

North Central U.S. Climate-Drought Outlook

August 18, 2022

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University of Nebraska-Lincoln
School of Natural Resources



NATIONAL DROUGHT
MITIGATION CENTER
UNIVERSITY OF NEBRASKA

August 18, 2022

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



Ohio Soybeans from Aaron Wilson

- **Next Regular Climate/Drought Outlook Webinar**

- September 15, 2022 (1 PM CST) with **Darren Clabo, South Dakota State Fire Meteorologist**

- **Access to Future Climate Webinars and Related Information**

- www.drought.gov/drought/content/regional-programs/regional-drought-webinars

- **Access to Past Climate Webinars**

- <https://mrcc.purdue.edu/multimedia/webinars.jsp>
- www.hprcc.unl.edu/webinars.php



United States Department of Agriculture
Midwest Climate Hub



Agenda

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



Phillips County, CO taken by Russ Schumacher



Fires, Floods, and Drought...Oh My !



Photo by Missouri DNR



Photo by Candice King of Pearl City, IL



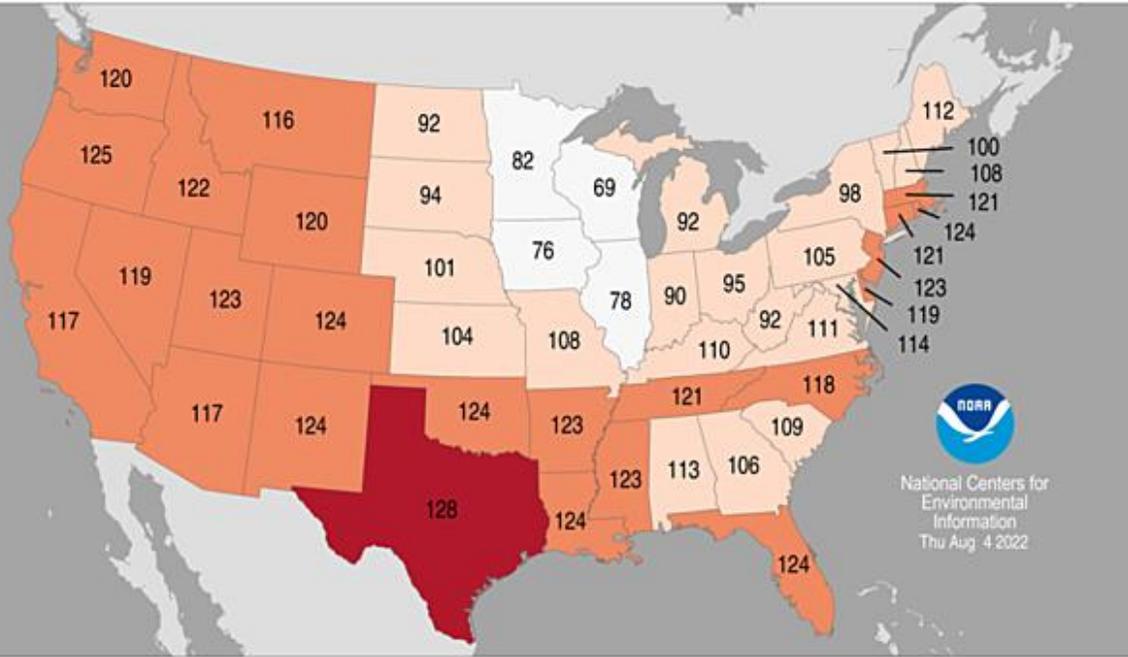
Carter Canyon Fire. Photo by Gary Stone



July Climatology from the National Centers for Environmental Information

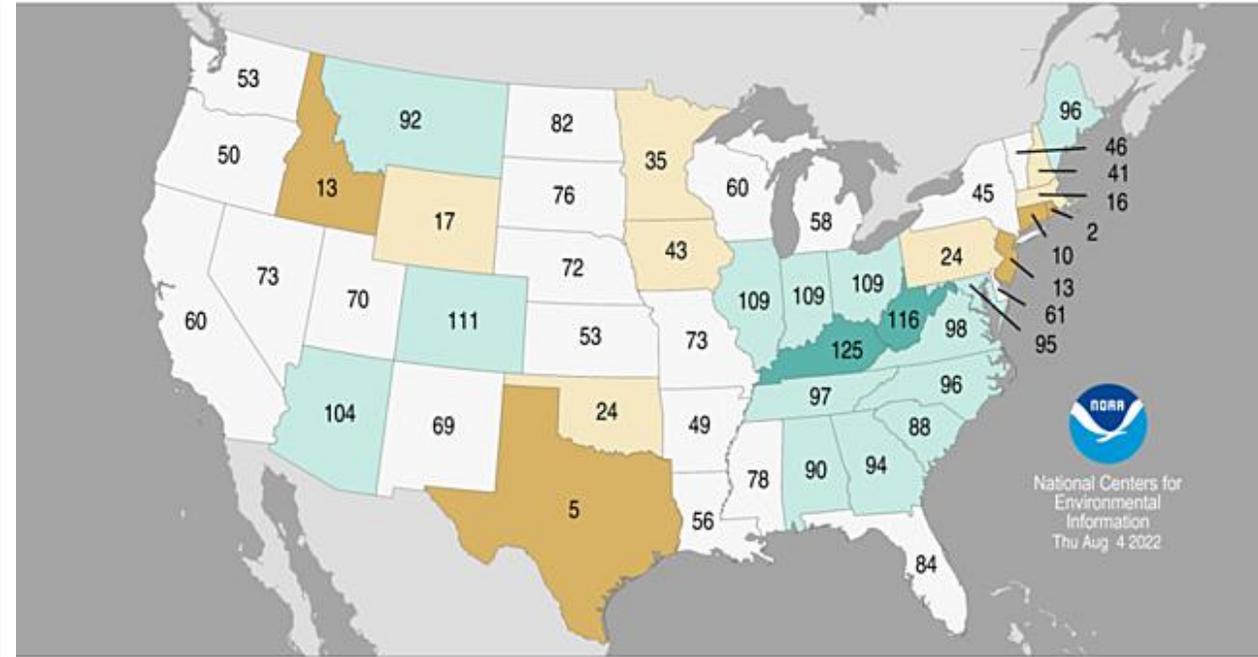
Statewide Average Temperature Ranks

July 2022
Period: 1895–2022



Statewide Precipitation Ranks

July 2022
Period: 1895–2022



■ Record Coldest (1)
■ Much Below Average
■ Below Average
■ Near Average
■ Above Average
■ Much Above Average
■ Record Warmest (128)

■ Record Driest (1)
■ Much Below Average
■ Below Average
■ Near Average
■ Above Average
■ Much Above Average
■ Record Wettest (128)



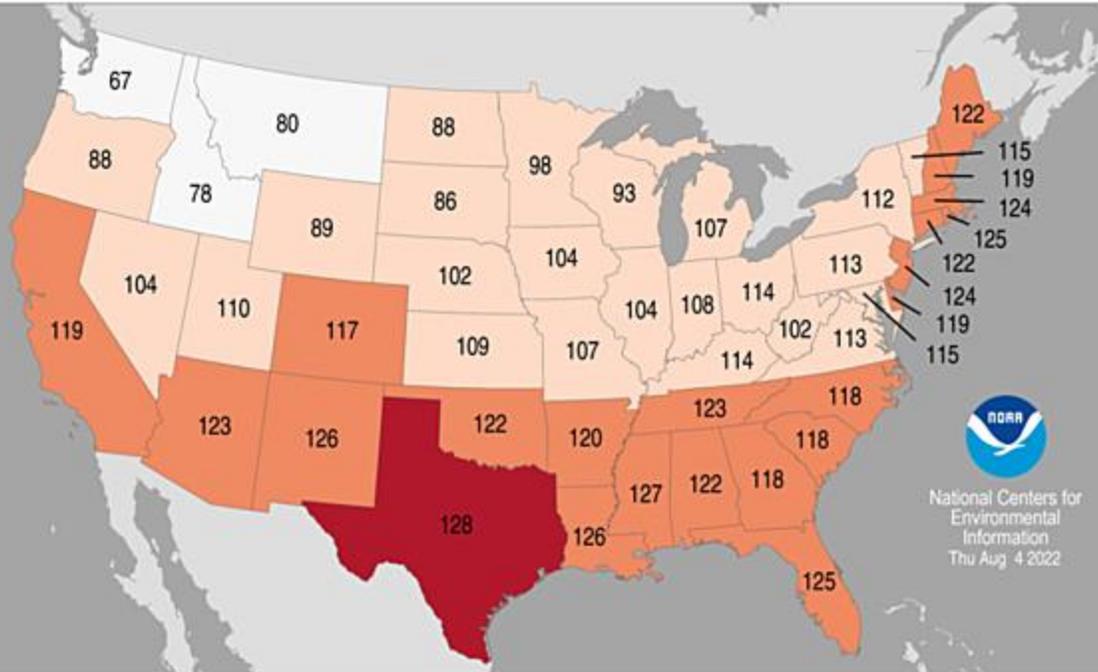
<https://www.ncdc.noaa.gov/sotc/>

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3-month Climatology from the National Centers for Environmental Information

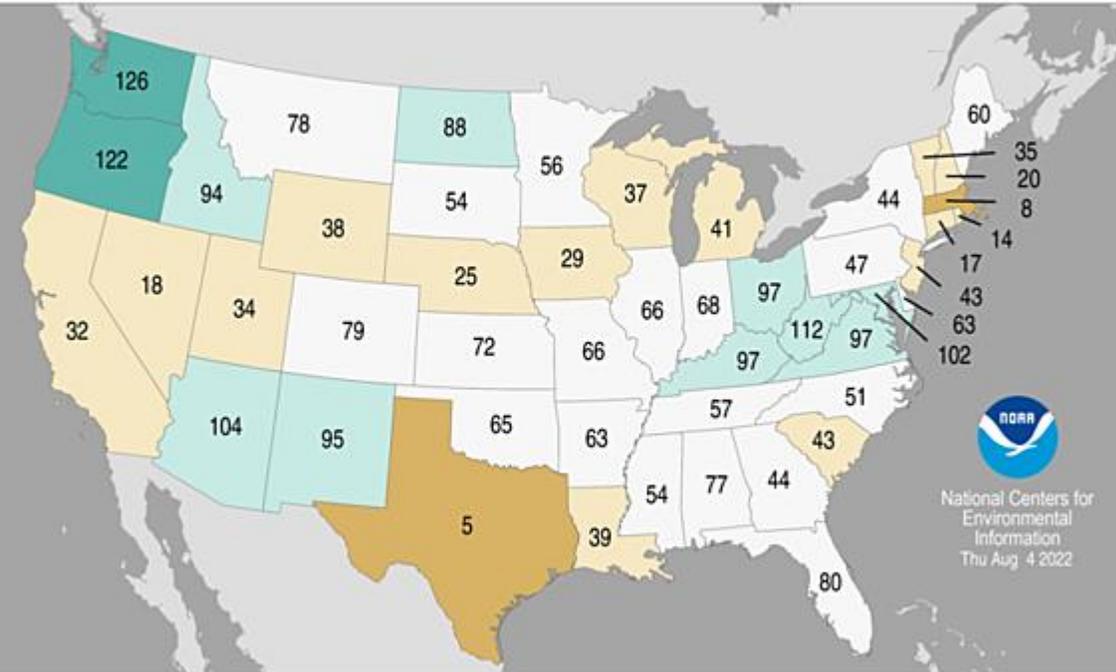
Statewide Average Temperature Ranks

May – July 2022
Period: 1895–2022



Statewide Precipitation Ranks

May – July 2022
Period: 1895–2022



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

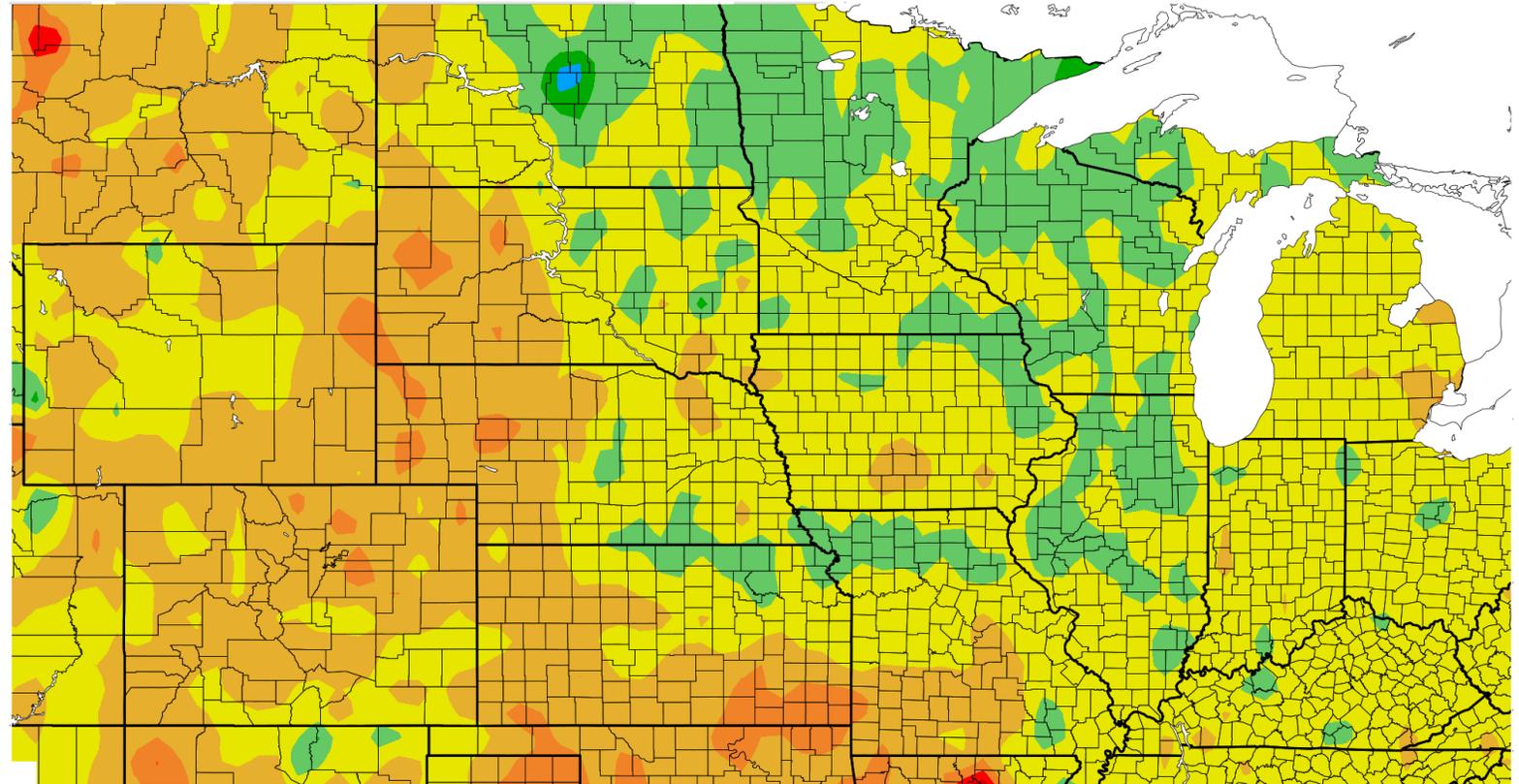
NATIONAL DROUGHT MITIGATION CENTER

Temperature departures over the last 30 Days

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



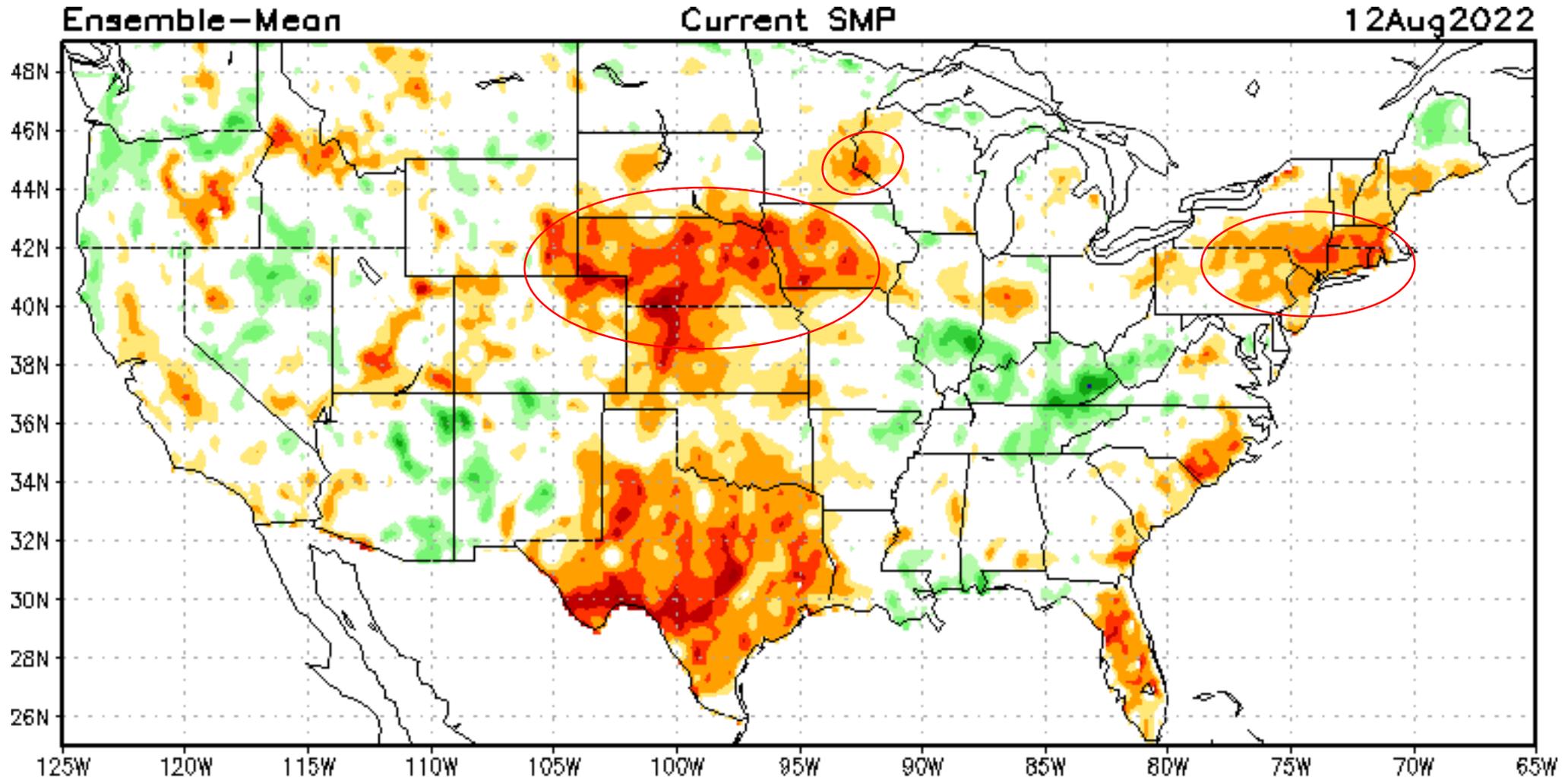
Departure from Normal Temperature (F)
7/18/2022 – 8/16/2022



Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

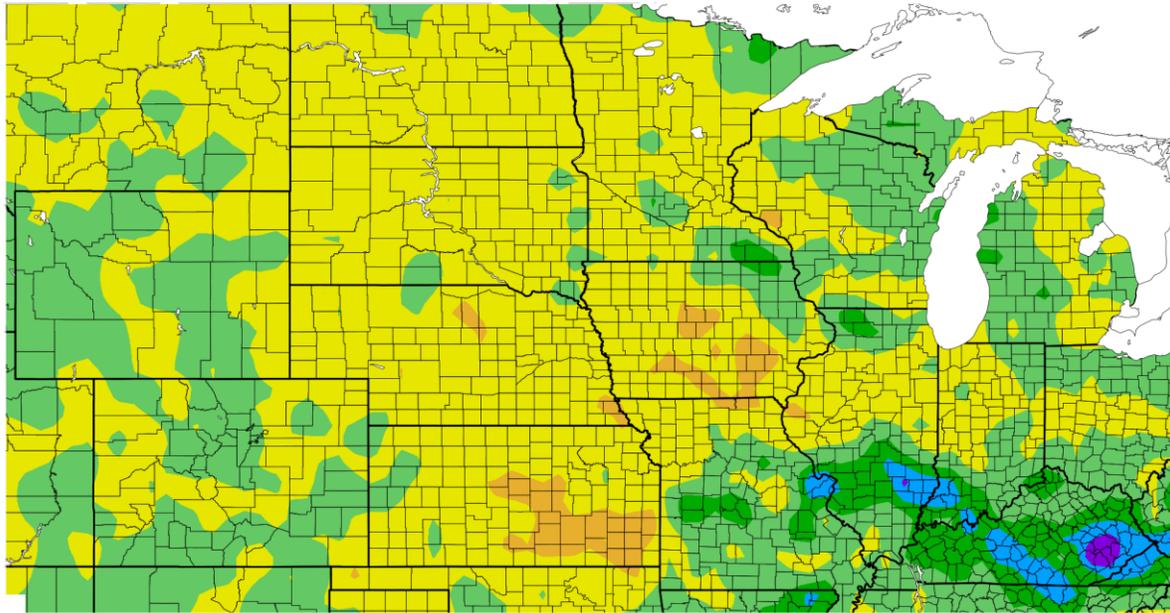
Current Soil Moisture Anomaly



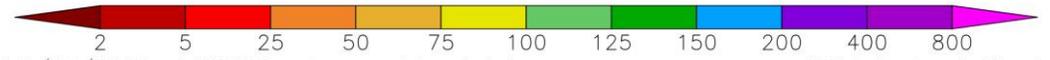
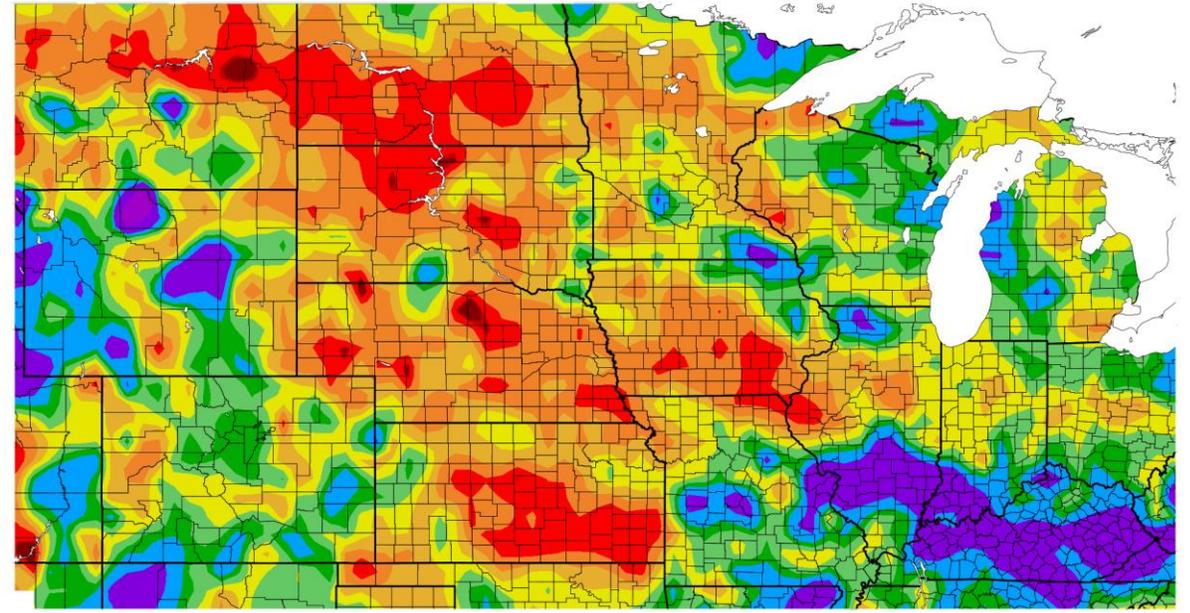
https://www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp_new.shtml#

Precipitation over the last 30 Days

Departure from Normal Precipitation (in)
7/18/2022 – 8/16/2022



Percent of Normal Precipitation (%)
7/18/2022 – 8/16/2022



Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Cen

Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

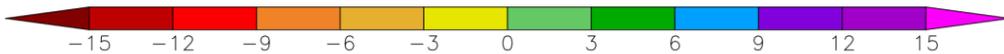
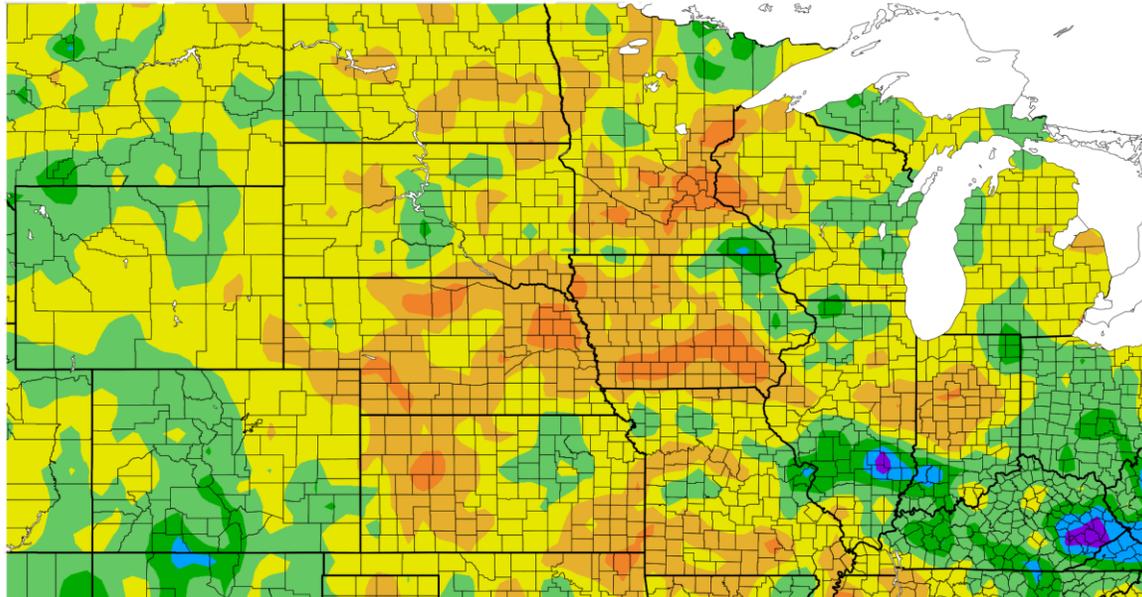


<http://www.hprcc.unl.edu/maps/current/>

NATIONAL DROUGHT MITIGATION CENTER

Precipitation over the last 90 Days

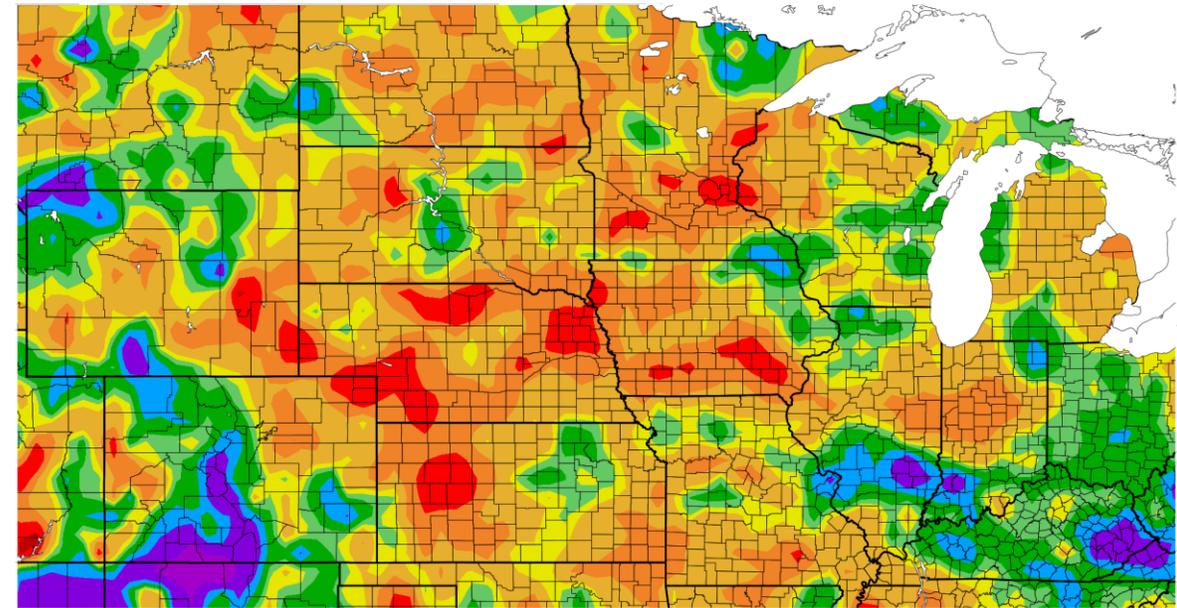
Departure from Normal Precipitation (in)
5/19/2022 – 8/16/2022



Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
5/19/2022 – 8/16/2022



Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers



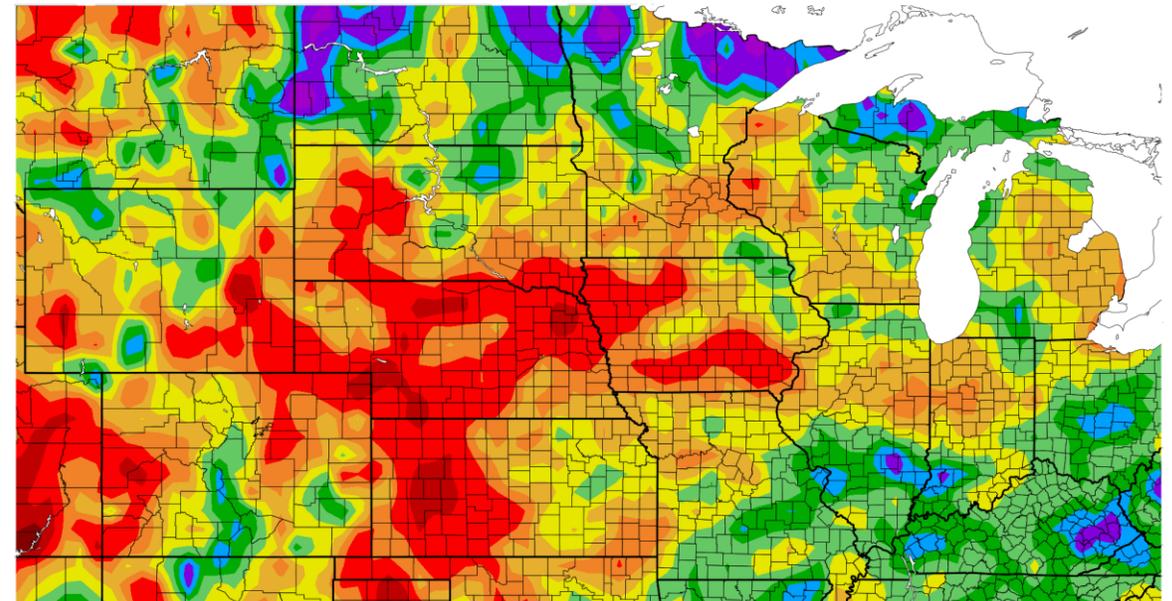
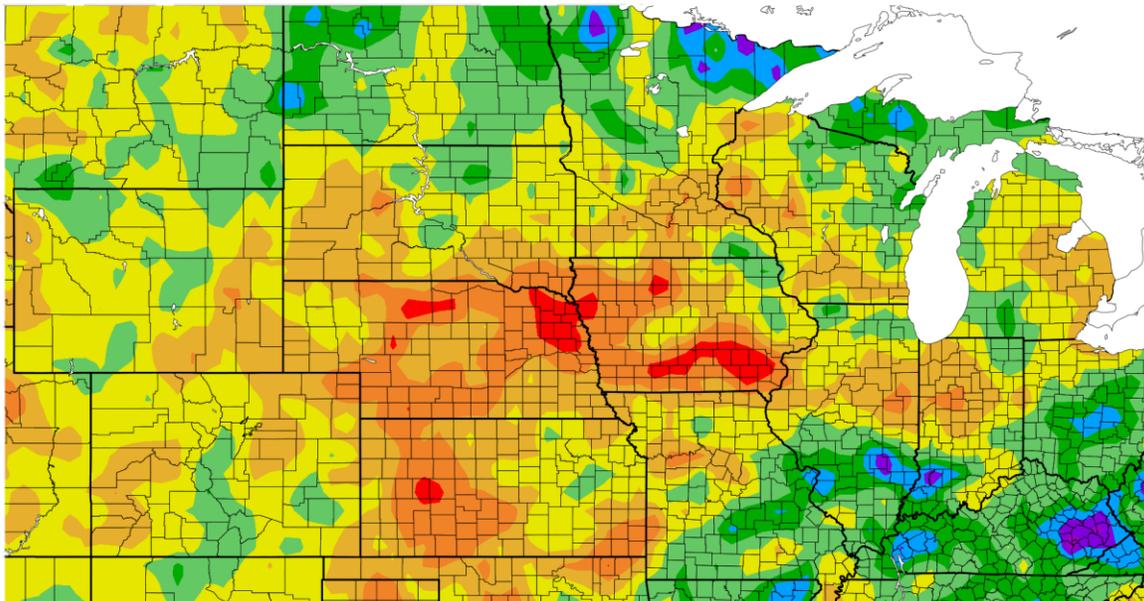
<http://www.hprcc.unl.edu/maps/current/>

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Calendar Year Precipitation

Departure from Normal Precipitation (in)
1/1/2022 - 8/16/2022

Percent of Normal Precipitation (%)
1/1/2022 - 8/16/2022



Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers Generated 8/17/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers



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

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Regional Impacts

Failed soybeans in Labette County, KS
Chip Redmond, KS state climate office



Fish Fire south of Sundance, WY courtesy of Darren Clabo



South Dakota ag impacts from Laura Edwards and Peter Sexton

Severe drought stress in corn, milo and pastures in Milesville (Haakon county) area. Corn will be cut for silage; milo nitrate levels are too high to feed.

In Southeast South Dakota, corn being cut for silage in the non-irrigated areas south of Freeman and in the Centerville-Viborg area with Clay & Union counties the worst, but not only area with extreme drought impacts.

- It looks like it will come in around 70 bu/ac at this point; however, that number will go down I am afraid if we don't get some rain in the next week - so we may come in closer to 45 to 50 bu/ac as an average yield. Its difficult to predict, but in any case we are in a severe to exceptional drought. 1/3 or less of the expected yield.

- Hybrid winter rye yielded on the order of 85 bu/ac - I thought we had a 150 bu/ac rye crop in late May, but the dry hot weather in June really cut into production and there was no reserve moisture to carry it through.

- Oats ran about 60 bu/ac, which is about half of what we'd like to see. Small grains went about half to two-thirds of what was expected in May.

- There was heat last week, but the areas with 1-1.5" of rain (or more) are probably holding steady on field conditions to compensate for the heat.

- More fires recently (lightning) especially in western SD

- Record daily rain in the Sioux Falls area, just north of the dry area in the southeast.



NATIONAL WEATHER SERVICE
National Oceanic and Atmospheric Administration
WEATHER.GOV/SIOUXFALLS

Multiple Rainfall Records Broken

August 7, 2022
Sioux Falls
5.44"

Previous Aug 7th Record: 1.88" in 1938
Previous Daily Record for Month of August and Entire Year: 4.59" Aug 1, 1975

All-Time 24-Hour Rainfall Record also broken, with 5.67" from 9AM Aug 6 – 9AM Aug 7, 2022 (Previous 24-Hour Record: 5.07" Sep 19-20, 2018)

Minnesota: Recent improvements from Pete Boulay

- Colder and wetter recently with conditions across the state looking better over the last 2-3 weeks.
- Crops look good
- Lingering tree stress (Oak) from longer term dryness

Kansas: From Chip Redmond

- Top 10 driest July 1 to present in Wichita
- Failed sorghum and soybeans in many parts of KS, especially southcentral
- Southeast KS corn is going to be in the 40 bushels/acre range compared to a normal of around 120 bushels/acre
- No water supply issues

Minnesota soybeans from Pete Boulay



Wyoming and Colorado



From Justin Derner:

- Hay supplies remain tight and prices high.
- Some recent fire activity such as the Fish Fire south of Sundance, WY (Photo by Darren Clabo)



From Becky Bollinger:

- Summer dryness in northeast Colorado has been hard on crops
- Much of Colorado has had a good monsoon season
- No fire issues at this time



Kentucky Update

- Buckhorn Lake NWS COOP station recorded 8” in 24hrs (State record 24hr precipitation is 10.48”)
- Monthly totals for KY Mesonet stations in Breathitt County measured over 17”
- The North Fork of the Kentucky River at Whitesburg USGS gage recorded over 6ft higher than previous record (14.7ft in 1957) before failure. At Jackson, the crest also broke previous record (43.1ft in 1939) by a few inches.
- **Transportation:** Washed out roadways caused significant problems in rescue and recovery efforts
- **Utilities:** Many areas were without power and clean water. Communications have also been affected.
- **Agriculture:** Many crops stressed from drought now are lost from flooding.
- **Education:** Delays in grade school start due to damaged buildings and infrastructure



Ohio and Indiana Update

- **Ohio** has had some areas of plentiful rain (NW to SE) and some drier areas over the last month as well (SW and NE).
- The only area of concern for impacts is the NE, where longer term dryness throughout pollination and now grain fill is likely to lead to a 10% yield reduction in this season's corn crop. It is also the only area of the state with impacts on stream flow.
- With increased humidity this season, disease pressure is increasing a bit as well.
- Recent temperatures (August) have been running below average as you undoubtedly already know
- **Indiana** has had no issues at this time



Lake Michigan from Doug Kluck



Michigan and Missouri Update

- **Michigan** dryness intensified over much of lower MI but the last few weeks has brought relief.
- For specialty crops, cherry harvest is complete, and peach and blueberry harvests have begun. Summer apple harvest should begin very soon. Many vegetable crops are also in full production. Quality and yields and yields have been good. Irrigation has made a significant difference this year where available (for the better).
- Dries conditions in July helped to reduce plant disease

- **Missouri** Flooding and drought all at the same time
- Northern Missouri has been wetter than southern MO with a significant flash drought developing in July
- Historic flood event hit the St. Louis area on July 26th with reports of up to 11" of rain in just over 8 hours. 2 fatalities were reported

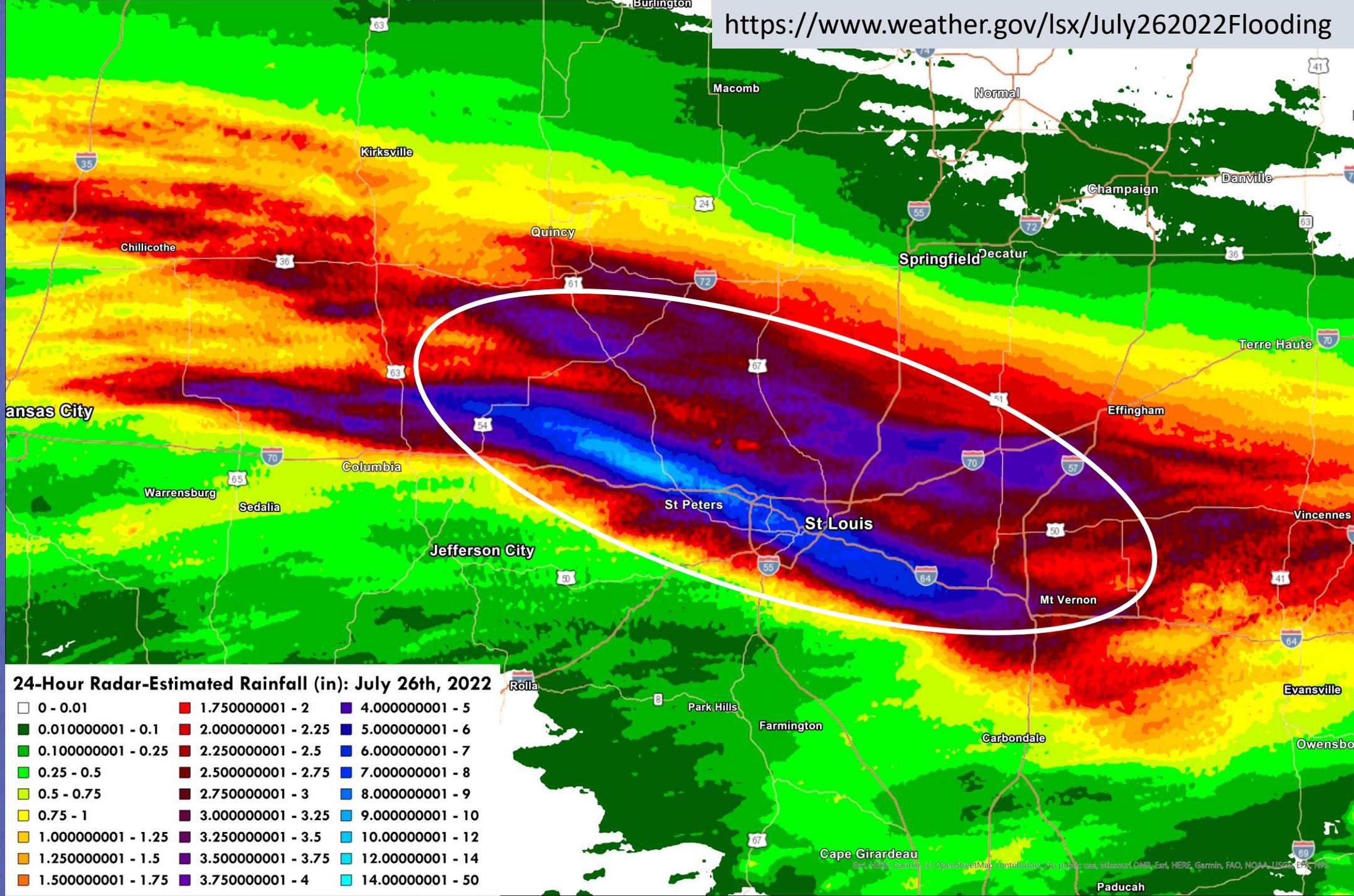


HISTORIC ST. LOUIS RAINFALL 25-26 July 2022



- **9.04"**: Highest 24-hour rainfall on record
(Beat 7.02" in August 19-20, 1915 with the remnants of the Galveston Hurricane)
- **7.68"**: Received in just 6 hours!
(This has less than a 1 in 1,000 chance of occurring in a given year)
- **25%**: Received about 25% of our normal yearly rainfall amount in 1.2 hours!
- **7.31"**: This is the normal amount of rain for July and August combined.
(St. Louis surpassed that amount in just 6 hours!)







