



SOUTH DAKOTA STATE
UNIVERSITY EXTENSION

North Central U.S. Climate & Drought Outlook

October 2022

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Tractor Fire, near Mitchell, SD.
Photo by Chet Edinger



United States Department of Agriculture
Midwest Climate Hub



Further Information & Partners

- **Today's and Past Recorded Presentations:**

<https://mrcc.purdue.edu/multimedia/webinars.jsp>

<https://hprcc.unl.edu/webinars.php>

Next webinar: November

- NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov
- NOAA Climate Portal: www.climate.gov
- U.S. Drought Portal: www.drought.gov
- National Drought Mitigation Center: <http://drought.unl.edu/>
- State climatologists
 - <http://www.stateclimate.org>
- Regional climate centers
 - **Midwest:** <https://mrcc.purdue.edu/>
 - **High Plains:** <http://www.hprcc.unl.edu>



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Agenda

Recent Conditions

Impacts

Outlooks

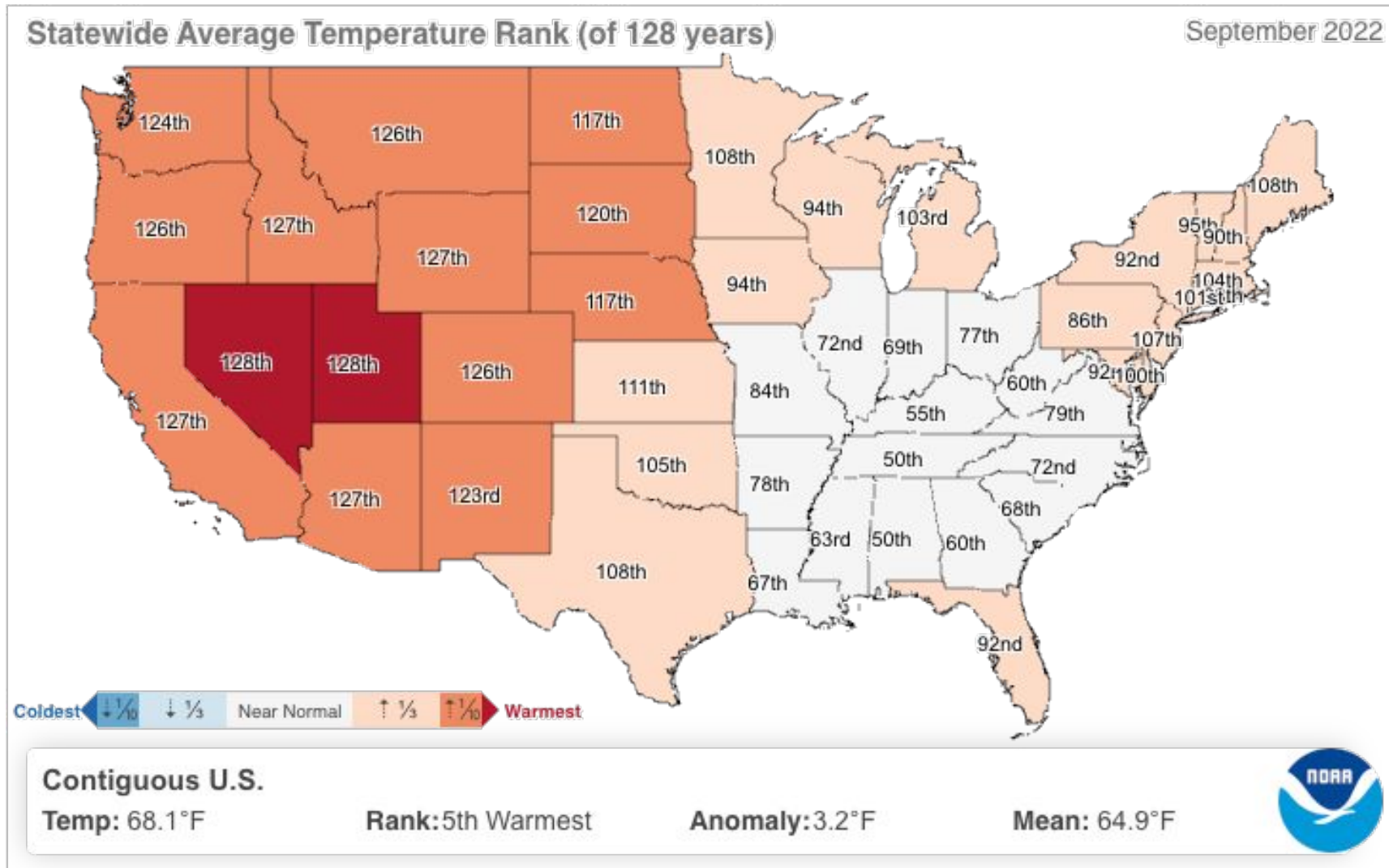
1-3 months

Winter season



Woolly bear caterpillar, photo courtesy of Aaron Wilson, OSU

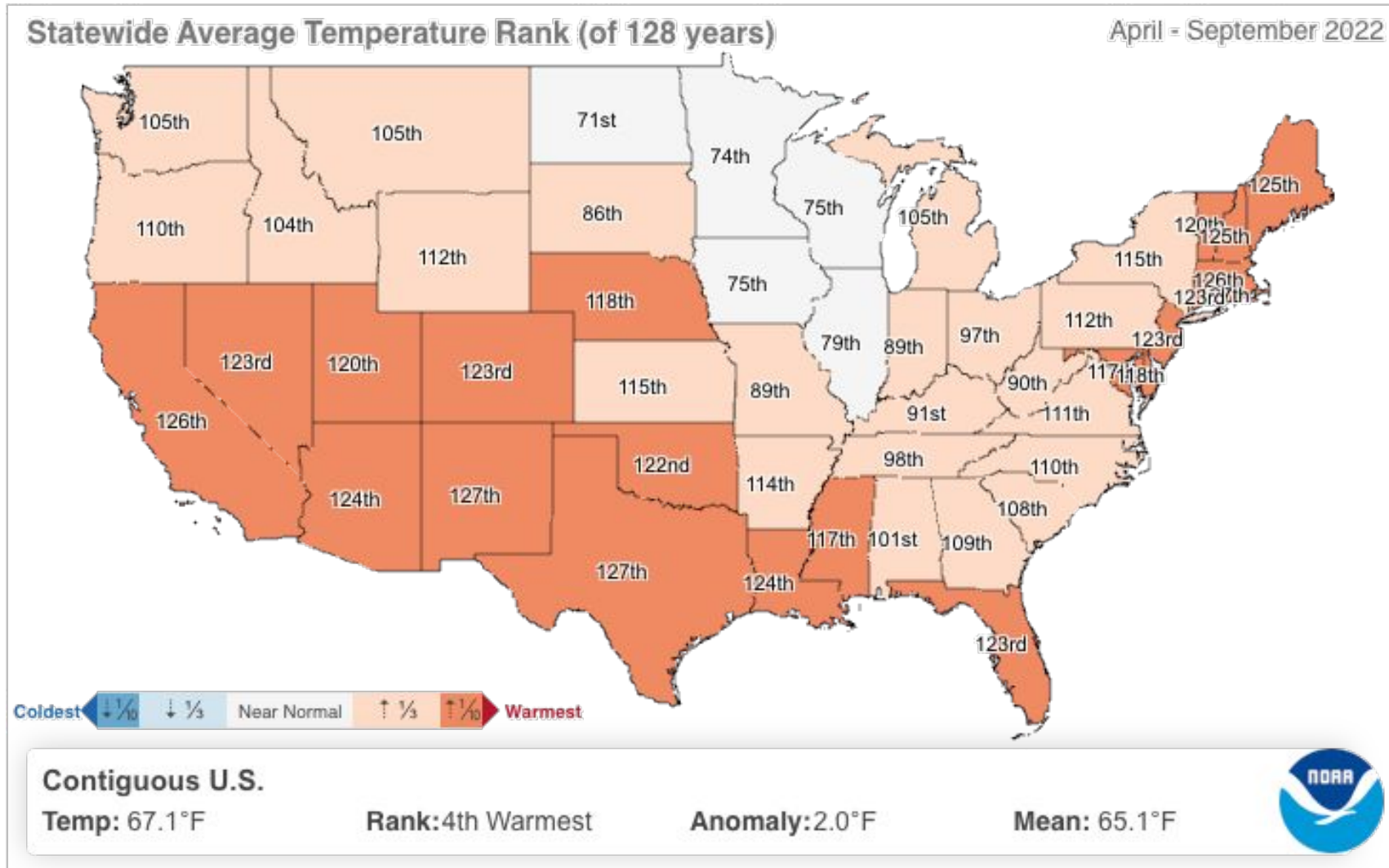
