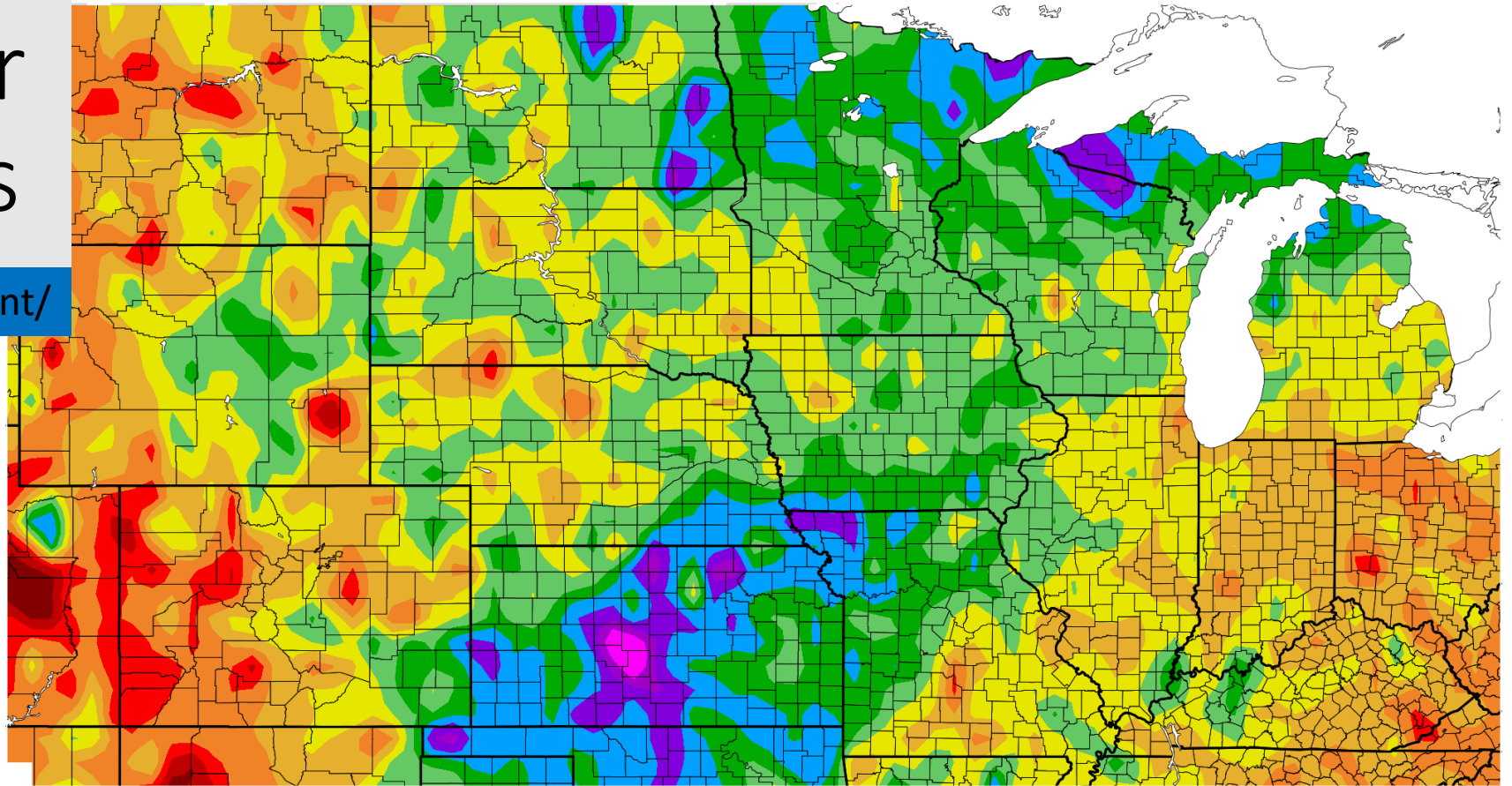
<https://www.ncdc.noaa.gov/sotc/>

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Departure from Normal Temperature (F) 8/17/2020 – 9/15/2020

Temperature departures over the last 30 Days

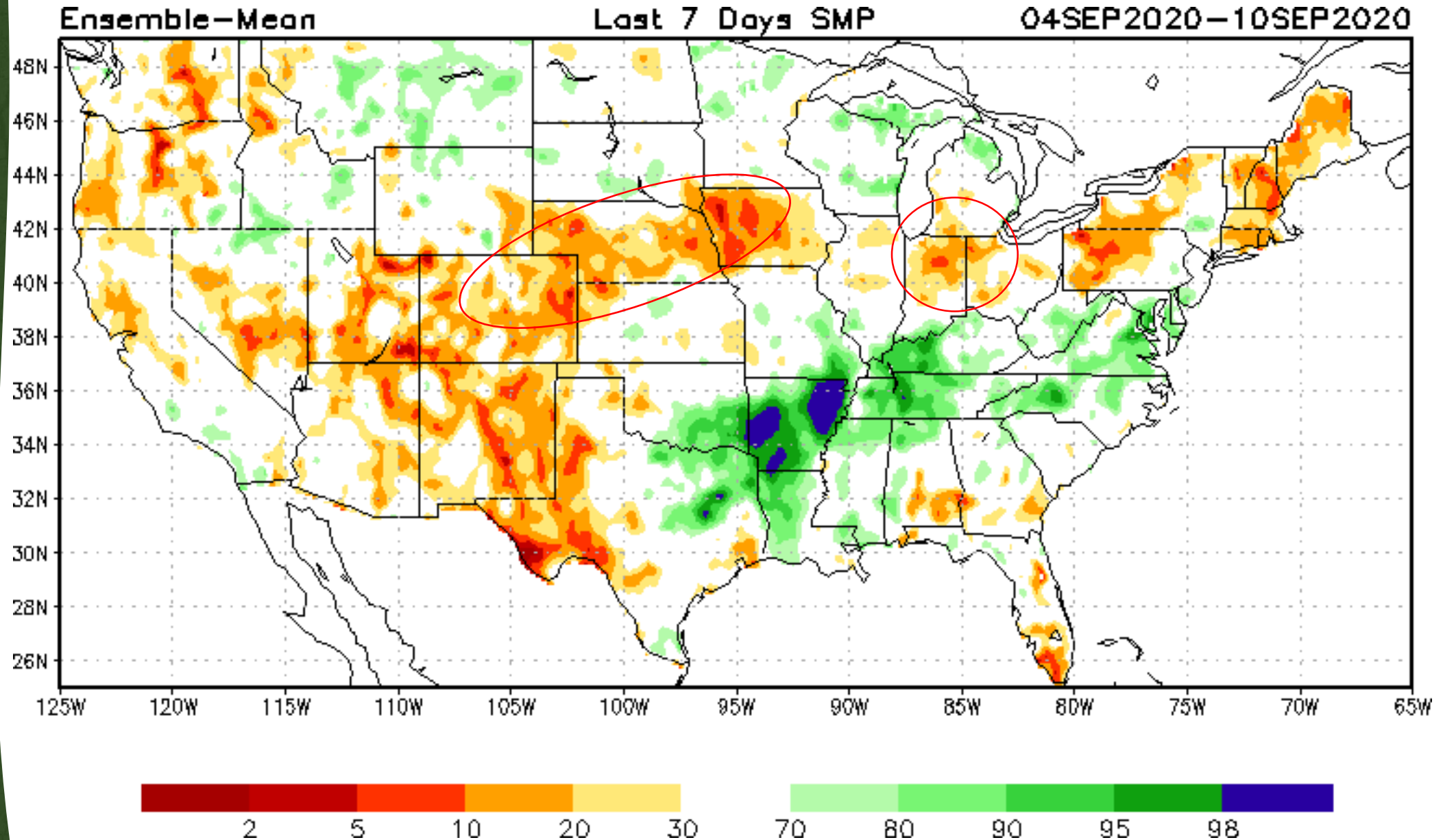
<http://www.hprcc.unl.edu/maps/current/>



Generated 9/16/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

Current Soil Moisture Anomaly

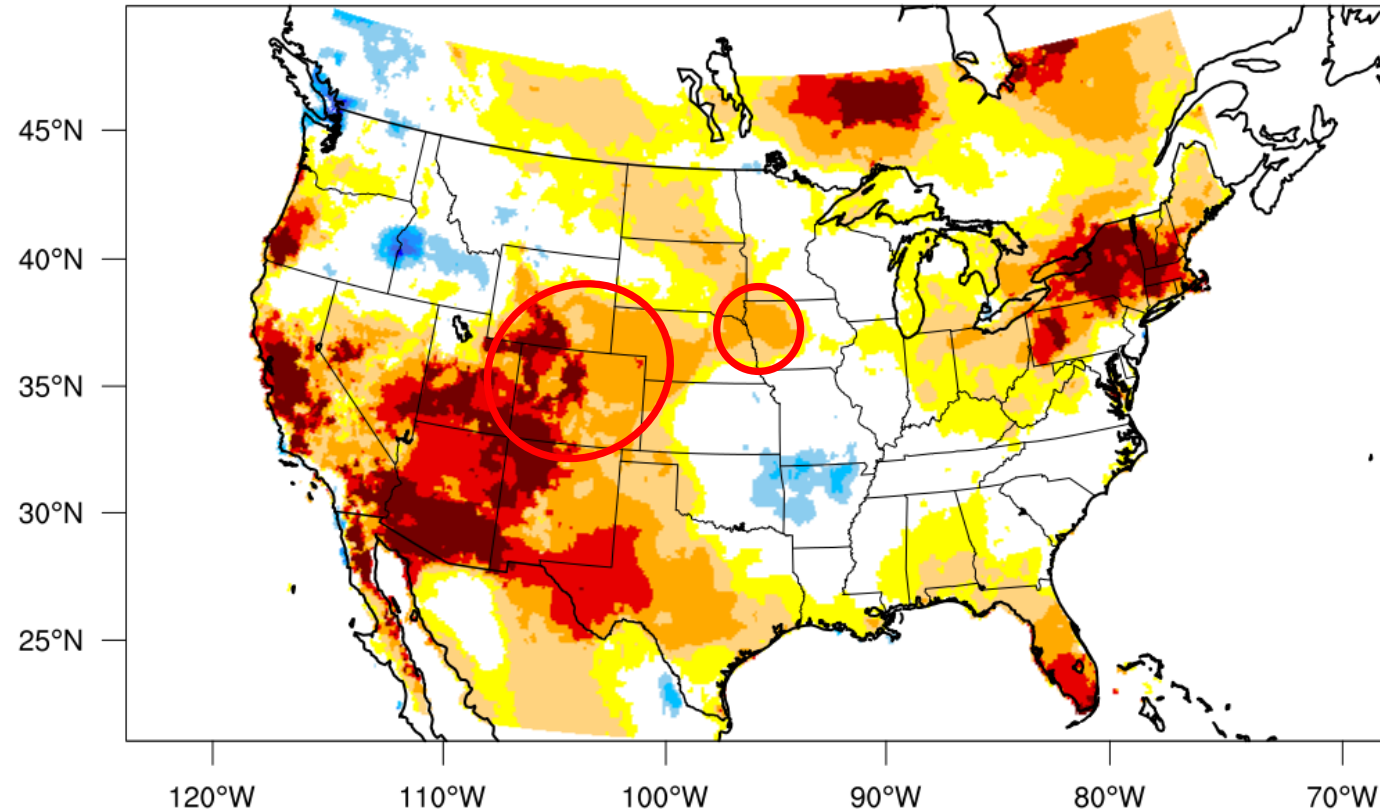


https://www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp_new.shtml#

Evaporative Demand Drought Index (EDDI)

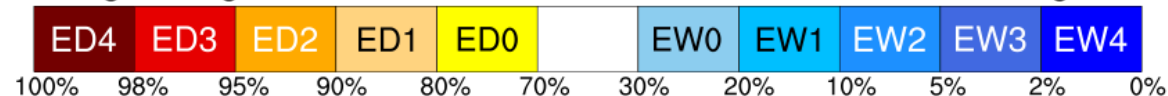
<https://www.esrl.noaa.gov/psd/eddi/>

3-month EDDI categories for September 9, 2020



Drought categories

Wetness categories

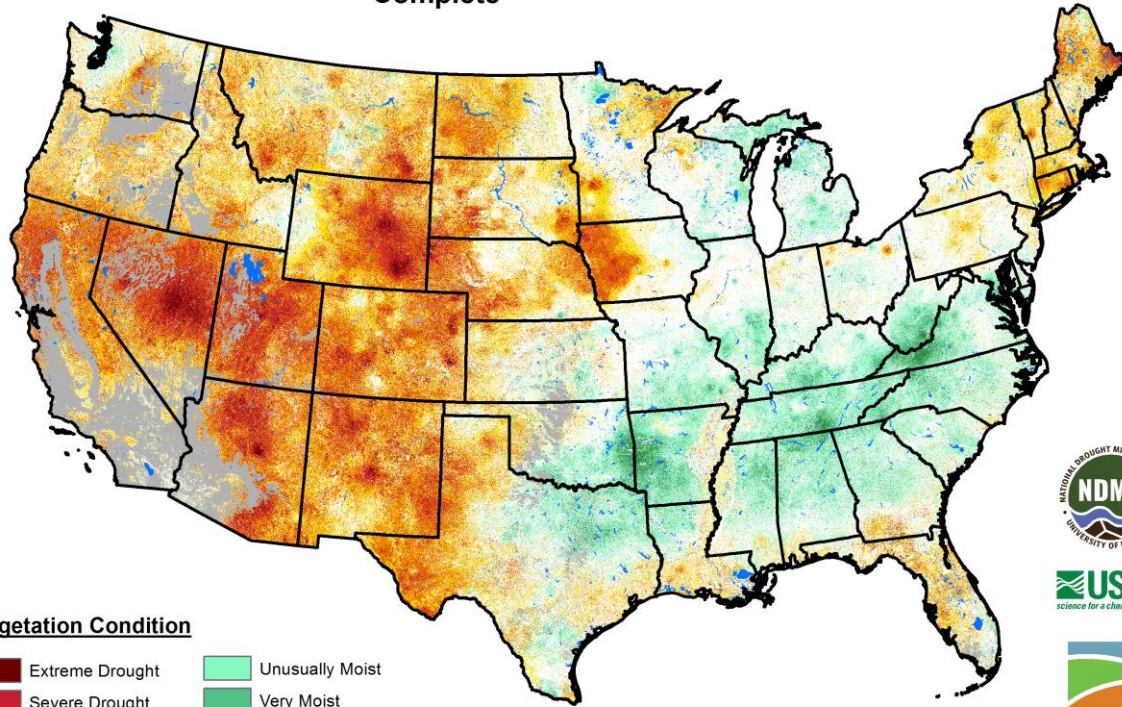


(EDDI-percentile category breaks: 100% = driest; 0% = wettest)

Vegetation Drought Response Index (VegDRI)

**Vegetation Drought Response Index
Complete**

September 13, 2020

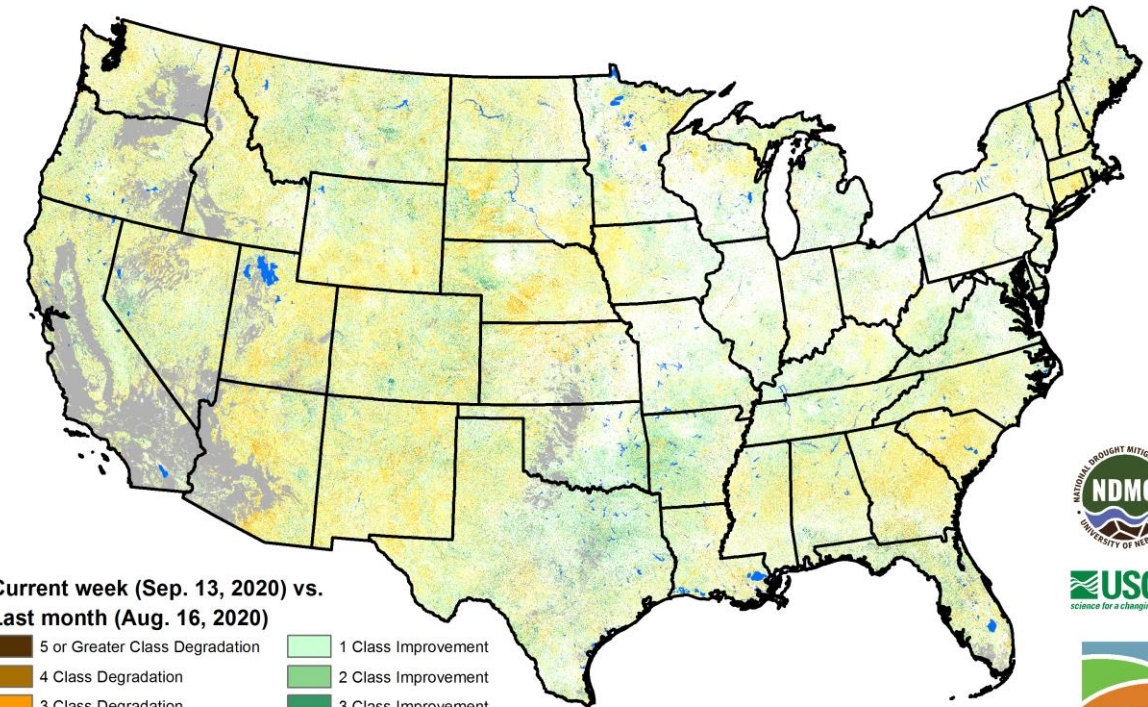


Vegetation Condition

Extreme Drought	Unusually Moist
Severe Drought	Very Moist
Moderate Drought	Extreme Moist
Pre-drought stress	Out of Season
Near Normal	Water



Vegetation Drought Response Index (VegDRI) Change



**Current week (Sep. 13, 2020) vs.
Last month (Aug. 16, 2020)**

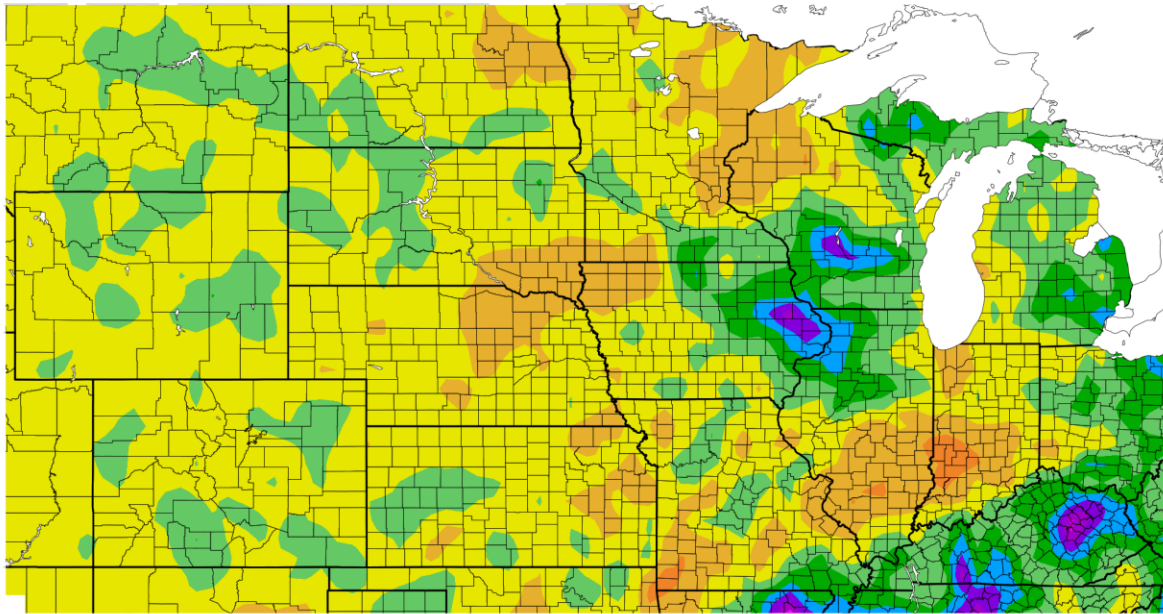
5 or Greater Class Degradation	1 Class Improvement
4 Class Degradation	2 Class Improvement
3 Class Degradation	3 Class Improvement
2 Class Degradation	4 Class Improvement
1 Class Degradation	5 or Greater Class Improvement
No Change	Out of Season