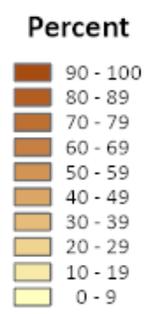
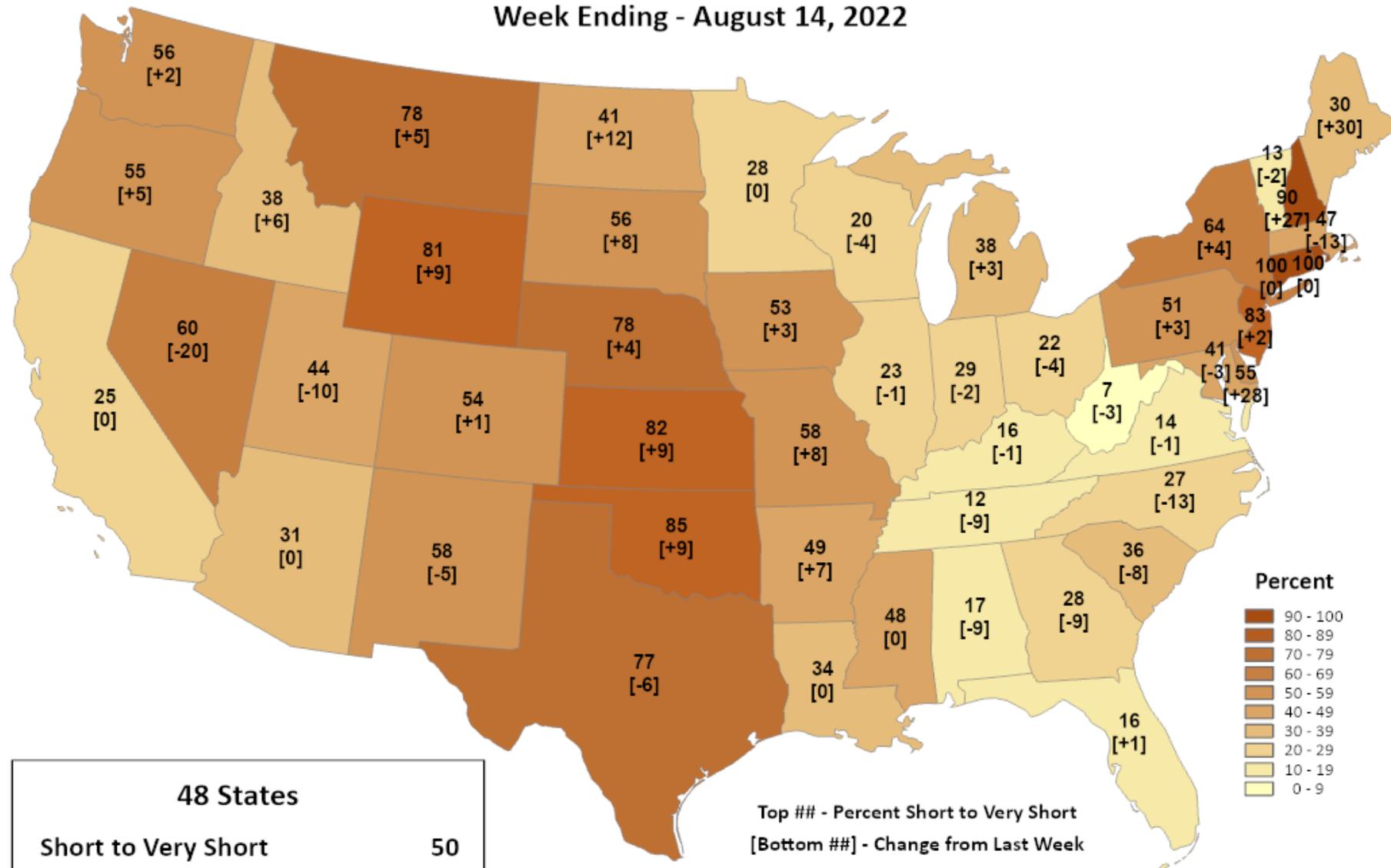
United States
Department of
Agriculture

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

Topsoil Moisture

Percent Short to Very Short

Week Ending - August 14, 2022



48 States	
Short to Very Short	50
Change from Last Week	+3

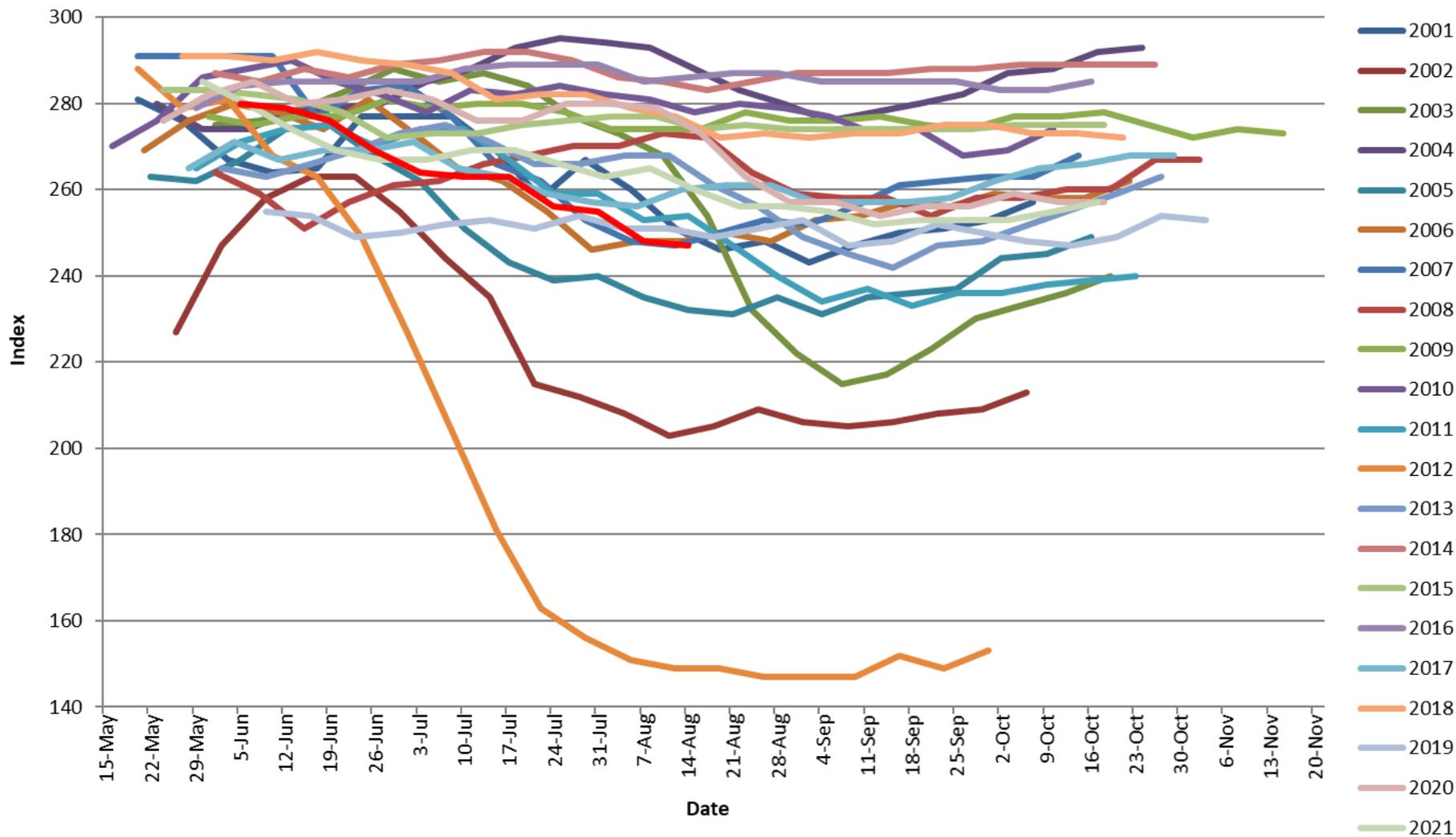
Top ## - Percent Short to Very Short
[Bottom ##] - Change from Last Week

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



Corn Conditions

U.S. CORN Condition Index



Condition Index = 4*Excellent + 3*Good + 2*Fair + 1*Poor

Based on NASS crop progress data.

Data obtained from USDA National Agricultural Statistics Service Weekly Crop Progress Reports.



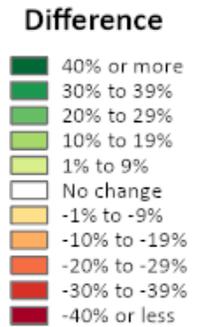
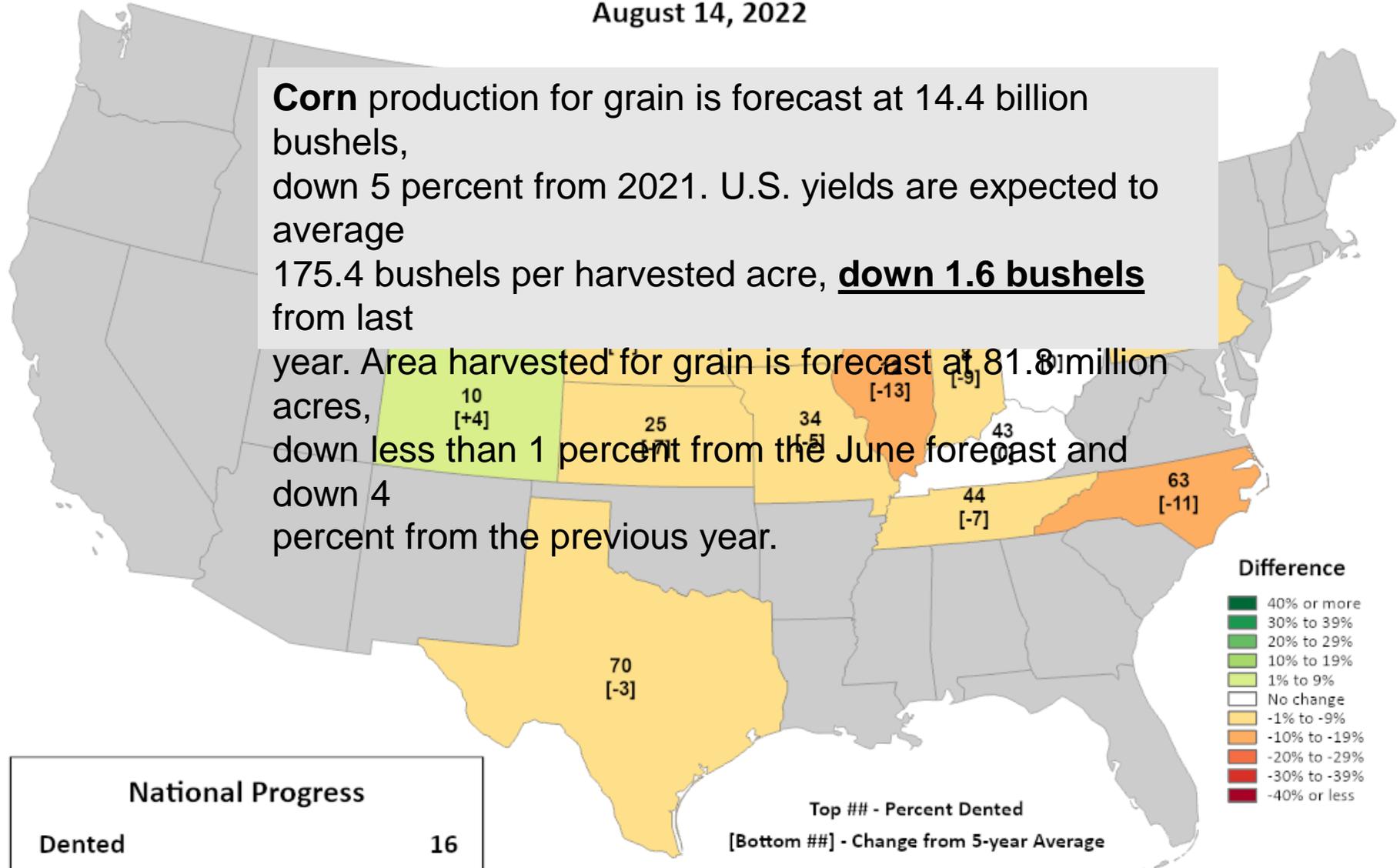
Corn Progress

Percent Dented

August 14, 2022

Corn production for grain is forecast at 14.4 billion bushels, down 5 percent from 2021. U.S. yields are expected to average 175.4 bushels per harvested acre, **down 1.6 bushels** from last

year. Area harvested for grain is forecast at 81.8 million acres, down less than 1 percent from the June forecast and down 4 percent from the previous year.



National Progress

Dented	16
Change from 5-year Average	-4

Top ## - Percent Dented

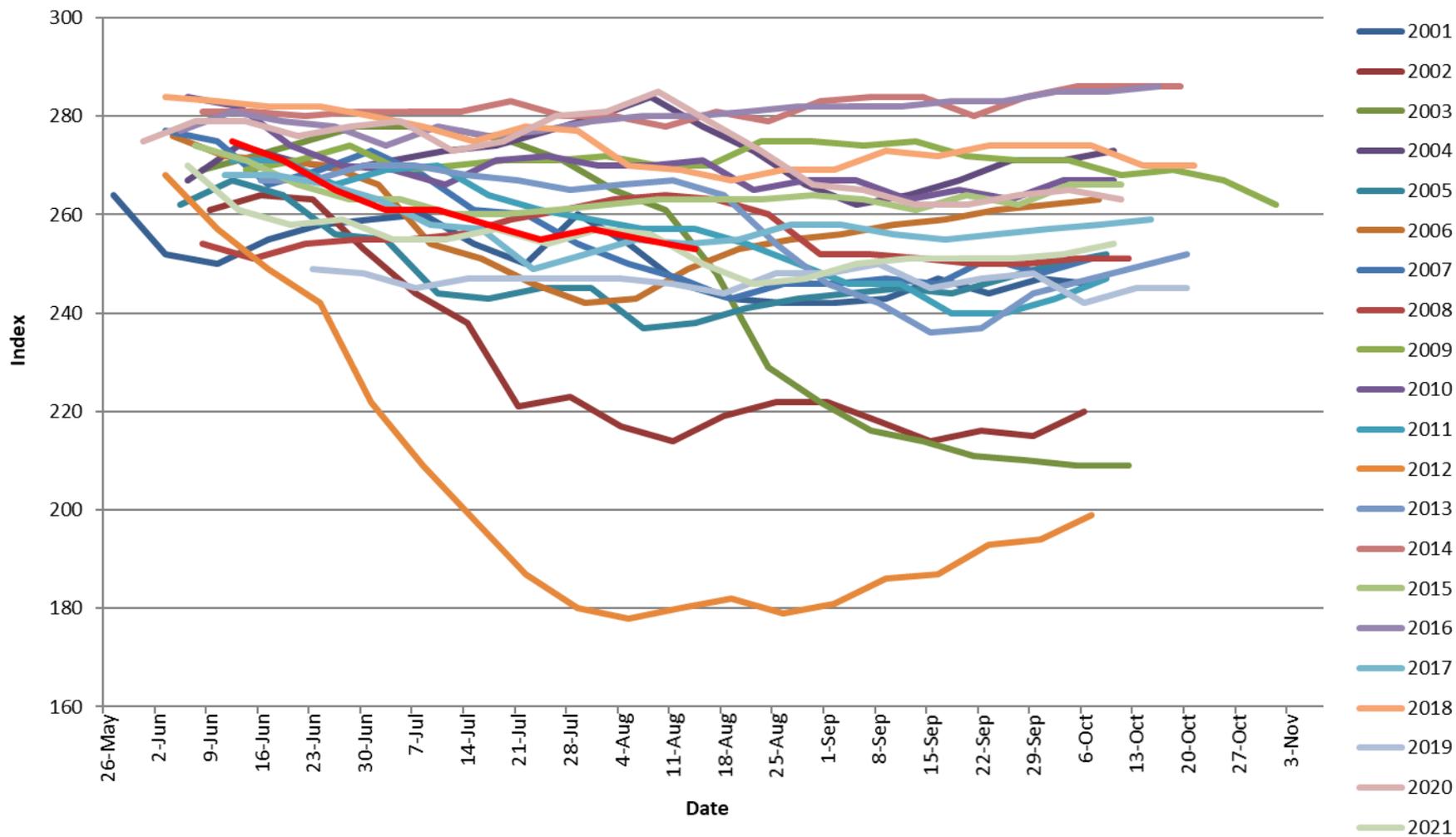
[Bottom ##] - Change from 5-year Average



Soybean Conditions

This pro
USDA O
World A

U.S. SOYBEAN Condition Index



Based on NASS crop progress data.