September Temperature Rankings



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

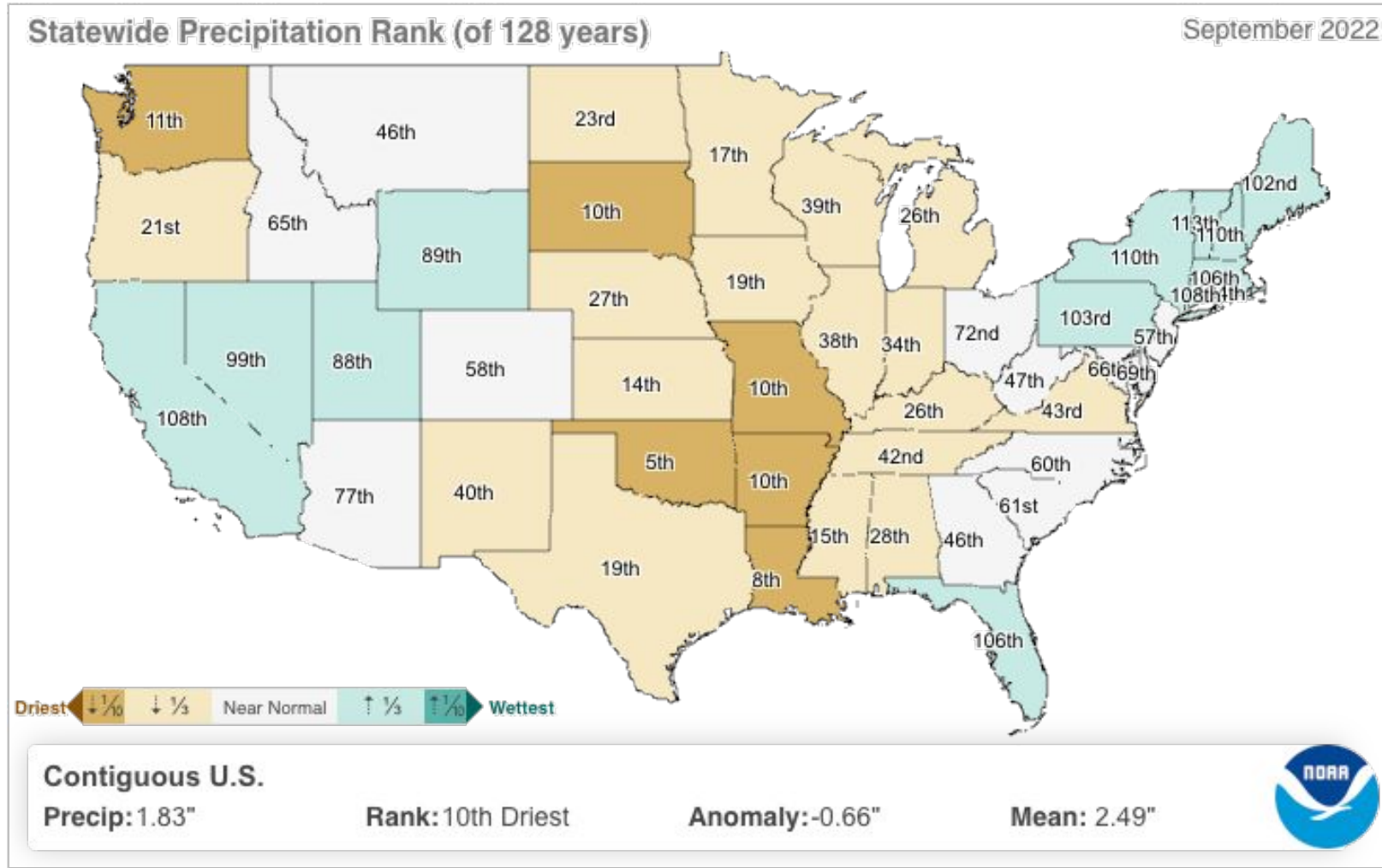
Growing Season Temperature Rankings



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

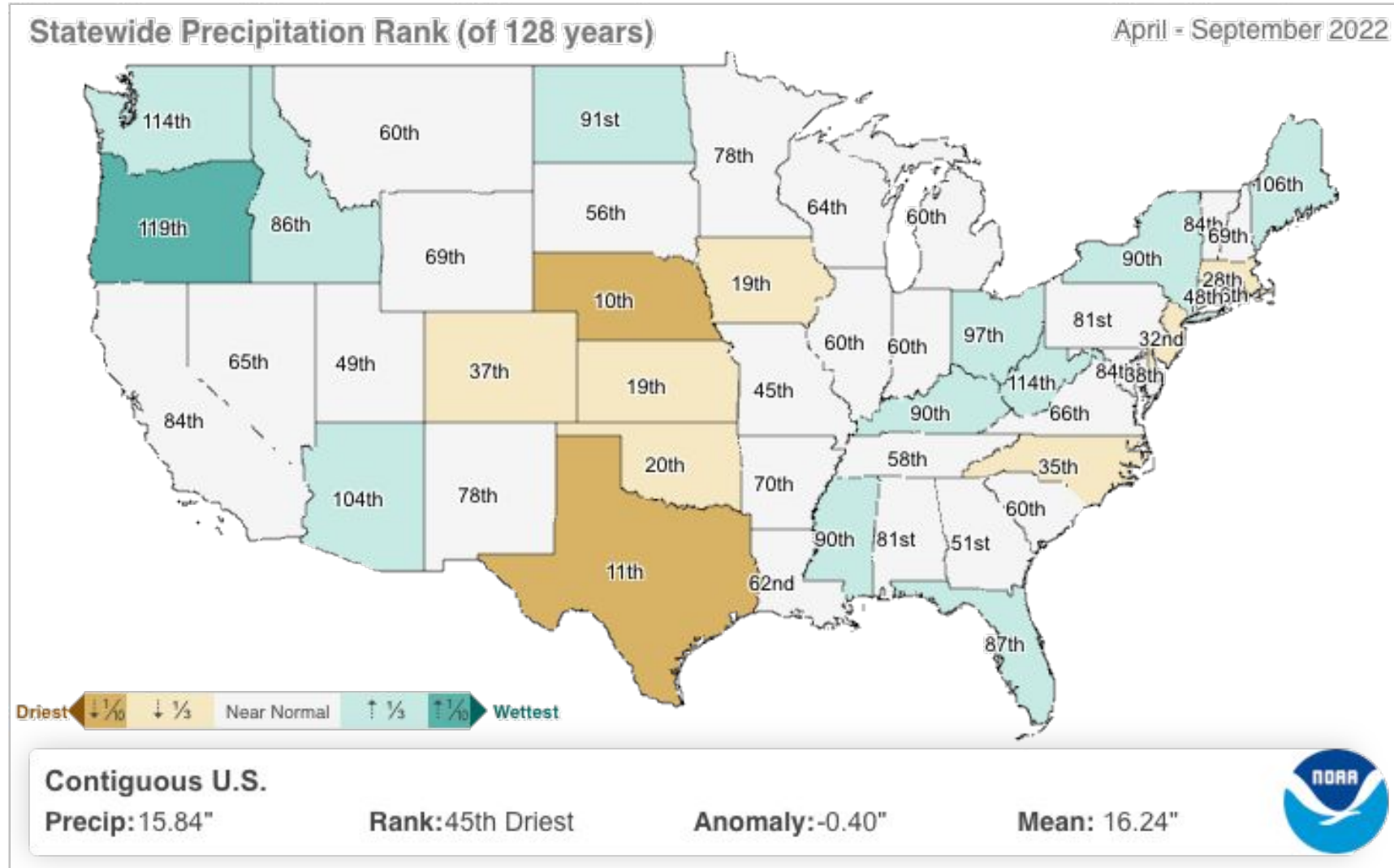
September Precipitation Rankings



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

Growing Season Precipitation Rankings

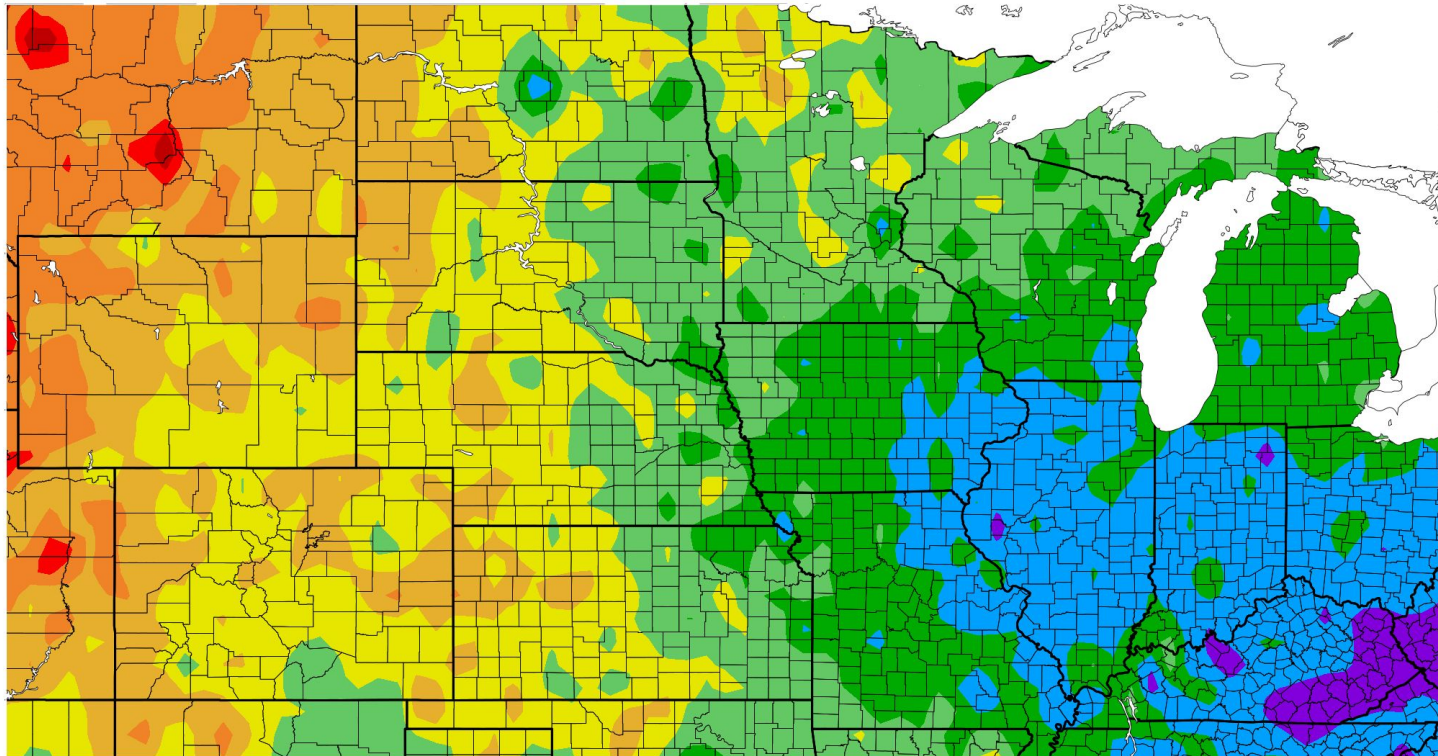


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<https://www.ncdc.noaa.gov/cag/>

October Temperature

Departure from Normal Temperature (F)
10/1/2022 – 10/19/2022



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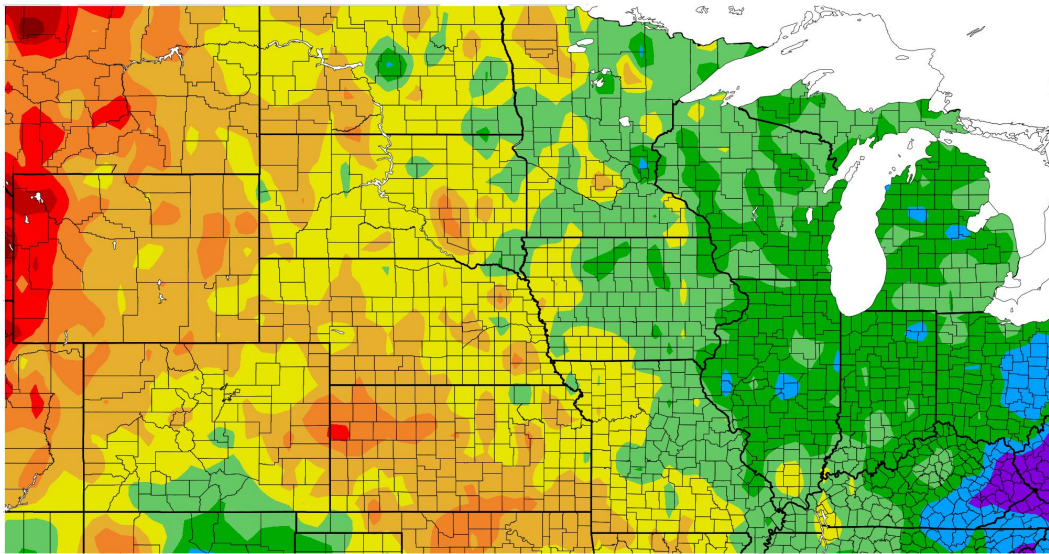


Generated 10/20/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

October Temperature

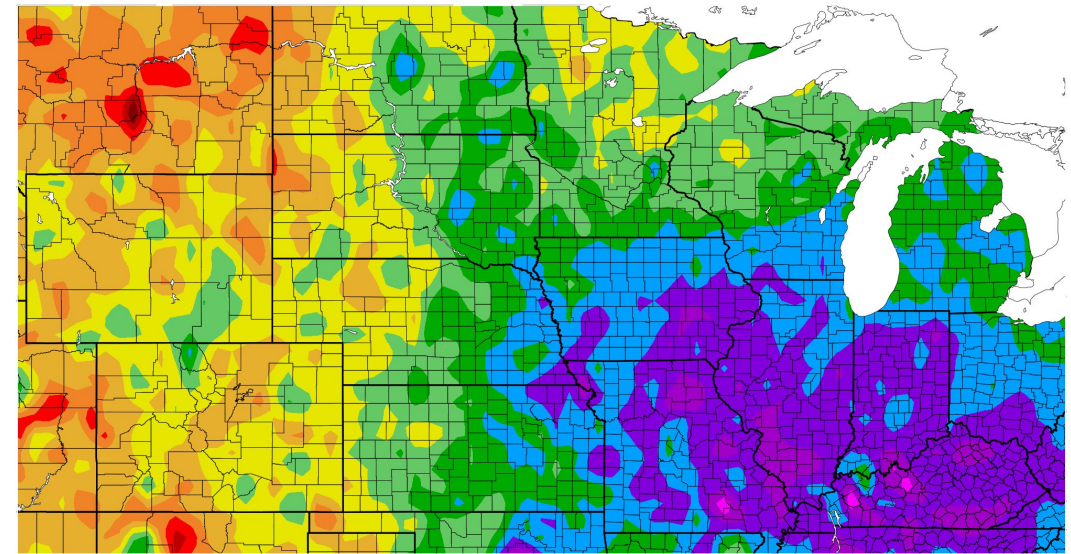
Departure from Normal Average Maximum Temperature (F)
10/1/2022 – 10/19/2022



Generated 10/20/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

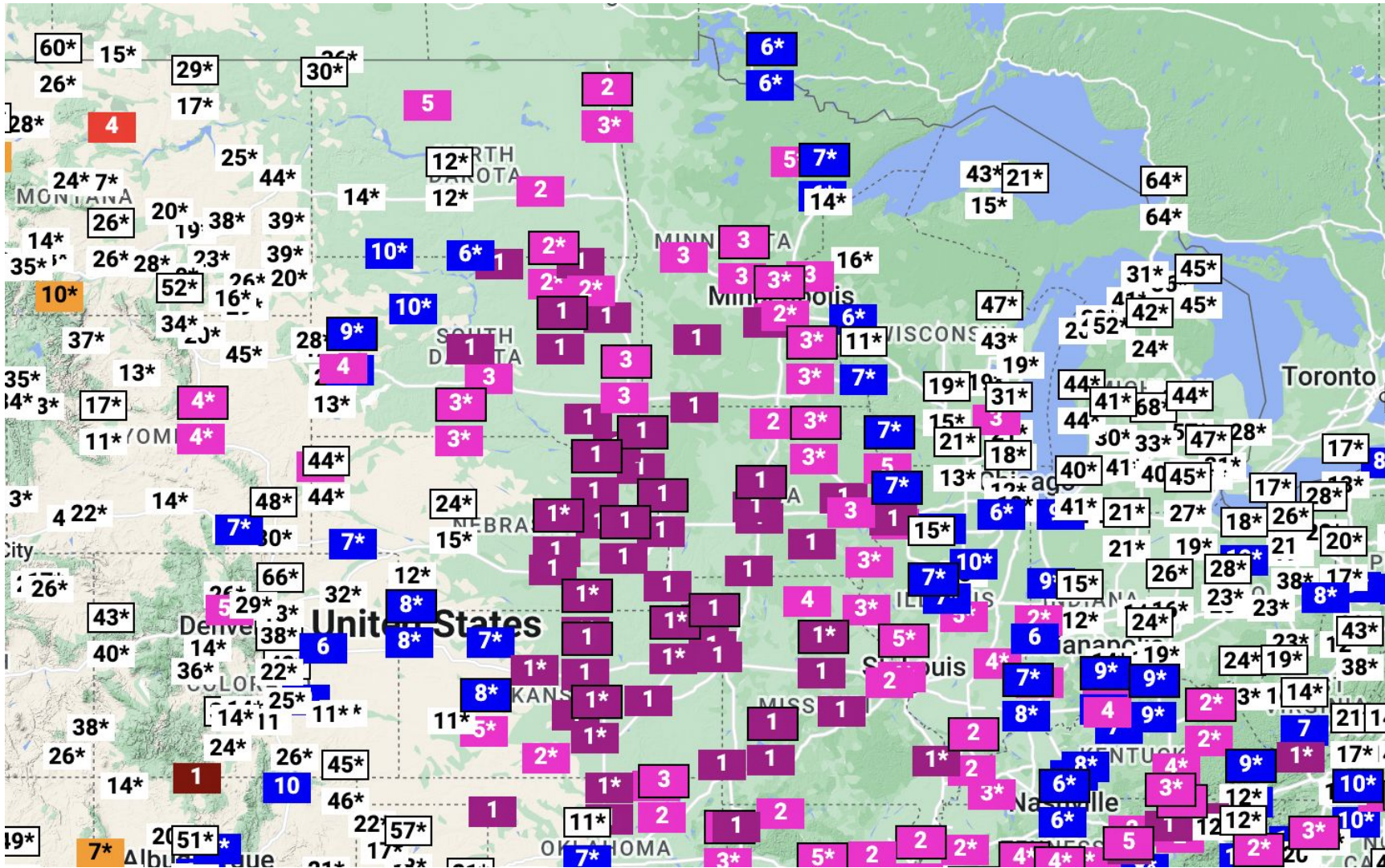
Departure from Normal Average Minimum Temperature (F)
10/1/2022 – 10/19/2022