Water



Precipitation over the last 30 Days

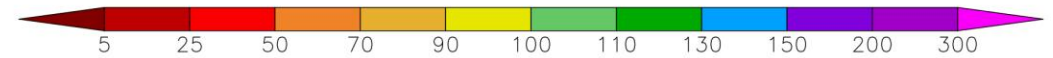
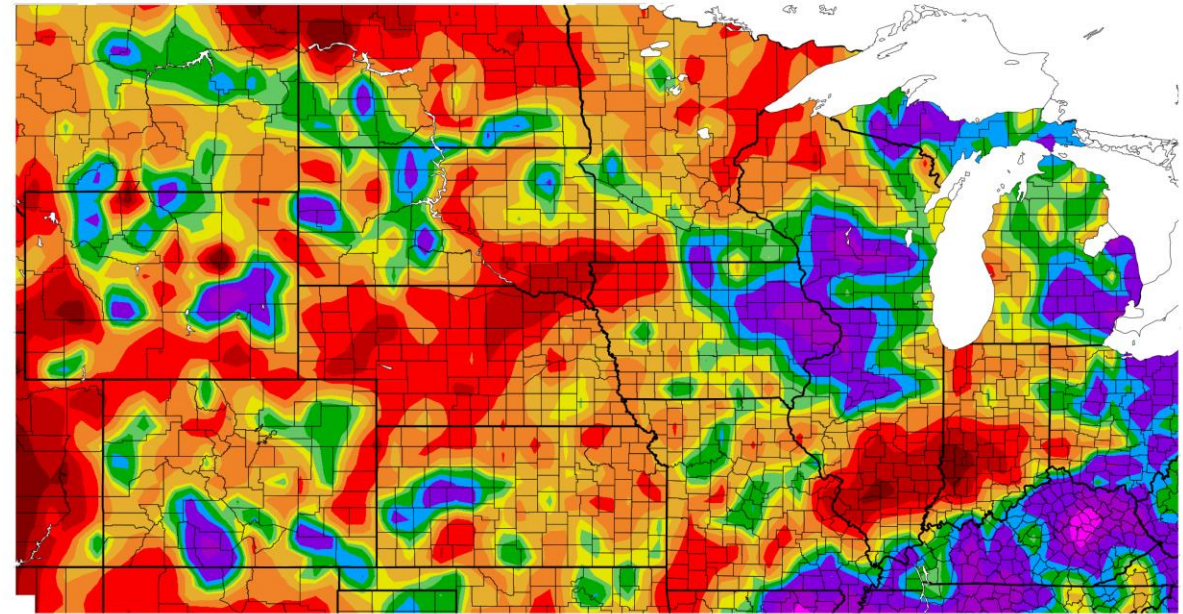
Departure from Normal Precipitation (in)
8/16/2020 – 9/14/2020



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

NOAA Regional Climate Centers

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



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

NOAA Regional Climate Centers

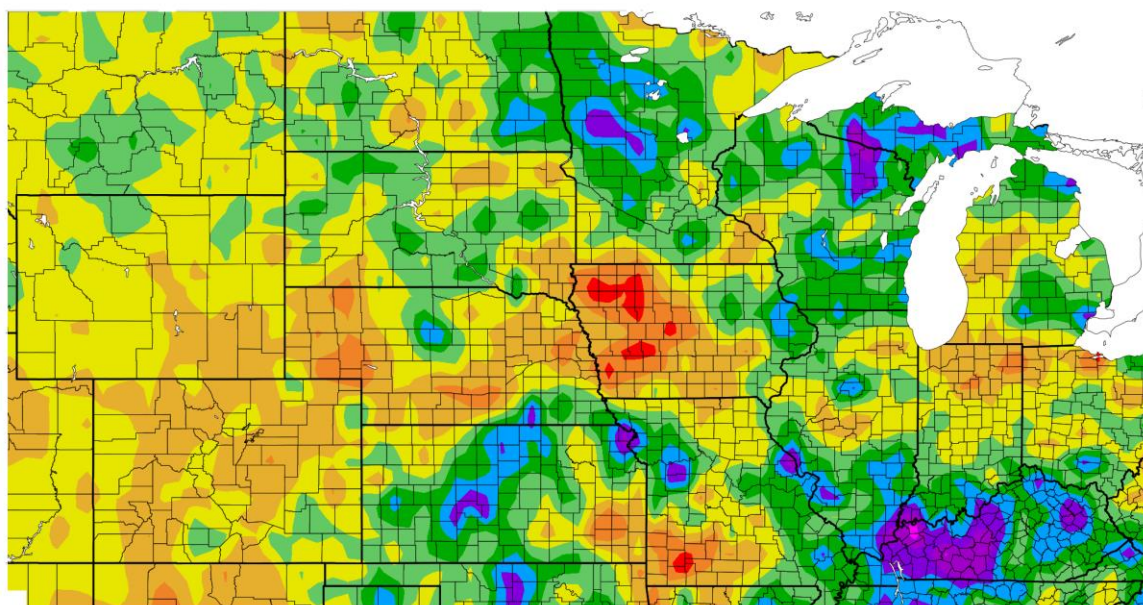


<http://www.hprcc.unl.edu/maps/current/>

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Precipitation over the last 90 Days

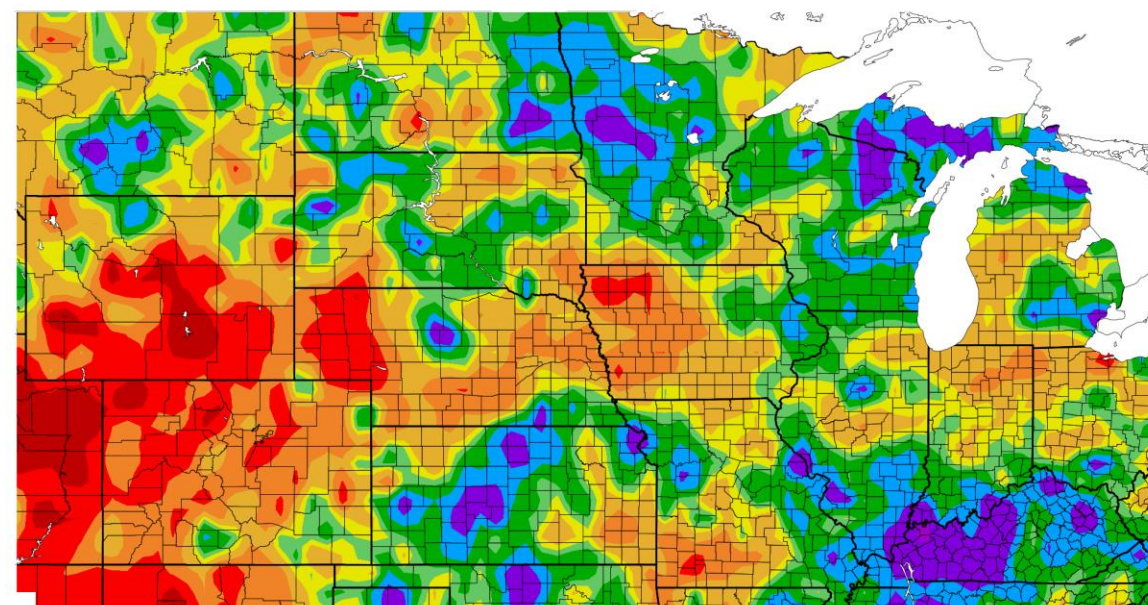
Departure from Normal Precipitation (in)
6/17/2020 – 9/14/2020



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

NOAA Regional Climate Centers

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



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

NOAA Regional Climate Centers

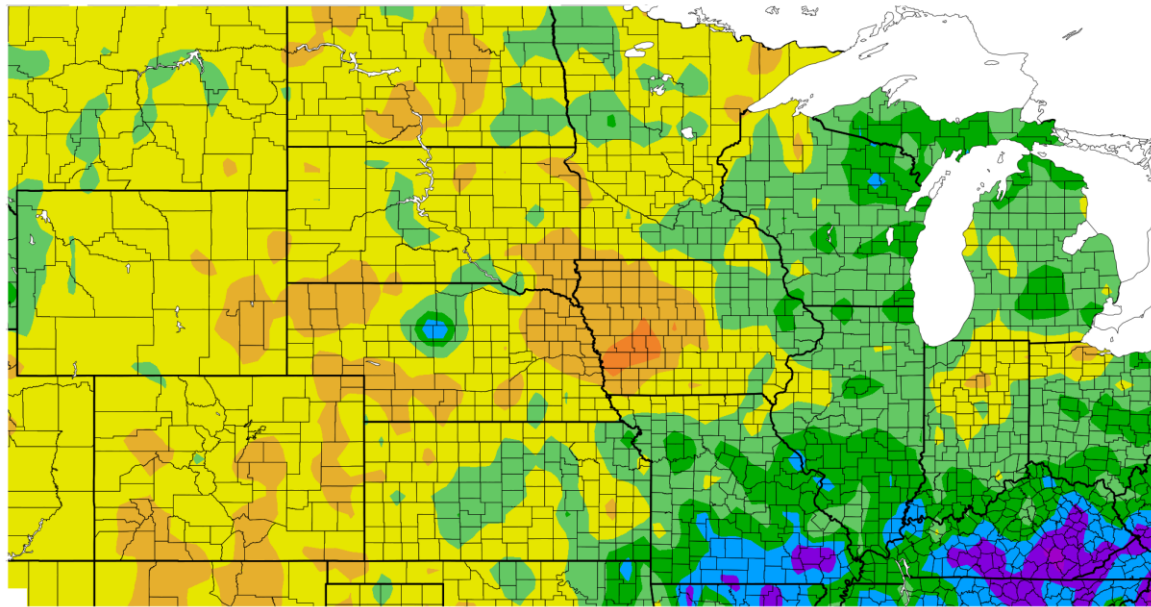


<http://www.hprcc.unl.edu/maps/current/>

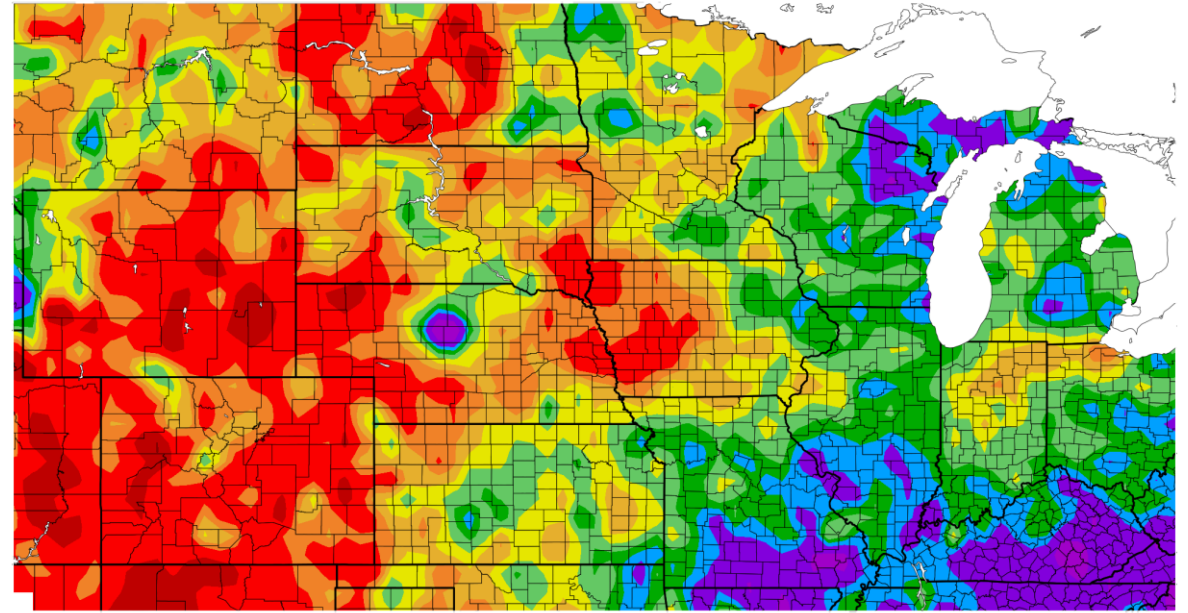
NATIONAL DROUGHT MITIGATION CENTER

Calendar Year Precipitation

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



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



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

NOAA Regional Climate Centers



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

NOAA Regional Climate Centers



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

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Natalie Umphlett

Regional Impacts

Natalie Umphlett



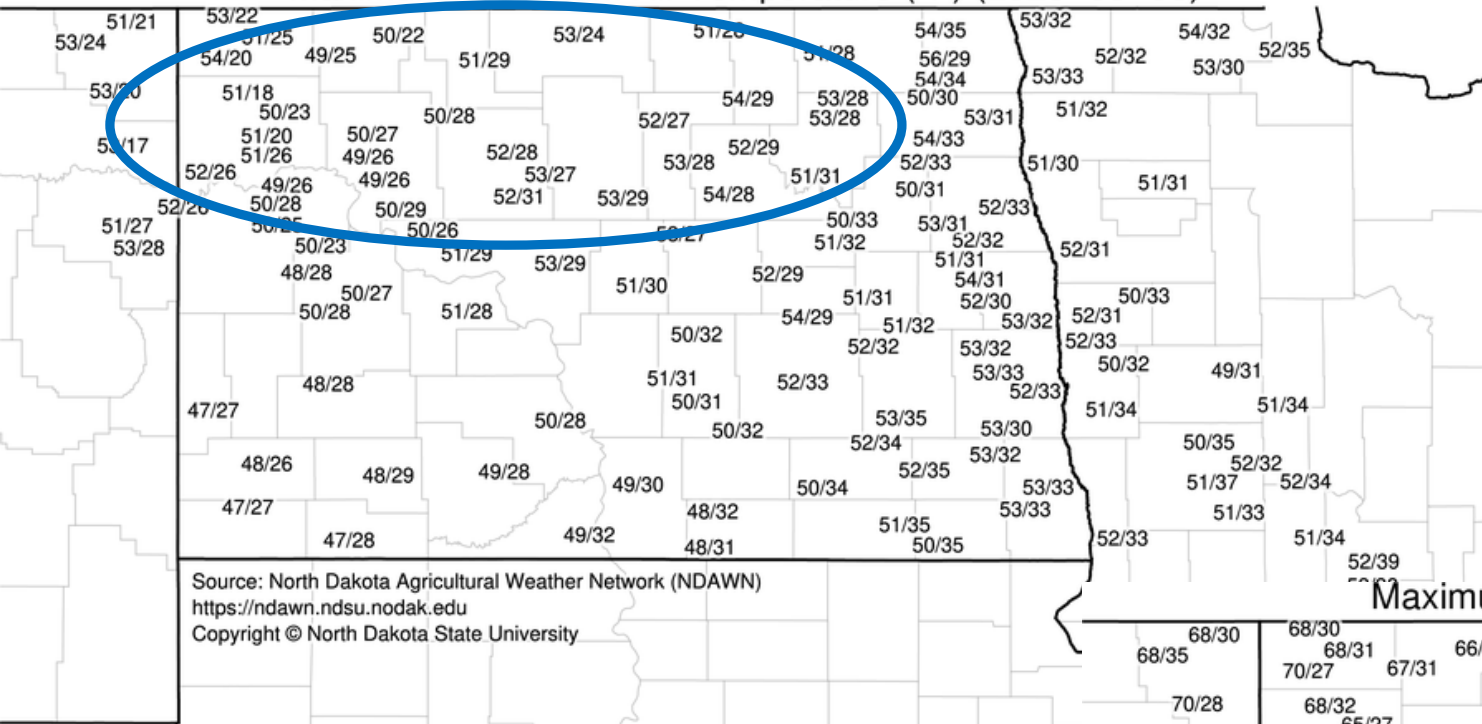
Natalie Umphlett



Doug Kluck

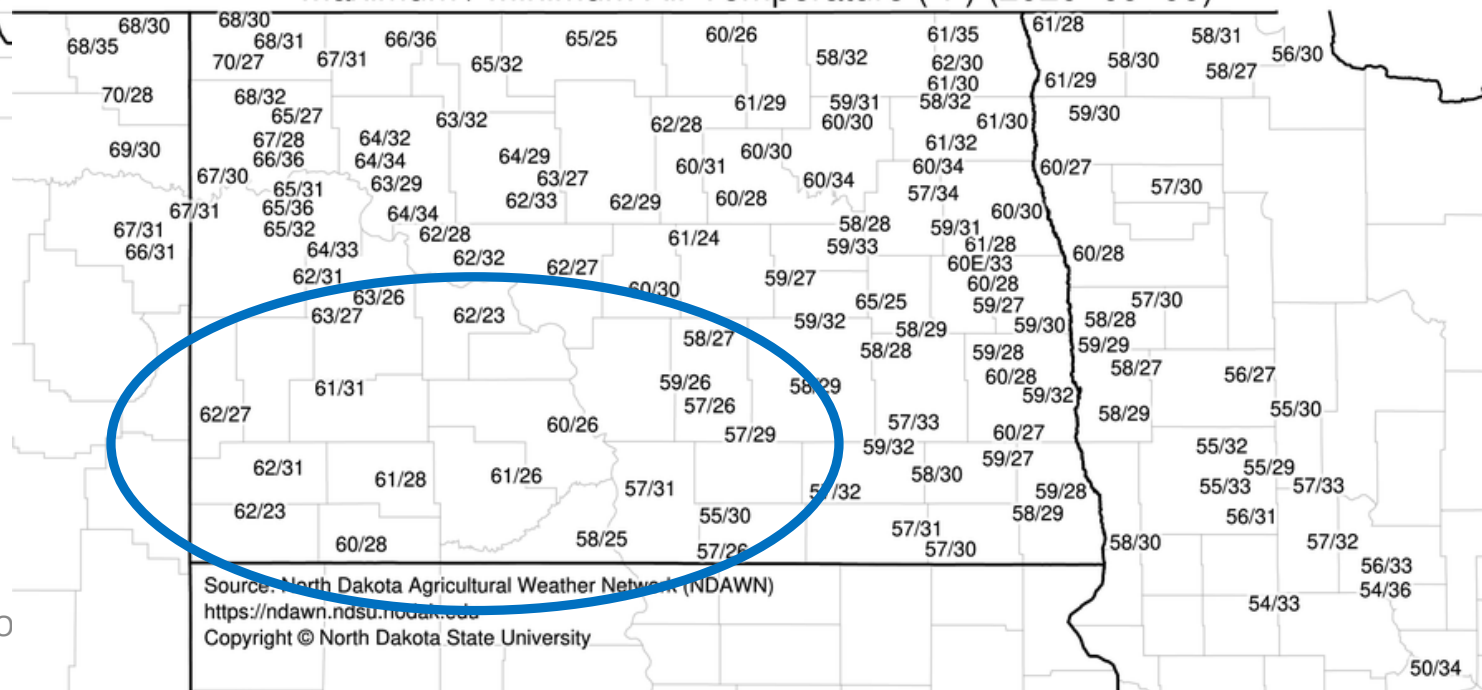


Maximum / Minimum Air Temperature (°F) (2020-09-08)