Condition Index = 4*Excellent + 3*Good + 2*Fair + 1*Poor

Change from Last Year **-3**

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

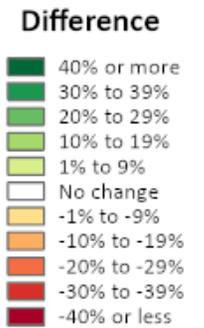
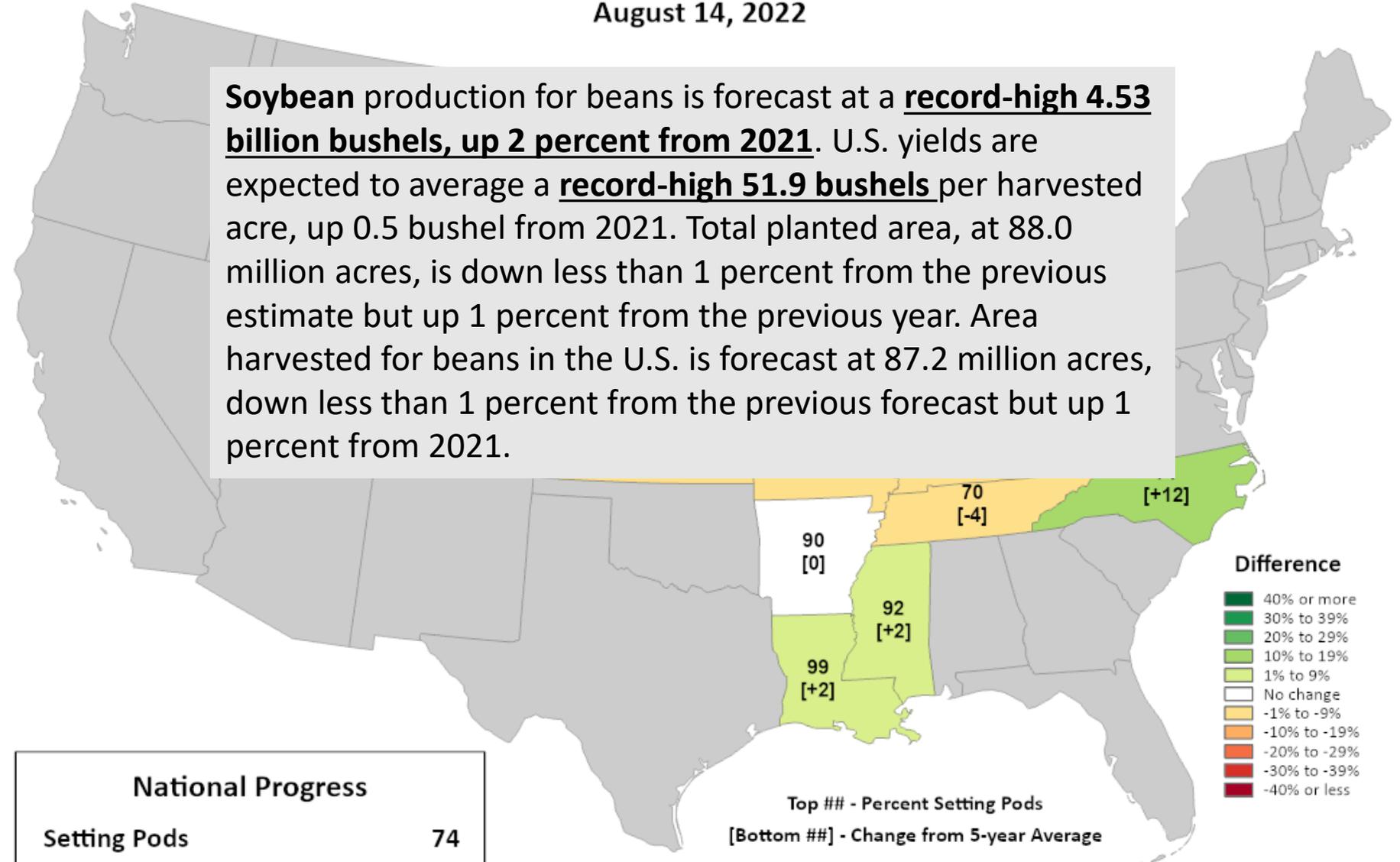


Soybeans Progress

Percent Setting Pods

August 14, 2022

Soybean production for beans is forecast at a **record-high 4.53 billion bushels, up 2 percent from 2021**. U.S. yields are expected to average a **record-high 51.9 bushels** per harvested acre, up 0.5 bushel from 2021. Total planted area, at 88.0 million acres, is down less than 1 percent from the previous estimate but up 1 percent from the previous year. Area harvested for beans in the U.S. is forecast at 87.2 million acres, down less than 1 percent from the previous forecast but up 1 percent from 2021.



National Progress	
Setting Pods	74
Change from 5-year Average	-3

Top ## - Percent Setting Pods
[Bottom ##] - Change from 5-year Average

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





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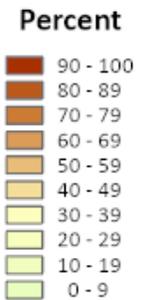
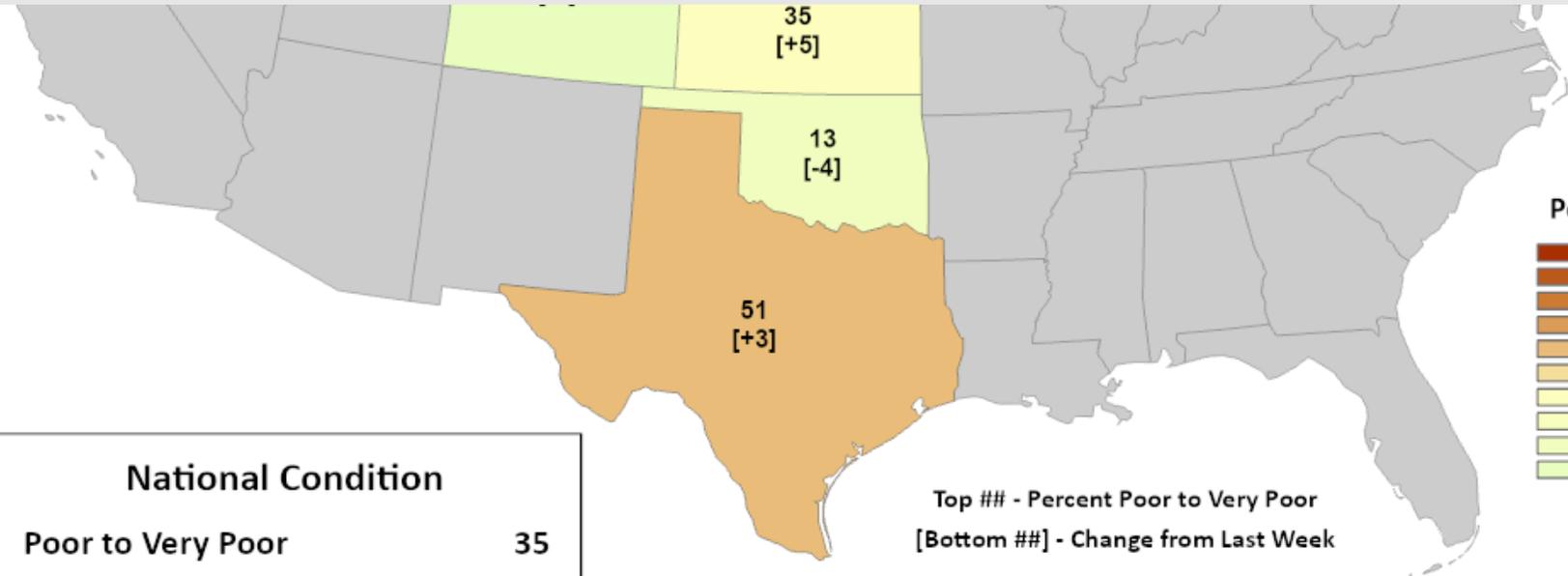
Sorghum Conditions

Percent Poor to Very Poor

August 7, 2022



This year's projected U.S. sorghum yield is down 23% from last year, while the production forecast is down 36% from 2021. (Source: [https://www.nass.usda.gov/Newsroom/Executive Briefings/2022/08-12-2022.pdf](https://www.nass.usda.gov/Newsroom/Executive_Briefings/2022/08-12-2022.pdf)) Sorghum is usually considered a drought tolerant crop.



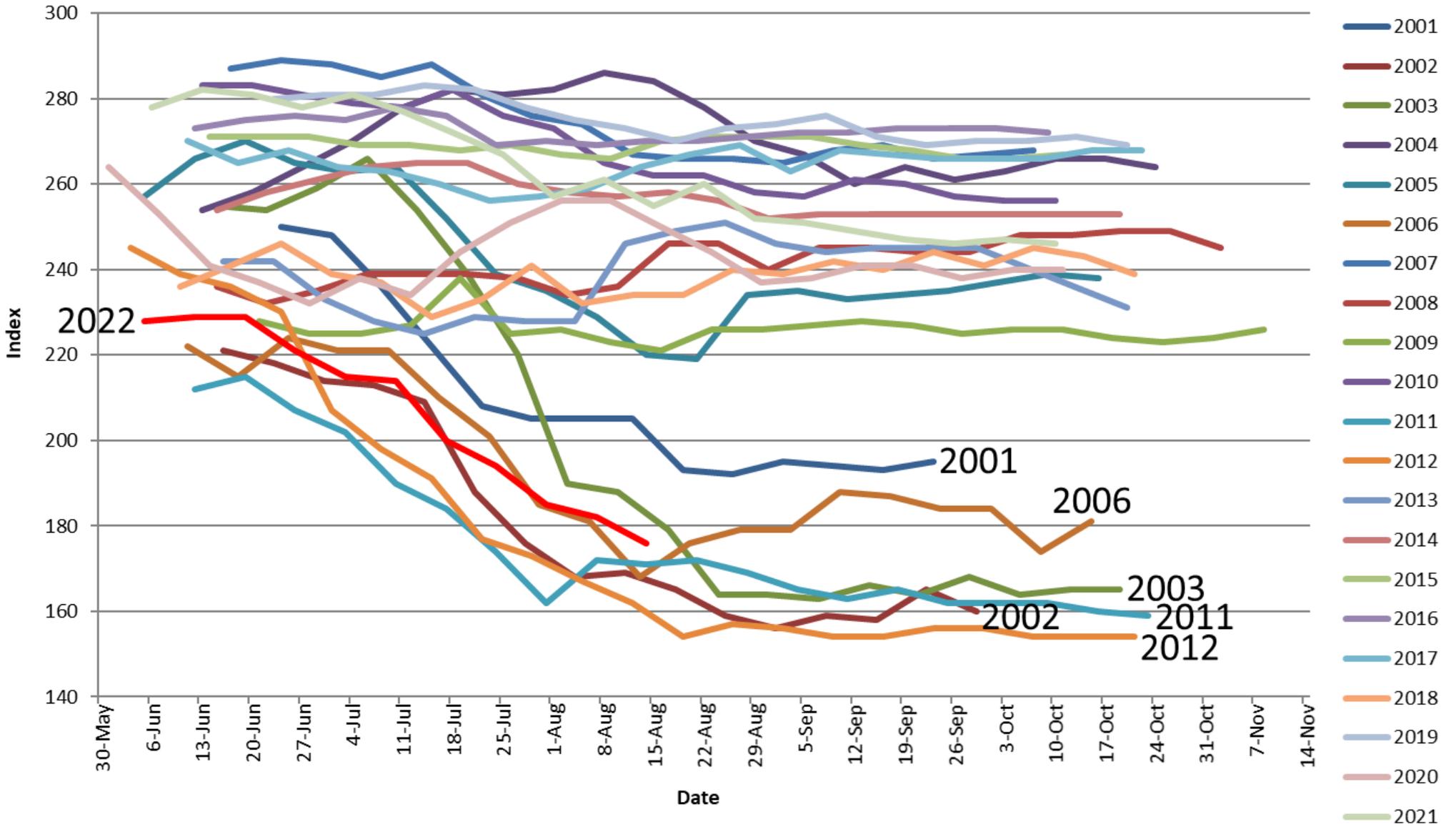
National Condition	
Poor to Very Poor	35
Change from Last Week	+3

Top ## - Percent Poor to Very Poor
[Bottom ##] - Change from Last Week

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



U.S. SORGHUM Condition Index



Based on NASS crop progress data.

Condition Index = 4*Excellent + 3*Good + 2*Fair + 1*Poor





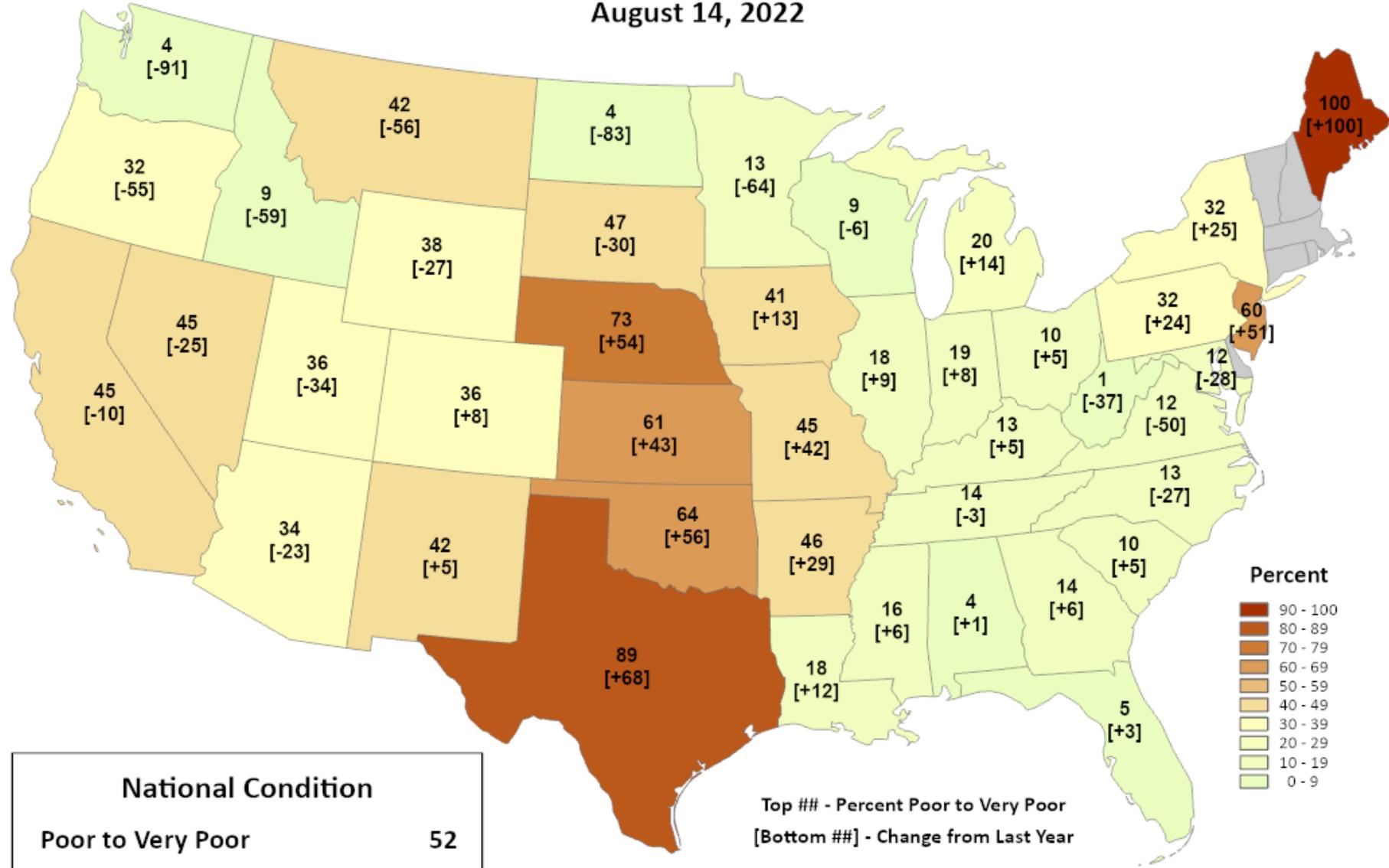
United States
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Pasture and Range Conditions

Percent Poor to Very Poor

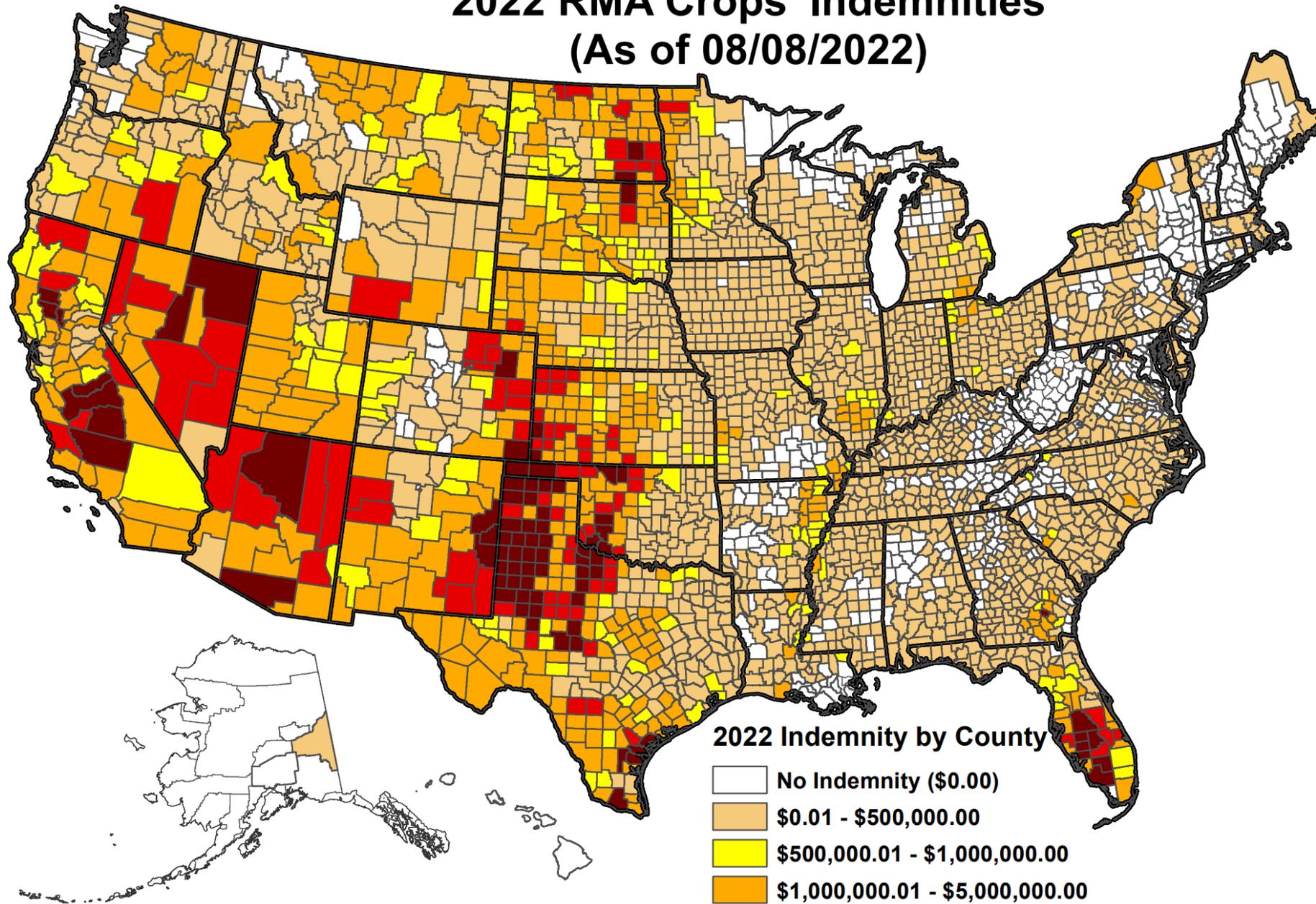
August 14, 2022



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



2022 RMA Crops' Indemnities (As of 08/08/2022)



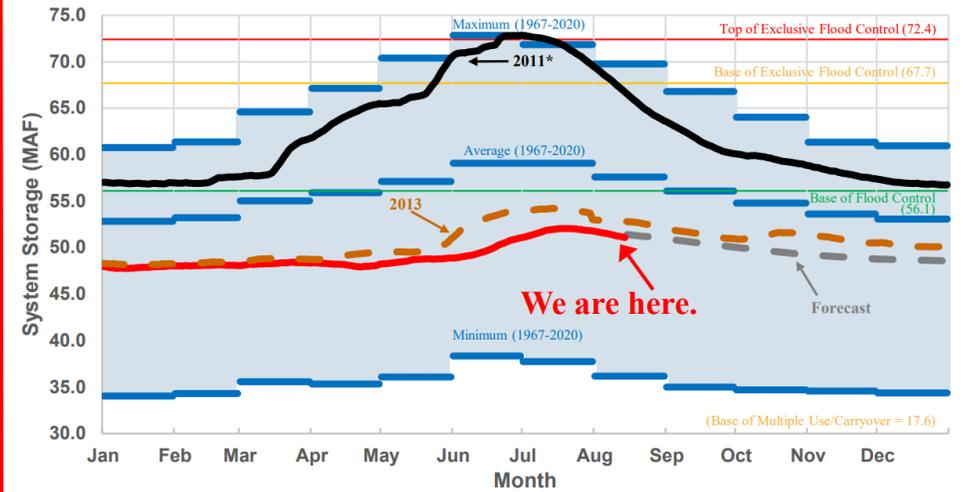
2022 Indemnity by County

- White box: No Indemnity (\$0.00)
- Light orange box: \$0.01 - \$500,000.00
- Yellow box: \$500,000.01 - \$1,000,000.00
- Orange box: \$1,000,000.01 - \$5,000,000.00
- Red box: \$5,000,000.01 - \$10,000,000.00
- Dark red box: over \$10,000,000.01

Mainstem Reservoir Status:

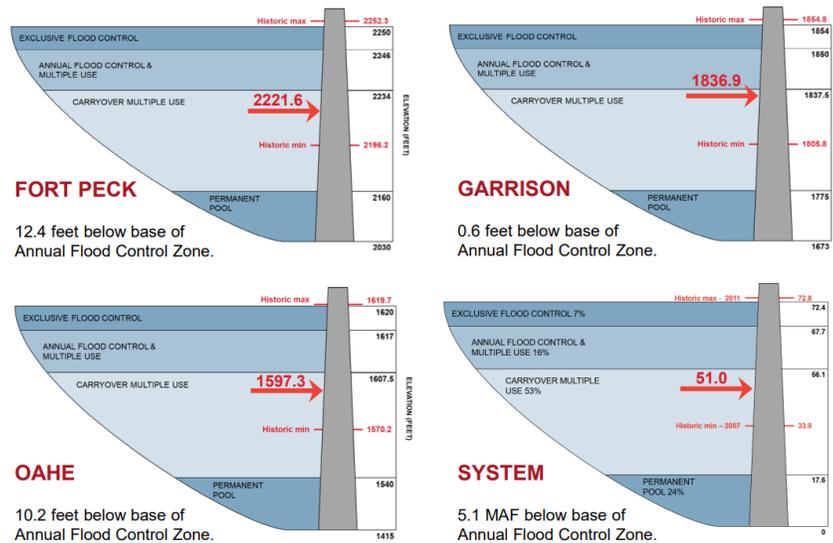
- ❖ System storage is 51.0 MAF, 0.4 MAF less than last week (upper right quadrant). Current and projected System storage is shown on the plot.
- ❖ For the August monthly study with forecasted pool levels and releases for each mainstem project ([click here](#)).
- ❖ The Gavins Point release will be adjusted to meet the current service level of 500 cfs above minimum service, per the Master Manual. Releases are currently 30,500 cfs. The release schedule for Gavins Point is provided in our daily forecast ([click here](#)).
- ❖ The 8-week drought monitor comparison shows improvements in the upper Basin and degradation in the lower Basin (lower right quadrant).
- ❖ Refer to the 3-Week Forecast ([click here](#)) for the most up-to-date System information – pool levels, inflows, and releases.