Generated 10/20/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

Record low temperatures 10/18/22



Legend

Rank

Highest

2nd-5th

6th-10th

-

10th-6th

5th-2nd

Lowest

* Indicates tied ranking

Climate Perspectives

Powered by

ACIS

NOAA Regional Climate Centers

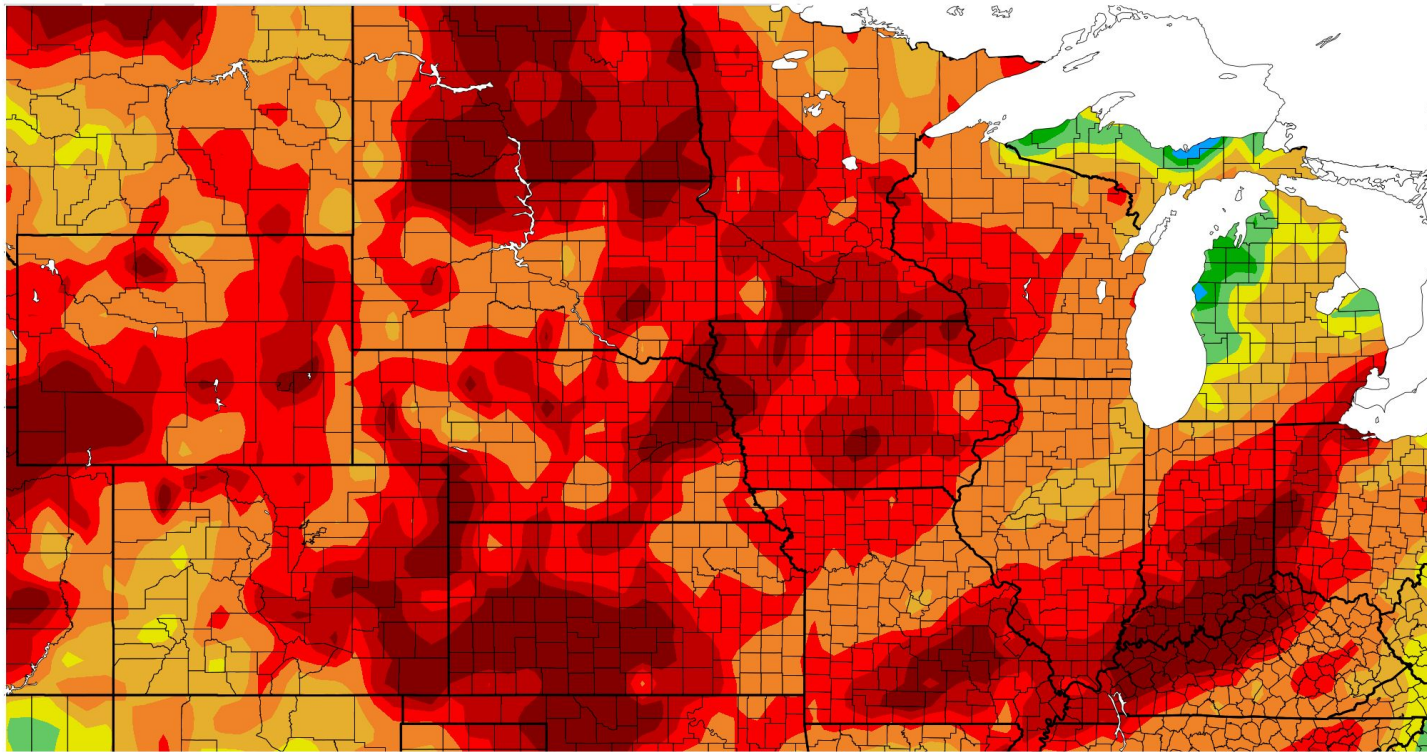
SOUTHEAST REGIONAL
CLIMATE CENTER



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October Precipitation

Precipitation (in)
10/1/2022 – 10/19/2022



Generated 10/20/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

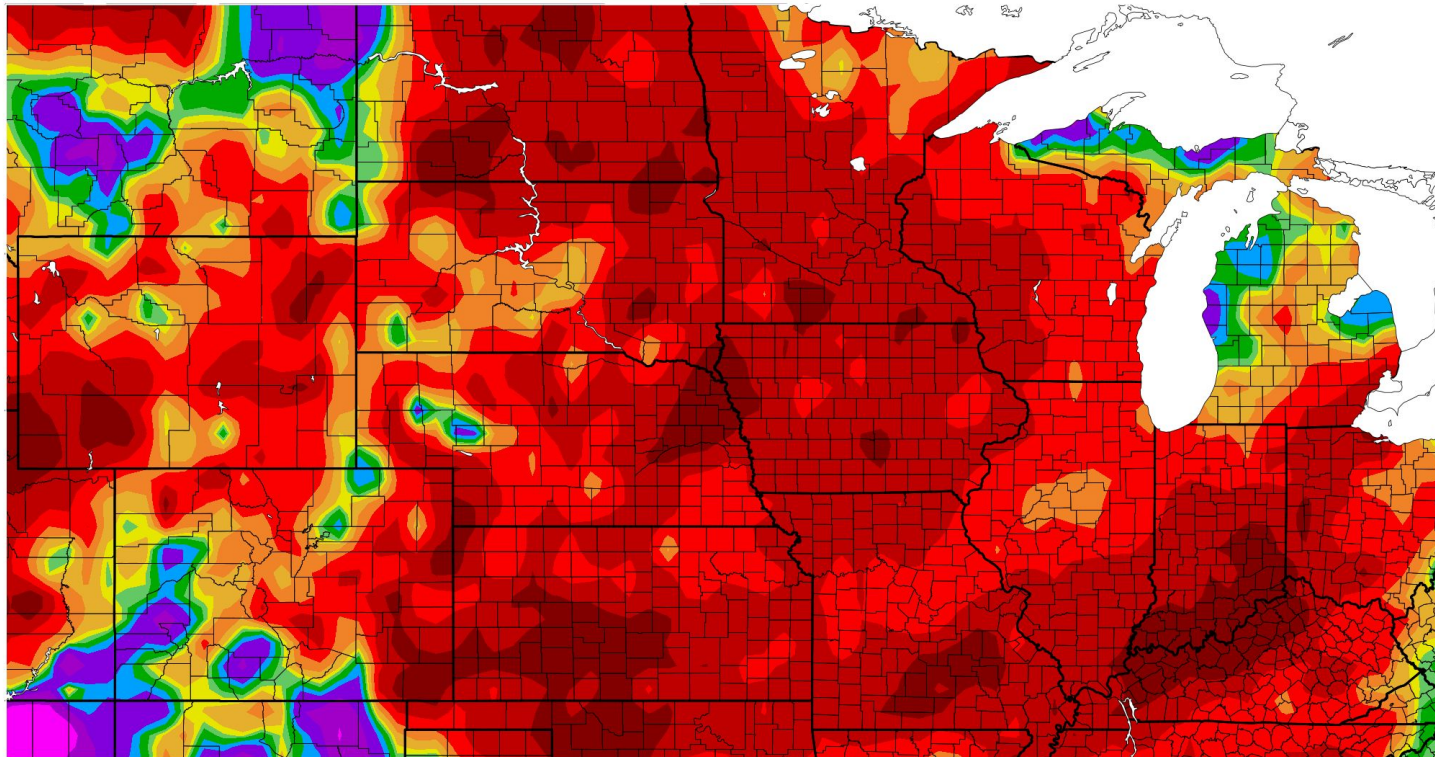


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October Precipitation, Percent of Normal

Percent of Normal Precipitation (%)

10/1/2022 – 10/19/2022



Generated 10/20/2022 at HPRCC using provisional data.

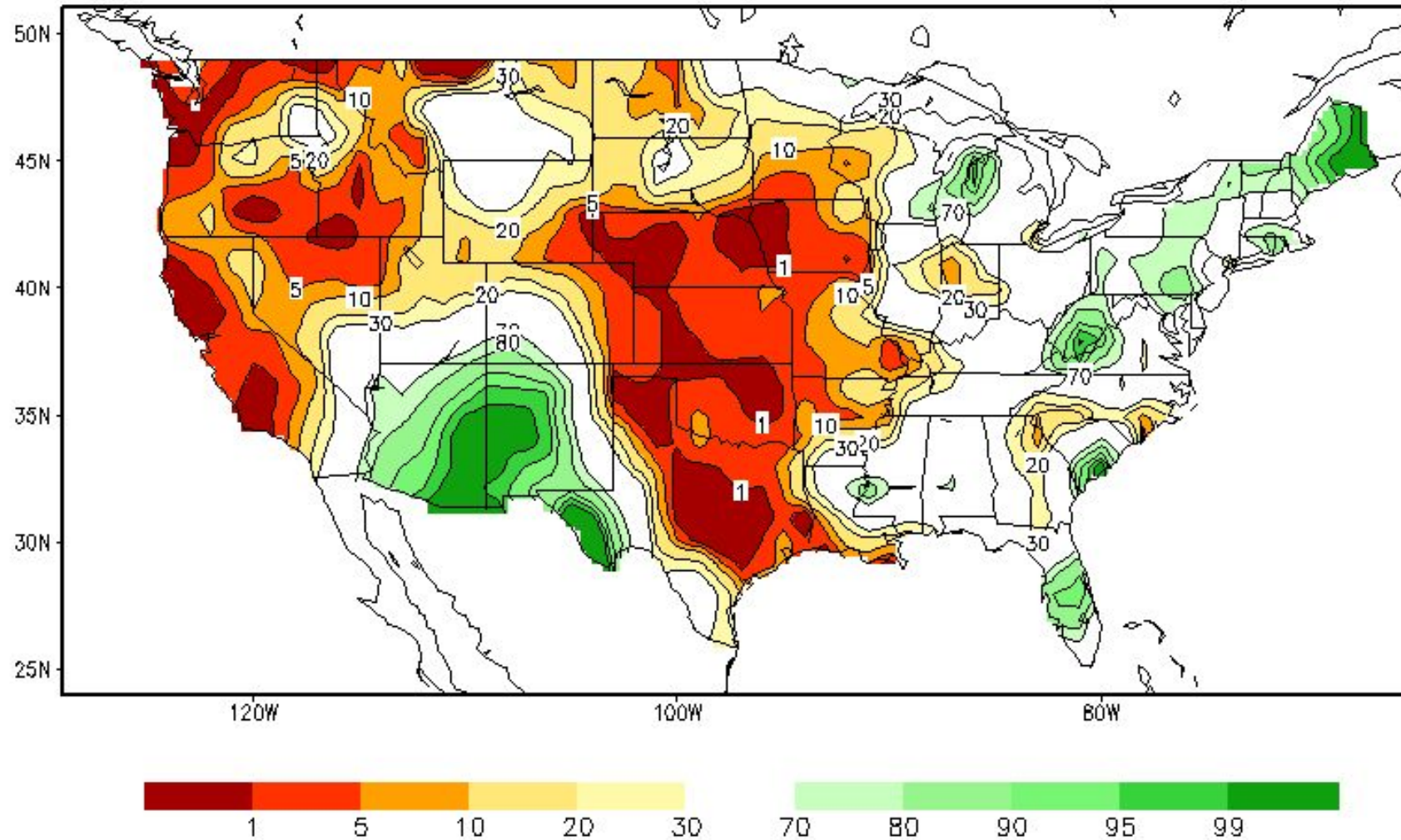
NOAA Regional Climate Centers



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Soil Moisture

Calculated Soil Moisture Ranking Percentile
OCT 18, 2022

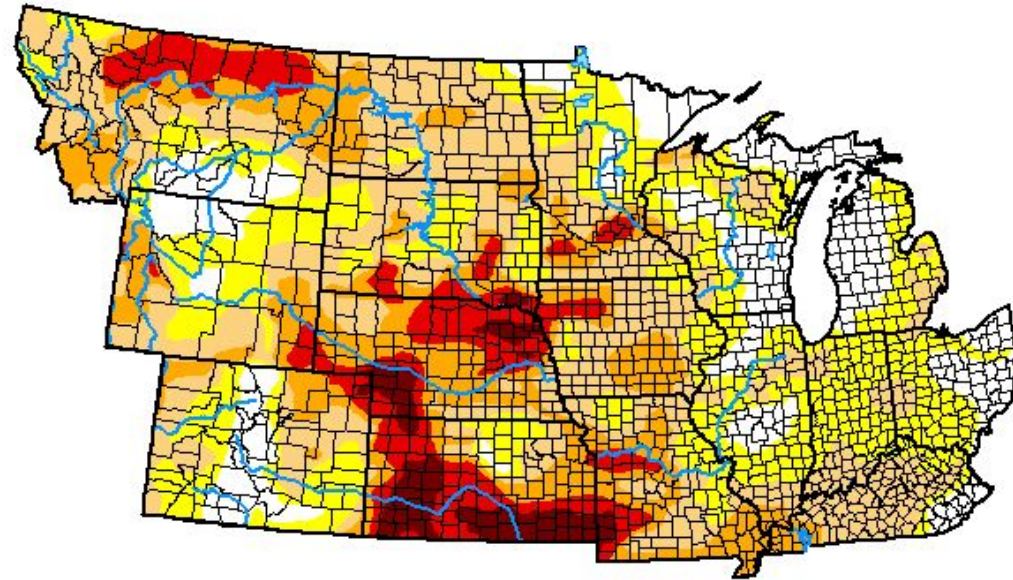


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https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

U.S. Drought Monitor NWS Central

October 18, 2022
(Released Thursday, Oct. 20, 2022)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	14.16	85.84	59.67	29.36	12.01	3.19
Last Week 10-11-2022	16.38	83.62	53.10	26.52	10.59	2.96
3 Months Ago 07-19-2022	44.40	55.60	33.92	16.69	4.16	0.28
Start of Calendar Year 01-04-2022	33.94	66.06	46.53	27.27	10.67	1.77
Start of Water Year 09-27-2022	27.00	73.00	47.70	23.08	8.80	2.73
One Year Ago 10-19-2021	33.69	66.31	48.16	30.73	14.36	2.47

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:

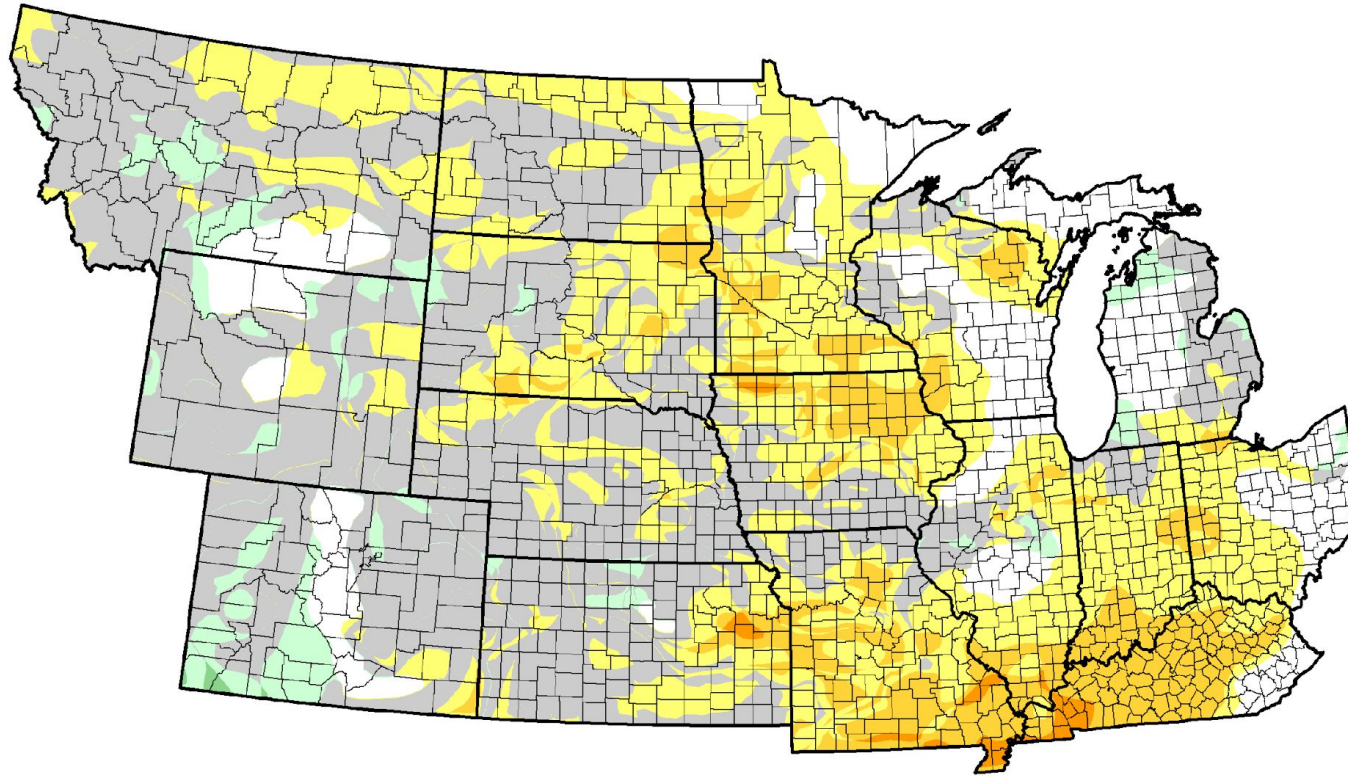
Adam Hartman
NOAA/NWS/NCEP/CPC



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droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - NWS Central 4 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