Early Freeze in
North Dakota

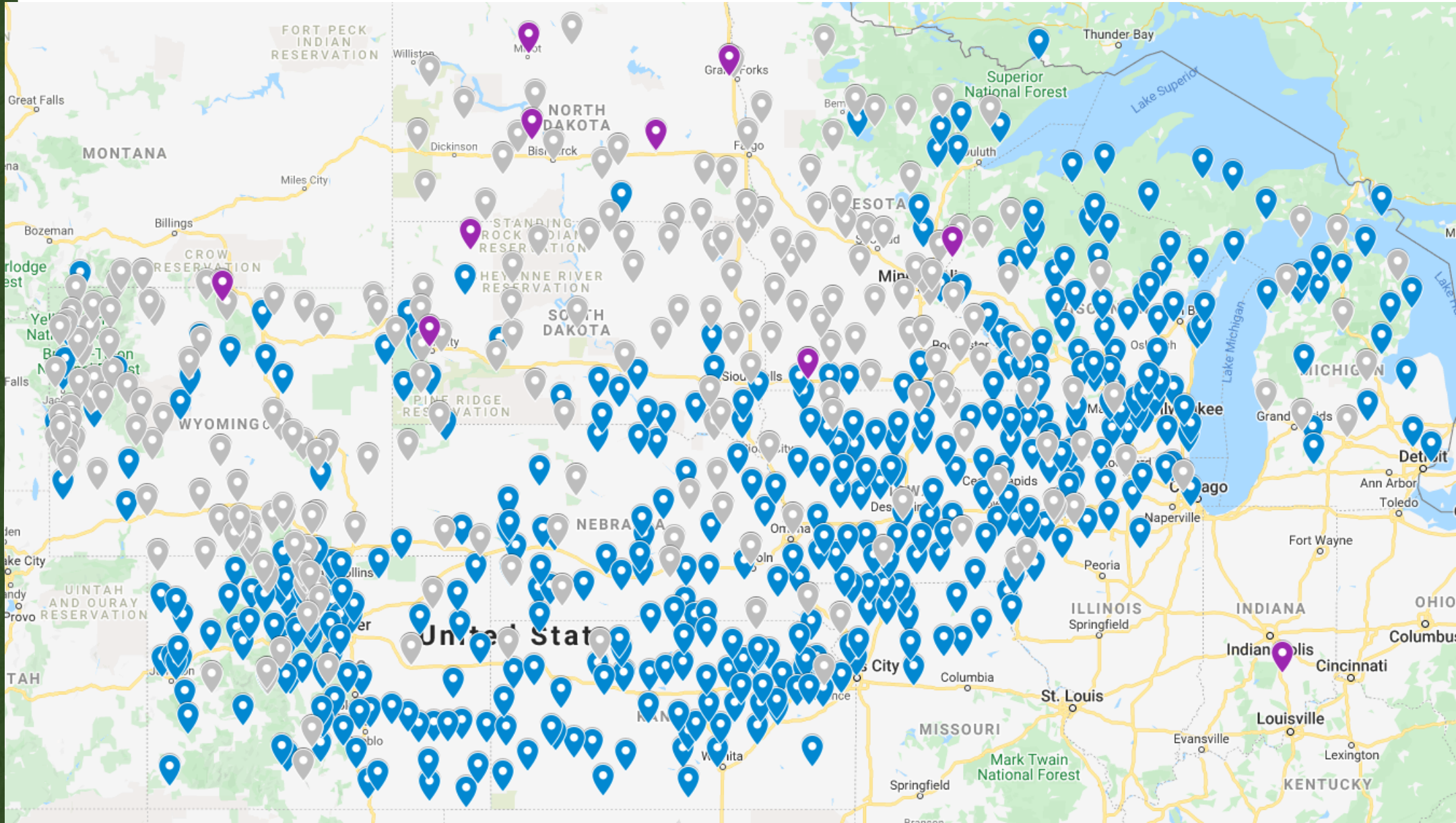
Maximum / Minimum Air Temperature (°F) (2020-09-09)



Record Low Maximum Temperatures for September 7-9, 2020

(courtesy of the Midwest Regional Climate Center)

https://www.google.com/maps/d/embed?mid=1zIjBVf_76KTvNekCuxvoHqWZ7kRVa2Za



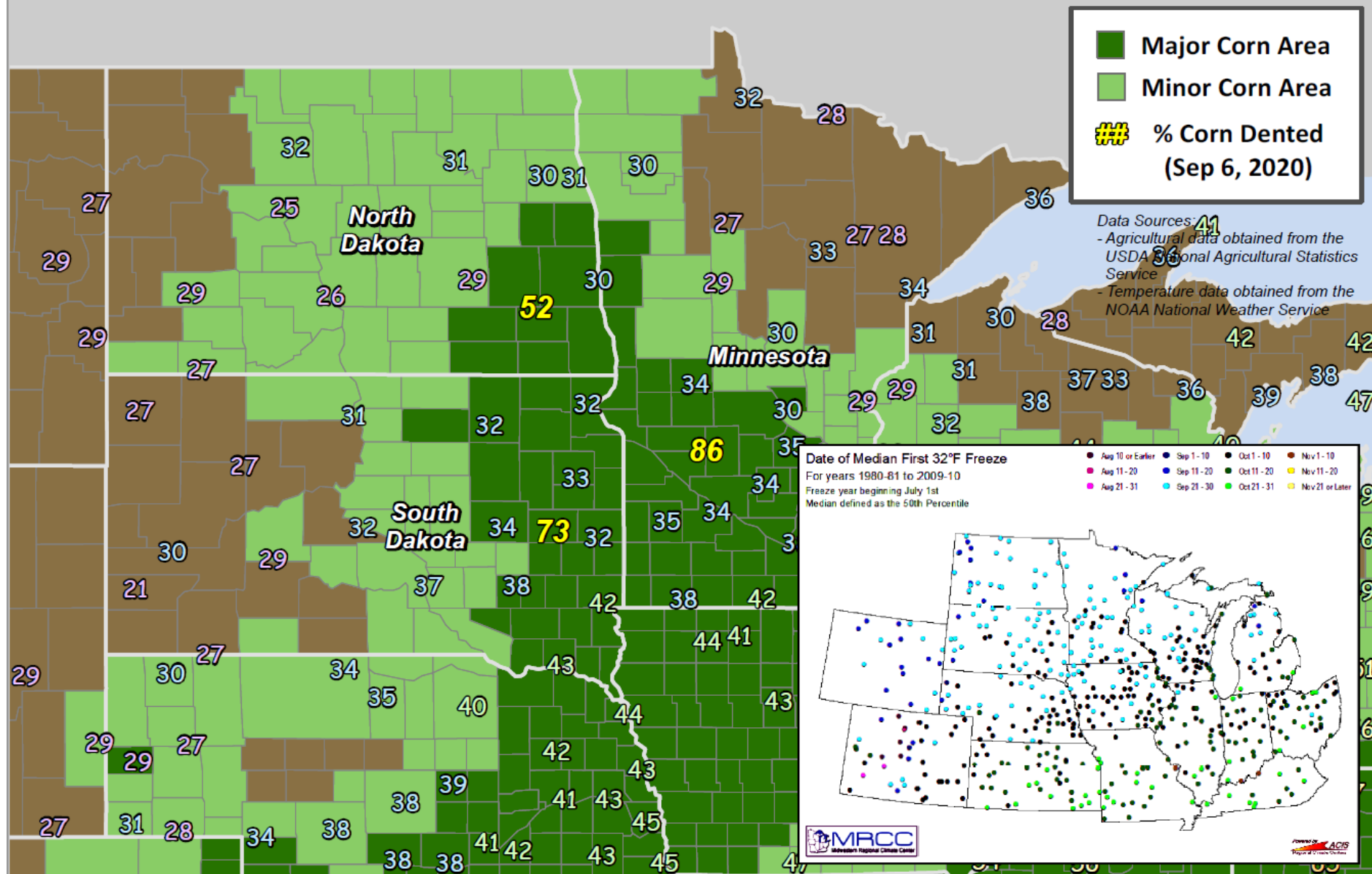


*This product was prepared by the
USDA Office of the Chief Economist (OCE)
World Agricultural Outlook Board (WAOB)*

Red River Valley Freeze Extreme Minimum Temperatures (°F)

September 8-10, 2020

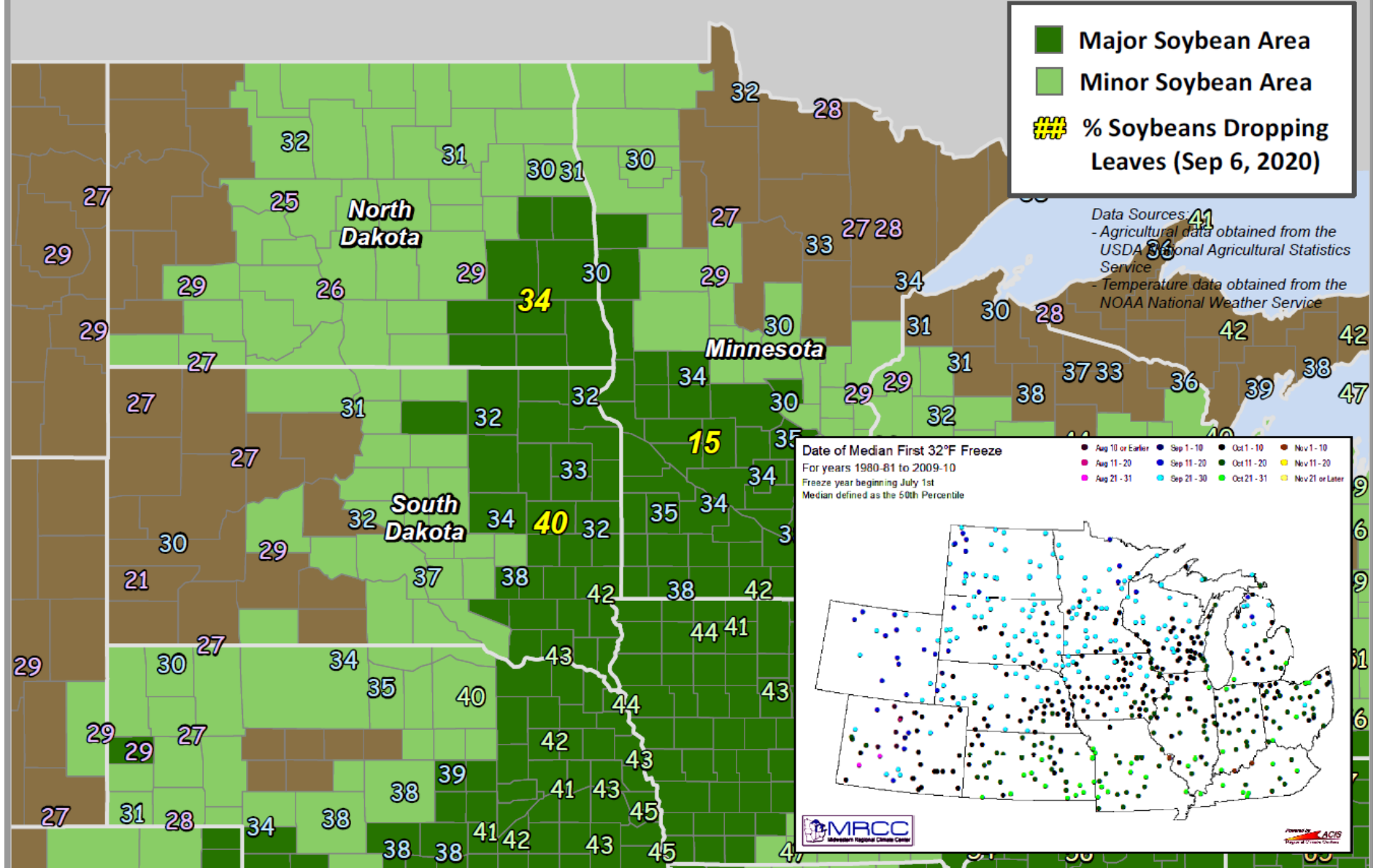
(Updated - Sep 10, 2020)





Red River Valley Freeze Extreme Minimum Temperatures (°F)

(Updated - Sep 10, 2020)





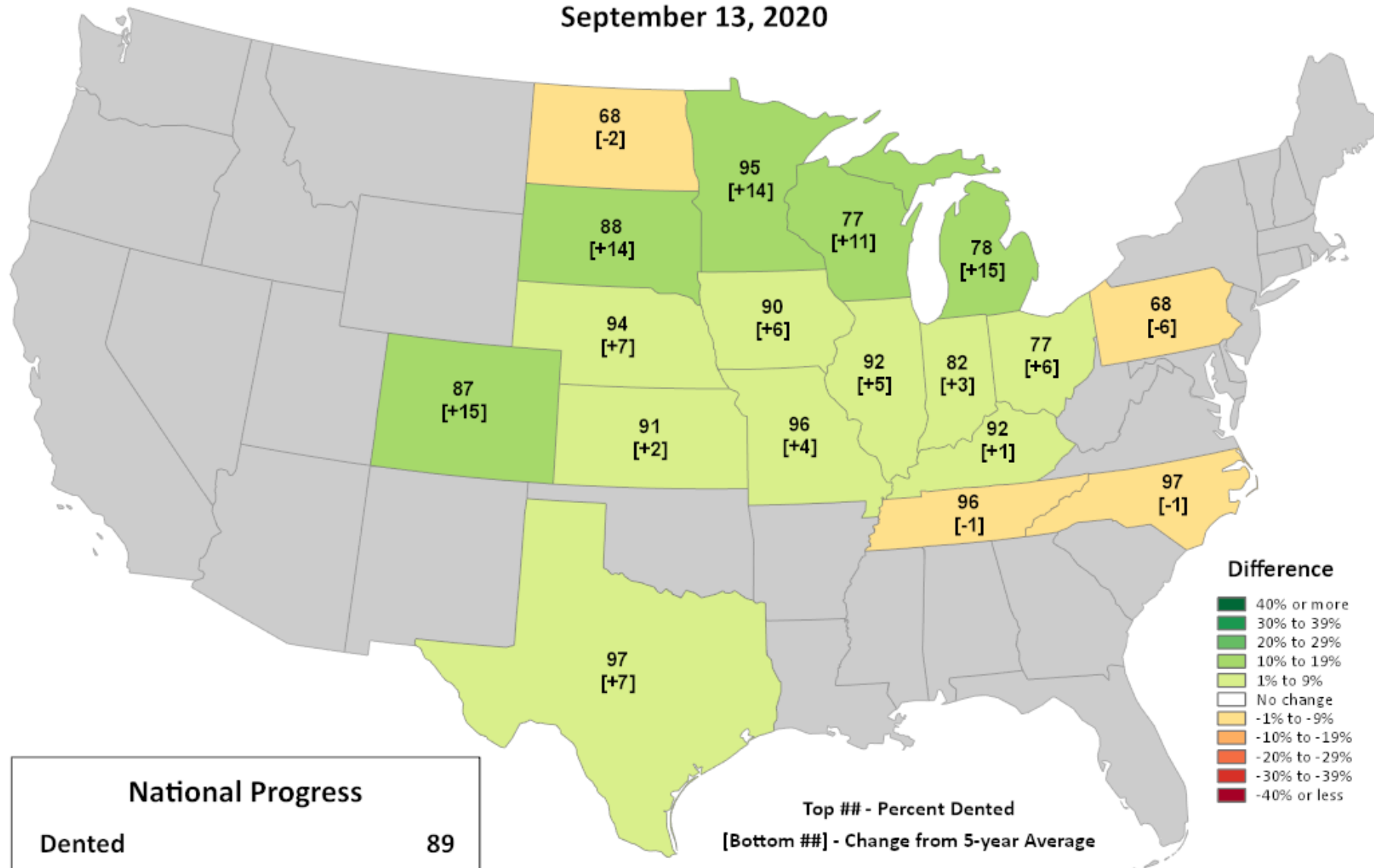
United States
Department of
Agriculture

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

Corn Progress

Percent Dented

September 13, 2020



National Progress

Dented 89

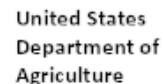
Change from 5-year Average +7

Top ## - Percent Dented

[Bottom ##] - Change from 5-year Average

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



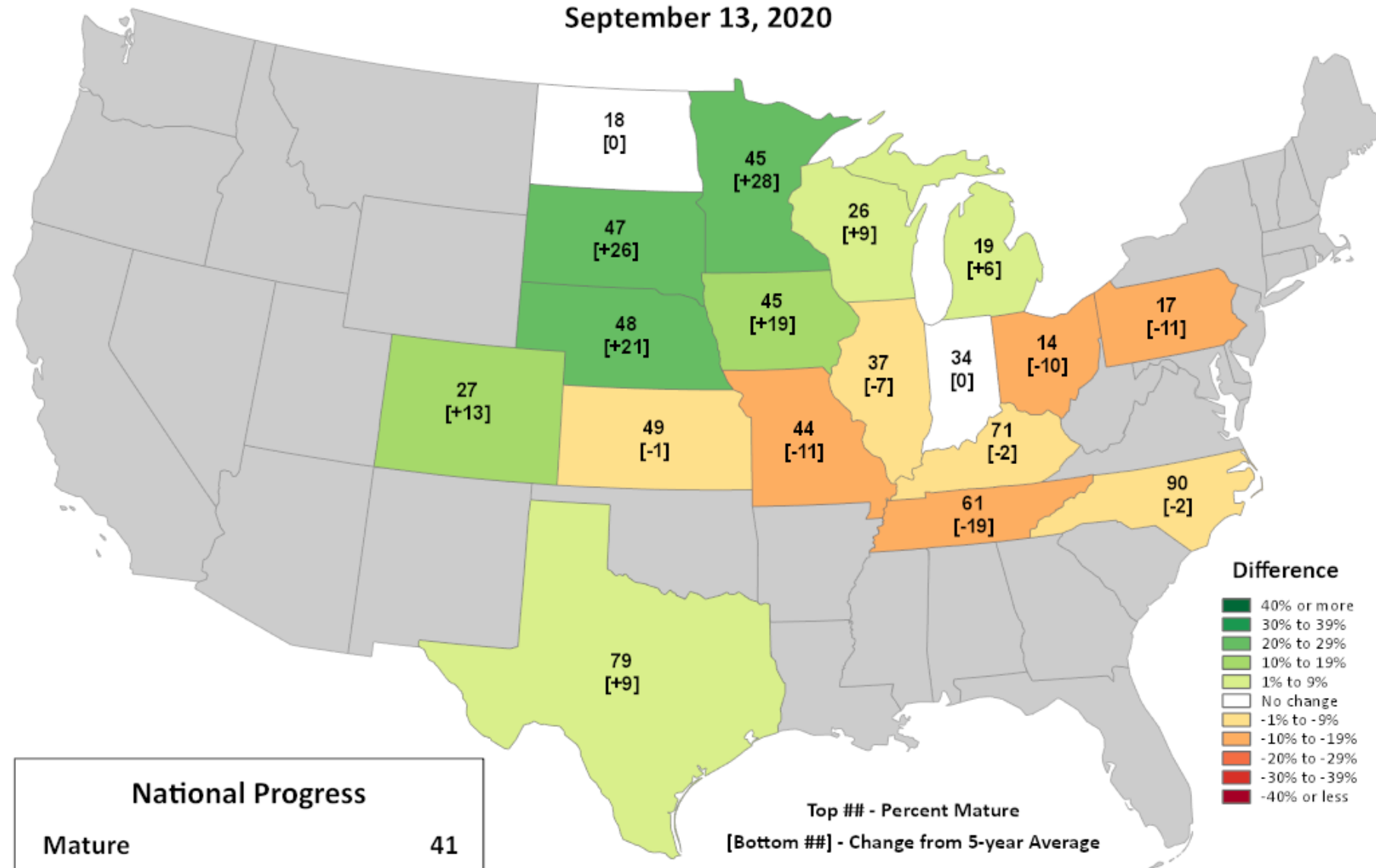


*This product was prepared by the
USDA Office of the Chief Economist (OCE)
World Agricultural Outlook Board (WAOB)*