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.

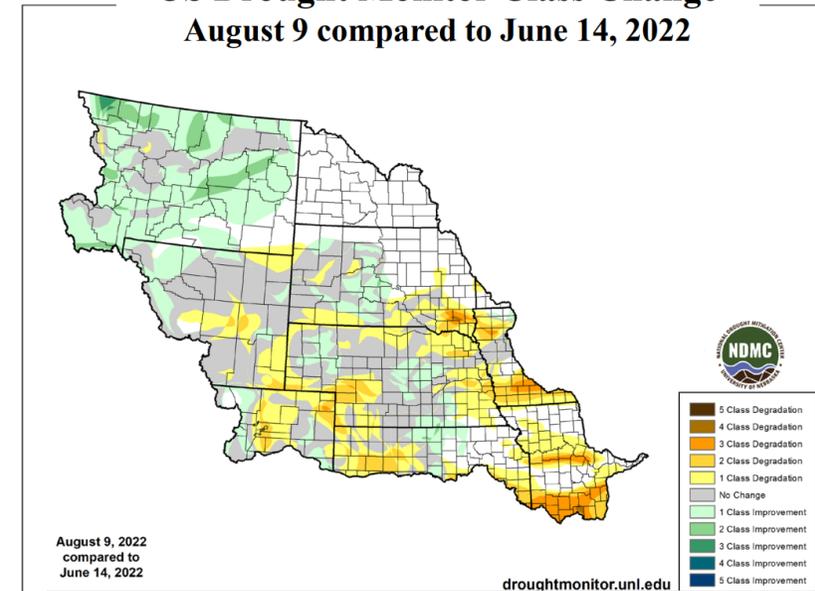
Current Reservoir Levels



[Click Here](#) for Latest 3-Week Forecast

[Click Here](#) for Comparison Plots

US Drought Monitor Class Change August 9 compared to June 14, 2022



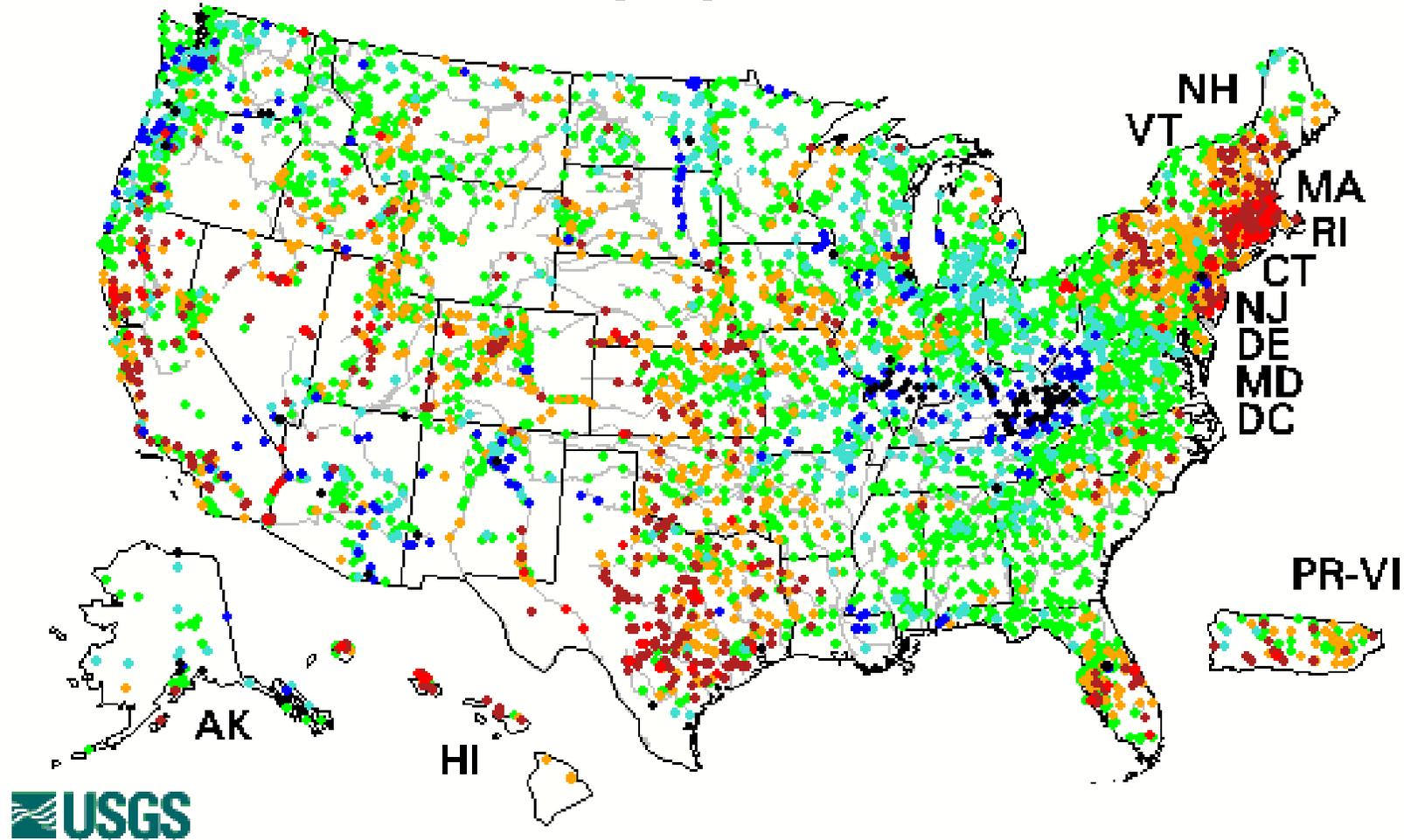
August 9, 2022
 compared to
 June 14, 2022

droughtmonitor.unl.edu



28-Day Average Streamflow

Tuesday, August 16, 2022



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/>



Drought Update



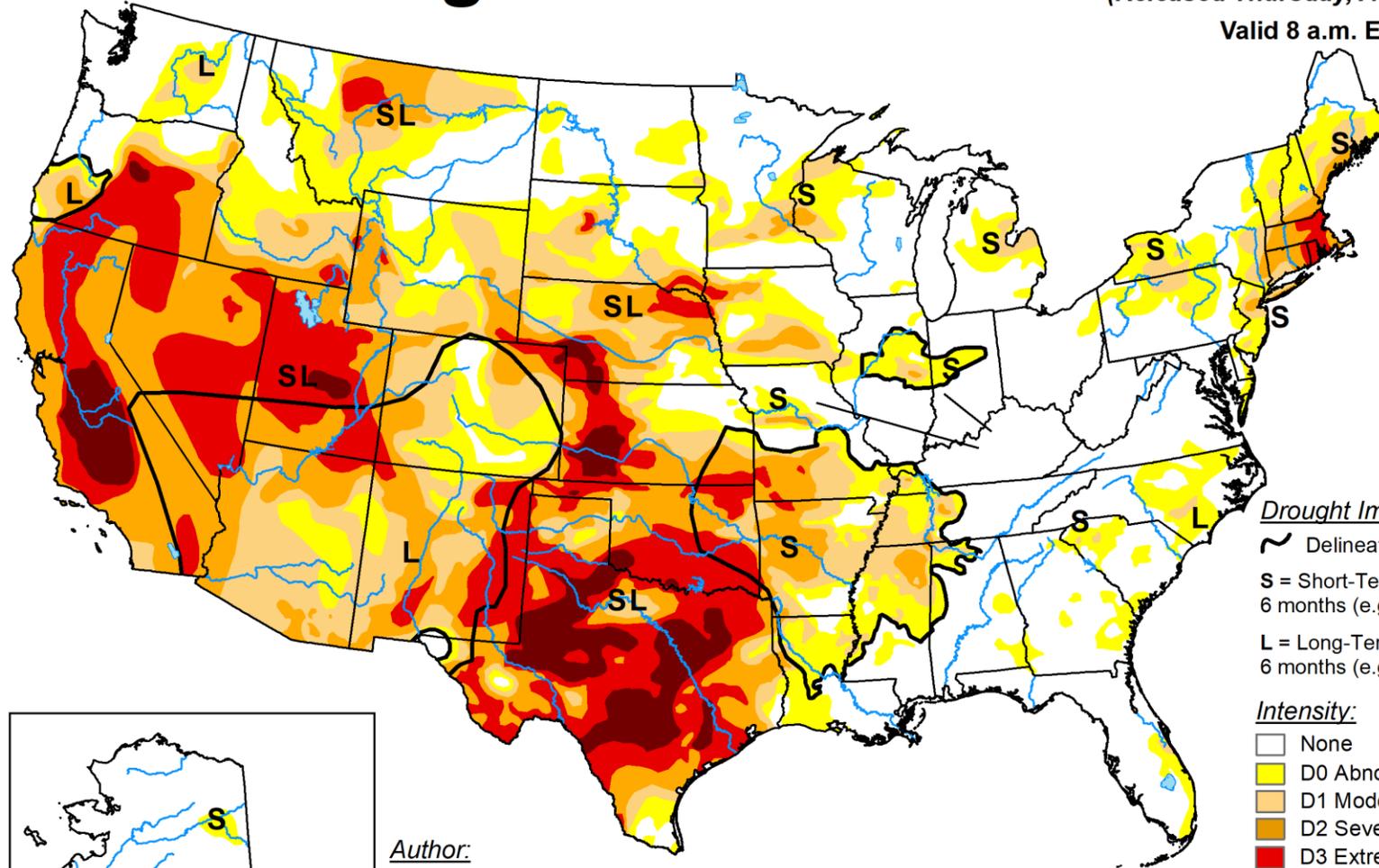
Photo of Phillips County, CO from Russ Schumacher



U.S. Drought Monitor

August 16, 2022
(Released Thursday, Aug. 18, 2022)

Valid 8 a.m. EDT

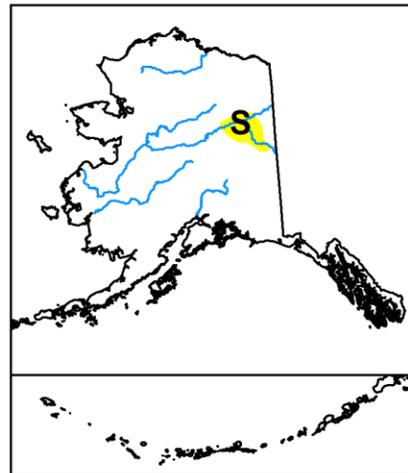


Drought Impact Types:

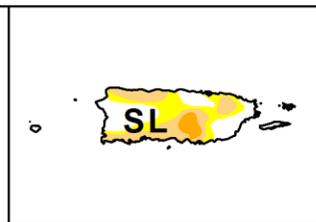
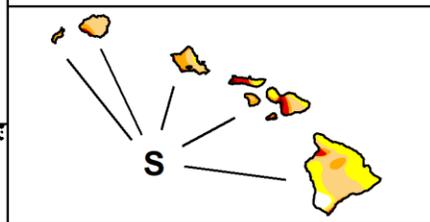
- ~ Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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



Author:
Richard Tinker
CPC/NOAA/NWS/NCEP



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: Cumulative Percent Area Export table: [CSV](#) [XLS](#)

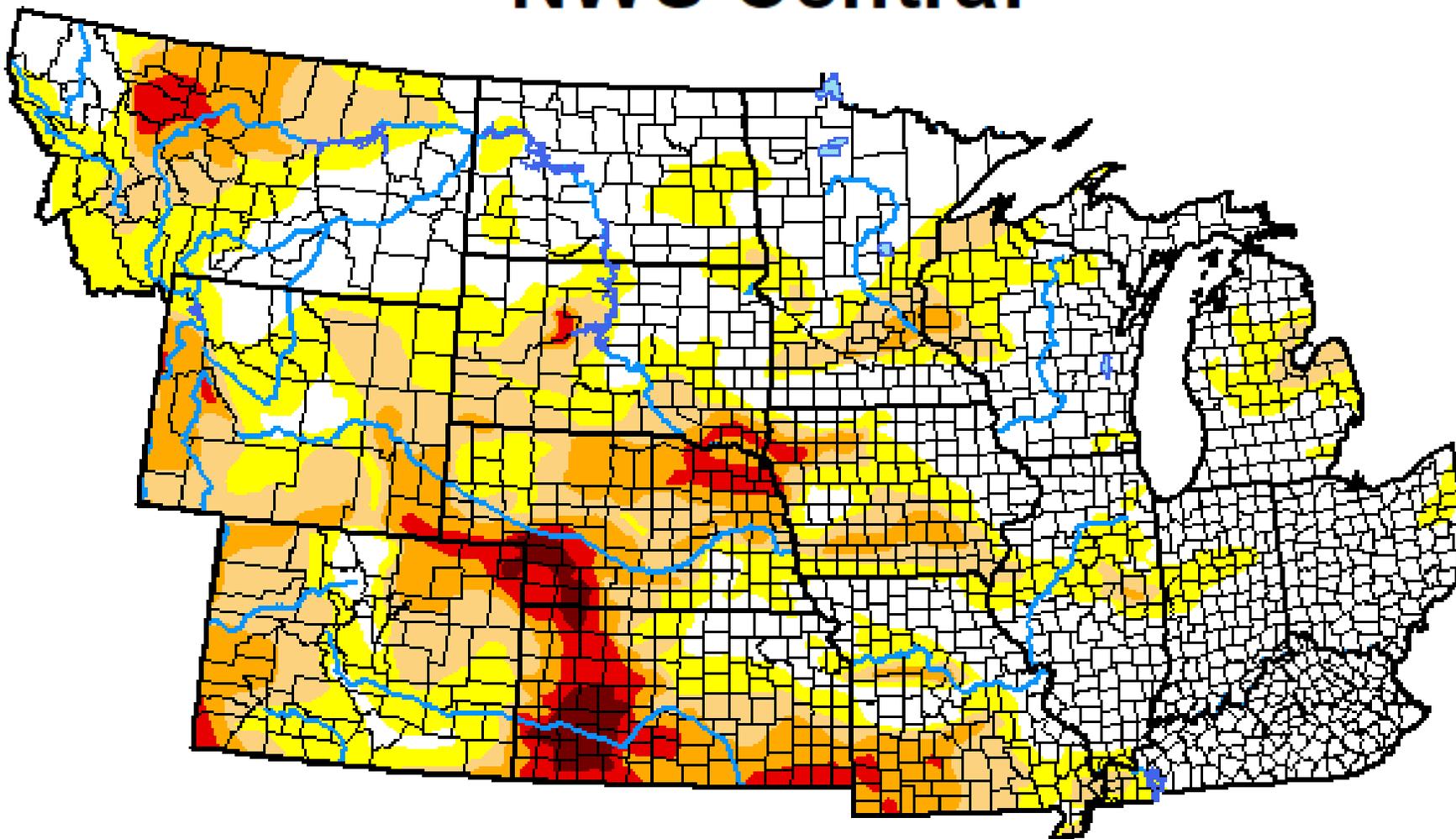
Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4	DSCI
Current	2022-08-16	43.68	56.32	41.23	29.13	14.47	3.26	144
Last Week	2022-08-09	44.53	55.47	41.97	30.32	15.56	3.60	147
3 Months Ago	2022-05-17	46.57	53.43	43.98	33.38	18.07	4.82	154
Start of Calendar Year	2021-12-28	38.50	61.50	46.23	30.30	11.70	1.59	151
Start of Water Year	2021-09-28	47.51	52.49	40.05	30.61	19.32	6.07	149
One Year Ago	2021-08-17	49.65	50.35	40.28	32.17	22.39	7.71	153

As of 8/16/22 just over 130,000,000 people are being impacted by drought in the United States.