October 18, 2022
compared to
September 20, 2022

droughtmonitor.unl.edu



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Climate Impacts

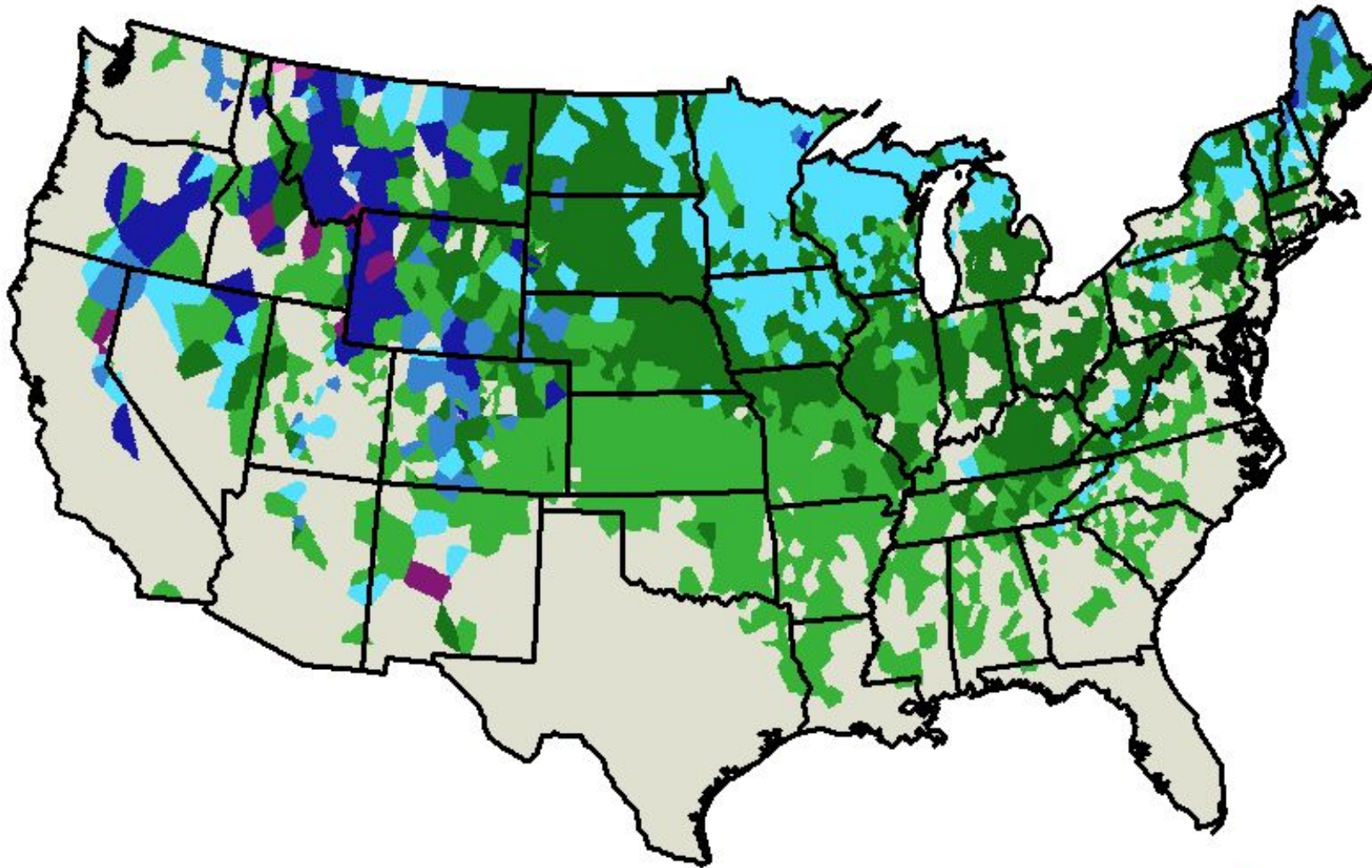
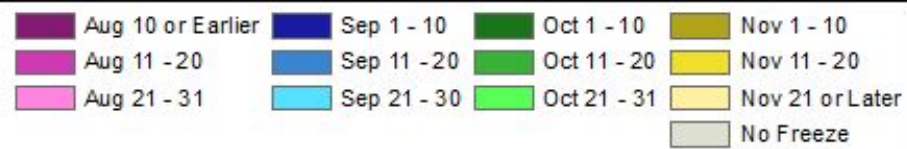


Photo by Laura Edwards



Photo by Aaron Wilson

Date of First 32°F Freeze
for period 7/1/22 to 10/19/22

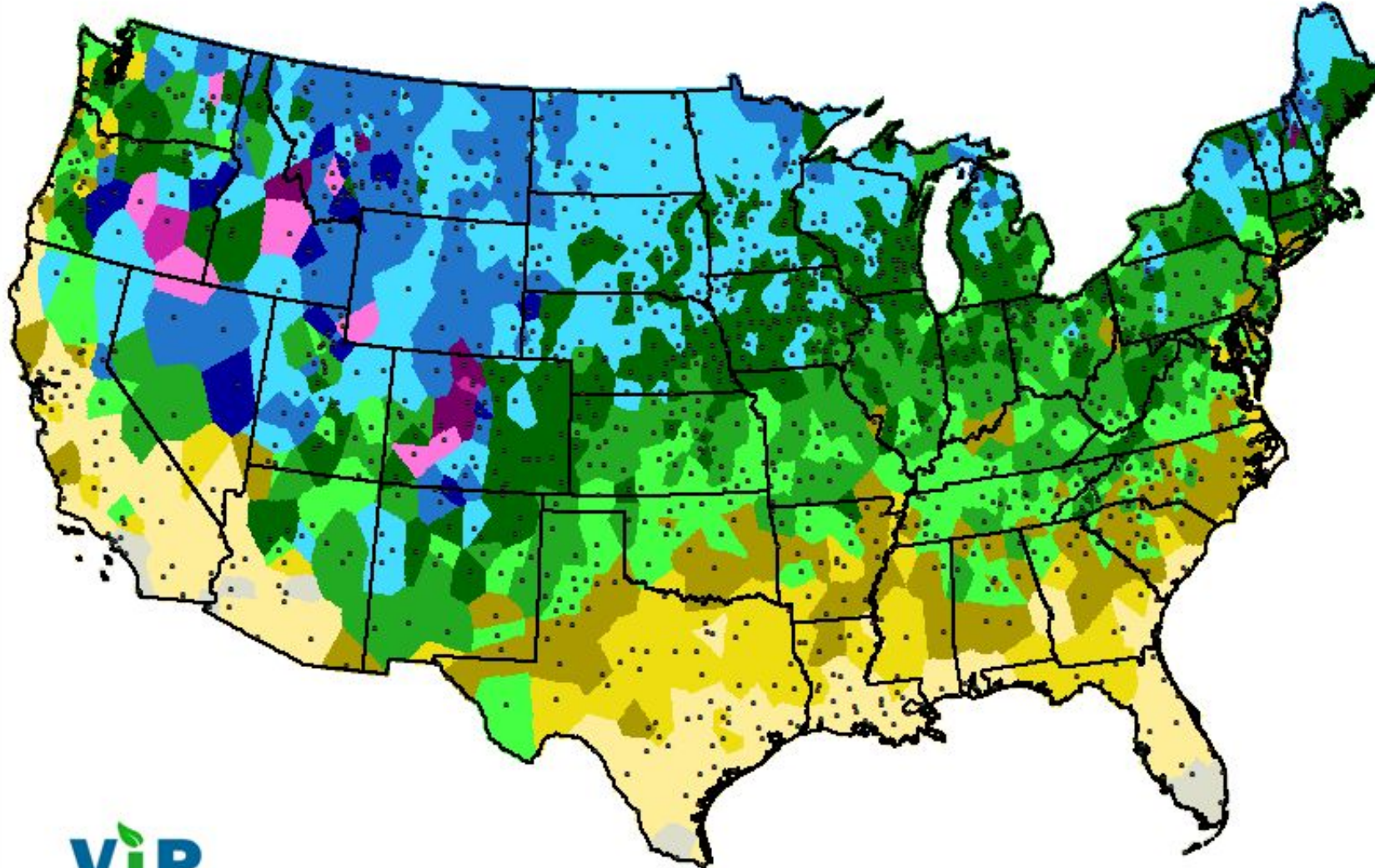
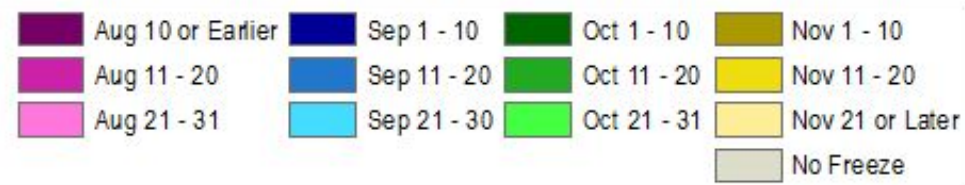


MRCC Experimental Freeze Guidance:
These experimental maps may be utilized as a guide to local and regional
freeze conditions but should NOT be used by themselves for decision processes.

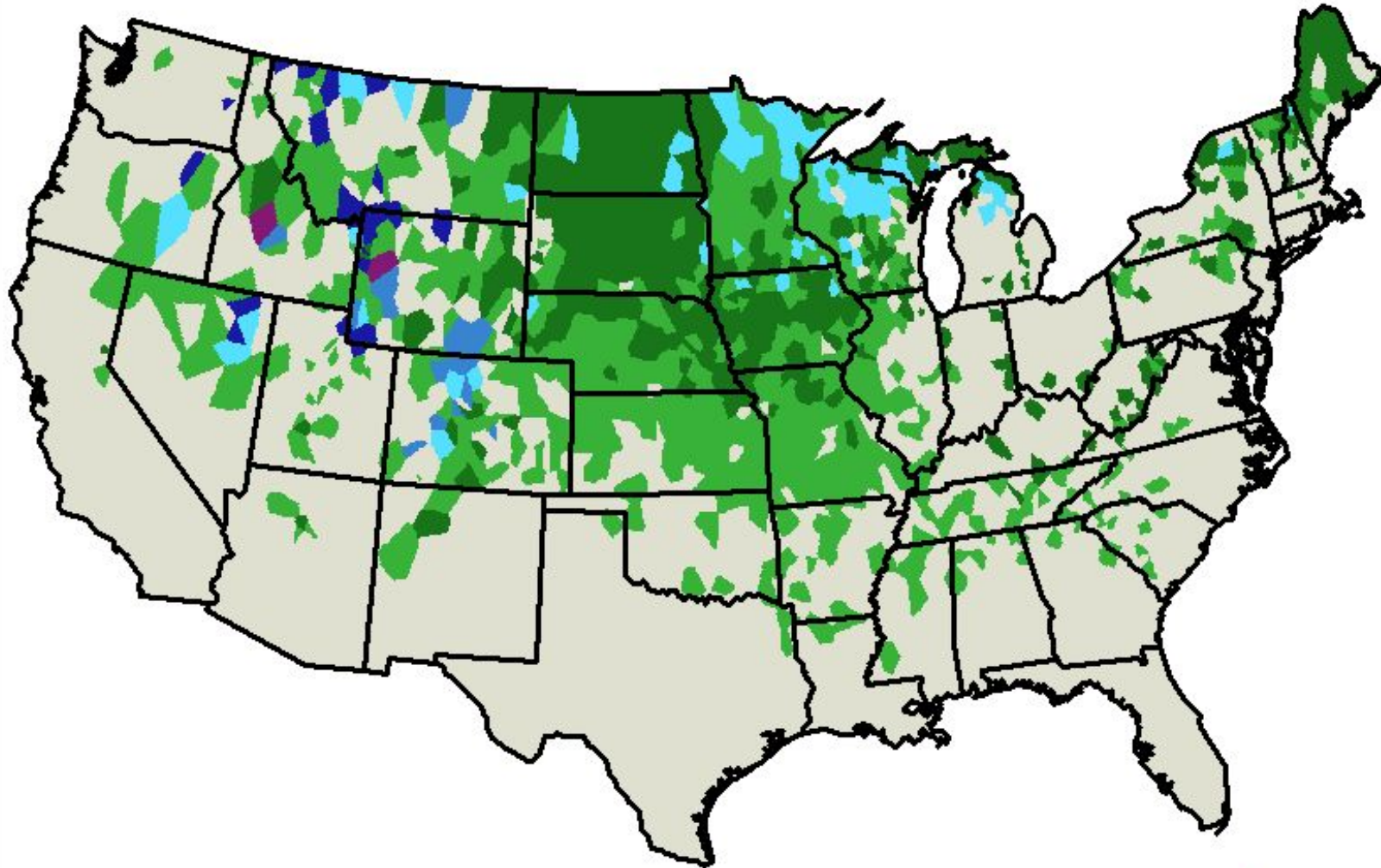
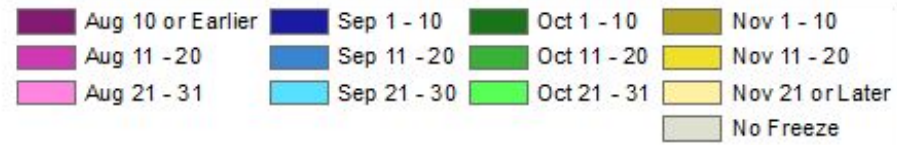


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Climatological Date of Median First 32°F Freeze
For years 1980-81 to 2009-10
Freeze year beginning July 1st
Median defined as the 50th Percentile



Date of First 28°F Freeze
for period 7/1/22 to 10/19/22

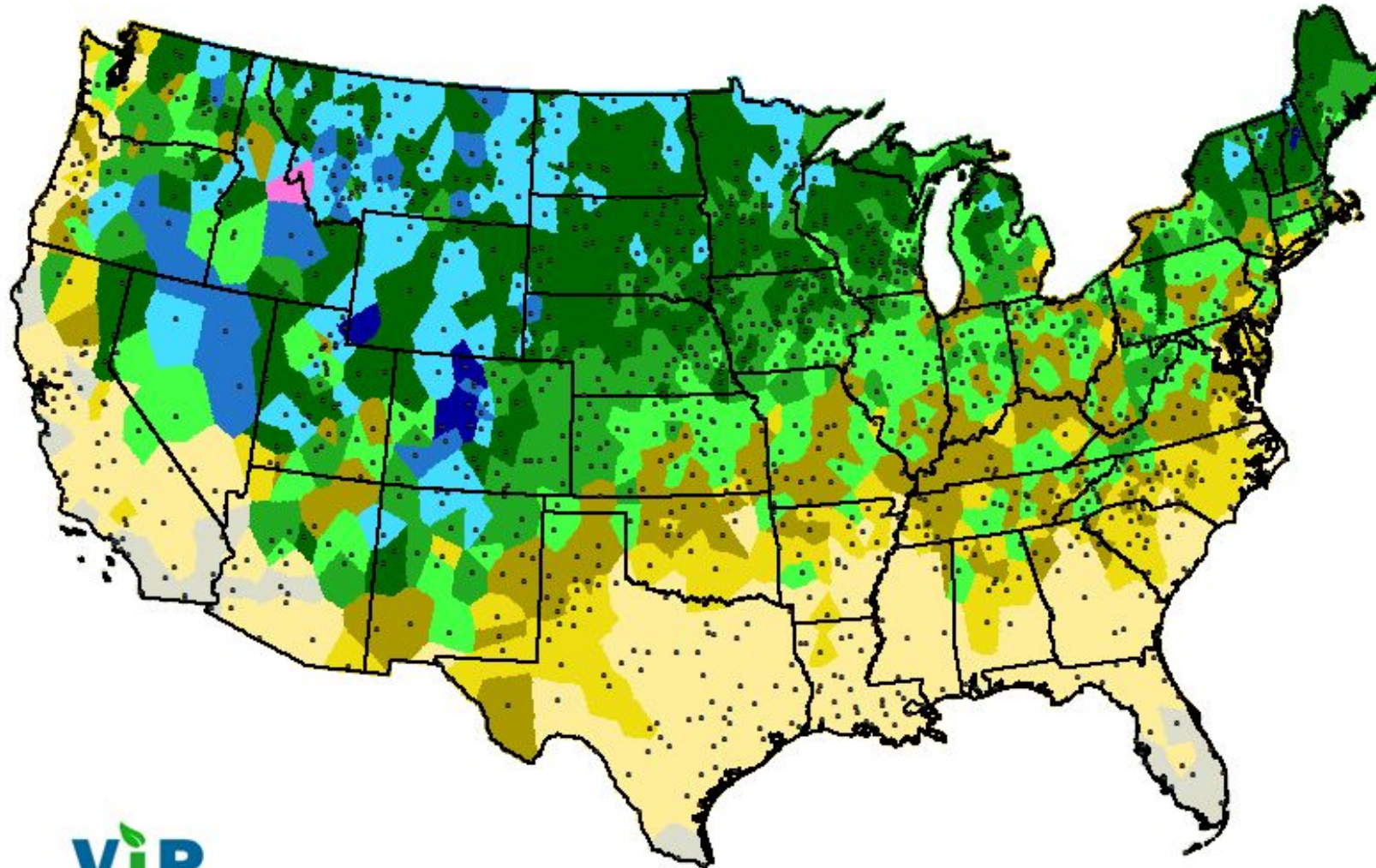
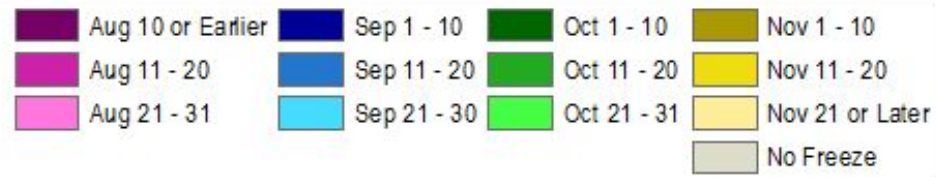