Corn Progress

Percent Mature

September 13, 2020



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





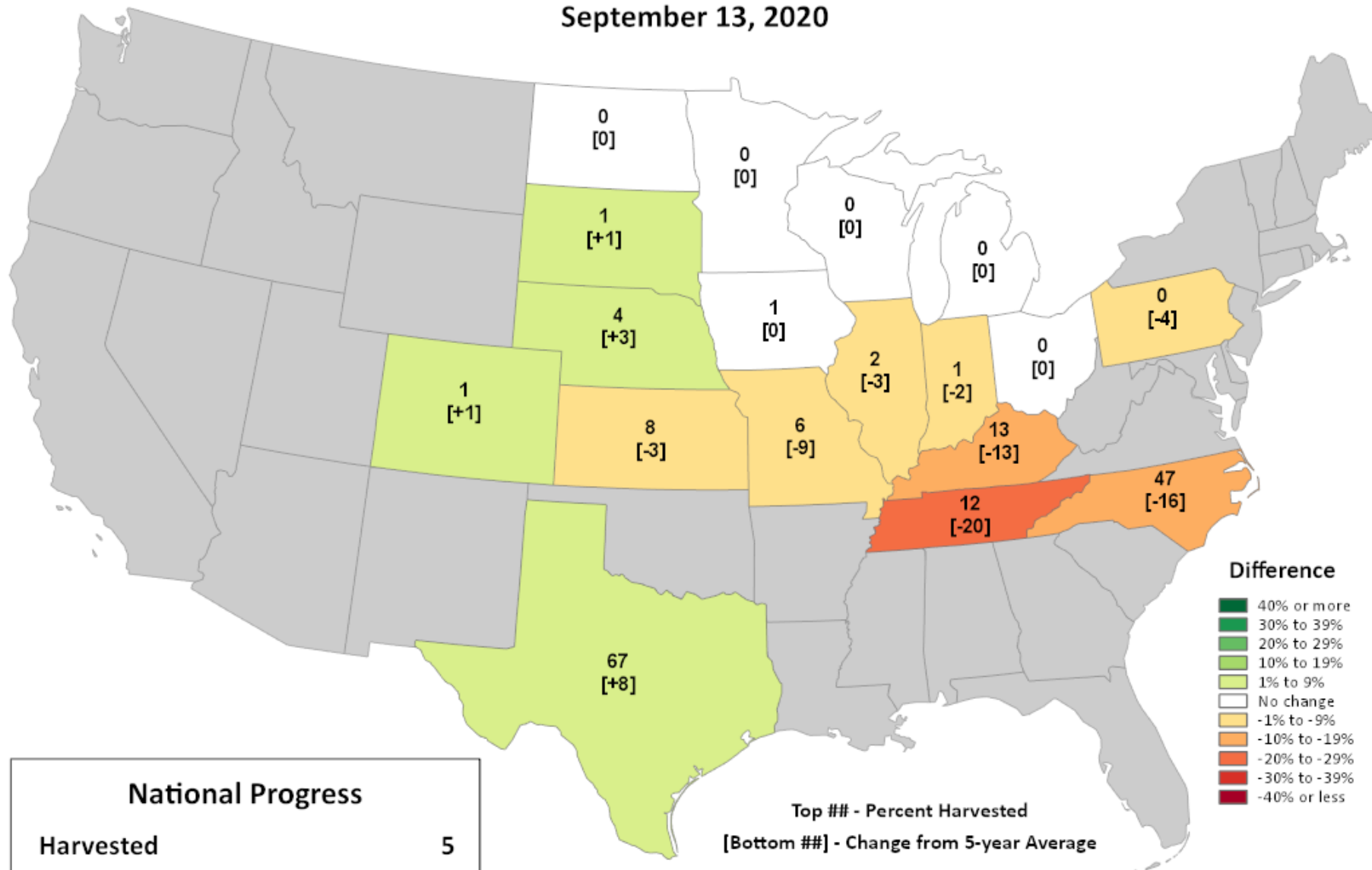
United States
Department of
Agriculture

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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

Top ## - Percent Harvested

[Bottom ##] - Change from 5-year Average

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





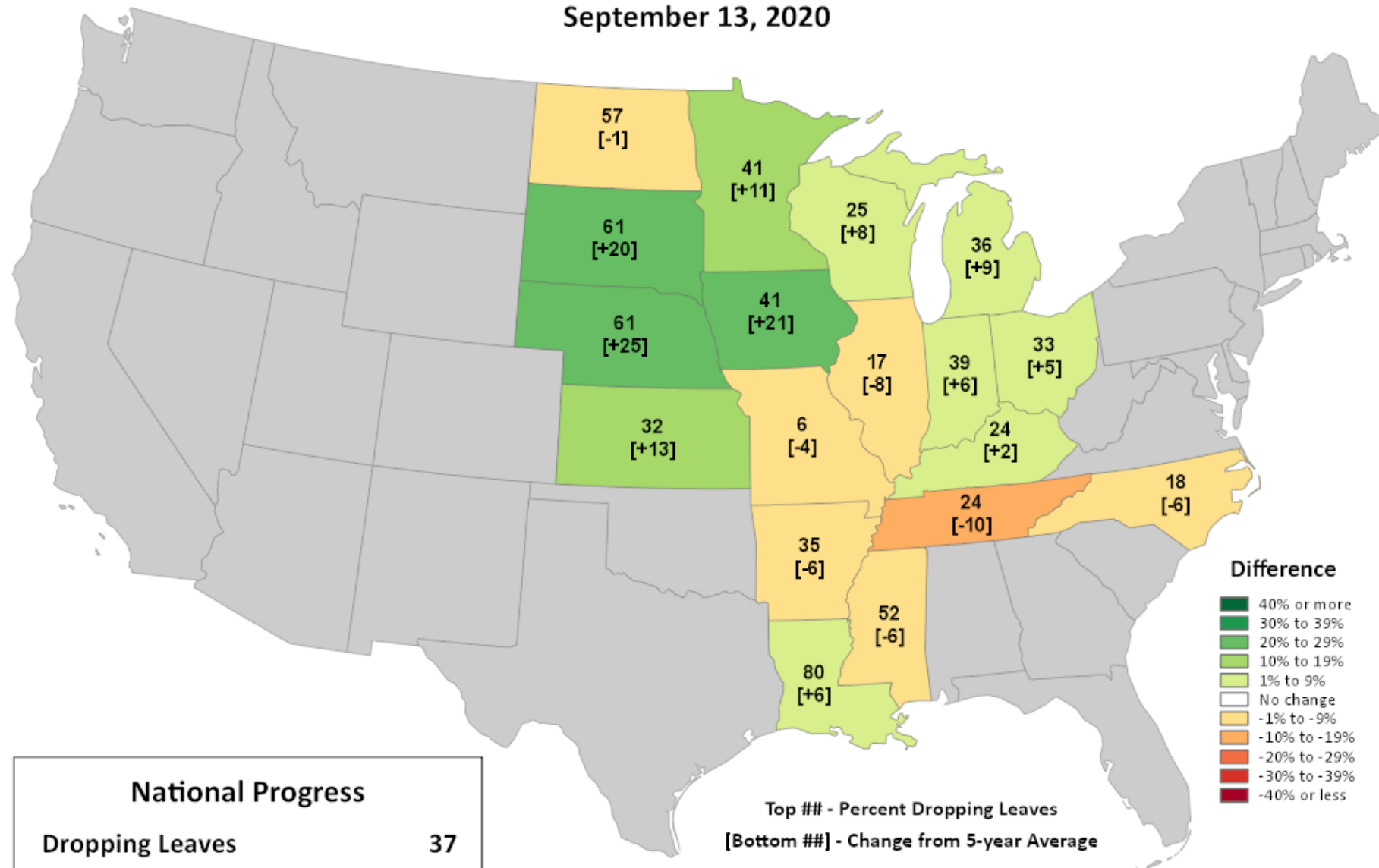
United States
Department of
Agriculture

*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



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





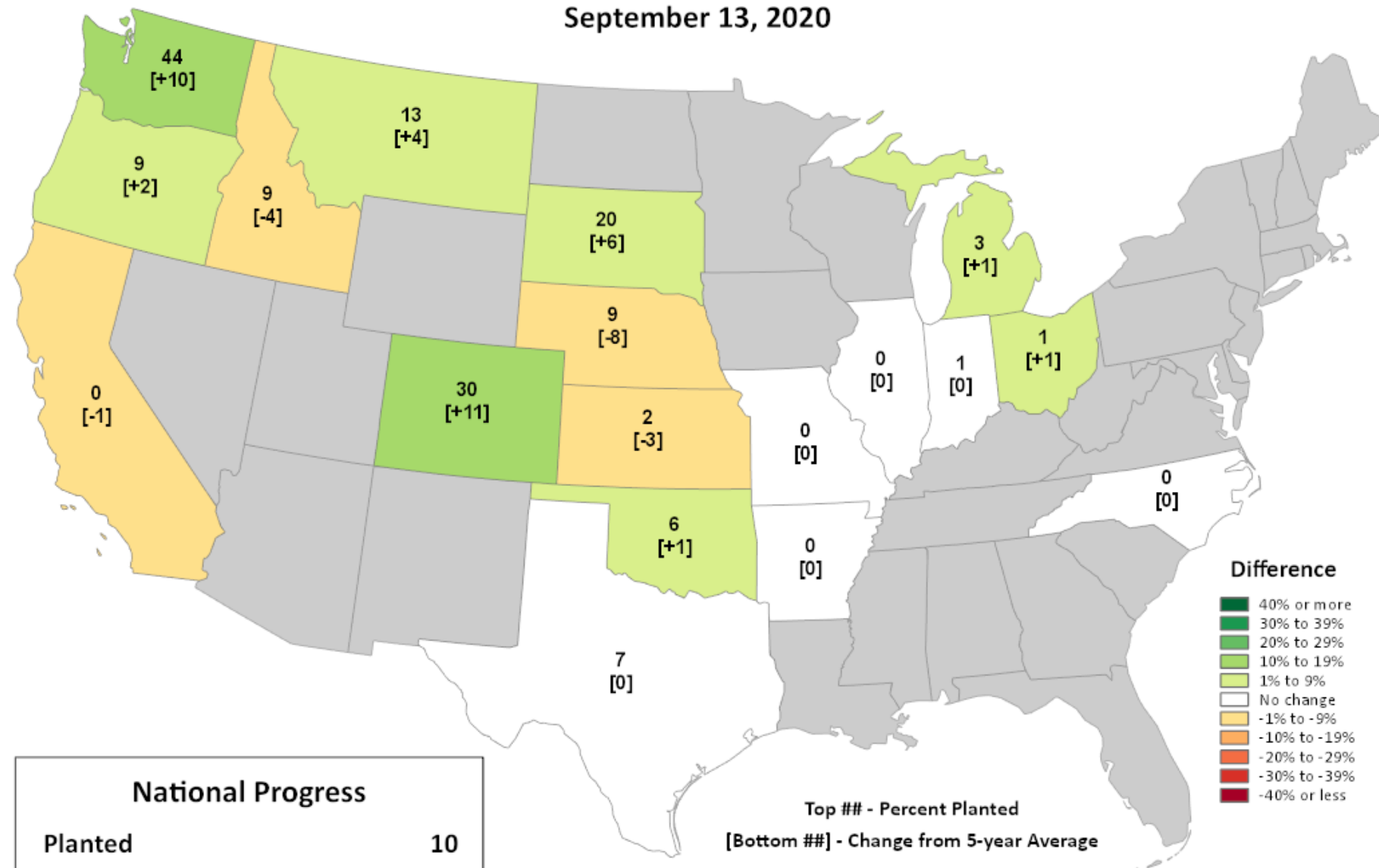
United States
Department of
Agriculture

*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



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



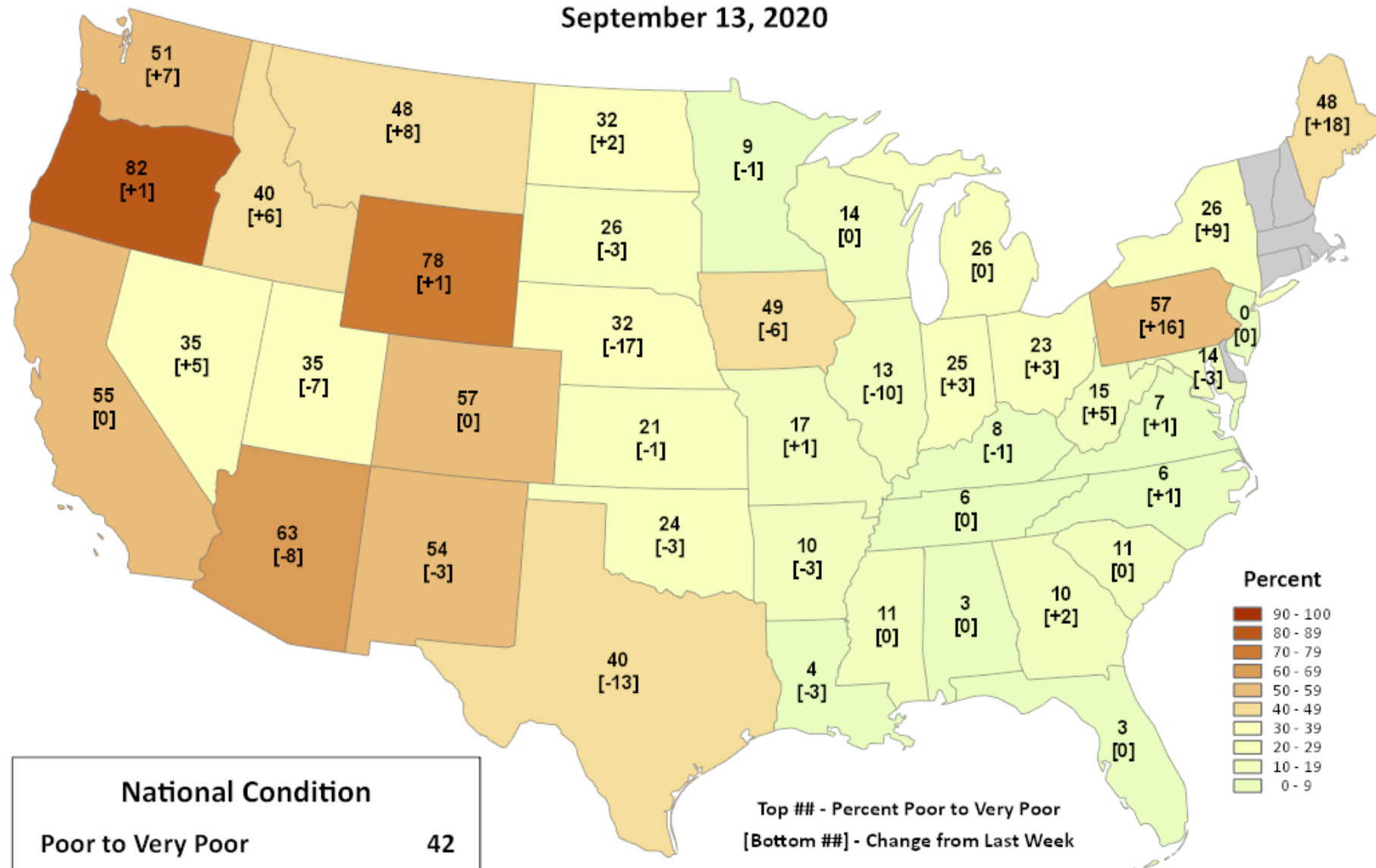


*This product was prepared by the
USDA Office of the Chief Economist (OCE)
World Agricultural Outlook Board (WAOB)*

Pasture and Range Conditions

Percent Poor to Very Poor

September 13, 2020



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



Missouri River Basin

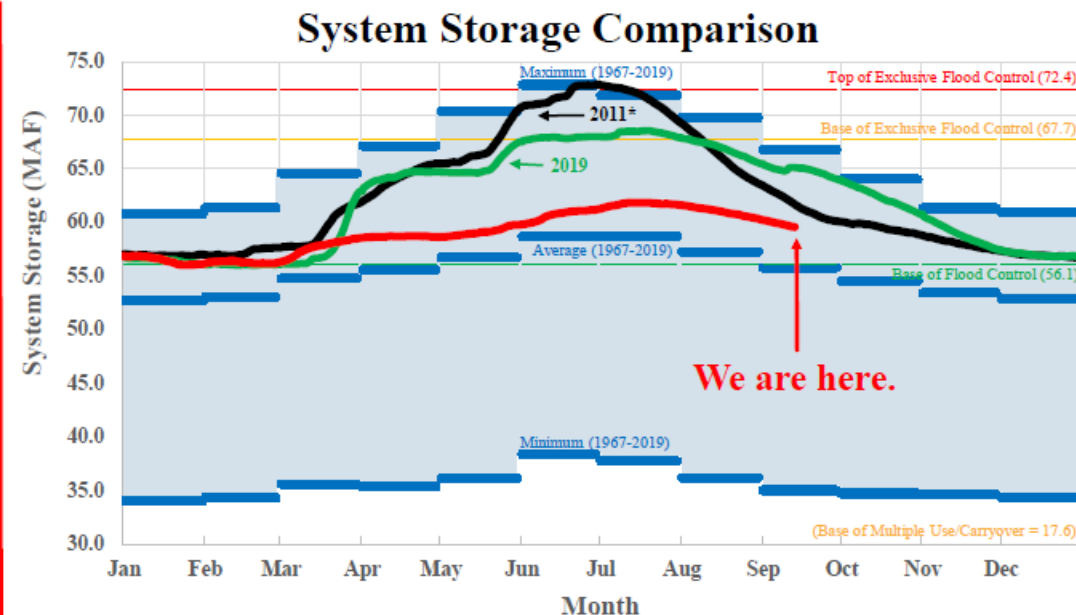
<http://www.nwd-mr.usace.army.mil/rcc/reports/pdfs/weeklyupdate.pdf>

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



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

<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.