U.S. Drought Monitor NWS Central

August 16, 2022
(Released Thursday, Aug. 18, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	43.30	56.70	32.86	16.08	4.88	1.13
Last Week <i>08-09-2022</i>	46.51	53.49	33.46	16.98	5.18	1.08
3 Months Ago <i>05-17-2022</i>	48.83	51.17	42.62	25.71	7.64	0.53
Start of Calendar Year <i>01-04-2022</i>	33.94	66.06	46.53	27.27	10.67	1.77
Start of Water Year <i>09-28-2021</i>	31.08	68.92	50.85	37.30	18.35	3.17
One Year Ago <i>08-17-2021</i>	36.03	63.97	51.34	40.21	24.38	3.89

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:

Richard Tinker
CPC/NOAA/NWS/NCEP

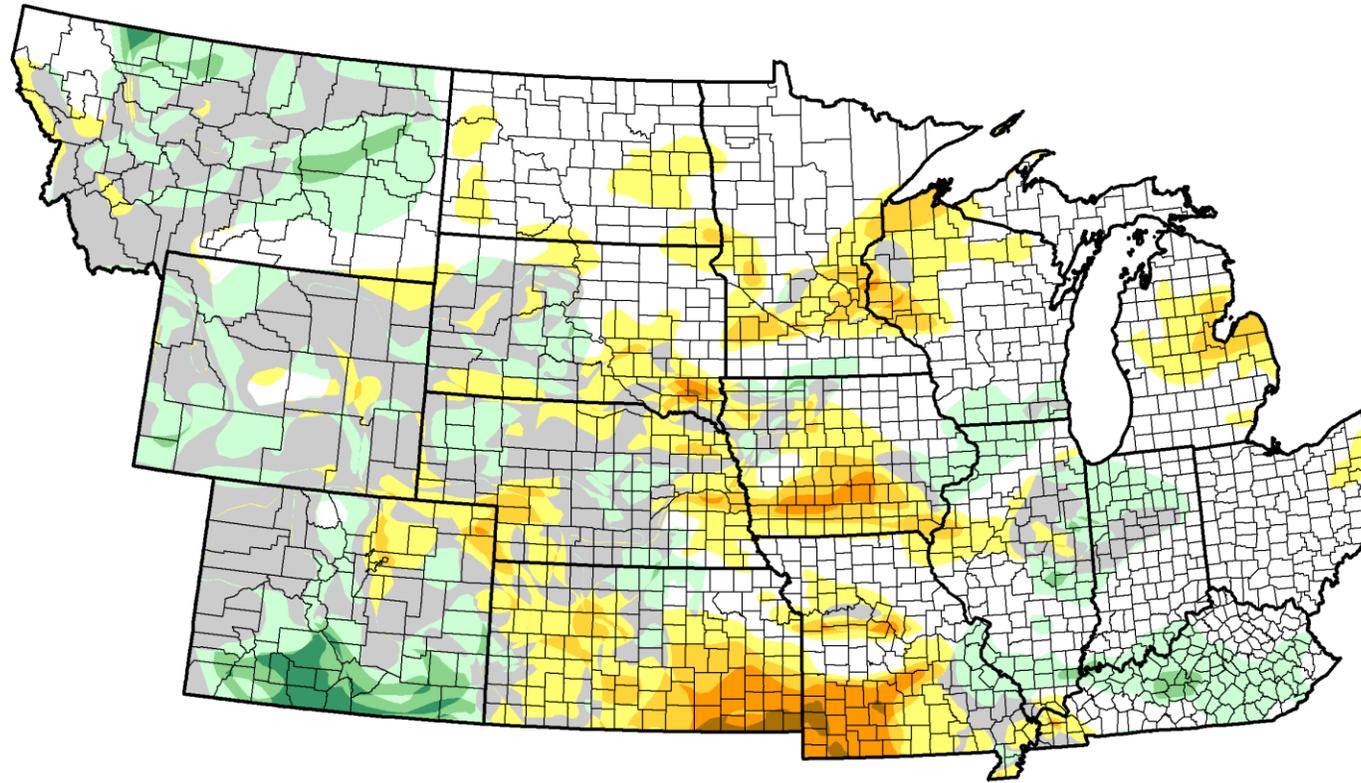


NATIONAL DROUGHT MITIGATION CENTER



droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - NWS Central 8 Week



- 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

August 16, 2022
compared to
June 21, 2022

droughtmonitor.unl.edu

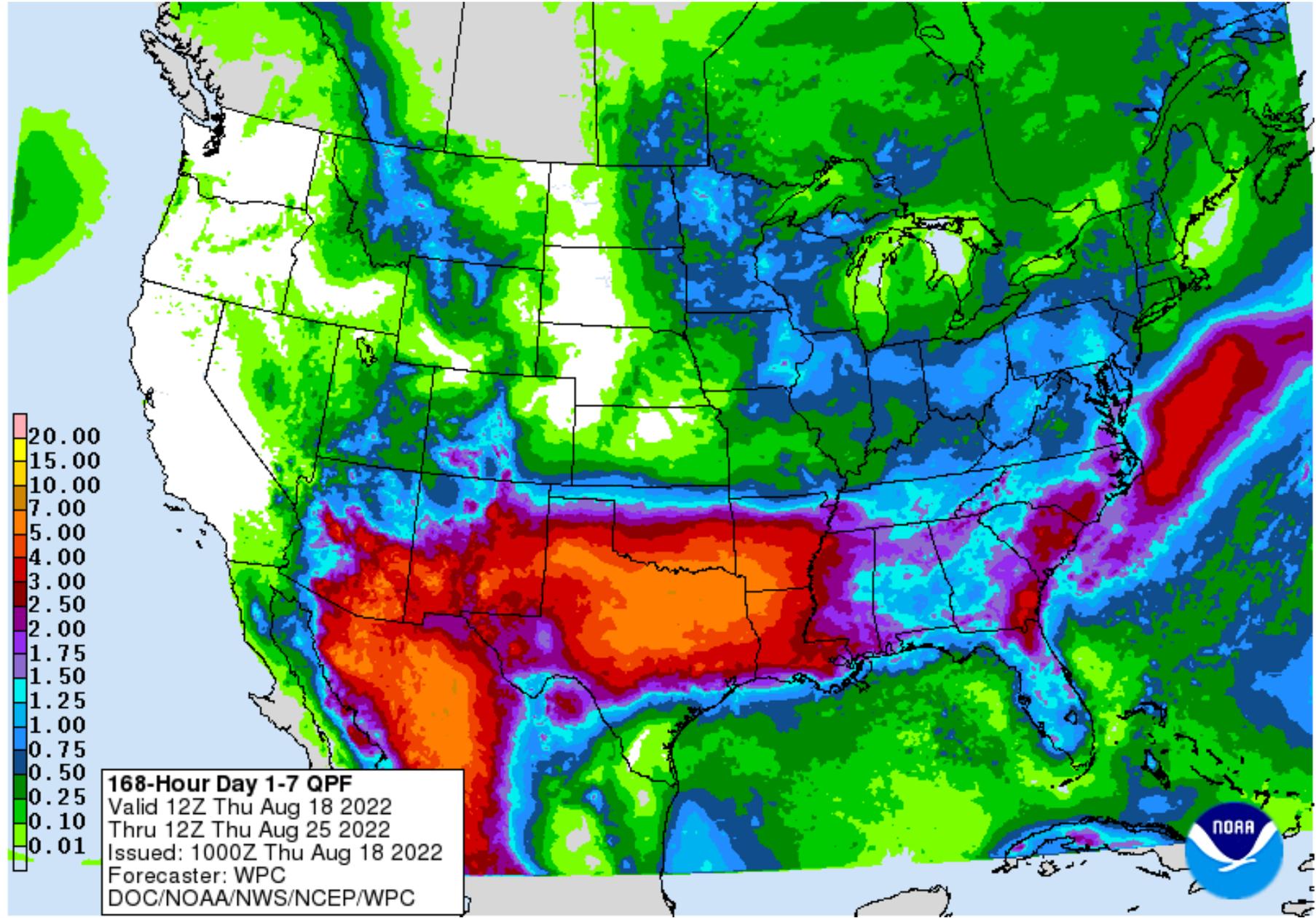


Climate Outlooks

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



Forecasted rainfall for the next 7-Days valid from August 18-25, 2022



8-14 day outlook for August 25-31, 2022

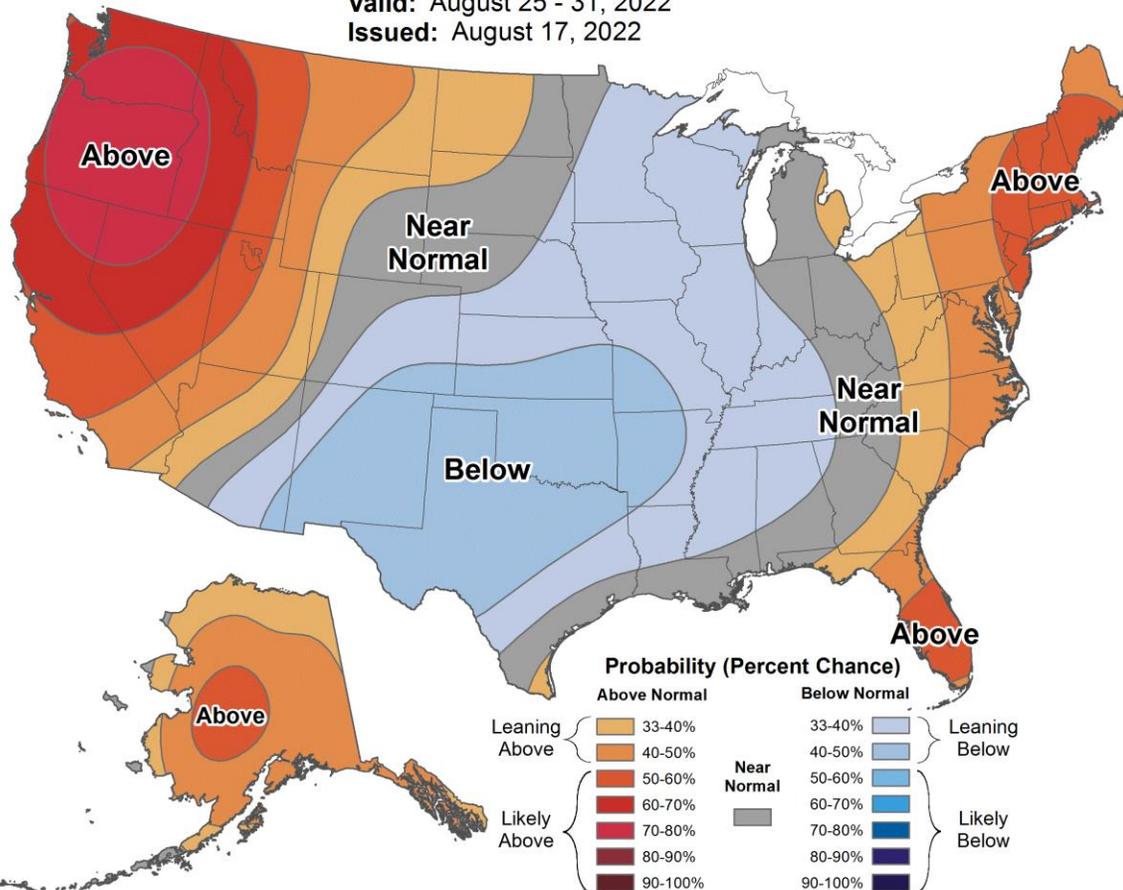
<http://www.cpc.ncep.noaa.gov/products/predictions/814day/>



8-14 Day Temperature Outlook



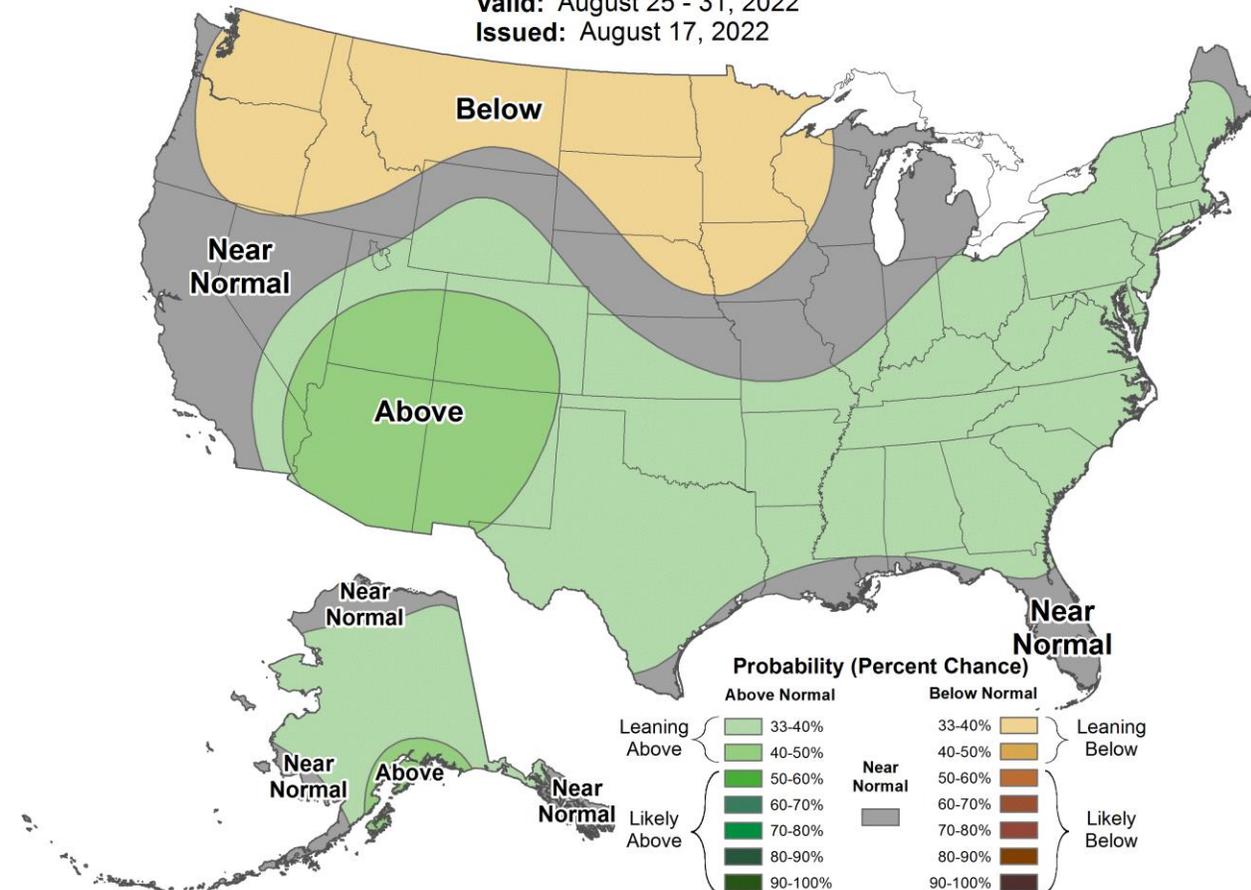
Valid: August 25 - 31, 2022
Issued: August 17, 2022



8-14 Day Precipitation Outlook



Valid: August 25 - 31, 2022
Issued: August 17, 2022



Monthly Outlook for September 2022

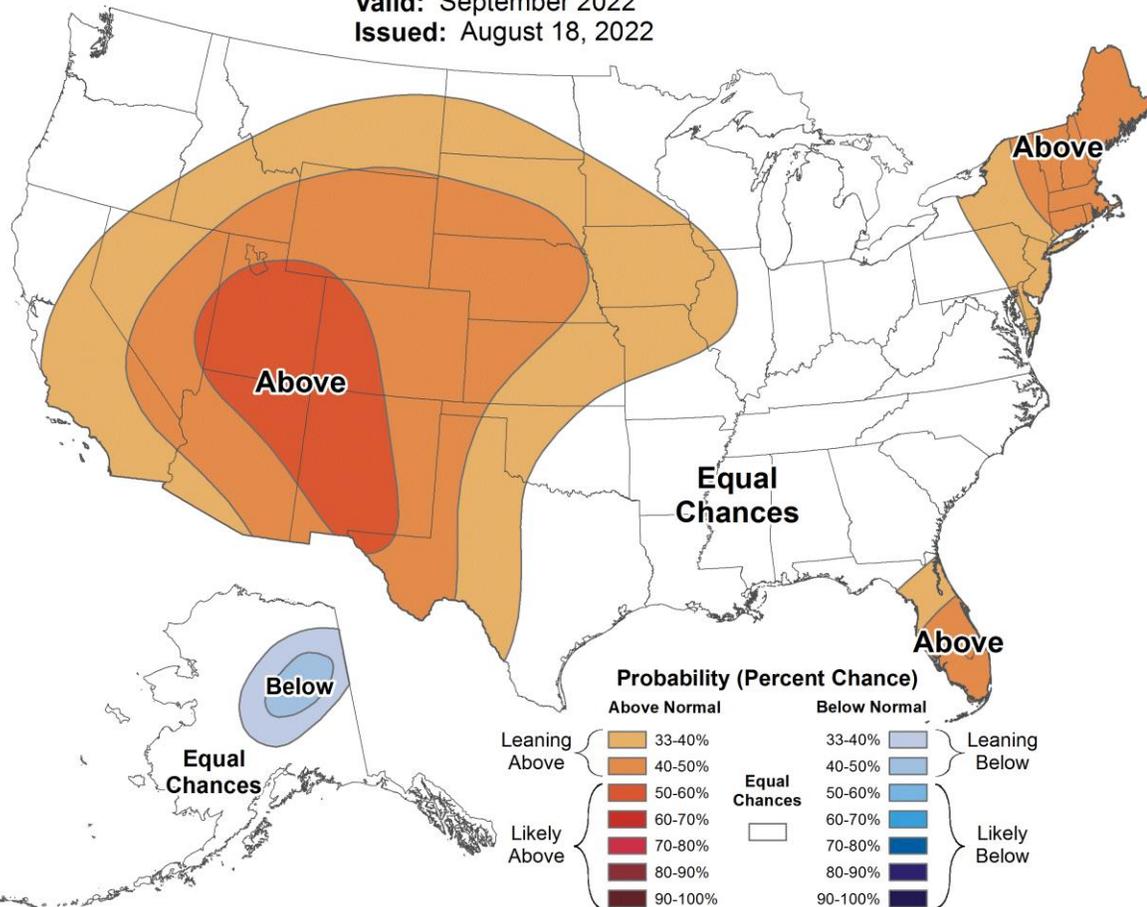
<https://www.cpc.ncep.noaa.gov/products/predictions/30day/>



Monthly Temperature Outlook



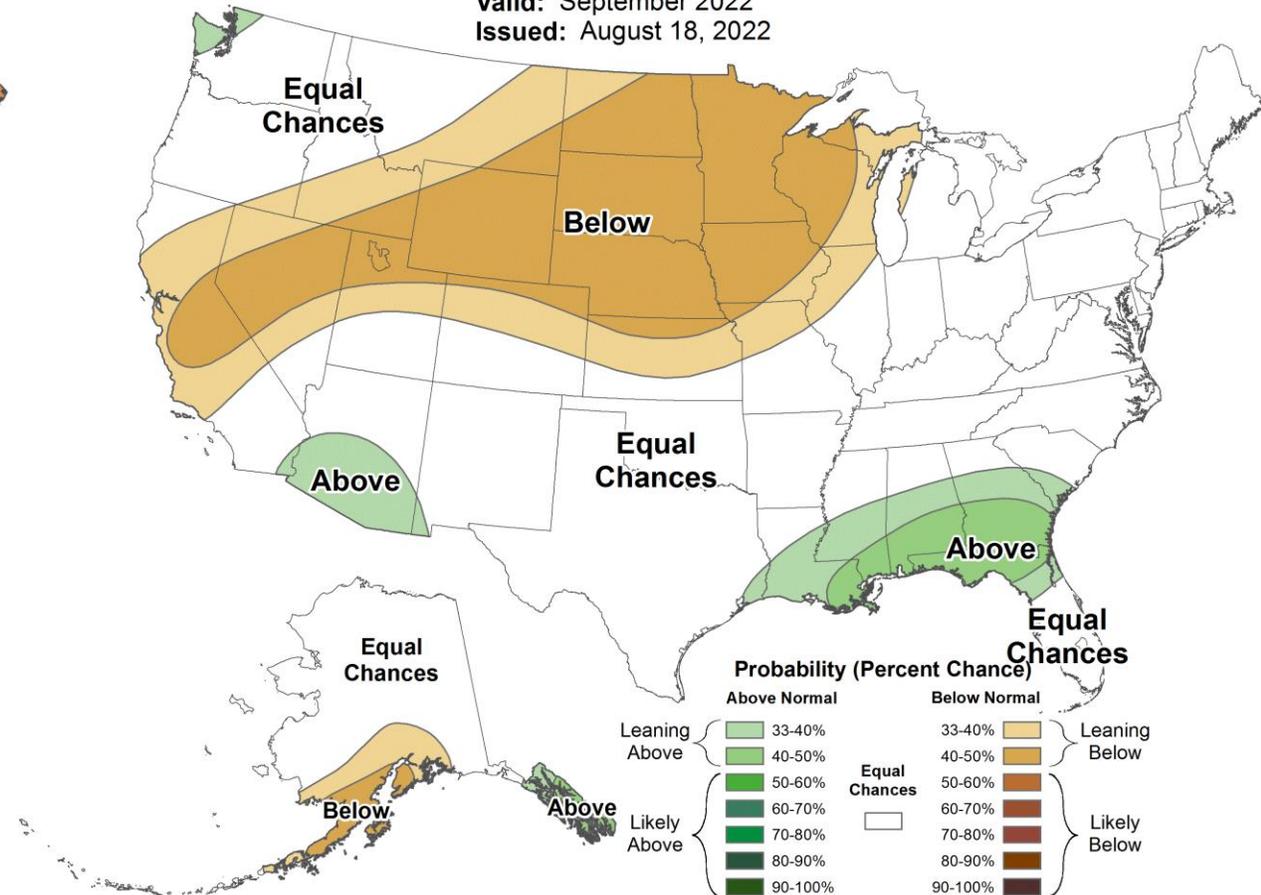
Valid: September 2022
Issued: August 18, 2022



Monthly Precipitation Outlook



Valid: September 2022
Issued: August 18, 2022



3-month Outlook (September-November 2022)