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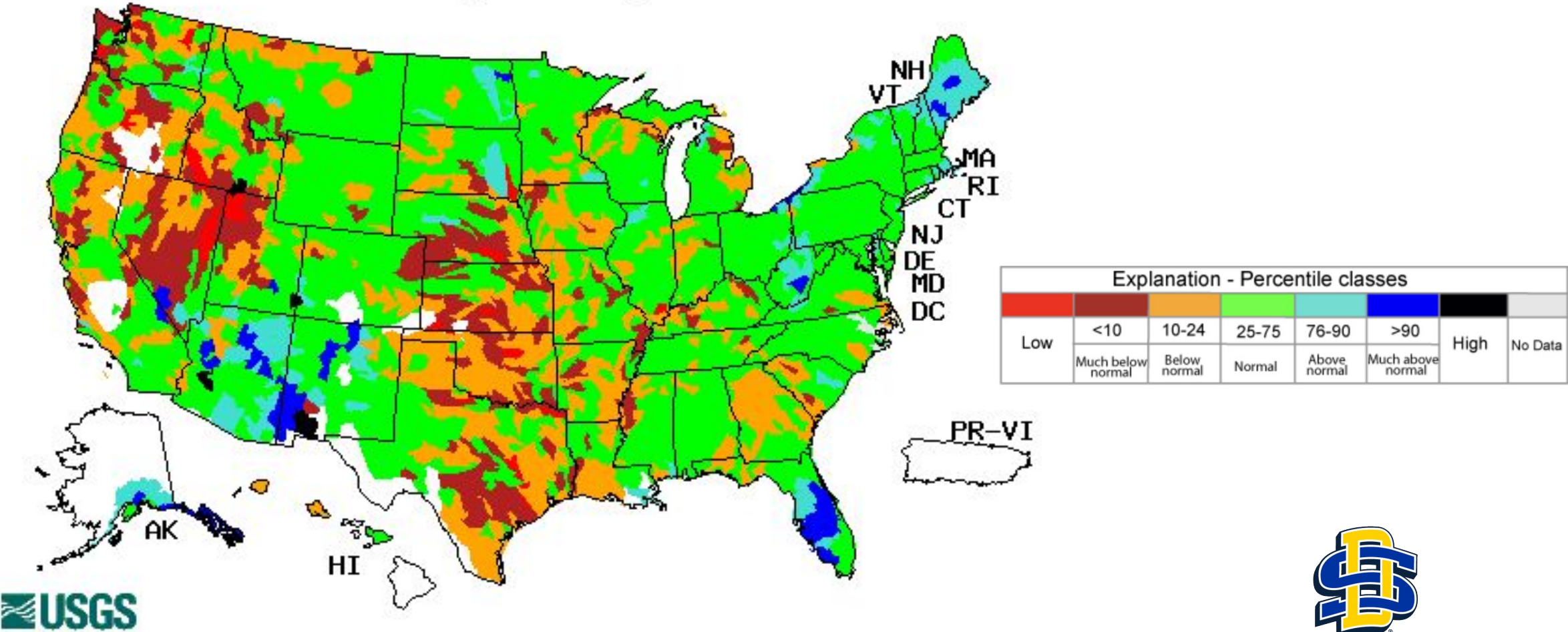
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Climatological Date of Median First 28°F Freeze
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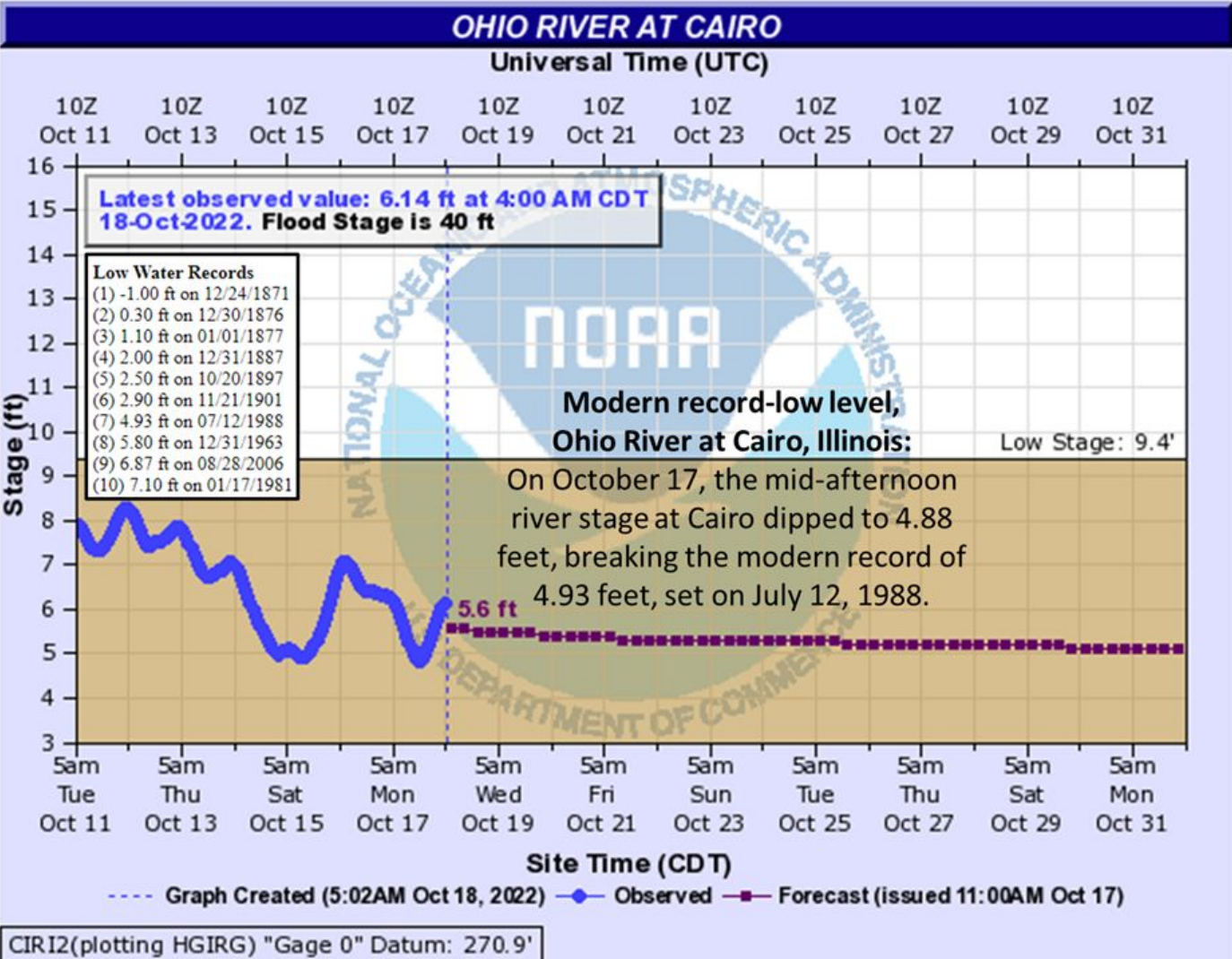


28-day streamflow percentile

Wednesday, October 19, 2022



Ohio River



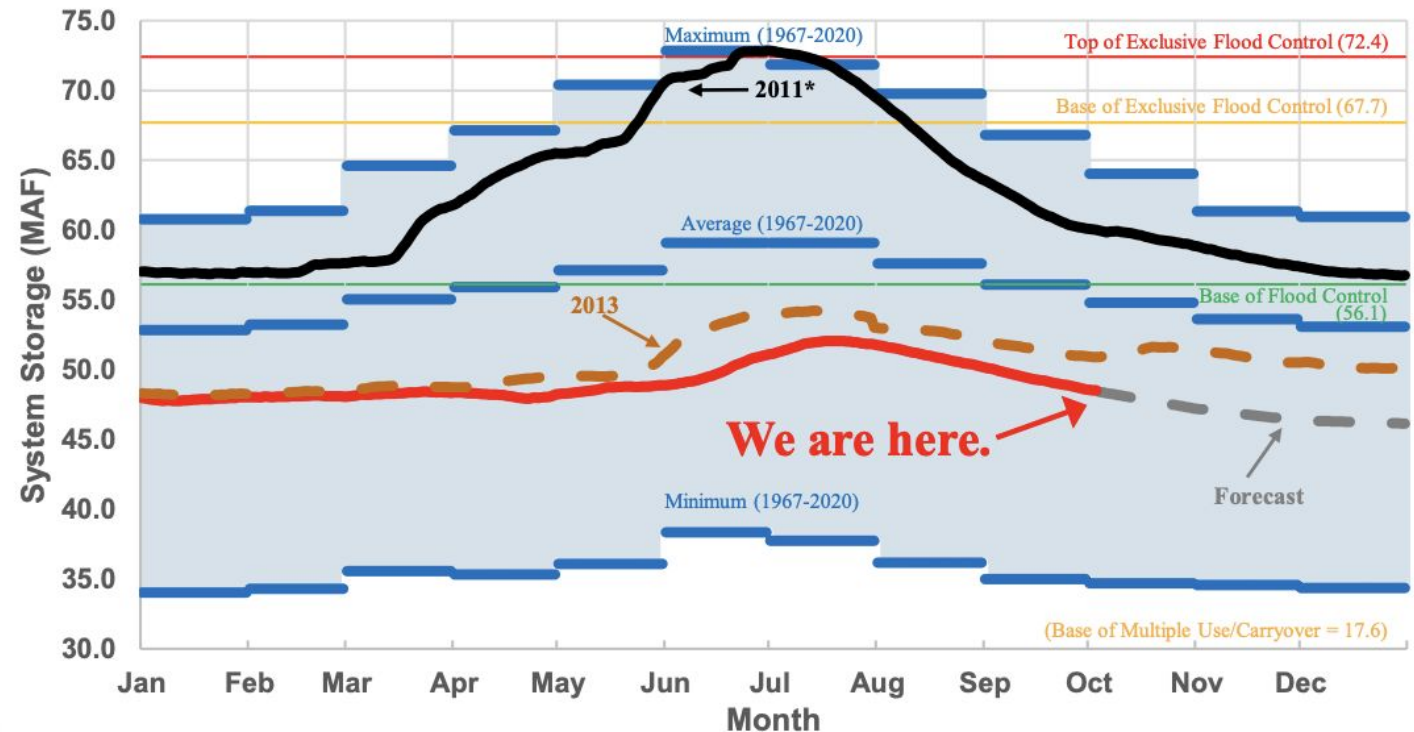
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Missouri River

- Missouri Mainstem Reservoir Status (as of 10/4/22):
- Current system storage is 48.5 million acre-feet, about 2 MAF below this time last year
- 2022 runoff forecast = 76% of average, 19.5 million acre-feet
- Over 90% of basin is in abnormally dry or drought conditions
- Gavins Point release will be 500 cfs above minimum, currently 32,000 cfs
- Fall public meetings planned for next week

System Storage Comparison





Lower Ohio & Mississippi Rivers

 Historical Low Water Events					
Lower Mississippi River Forecast Center			Current stage and forecast data as of October 18 th 2022		
Forecast Location	Current Stage	Forecast Low Stage	2012	2000	1988
Cairo, IL*	6.4 ft	5.2 ft	7.2 ft	8.5 ft	4.9 ft
Memphis, TN*	-10.7 ft	-11.1 ft	-9.8 ft	-9.2 ft	-10.7 ft
Arkansas City, AR	-1.9 ft	-3.1 ft	-3.2 ft	-2.9 ft	-5.0 ft
Greenville, MS	6.5 ft	5.5 ft	6.9 ft	8.2 ft	7.3 ft
Vicksburg, MS	1.8 ft	0.1 ft	-1.1 ft	0.2 ft	-1.6 ft
Red River Landing, LA	15.6 ft	12.9 ft	13.0 ft	13.1 ft	10.0 ft
Baton Rouge, LA	4.8 ft	2.1 ft	3.4 ft	3.9 ft	1.8 ft

* Locations that have preliminarily broken modern day low water records

Numbers in Red are the lowest forecast stage based on the 28 day forecast

Data provided by U.S. Army Corps of Engineers



Highlights

- KS, IN: planting winter wheat and cover crops into dry soils
- KS: some water main breaks due to soil contraction
- Slow emergence of winter wheat due to dry soils
- Many fall fires: harvest activities, dry vegetation
- Dry to very dry conditions for fall harvest. Soybean shattering due to extremely dry conditions. Rapid progress in most areas.
- Burn bans in effect in a lot of counties
- Some late planted crops could have been affected by early hard frost.
- Ohio River was above normal until mid-Sept. Has trended lower and now below average.
- Some changes in the Mississippi River channel due to degradation appear to be record low, but not true everywhere. Yes, water is very low.
- River levels unusually low in Miss., Ohio for fall season. Missouri River releases being reduced.