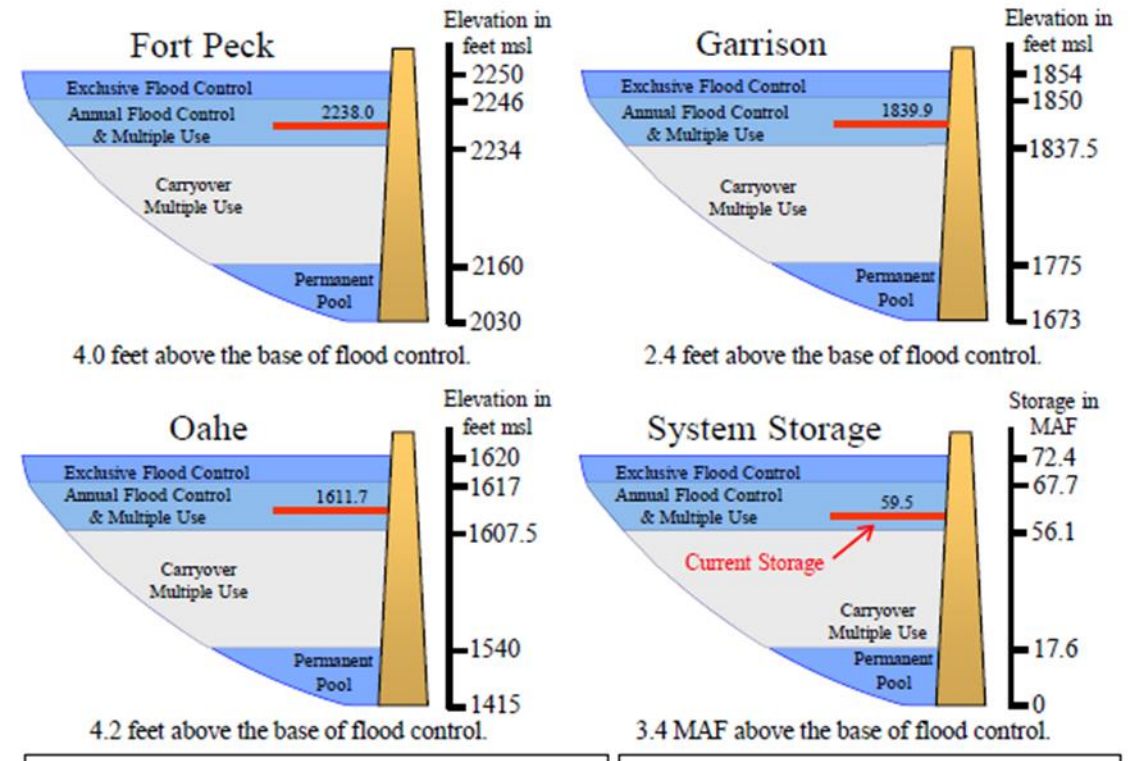
Kevin Grode, P.E.

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.

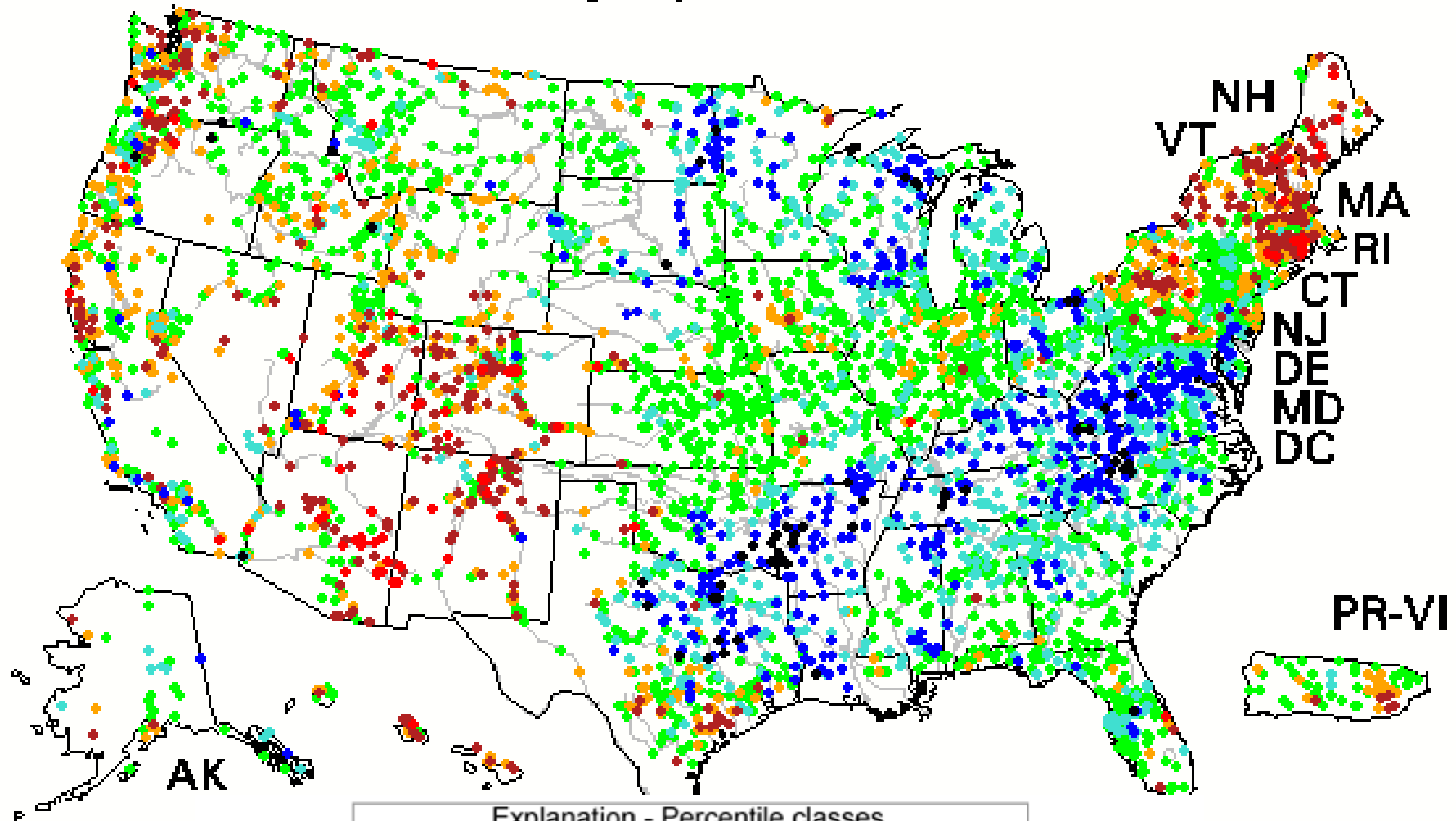
Kevin Low, MBRFC

Current Reservoir Levels



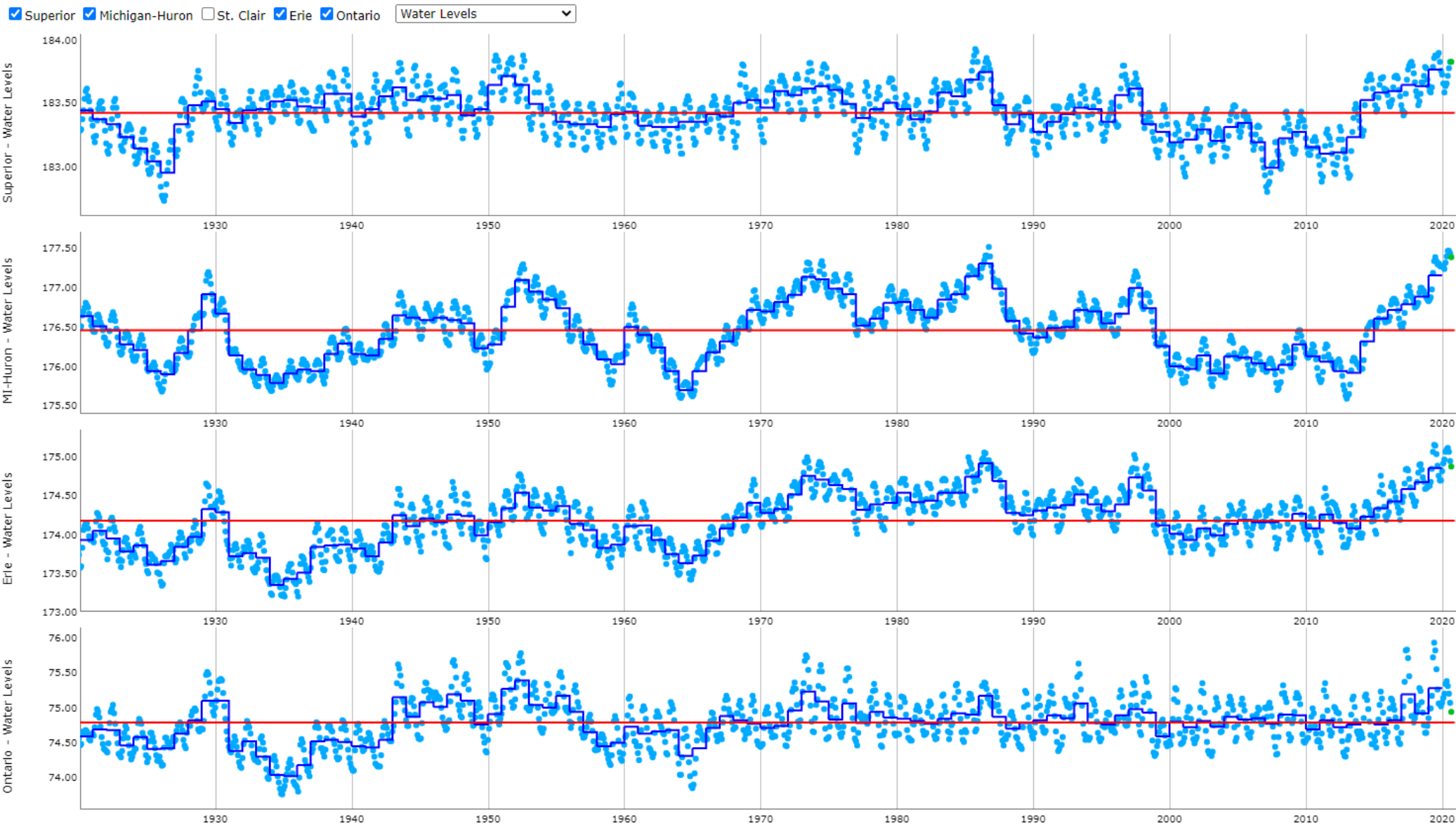
28-Day Average Streamflow

Tuesday, September 15, 2020



<http://waterwatch.usgs.gov/>

Great Lakes Water Levels



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

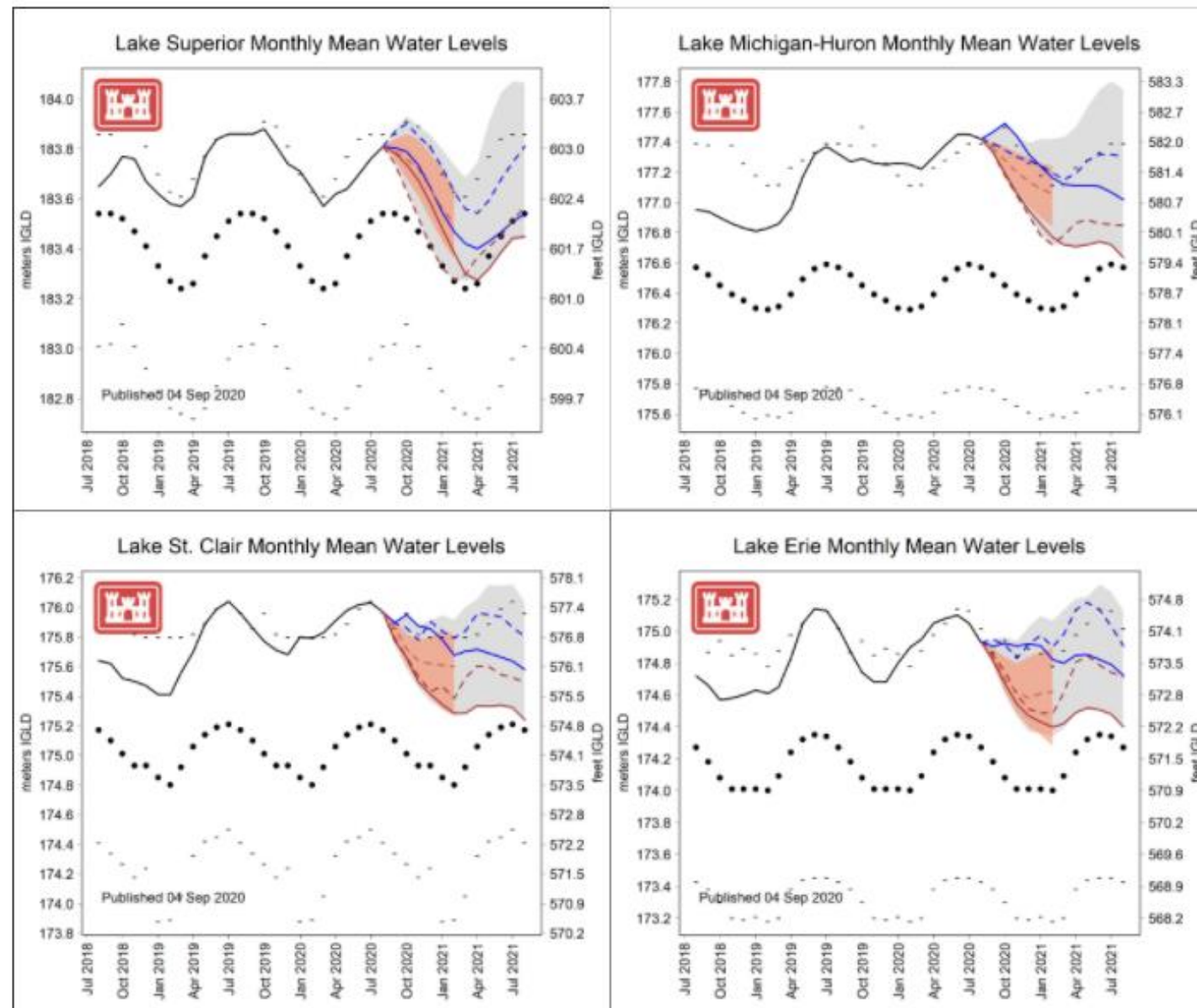
Outlook Summary:

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.



— Observed Monthly Mean • Long Term Average - Long Term Max/Min
■ Range of Possible Outcomes ■ Sep Bulletin Forecast Range — Bulletin Forecast Most Probable
— 1986-87 — 1977-78 — 1930-31 — 1976-77



Drought Update



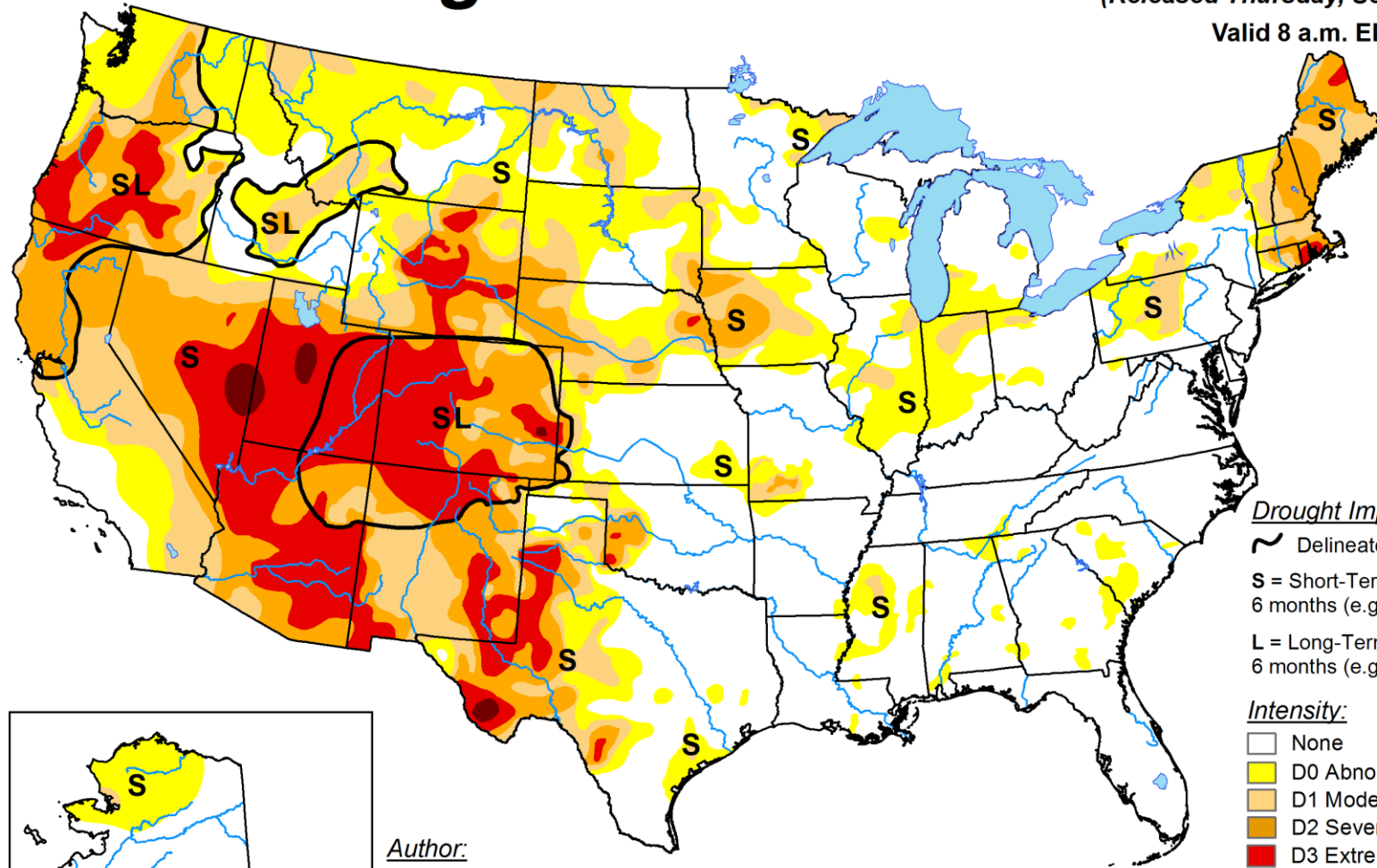
Photo from Becky Bolinger in Colorado



U.S. Drought Monitor

September 15, 2020
(Released Thursday, Sep. 17, 2020)

Valid 8 a.m. EDT

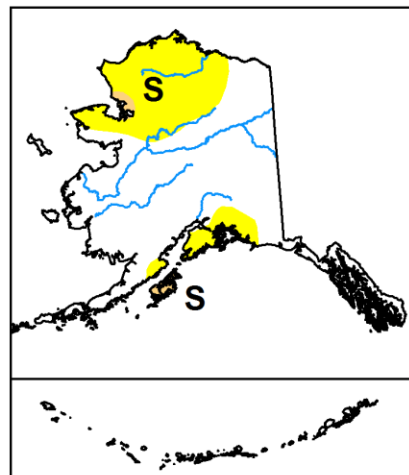


Drought Impact Types:

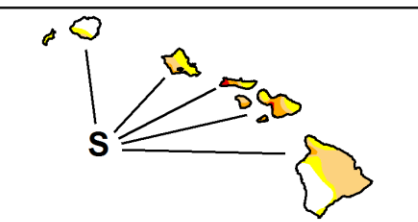
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

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:  

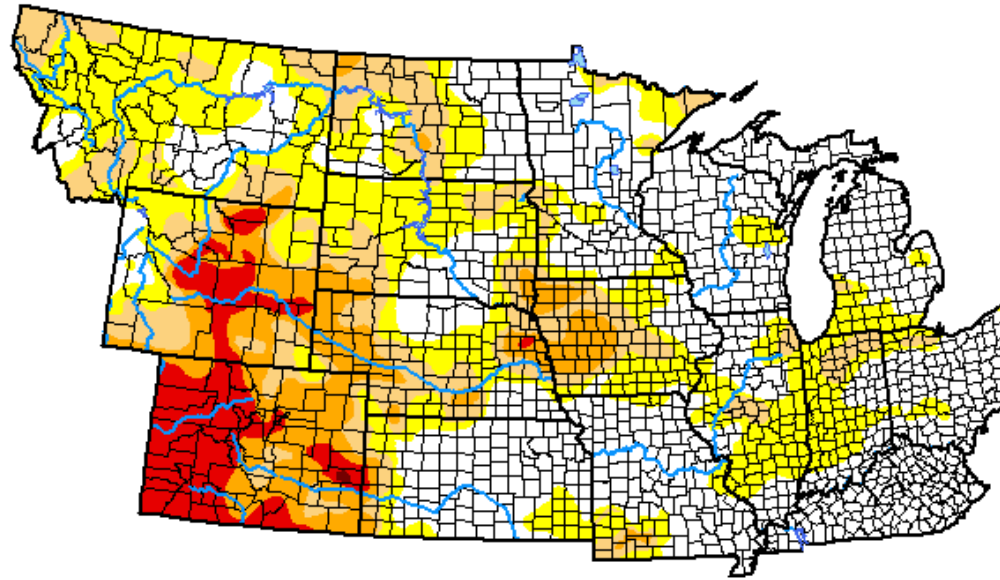
Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	2020-09-15	46.99	53.01	32.82	21.00	9.64	0.36	117
Last Week	2020-09-08	47.06	52.94	32.68	21.02	9.79	0.14	117
3 Months Ago	2020-06-16	63.27	36.73	19.61	8.31	1.90	0.00	67
Start of Calendar Year	2019-12-31	78.53	21.47	9.53	3.21	0.06	0.00	34
Start of 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	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. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