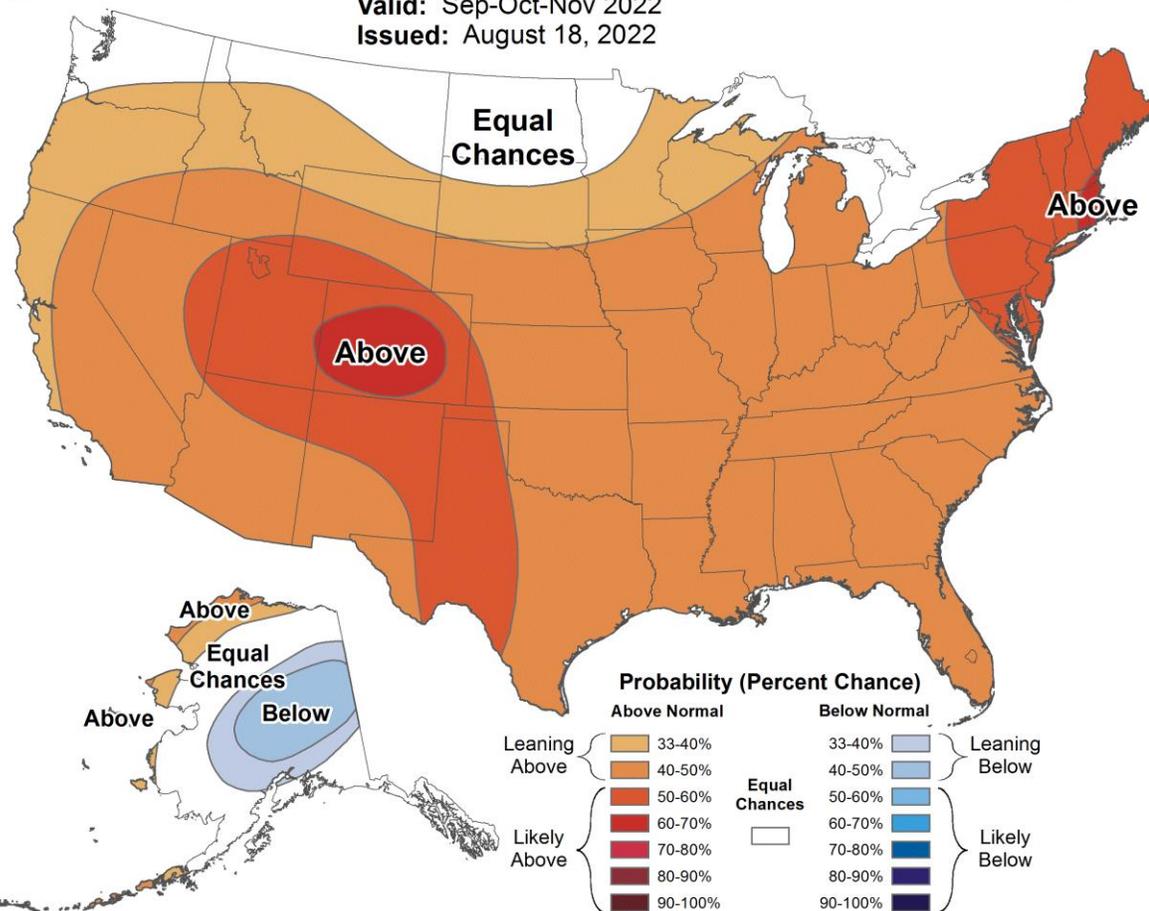
<https://www.cpc.ncep.noaa.gov/products/predictions/90day/>



Seasonal Temperature Outlook



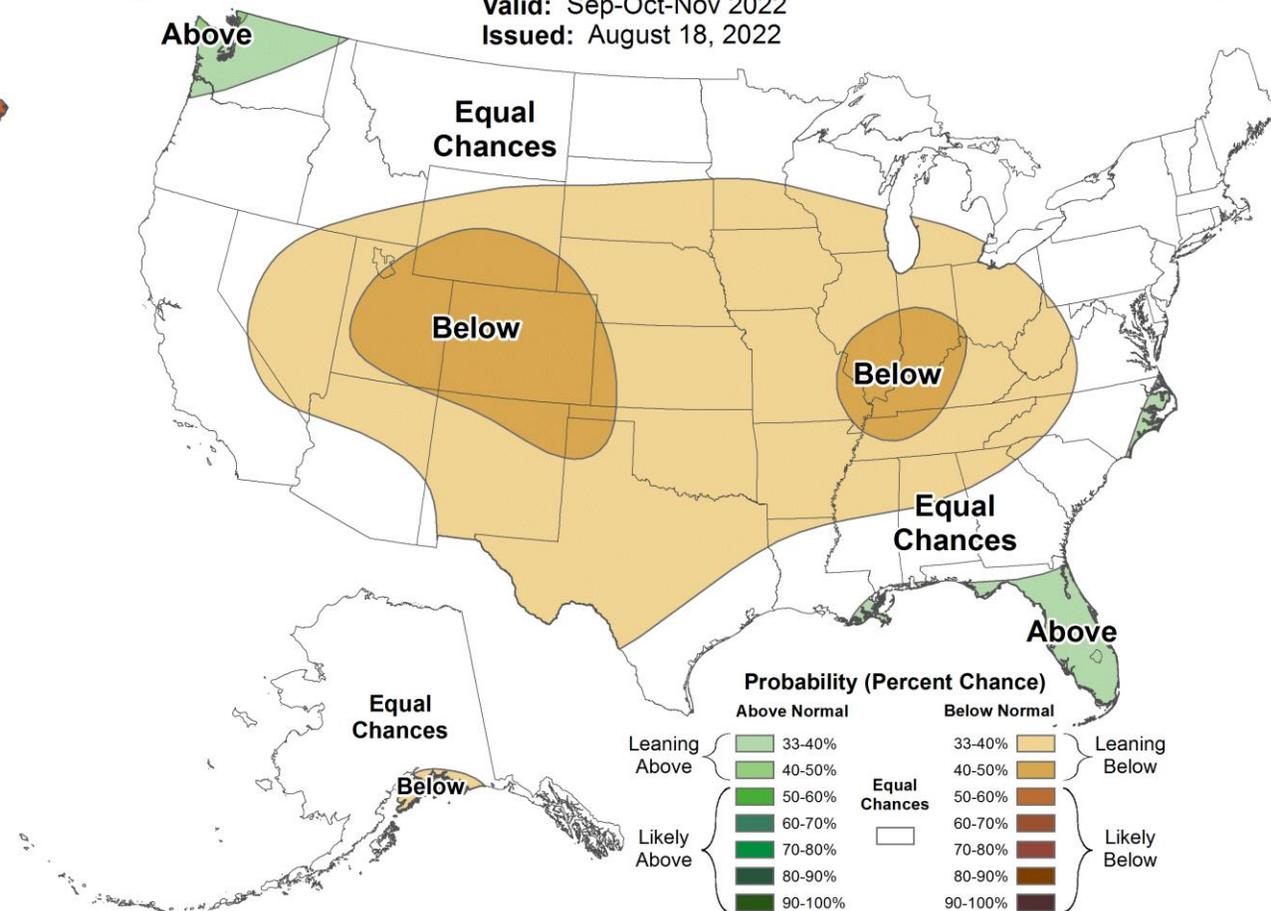
Valid: Sep-Oct-Nov 2022
Issued: August 18, 2022



Seasonal Precipitation Outlook



Valid: Sep-Oct-Nov 2022
Issued: August 18, 2022



The official winter outlook will come out on 10/20/22

Winter Outlook (December-February)

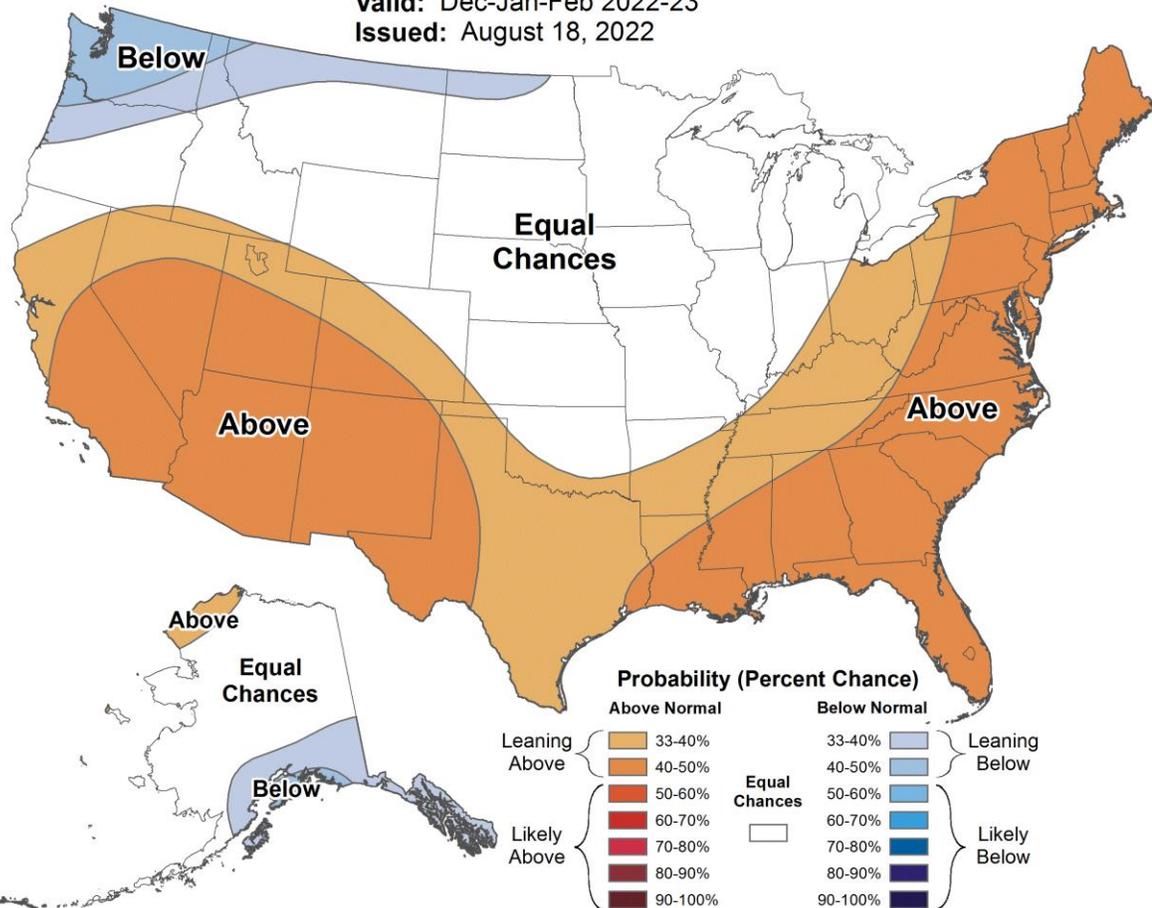
https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1



Seasonal Temperature Outlook



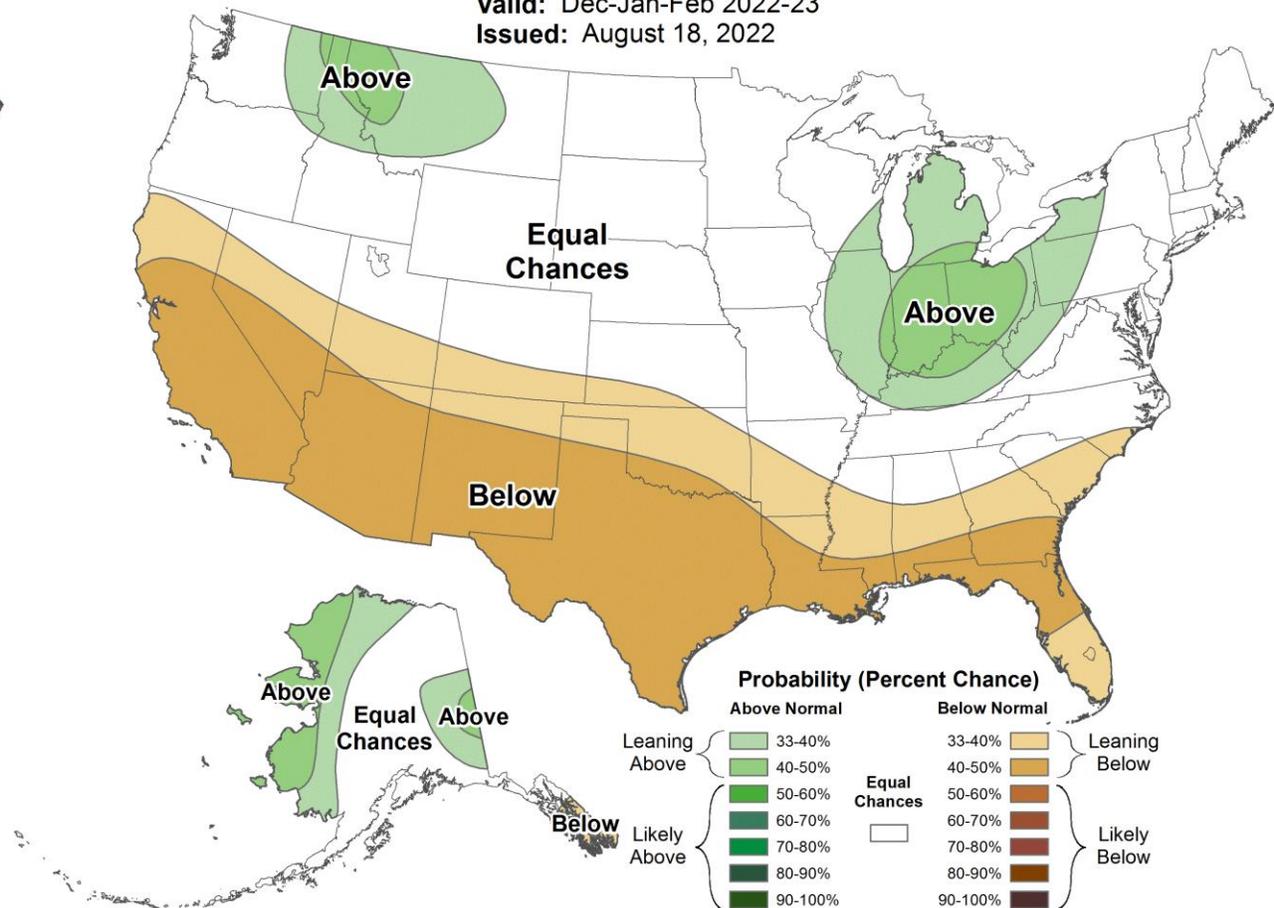
Valid: Dec-Jan-Feb 2022-23
 Issued: August 18, 2022



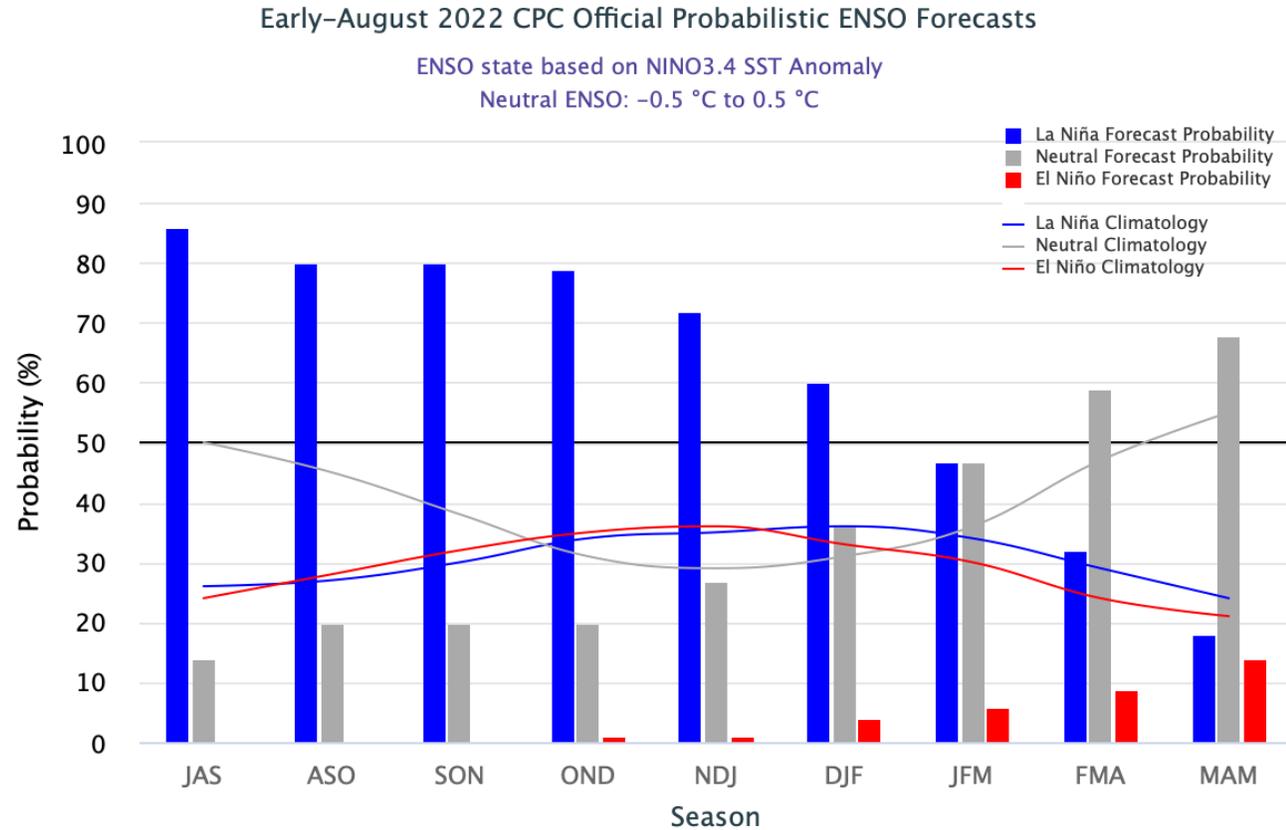
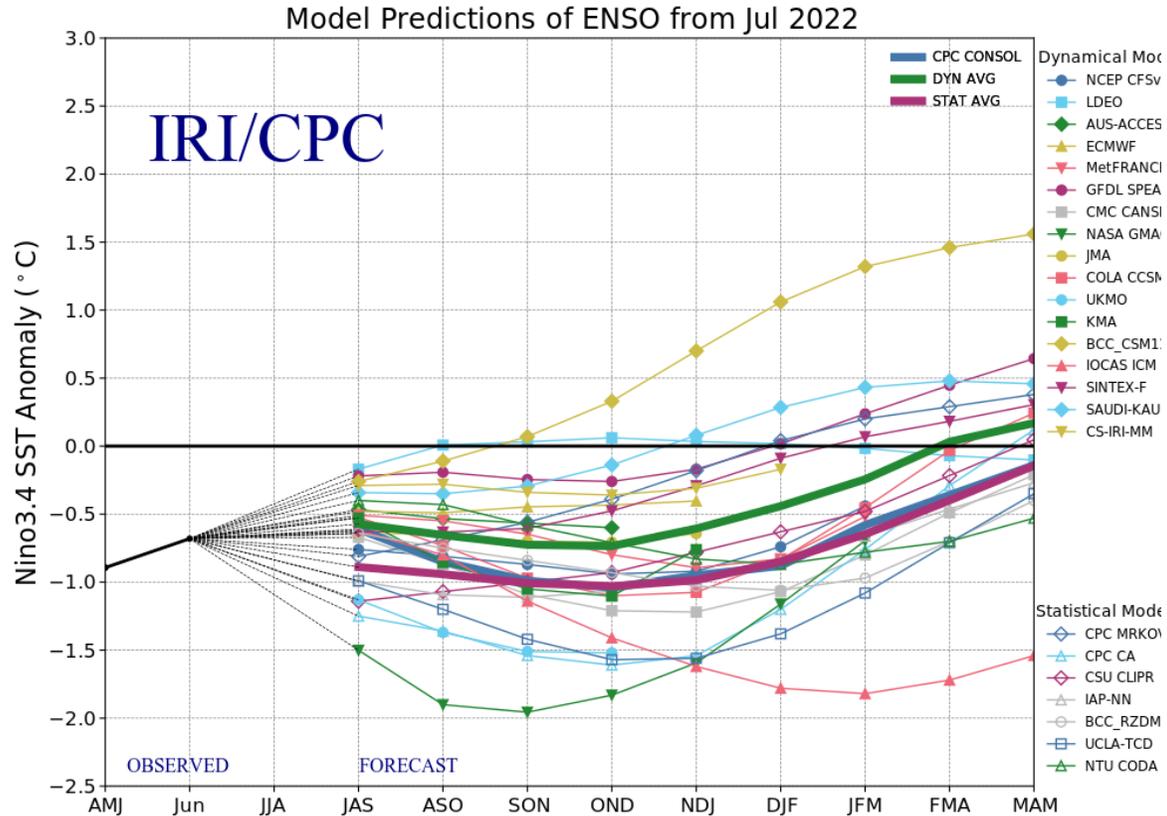
Seasonal Precipitation Outlook