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Climate outlooks

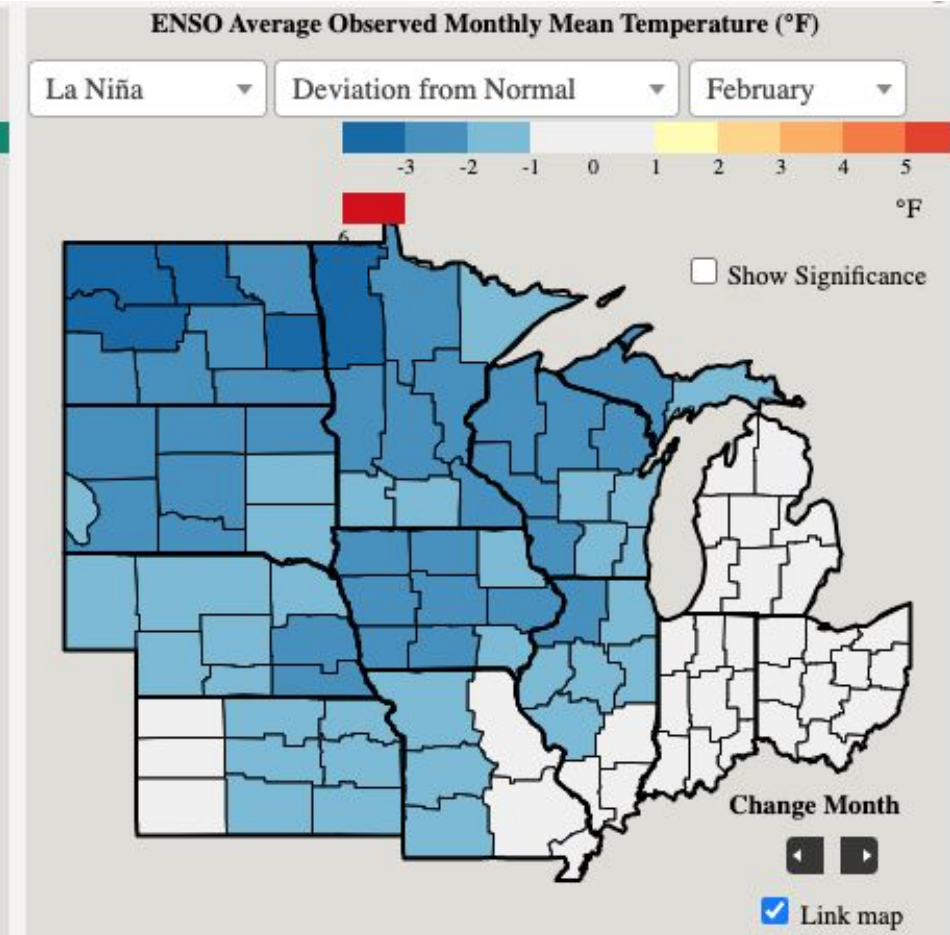
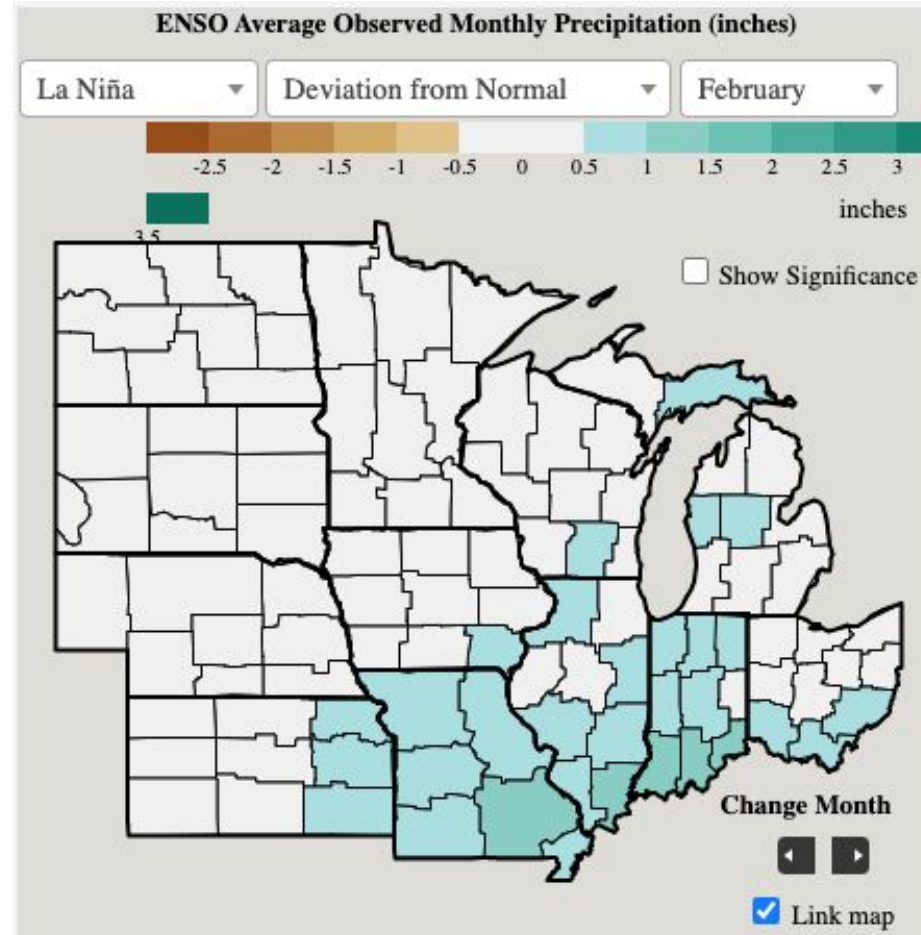
- La Niña
- 7-day precipitation forecast
- 8-14 day outlook
- November temperature and precipitation
- Winter season temperature and precipitation



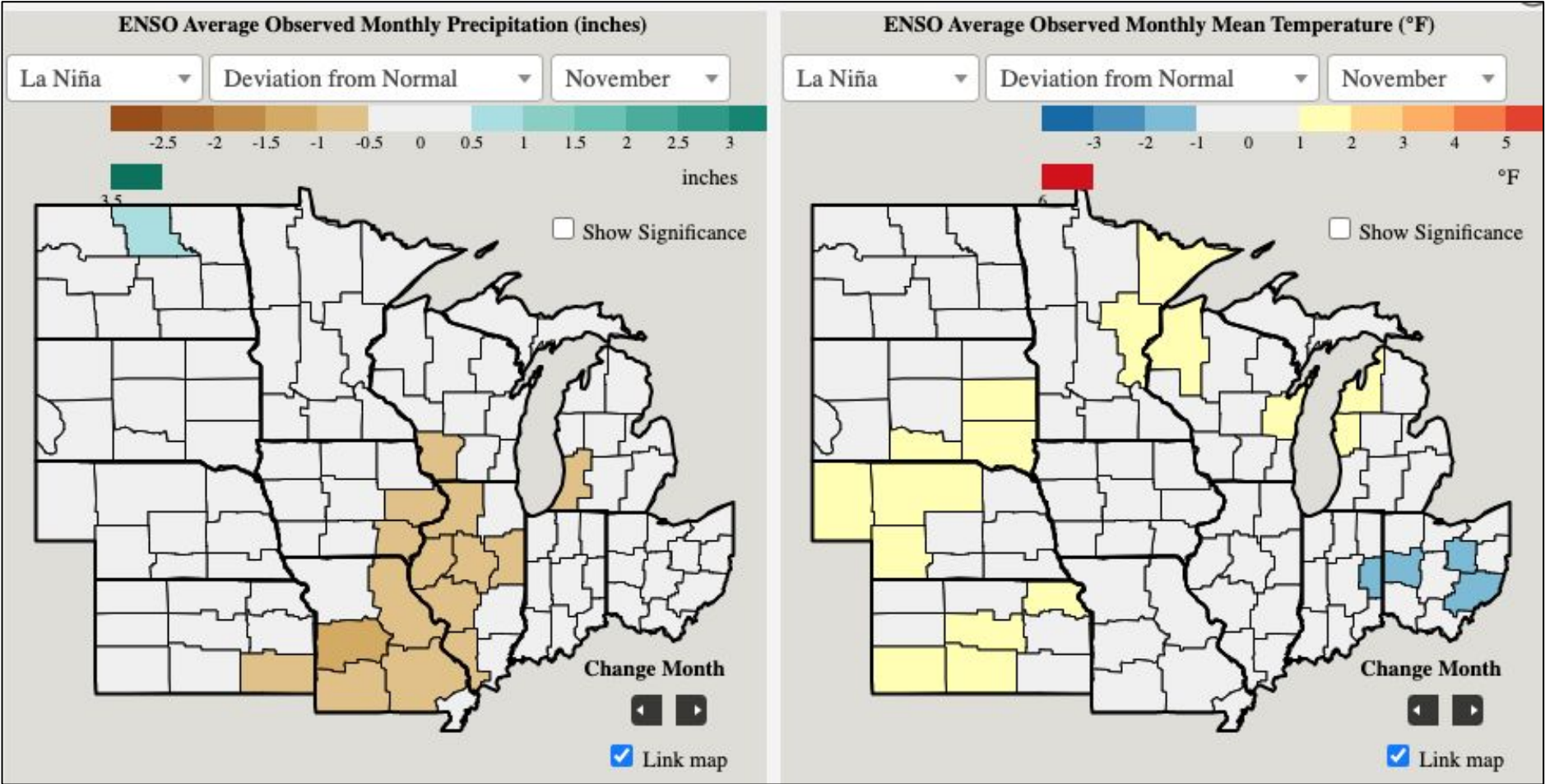
Photo by Chet Edinger

La Nina Advisory

- 75% chance of continuing in December through February
- 3rd La Nina winter in a row
- 54% of ENSO-neutral in February - April 2023



Historical La Niña Conditions

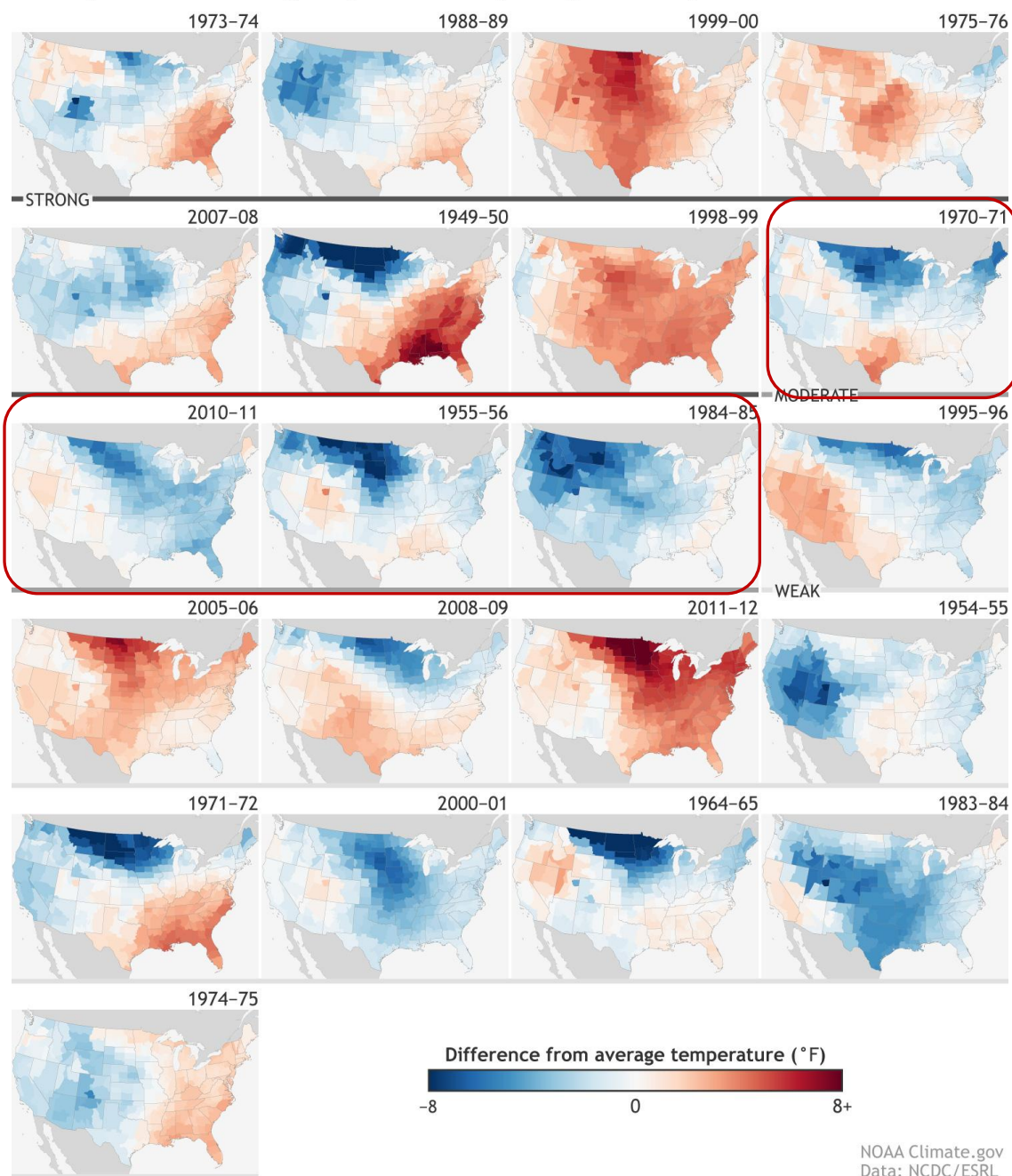


<https://hprcc.unl.edu/agroclimate/cpv.php>



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Winter (December-February) temperature during strong, moderate, and weak La Niñas since 1950

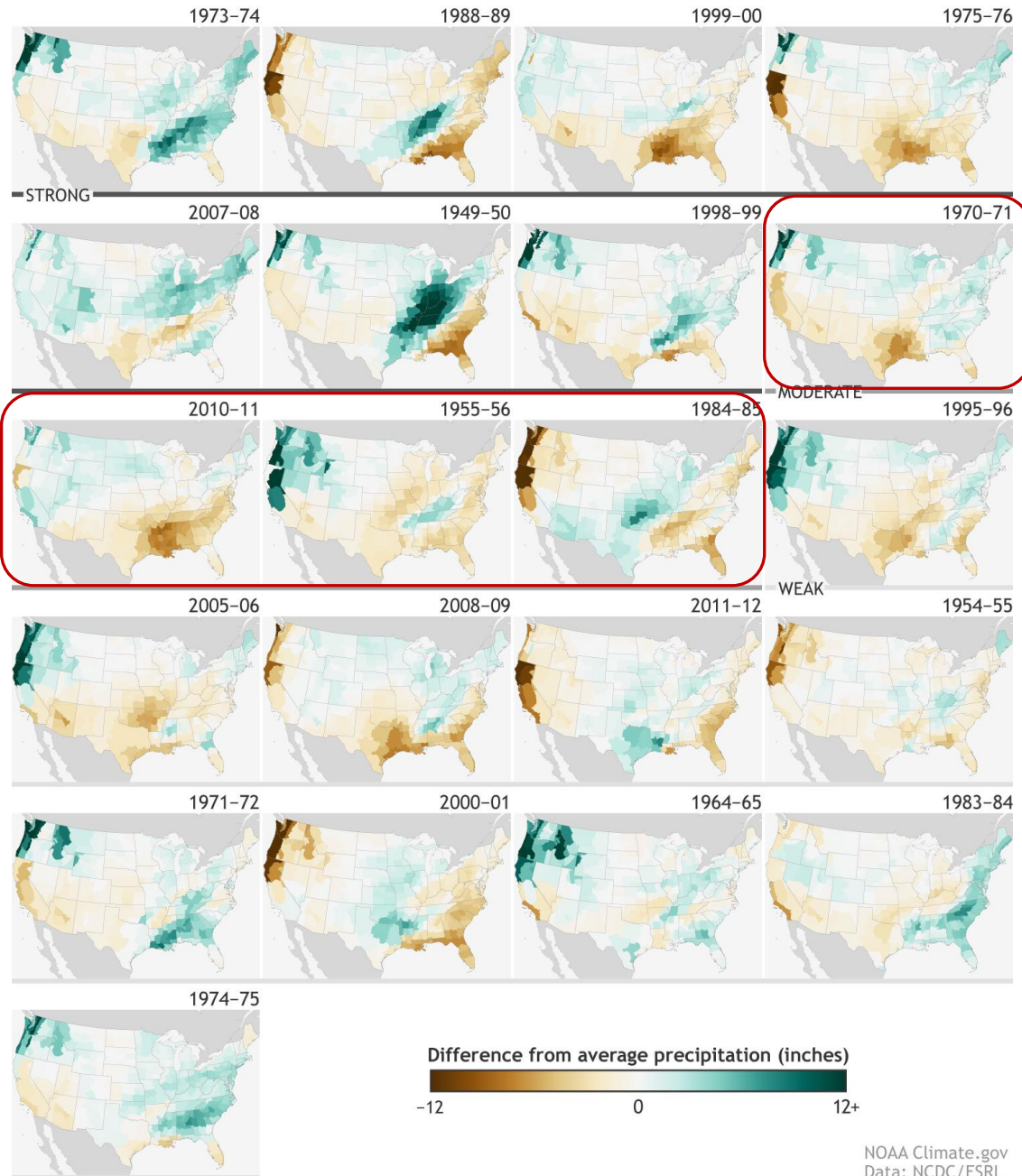


La Nina Winter Temperature



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Winter (December-February) precipitation during strong, moderate, and weak La Niñas since 1950