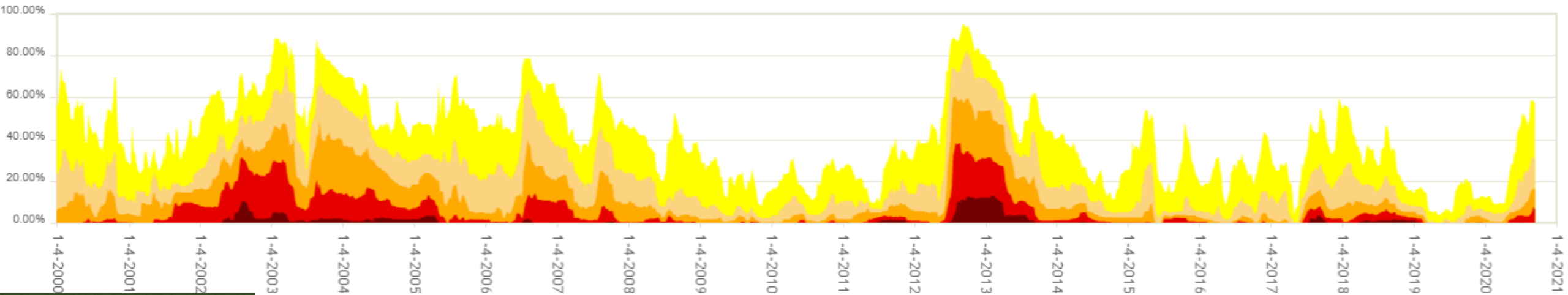
Author:

Brad Rippey
U.S. Department of Agriculture

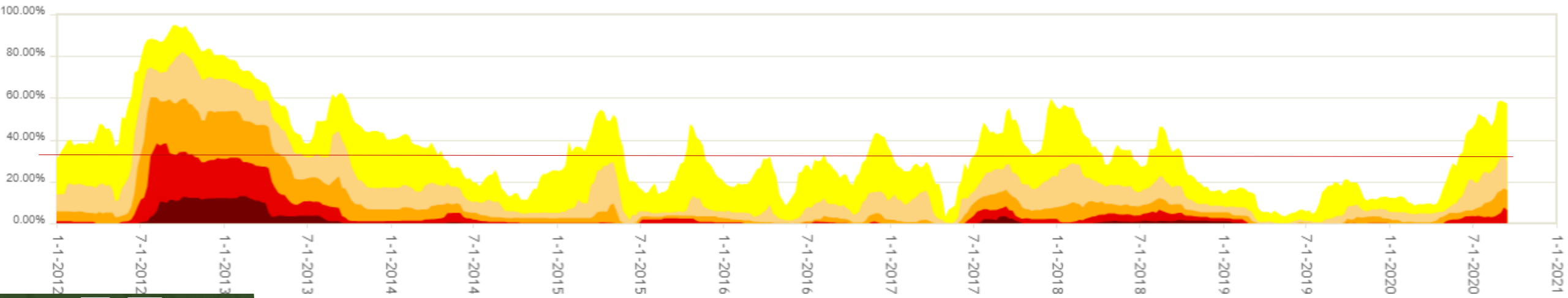


droughtmonitor.unl.edu

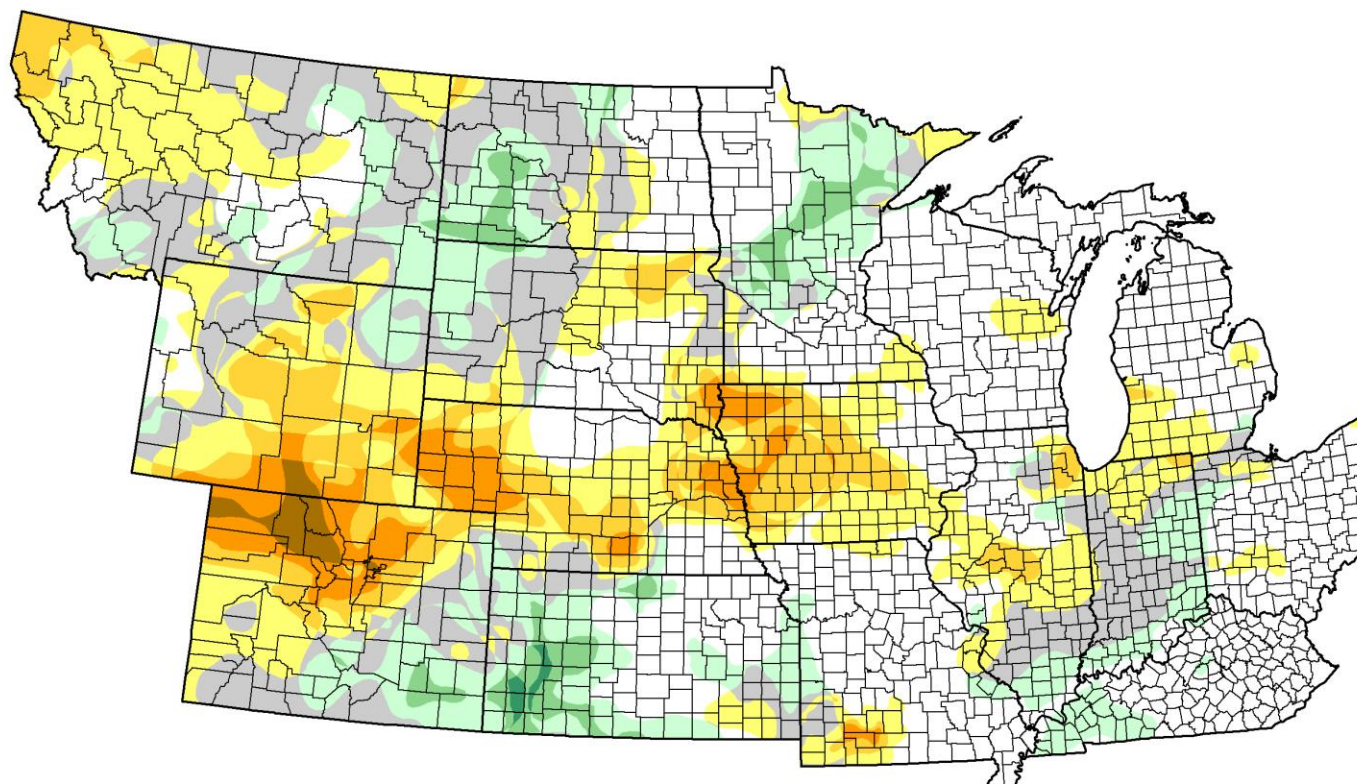
NWS Central Region Percent Area



NWS Central Region Percent Area



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



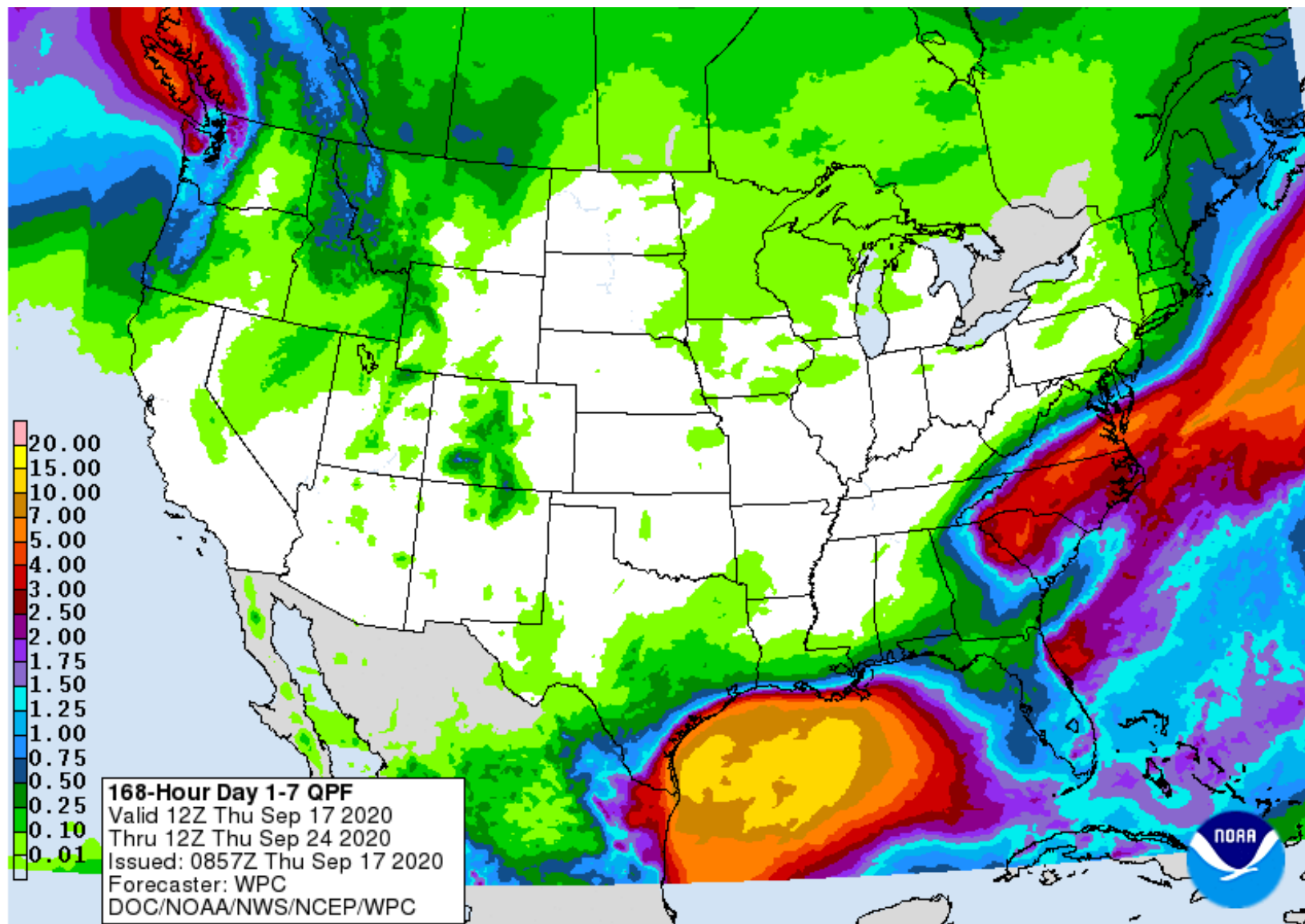
Climate Outlooks

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



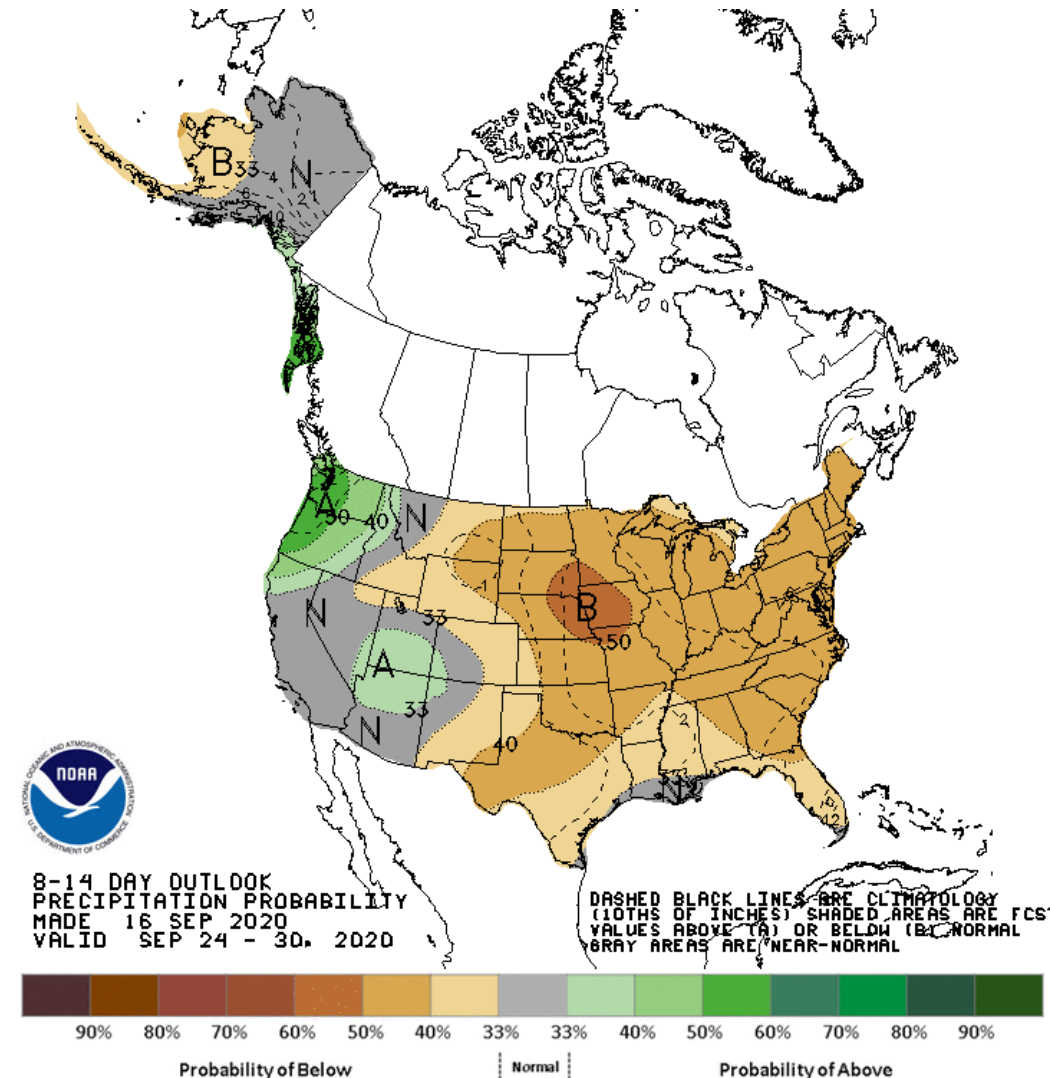
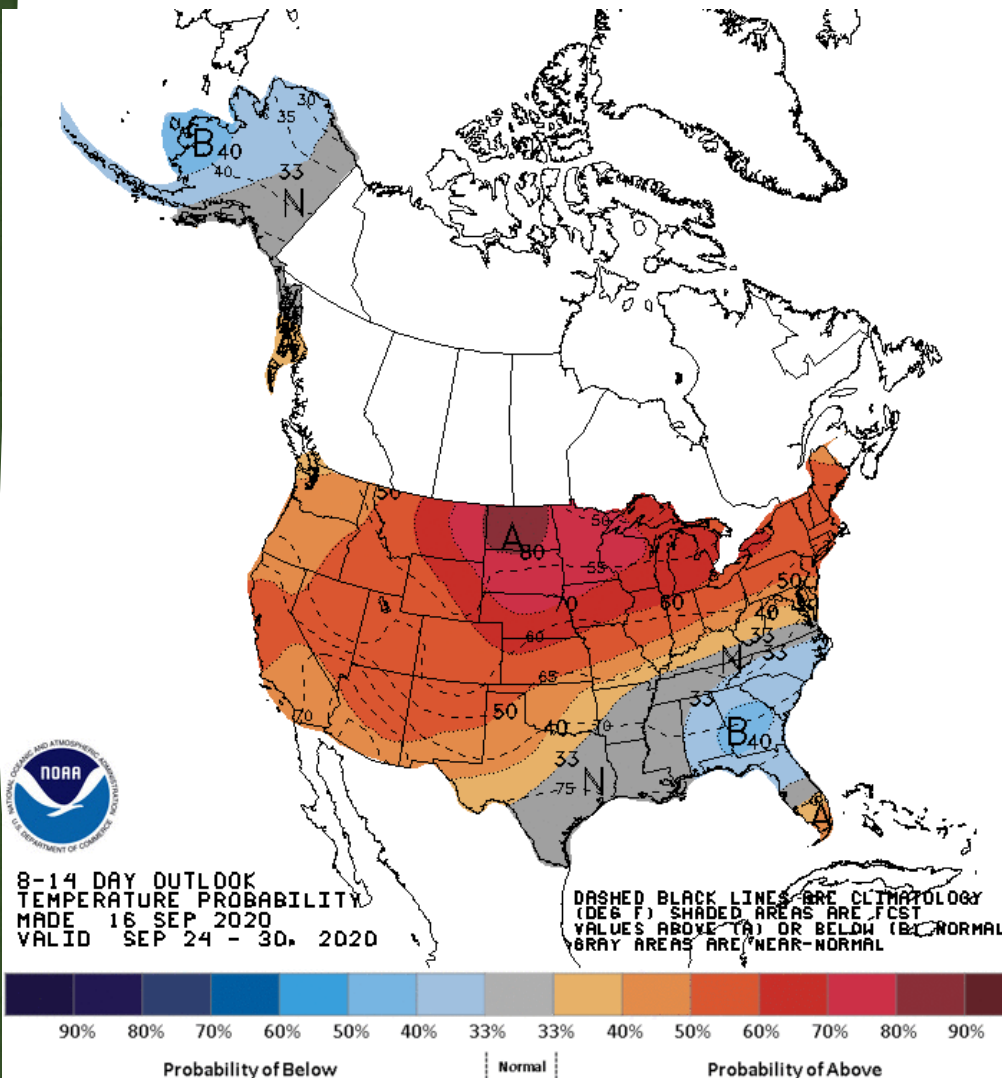
7 Day QPF valid from September 17-24, 2020