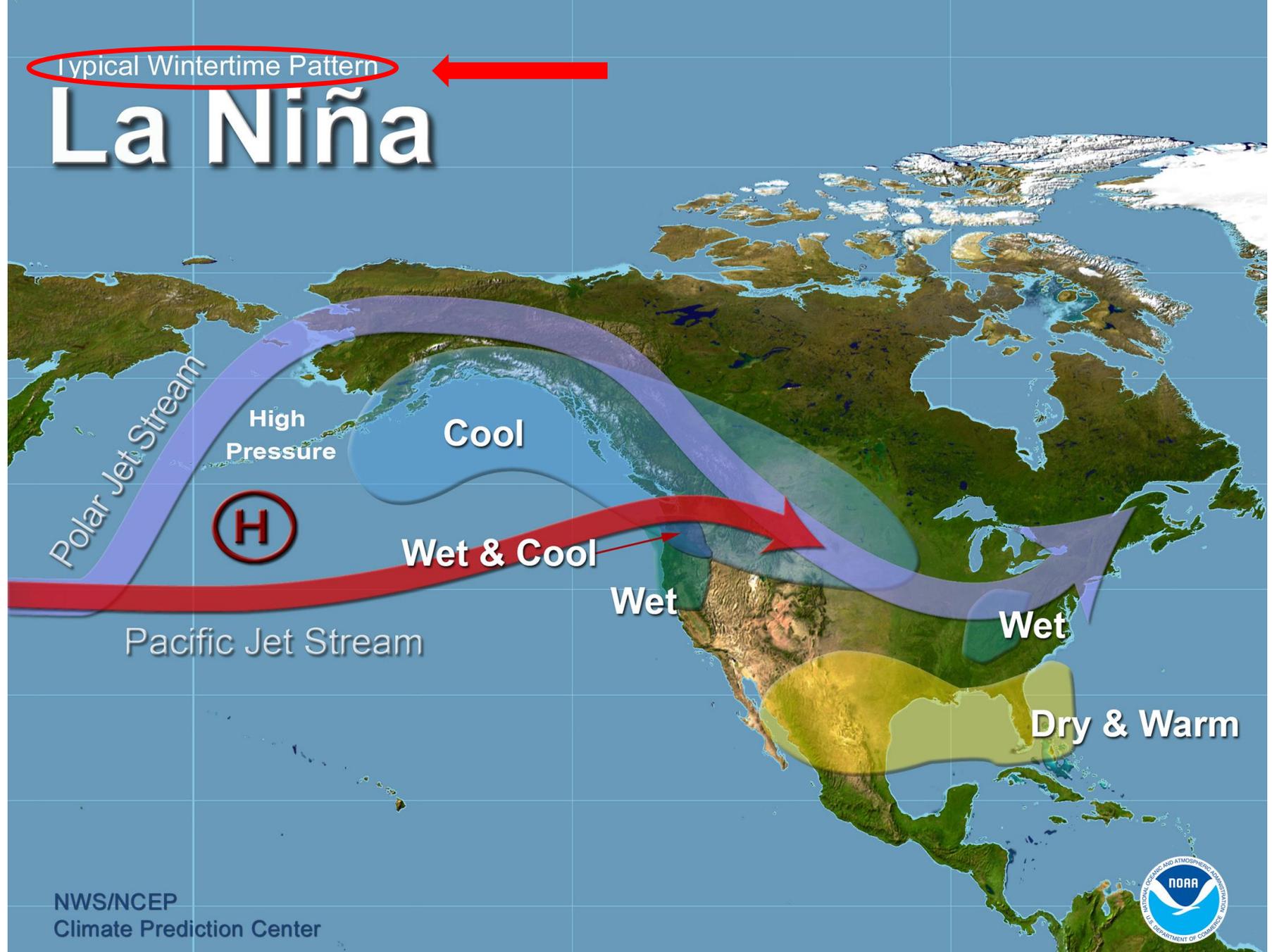
Valid: Dec-Jan-Feb 2022-23
 Issued: August 18, 2022



La Nina "3-Peat" on the Horizon



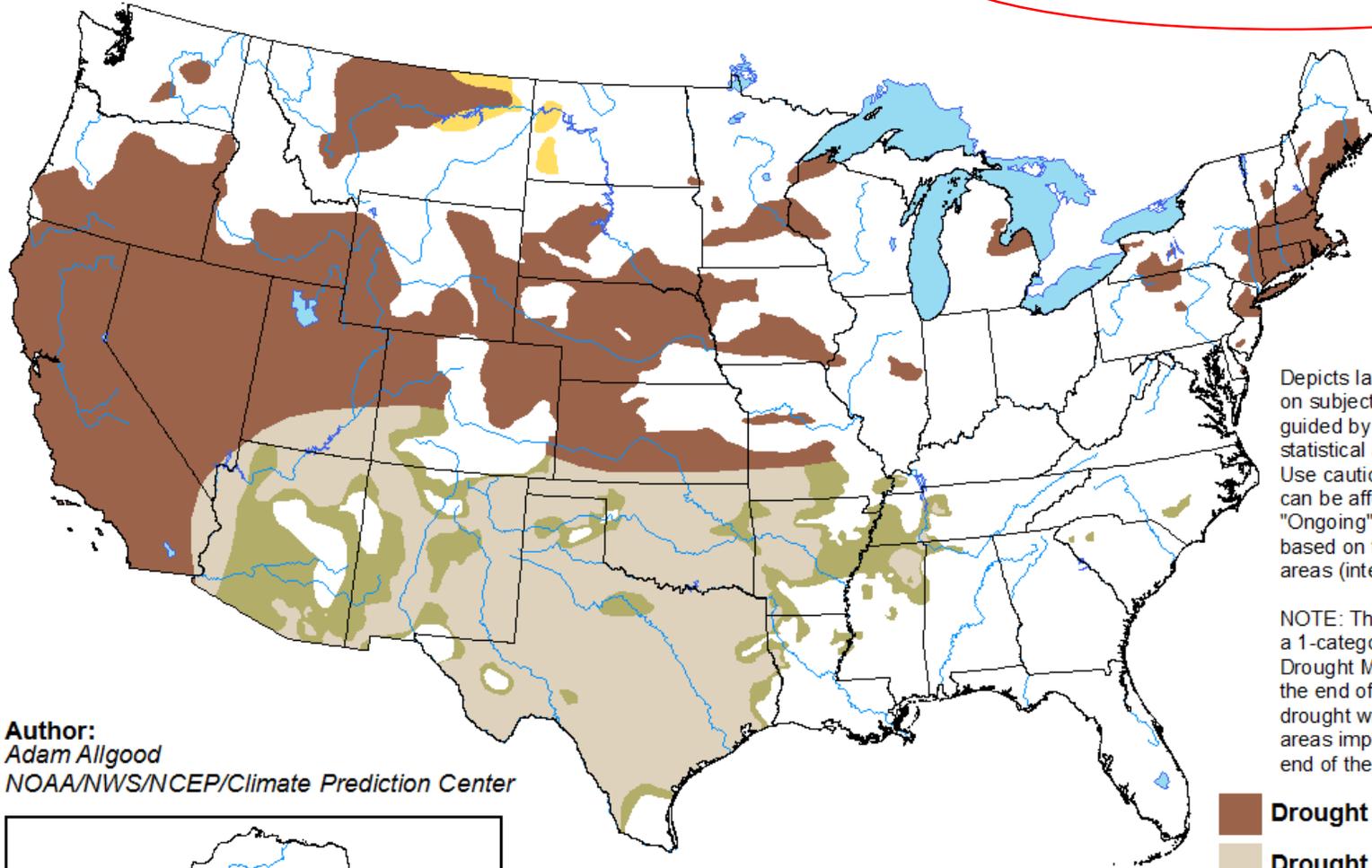
What does a typical La Nina pattern mean?



U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for August 18 - November 30, 2022
Released August 18

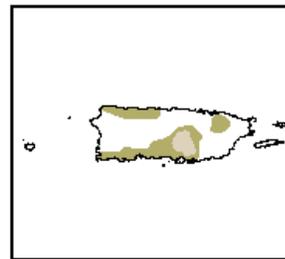
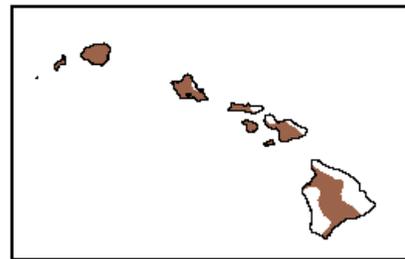
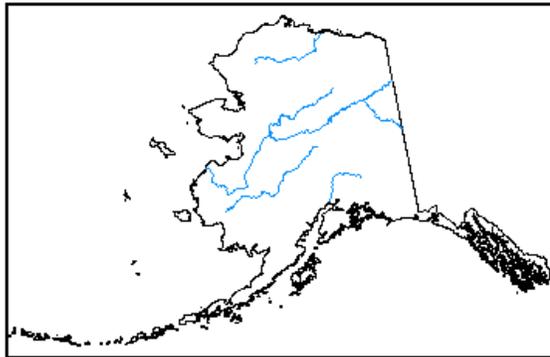


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to 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:
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<http://go.usa.gov/3eZ73>

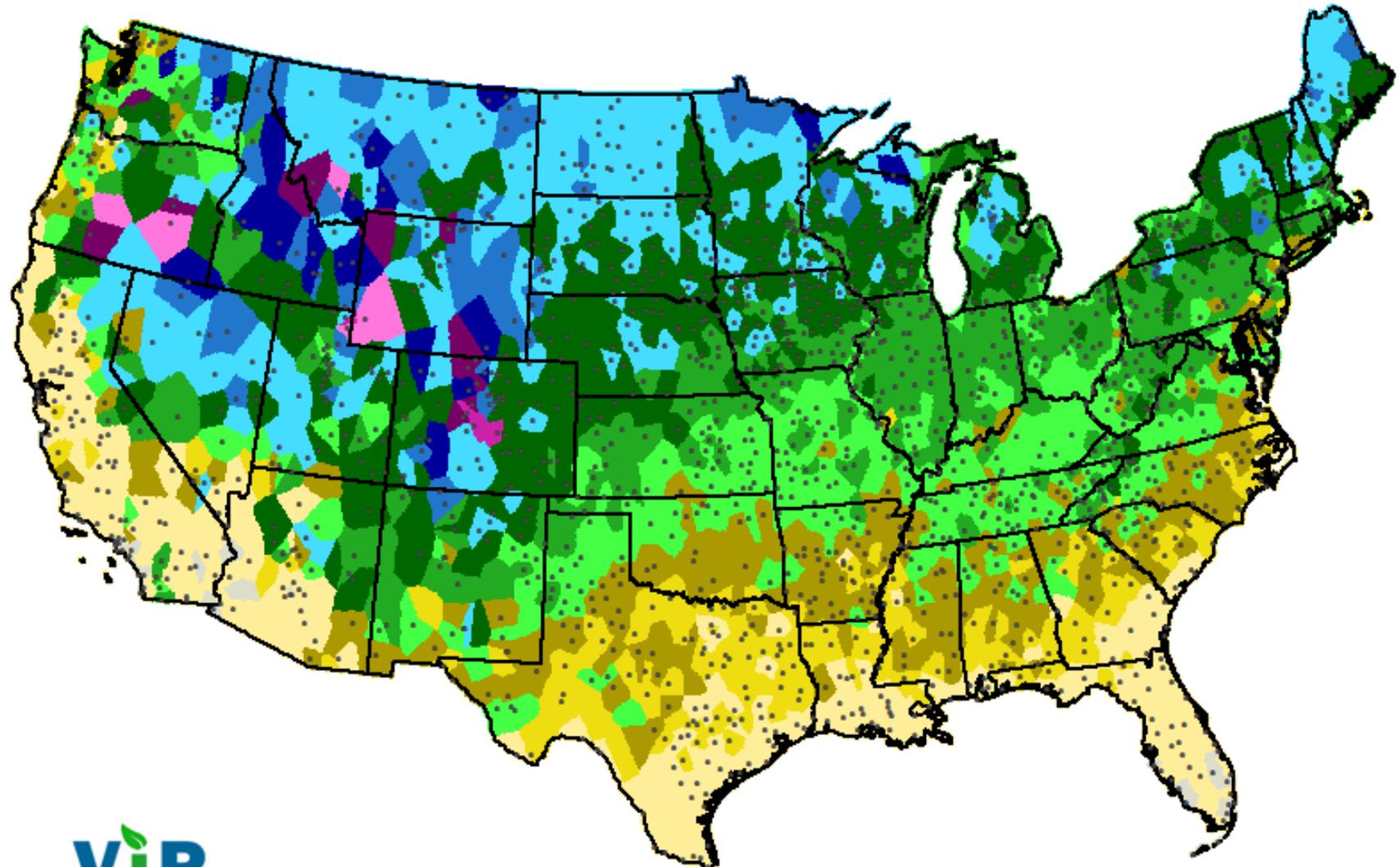
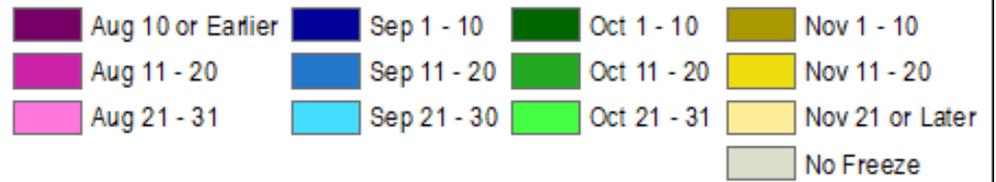


Climatological Date of Median First 32°F Freeze

For years 1990-91 to 2019-20

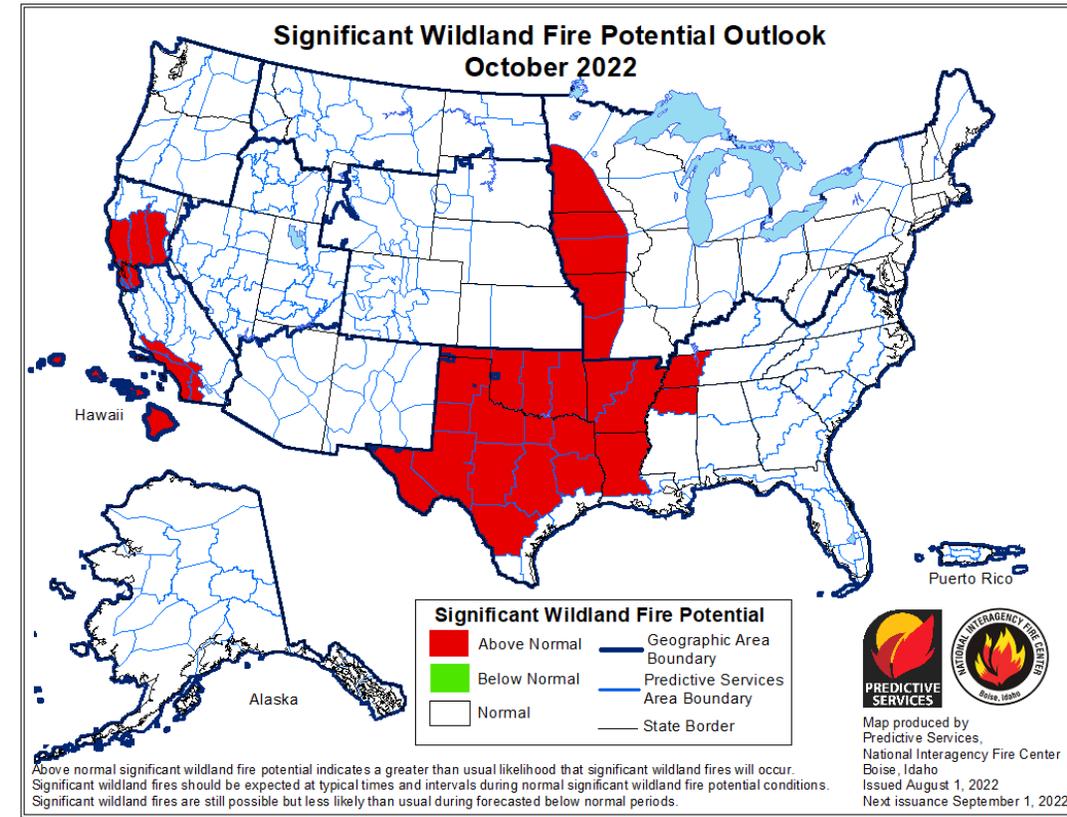
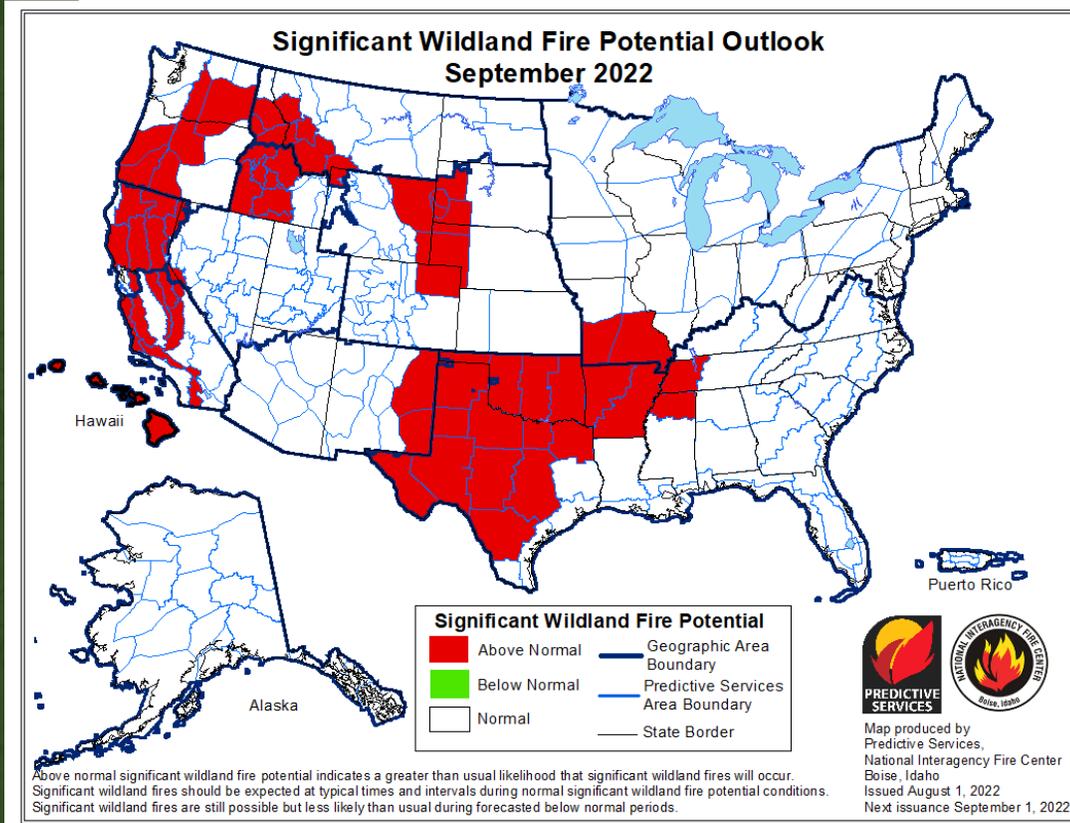
Freeze year beginning July 1st

Median defined as the 50th Percentile



Wildland Fire Potential

https://www.predictiveservices.nifc.gov/outlooks/month1_outlook.png



Summary

- Some historical flooding in Kentucky as well as the St. Louis metro.
- Some intermittent cooler temperatures have been mixed into an overall warmer than normal pattern for much of the region.
- Flash Drought developed over much of southern Missouri, southern Iowa and into portions of Nebraska in the last month.
- A warm and dry autumn is expected over most of the region
- La Nina will impact the U.S. early this winter before weakening.



FOR ADDITIONAL INFORMATION

Presentations Archive

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

<https://mrcc.purdue.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

National Drought Mitigation Center

drought.unl.edu

U.S. Drought Portal

www.drought.gov

State Climatologists

www.stateclimate.org

Regional Climate Centers

www.hprcc.unl.edu and <https://mrcc.purdue.edu/>



Thank you !

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