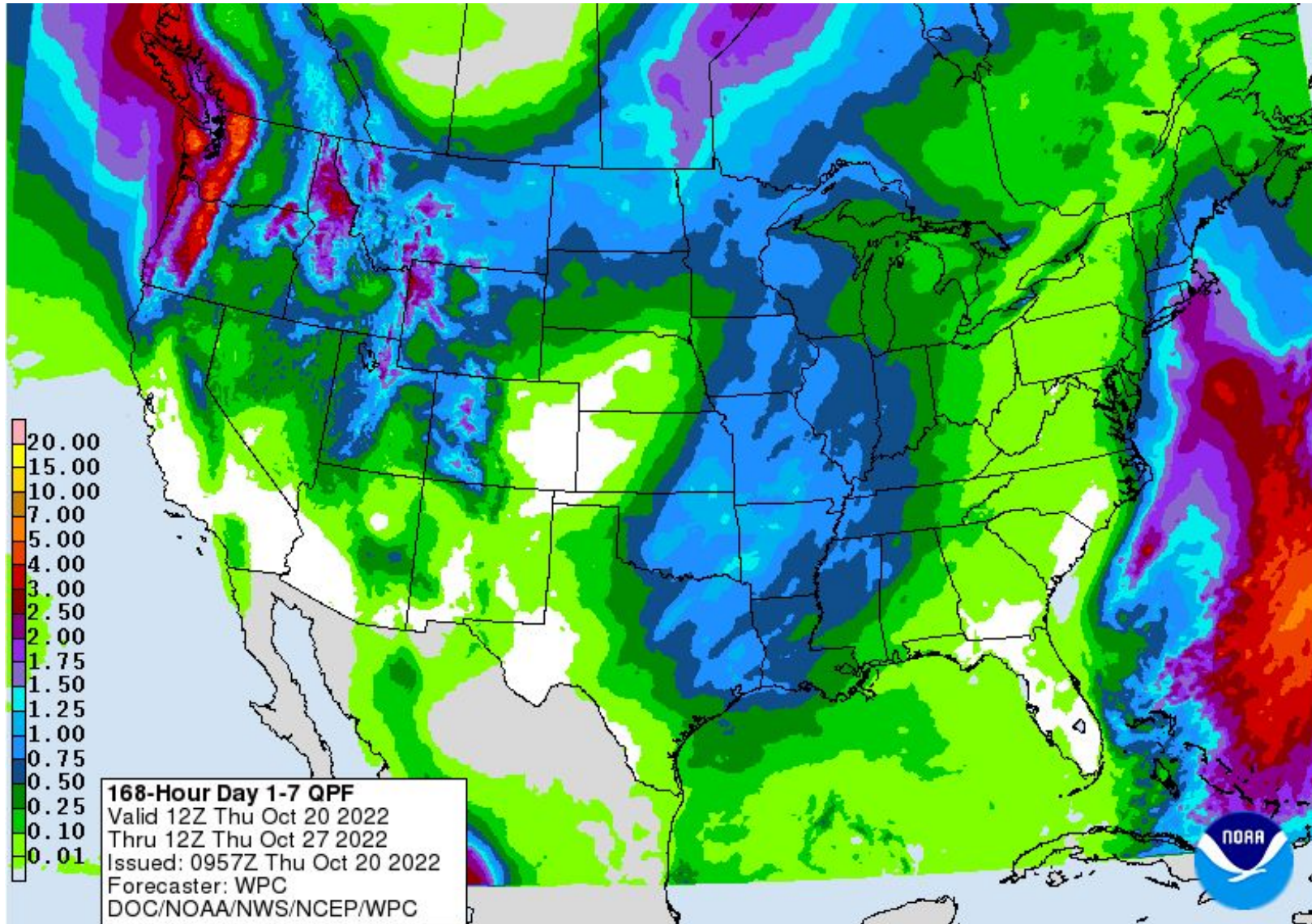
La Niña Winter Precipitation



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7-day Quantitative Precipitation Forecast

Valid: 20 Oct - 27 Oct



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



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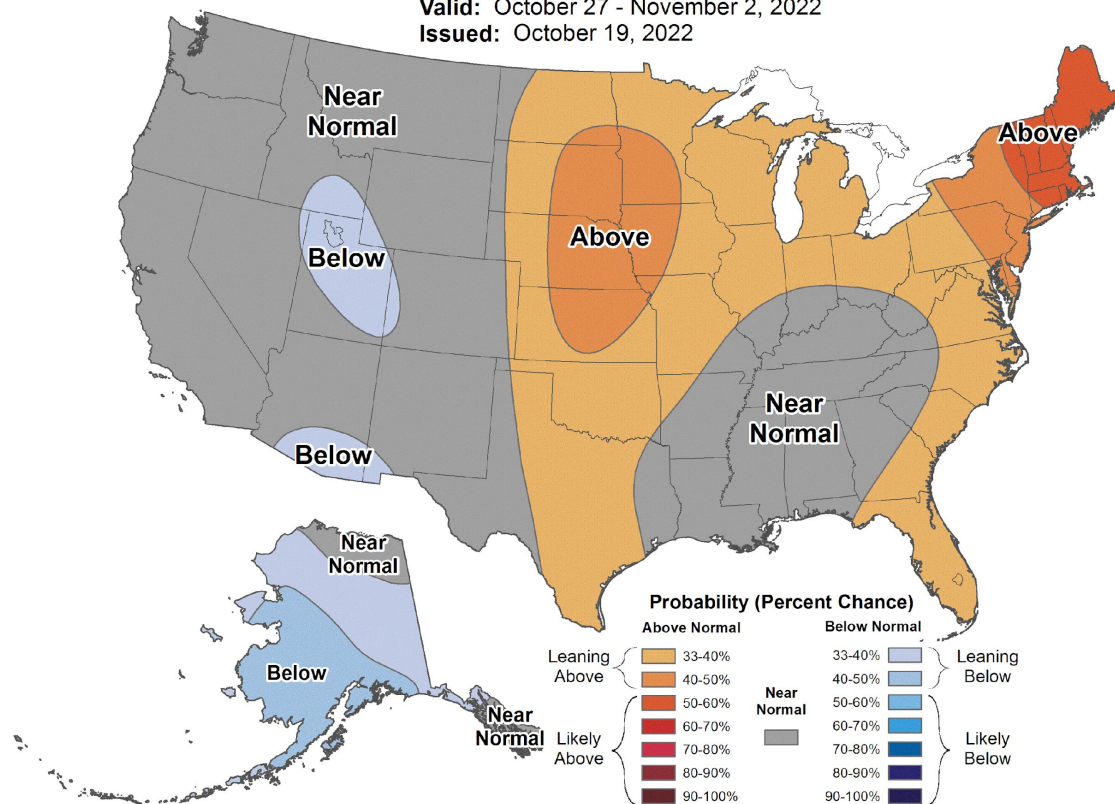
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8-14 Day Outlook