<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/>

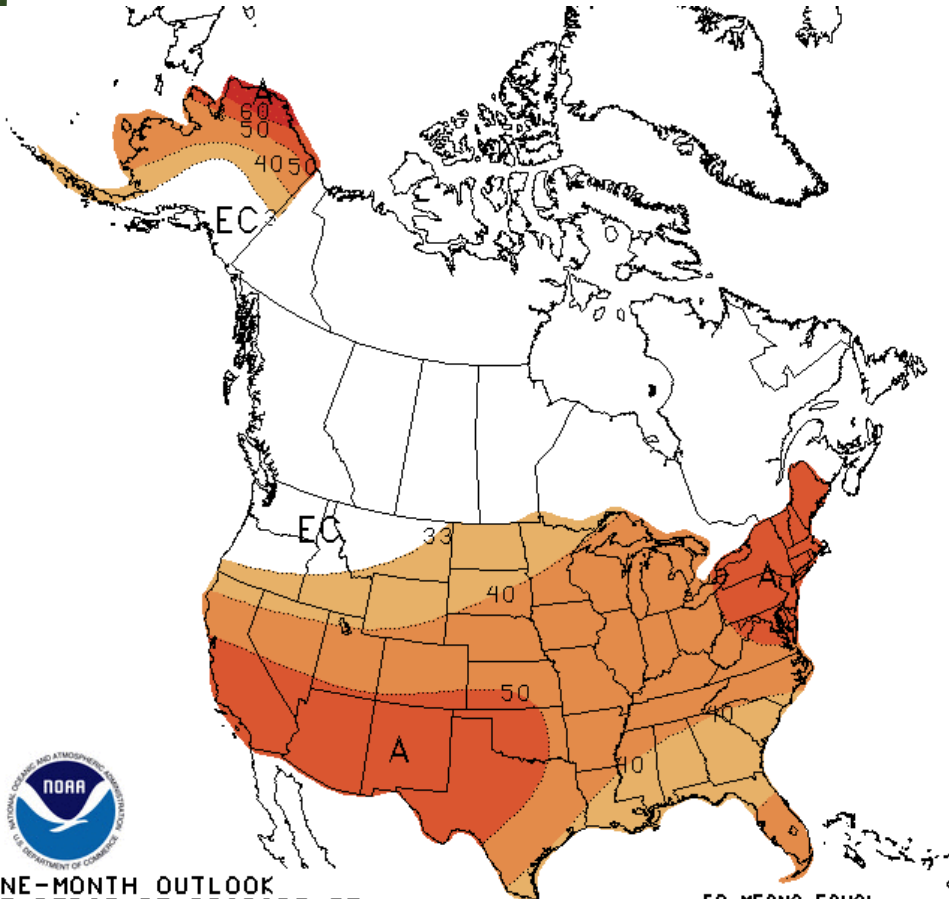


Monthly Outlook for October 2020

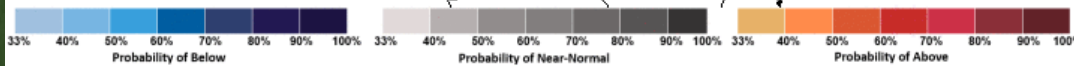
<https://www.cpc.ncep.noaa.gov/products/predictions/90day/>



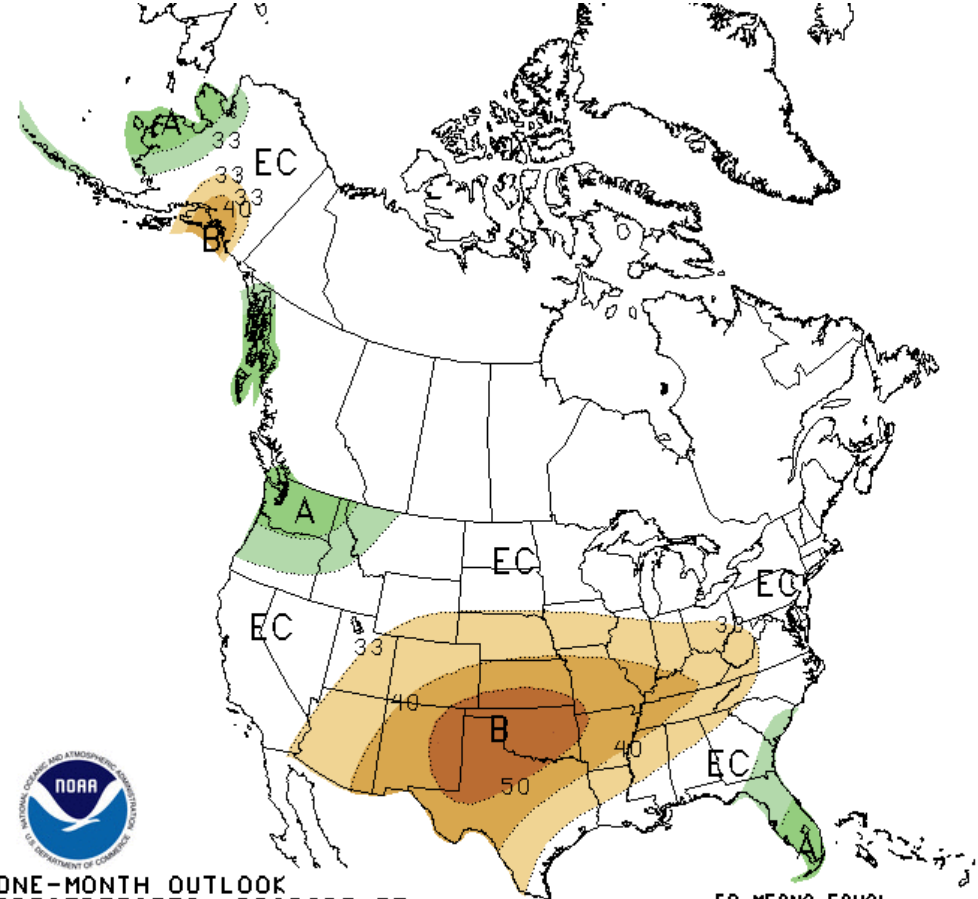
ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID OCT 2020
MADE 17 SEP 2020



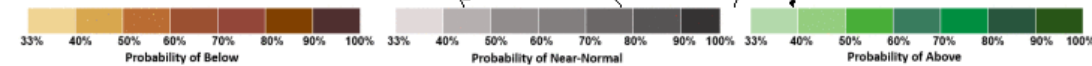
EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW



ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID OCT 2020
MADE 17 SEP 2020

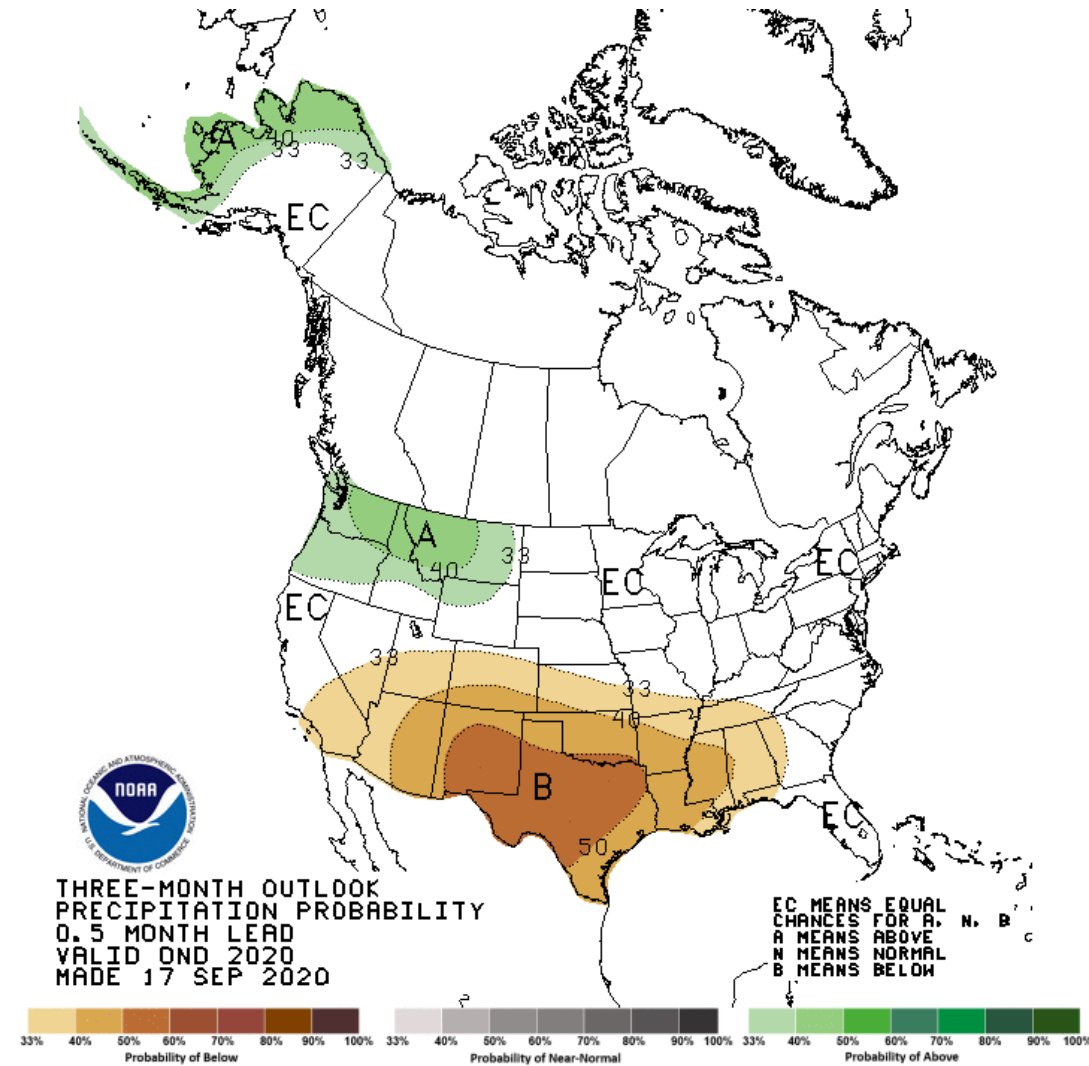
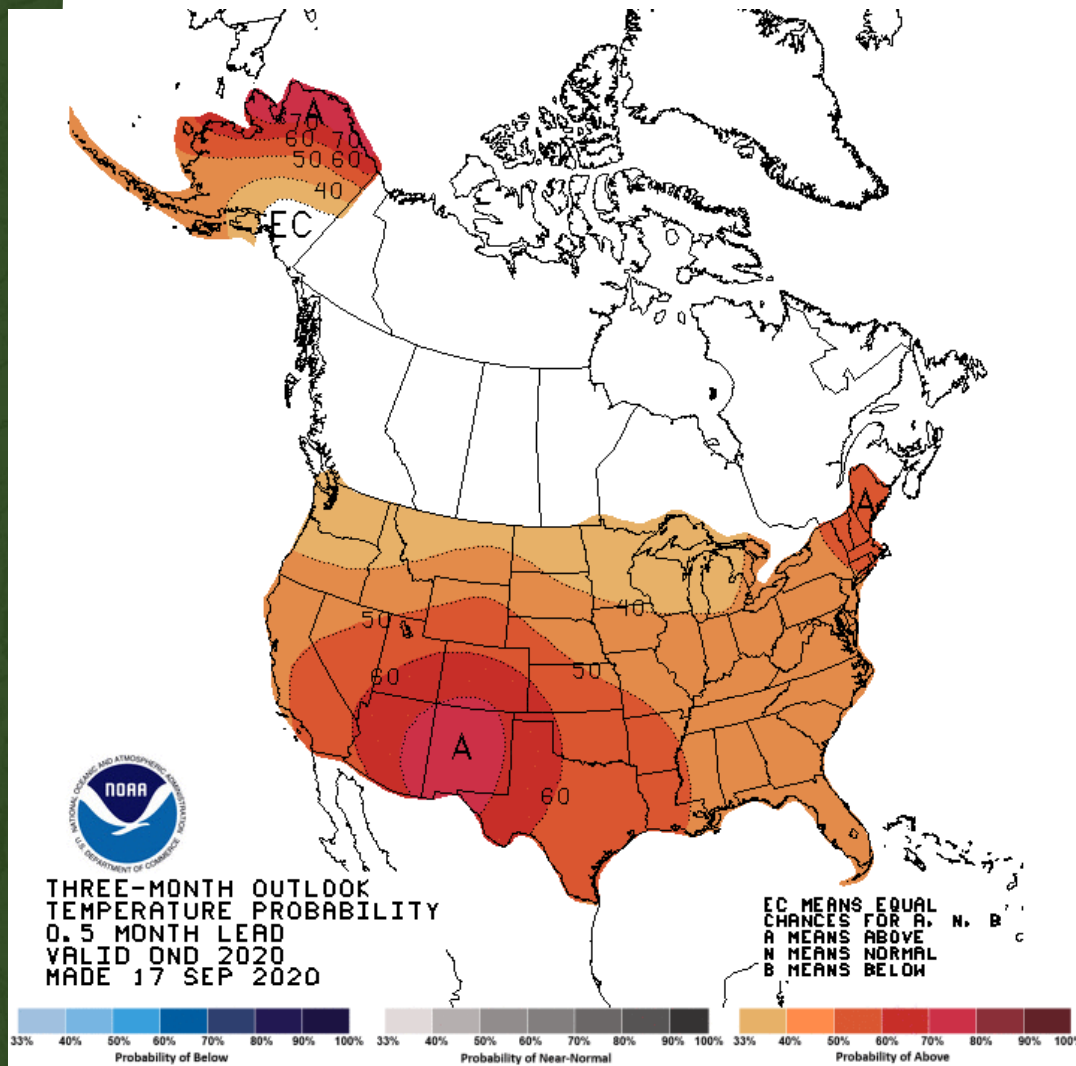


EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW



3-Month Outlook (October-December, 2020)

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



La Nina Advisory has been issued

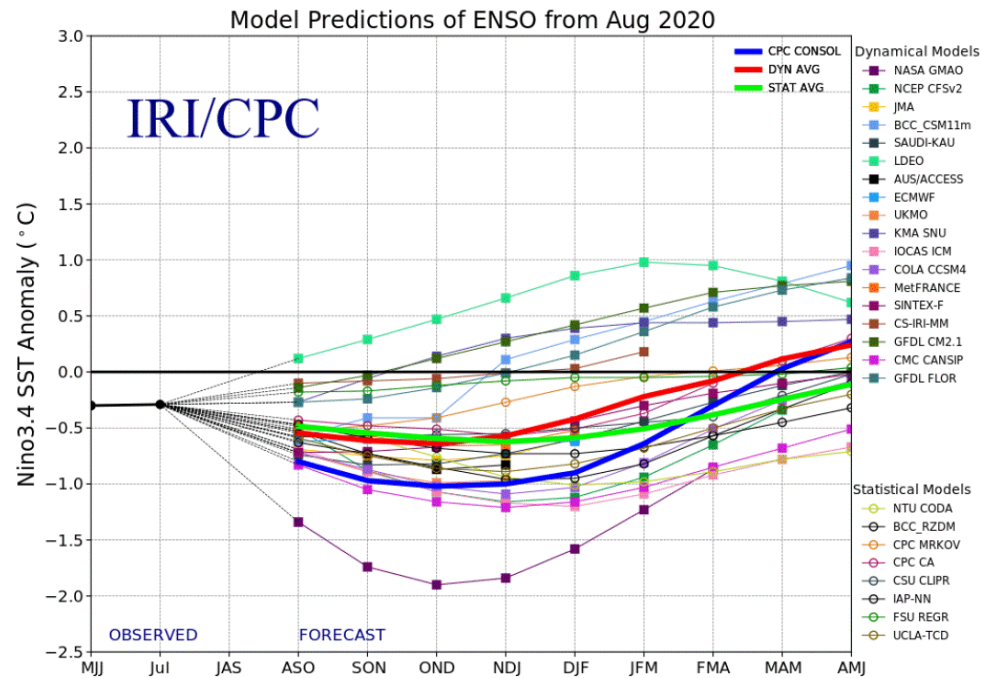
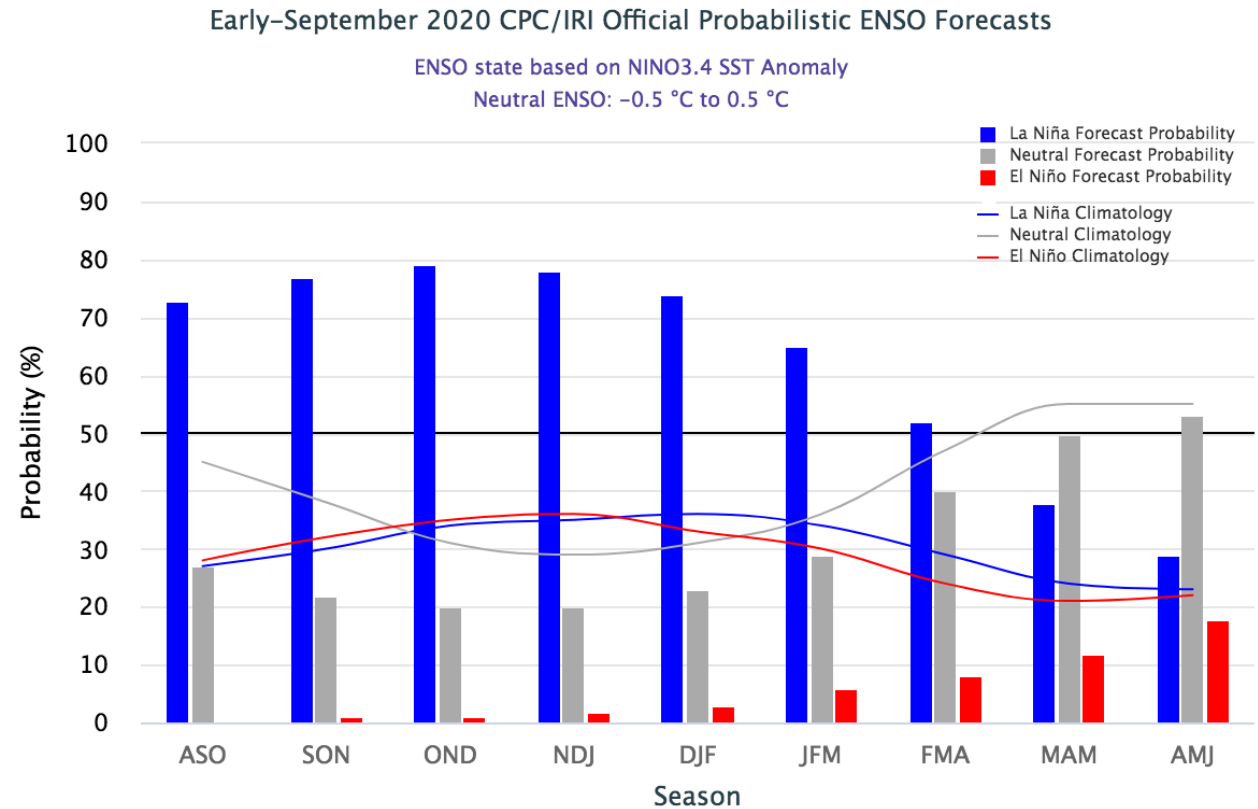
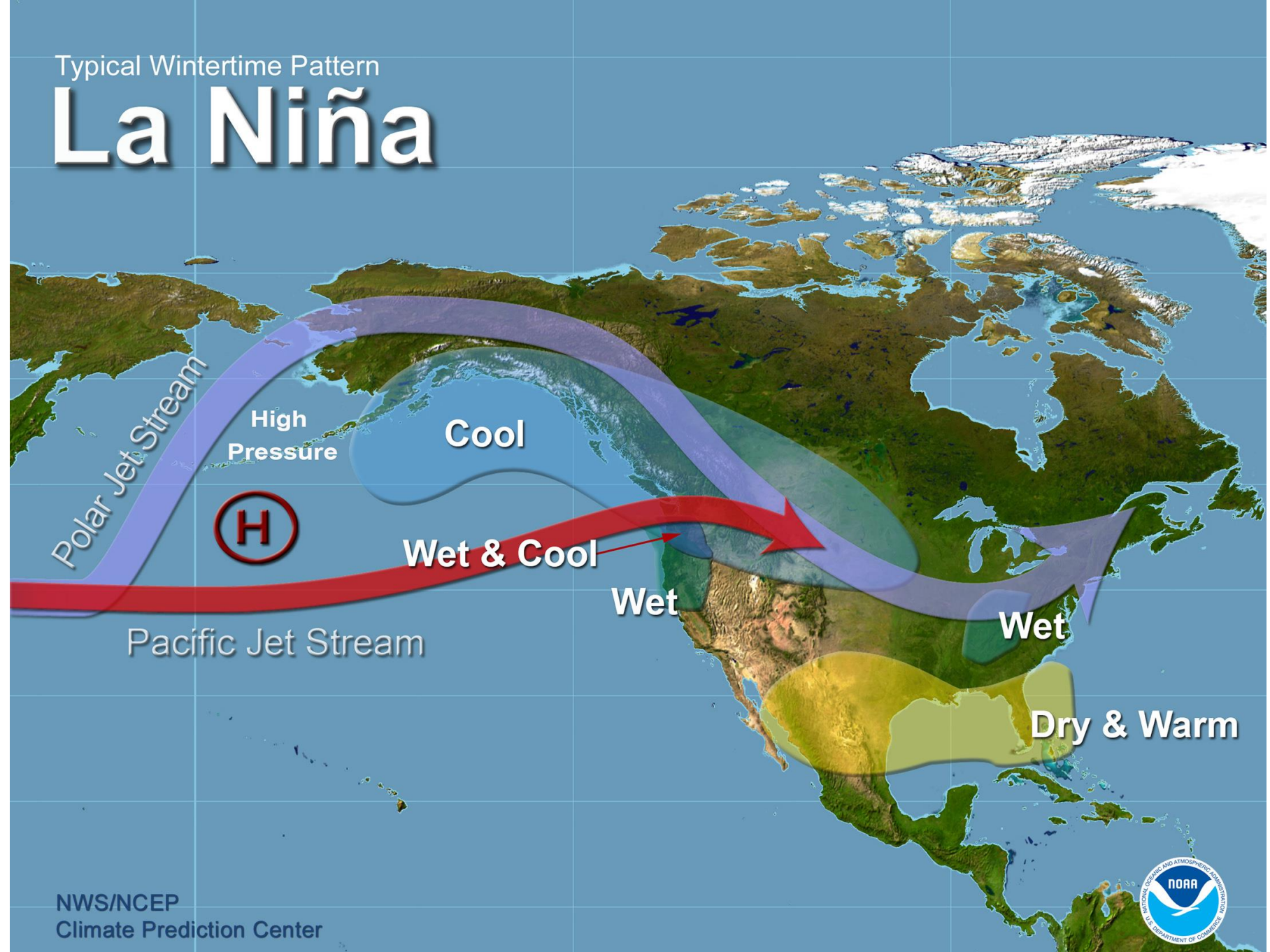


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N - 5°S , 120°W - 170°W). Figure updated 19 August 2020.



What does a typical La Nina pattern mean?

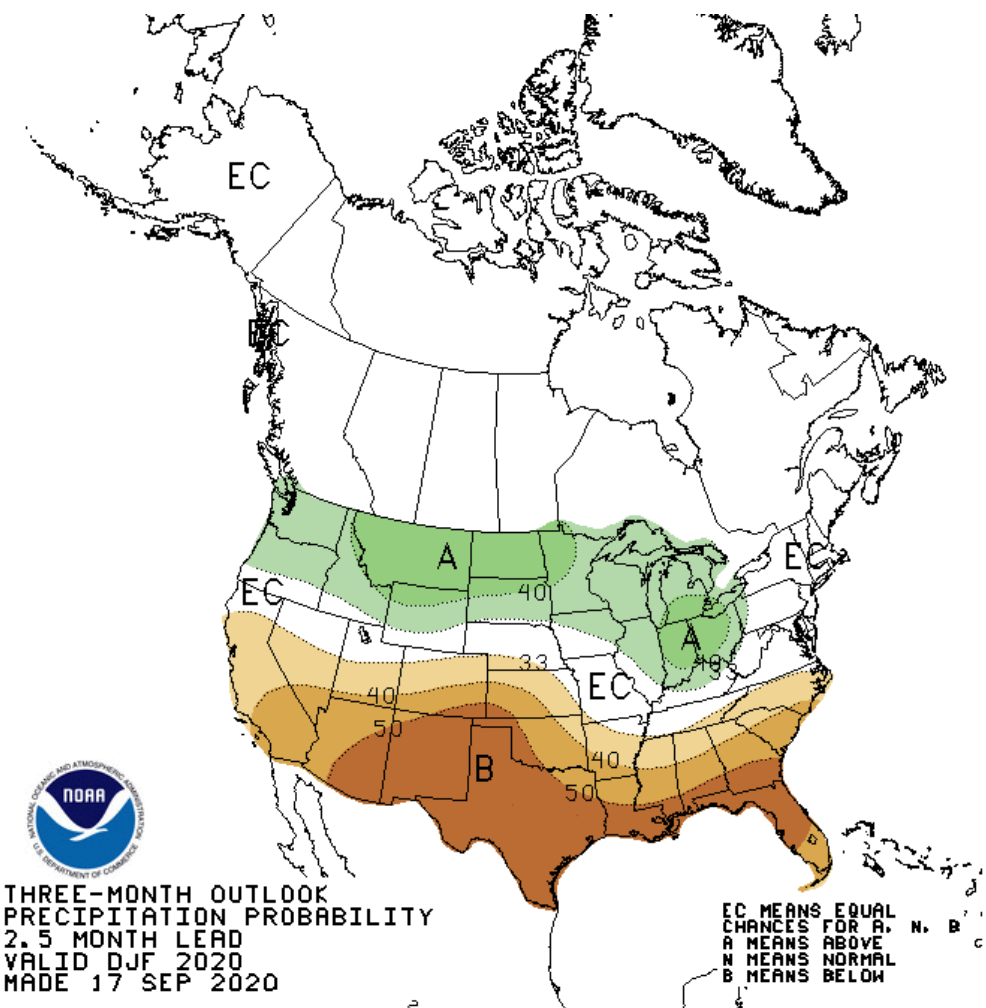
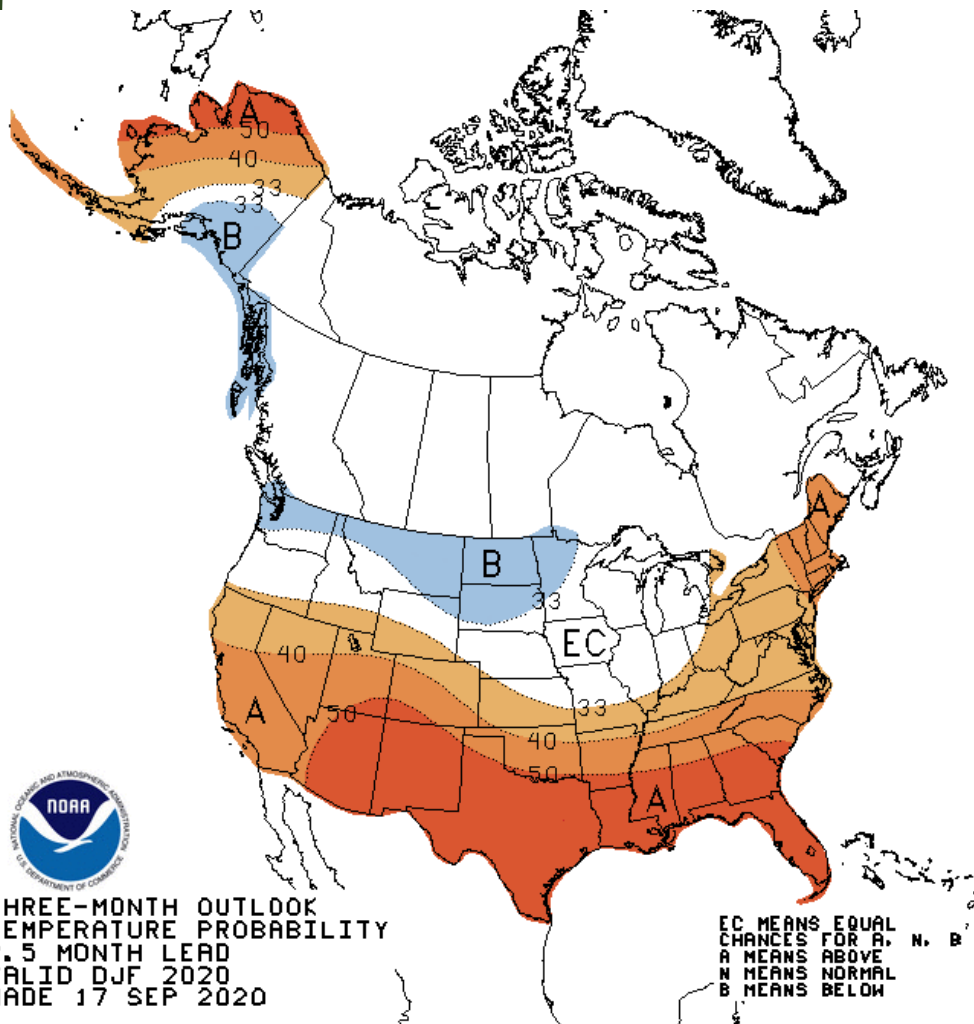


https://www.pmel.noaa.gov/el_nino/sites/default/files/thumbnails/image/LaNina-Jet-Wintertime-Pattern.jpg

Winter Outlook (December-February, 2020-21)

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

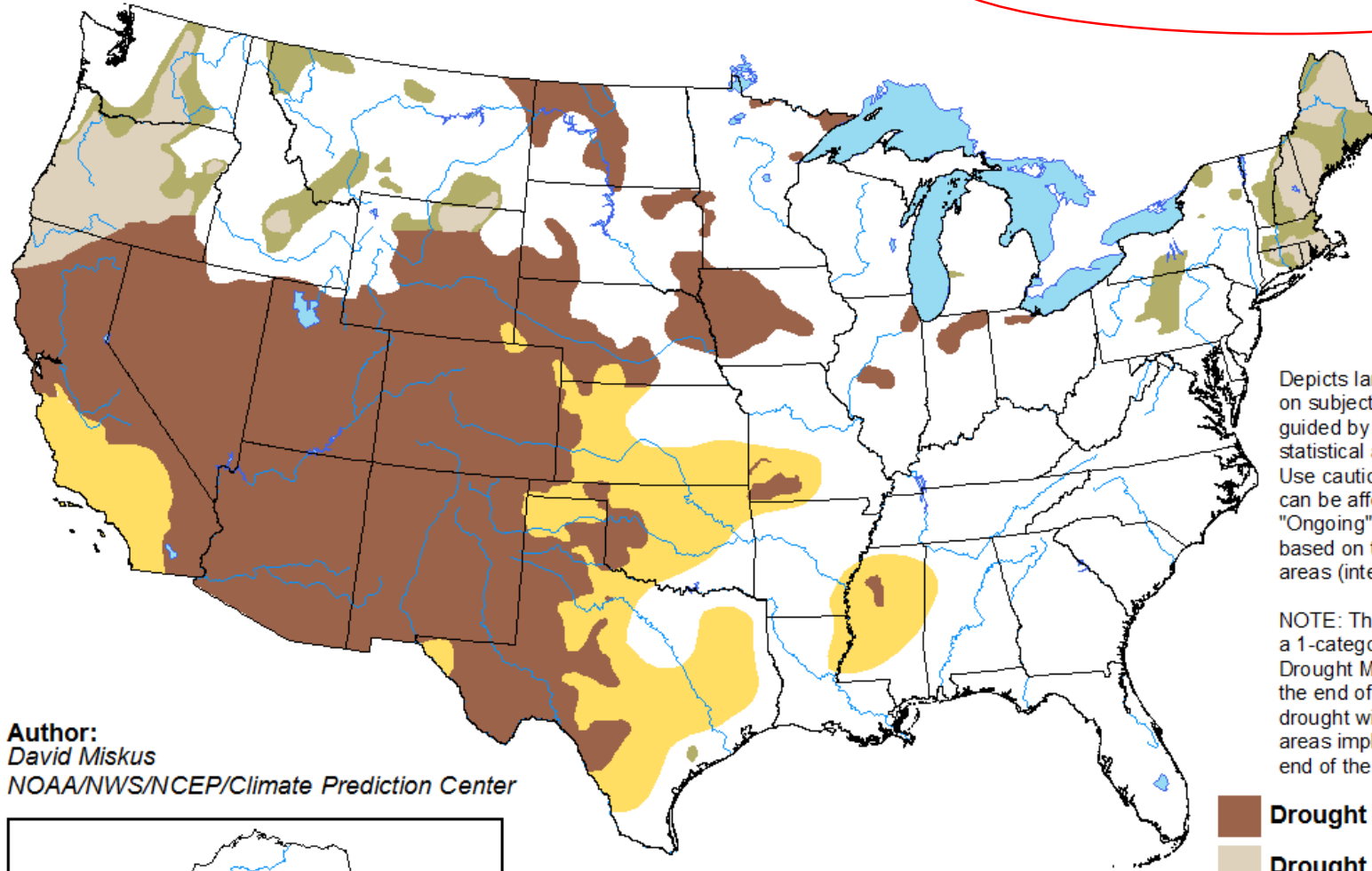
The official winter outlook will come out on 10/15/20 and will be discussed next month



U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

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

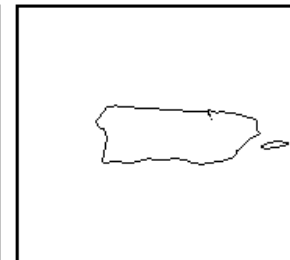
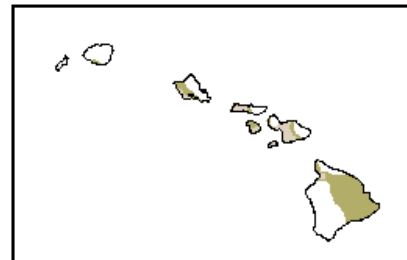
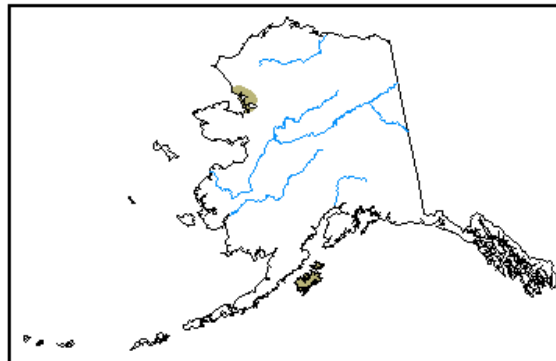


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to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

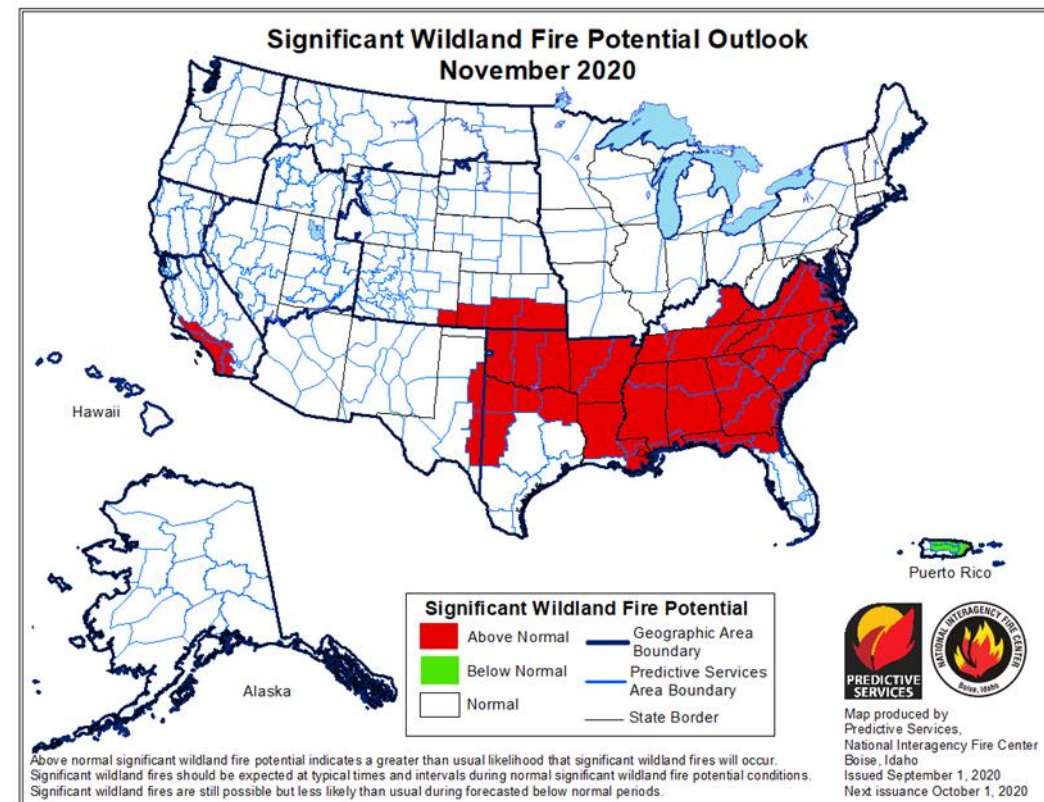
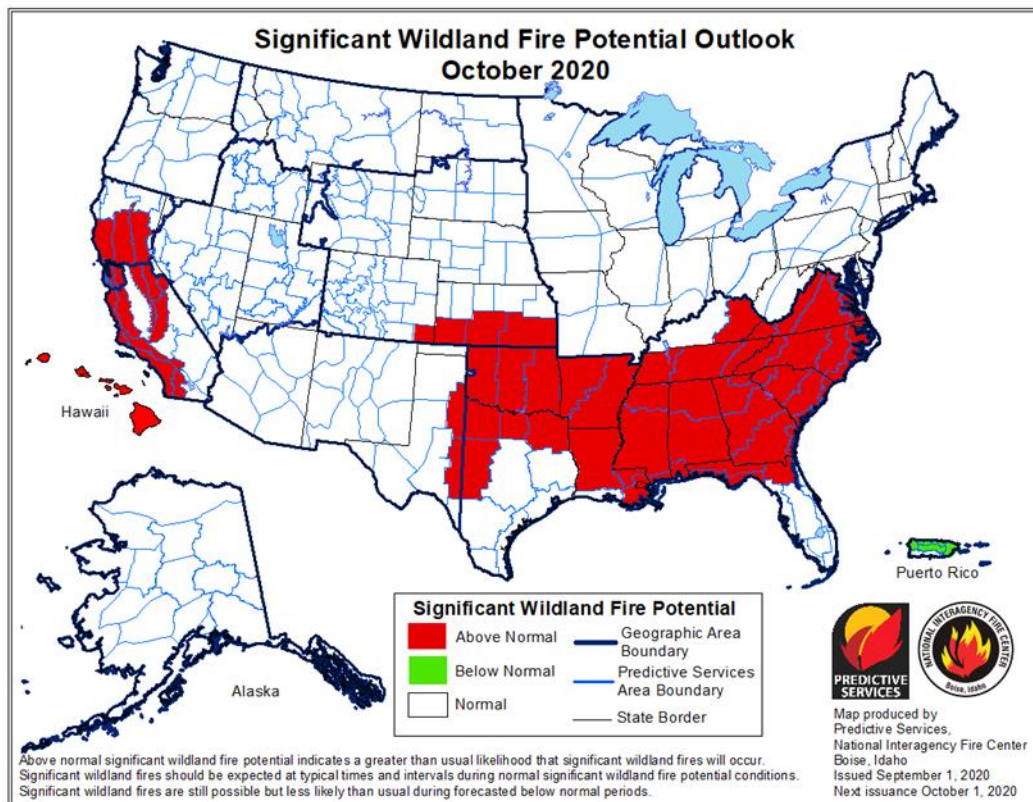
Author:
David Miskus
NOAA/NWS/NCEP/Climate Prediction Center



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



Significant Wildland Fire Potential Outlook



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 !

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