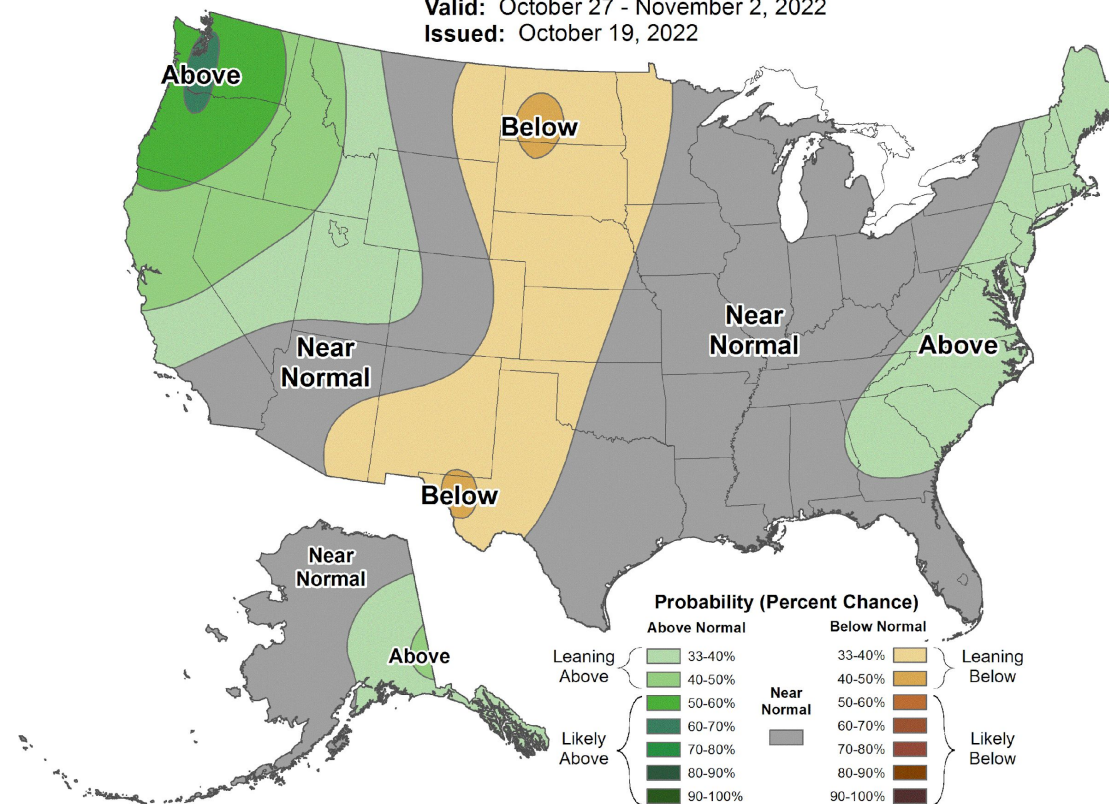
8-14 Day Temperature Outlook

Valid: October 27 - November 2, 2022
Issued: October 19, 2022



8-14 Day Precipitation Outlook

Valid: October 27 - November 2, 2022
Issued: October 19, 2022



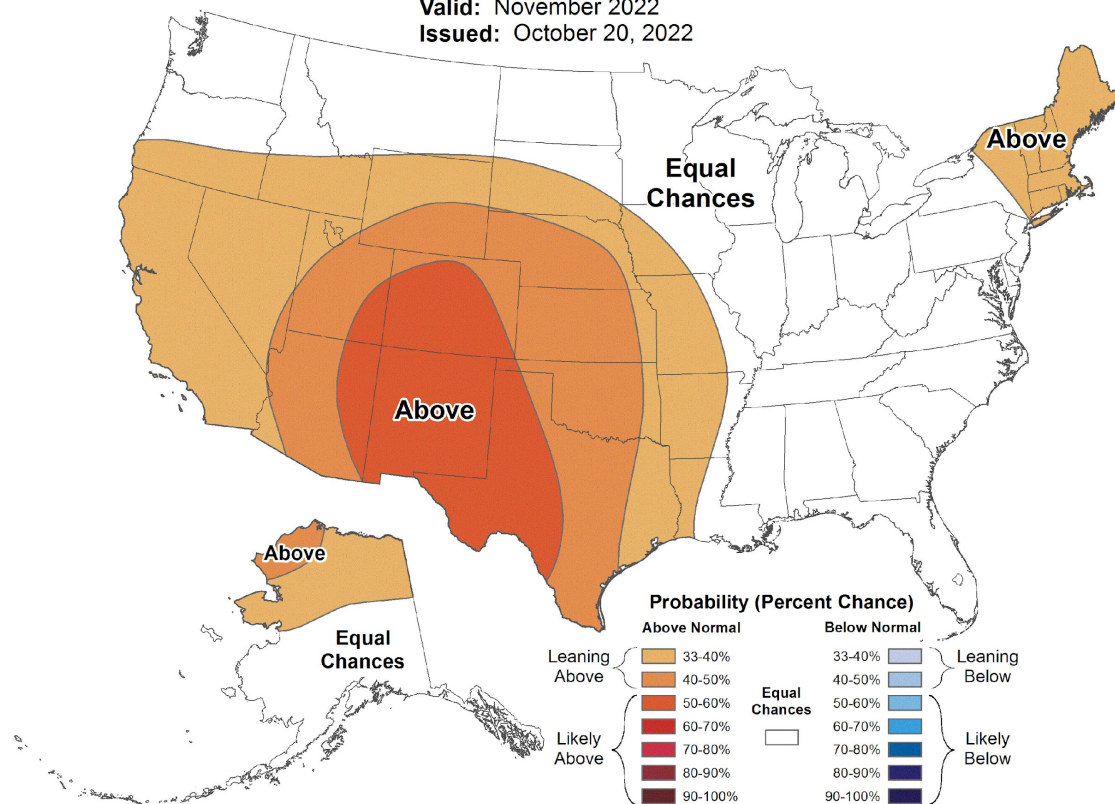


November Outlook



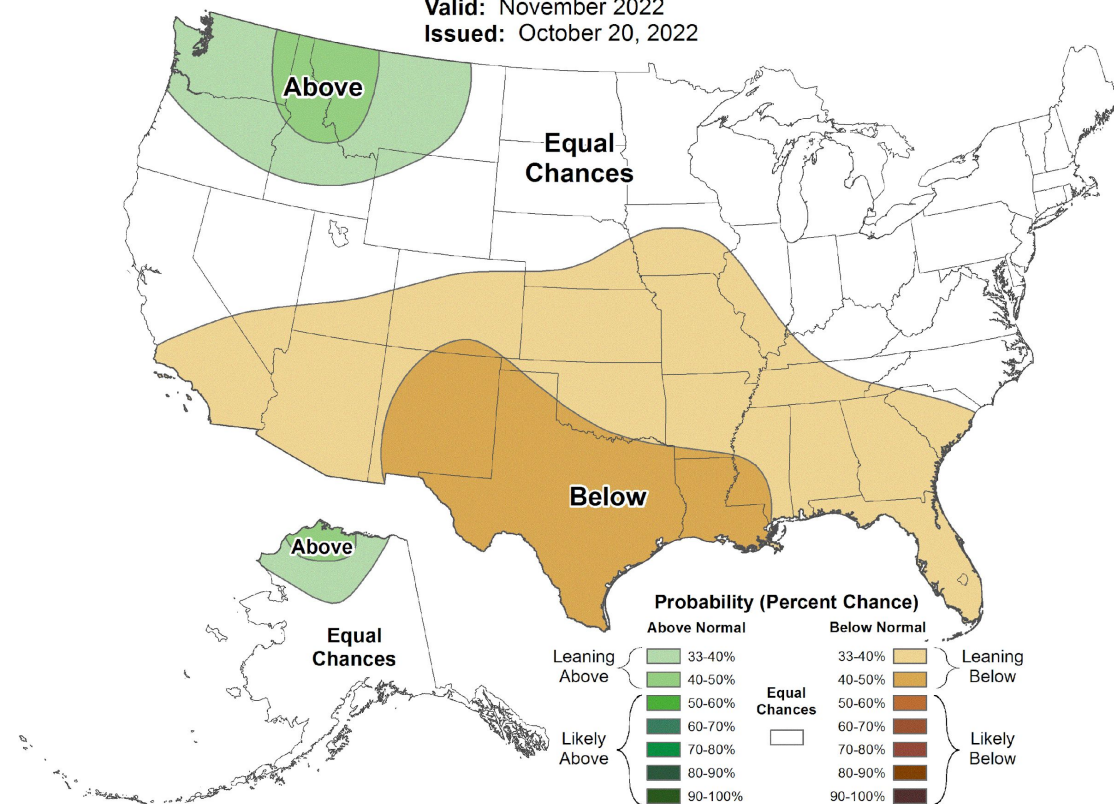
Monthly Temperature Outlook

Valid: November 2022
Issued: October 20, 2022



Monthly Precipitation Outlook

Valid: November 2022
Issued: October 20, 2022



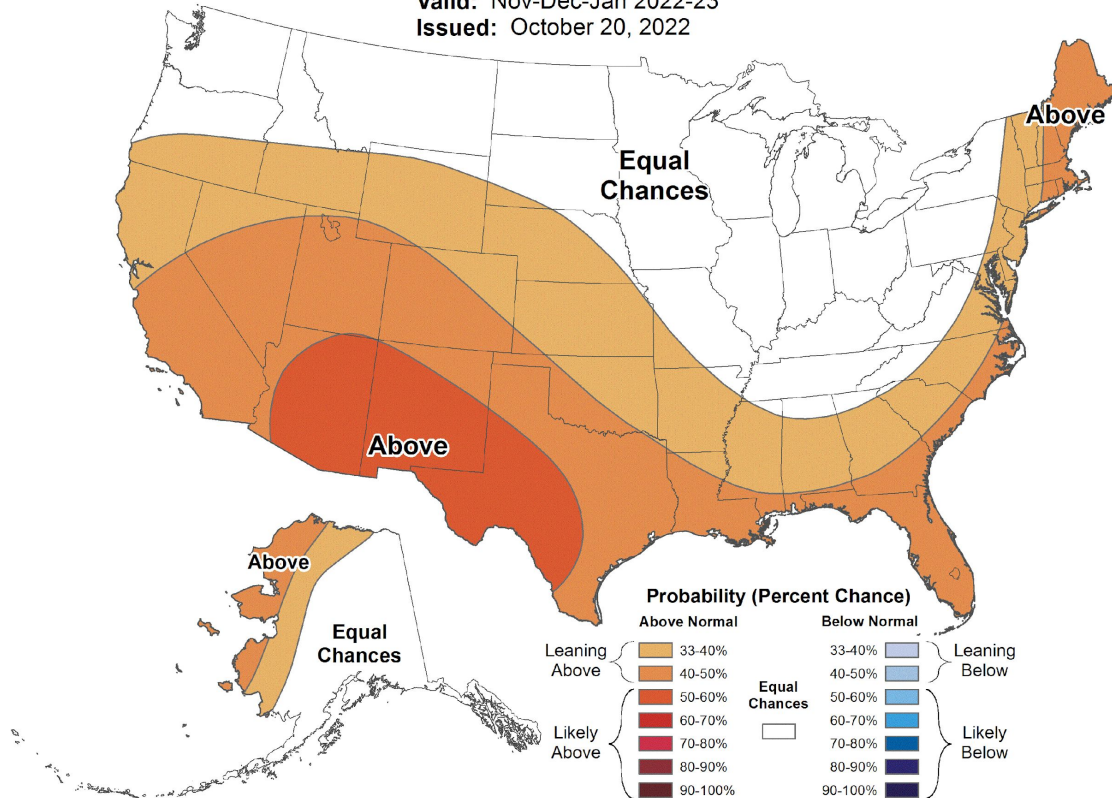
November-January Outlook



Seasonal Temperature Outlook



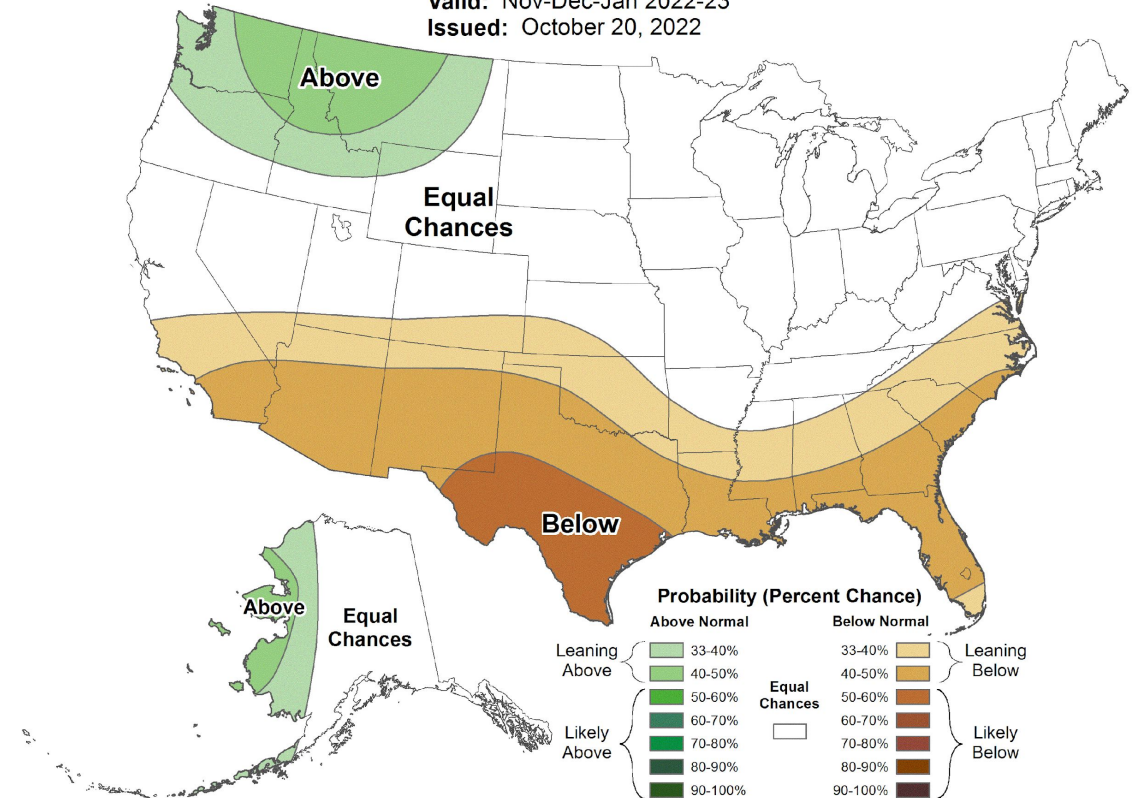
Valid: Nov-Dec-Jan 2022-23
Issued: October 20, 2022



Seasonal Precipitation Outlook



Valid: Nov-Dec-Jan 2022-23
Issued: October 20, 2022





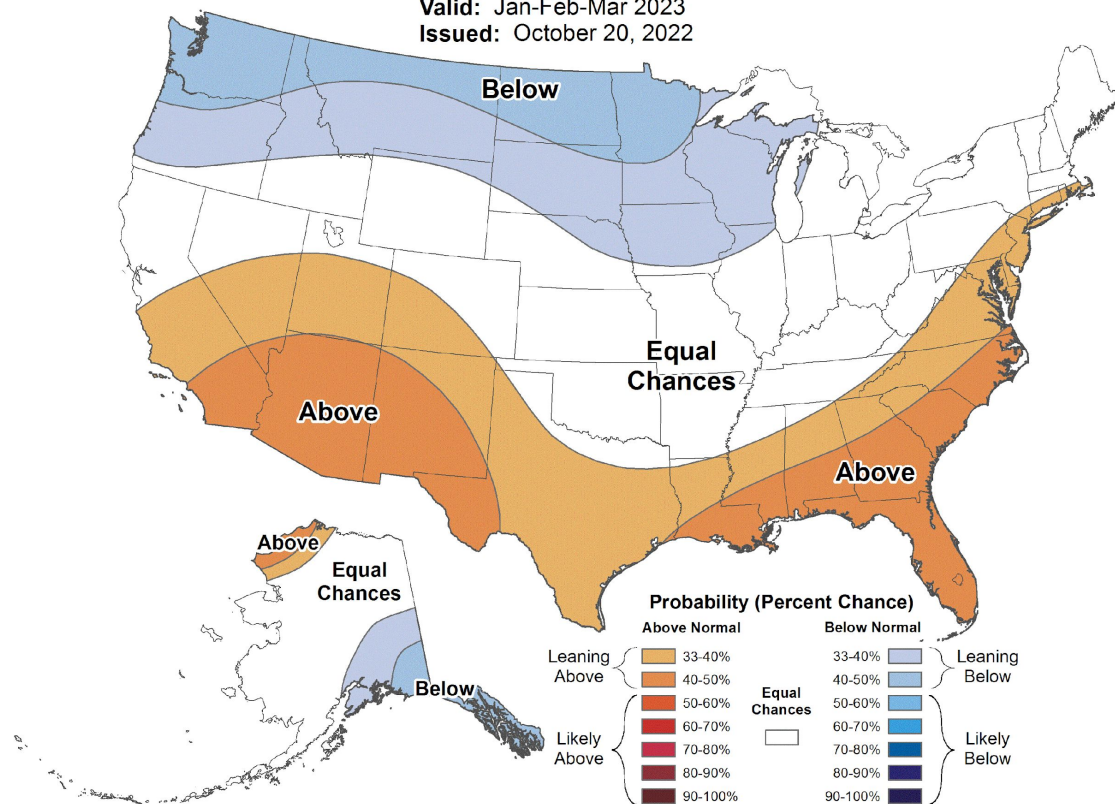
January-March Outlook



Seasonal Temperature Outlook



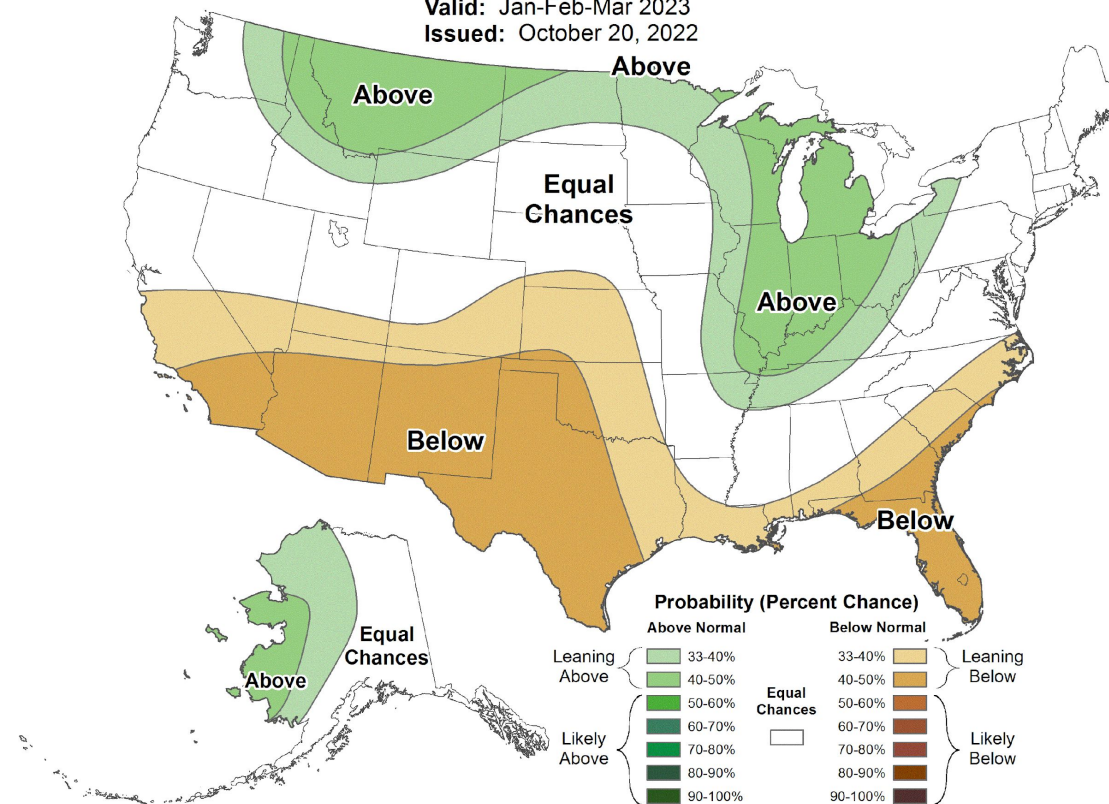
Valid: Jan-Feb-Mar 2023
Issued: October 20, 2022



Seasonal Precipitation Outlook



Valid: Jan-Feb-Mar 2023
Issued: October 20, 2022





Key Messages

- Mississippi, Missouri & Ohio rivers all experiencing drought at the same time. Unusual low river levels for fall season. Little optimism for substantial rises in the near future.
 - Concerns on early cold temperatures, potential to lead to deeper frost depths without snow cover to insulate the ground
 - Drought has intensified and expanded in last 30 days. Little improvement expected unless La Nina wetness arrives to
- **Great Lakes**
 - La Niña: 3rd year in a row, historically points to colder late winter temperatures and wetter winter over Great Lakes/Midwest

Thank You!

- Questions:
 - **Climate:**
 - Laura Edwards: laura.edwards@sdstate.edu, 605-626-2870
 - Dennis Todey: dennis.todey@usda.gov , 515-294-2013
 - Doug Kluck: doug.kluck@noaa.gov, 816-994-3008
 - Brian Fuchs: bfuchs2@unl.edu 402 472-6775
 - **Agriculture:**
 - Brad Rippey, brad.rippy@usda.gov
 - **Weather:**
 - crhroc@noaa.gov



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