



Sunset near Hayti, SD, Oct 5, 2024
Courtesy K. Blumenfeld

North Central US Climate & Drought Outlook: November 2024



Further Information & Partners

Today's and Past Recorded Webinars

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

Next Webinar:

- Thursday, December 19, 2024 (1 PM CT) –
Bridgette Mason, Wisconsin State Climate
Office

Agency URLs:

National Centers for Environmental Information:

<https://www.ncei.noaa.gov/>

National Drought Mitigation Center: <https://drought.unl.edu/>

National Integrated Drought Information System (NIDIS):

<https://www.drought.gov/>

NOAA's Climate Prediction Center: <https://www.cpc.ncep.noaa.gov/>

Regional Climate Centers High Plains Regional Climate Center:

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

Midwestern Regional Climate Center: <https://mrcc.purdue.edu>

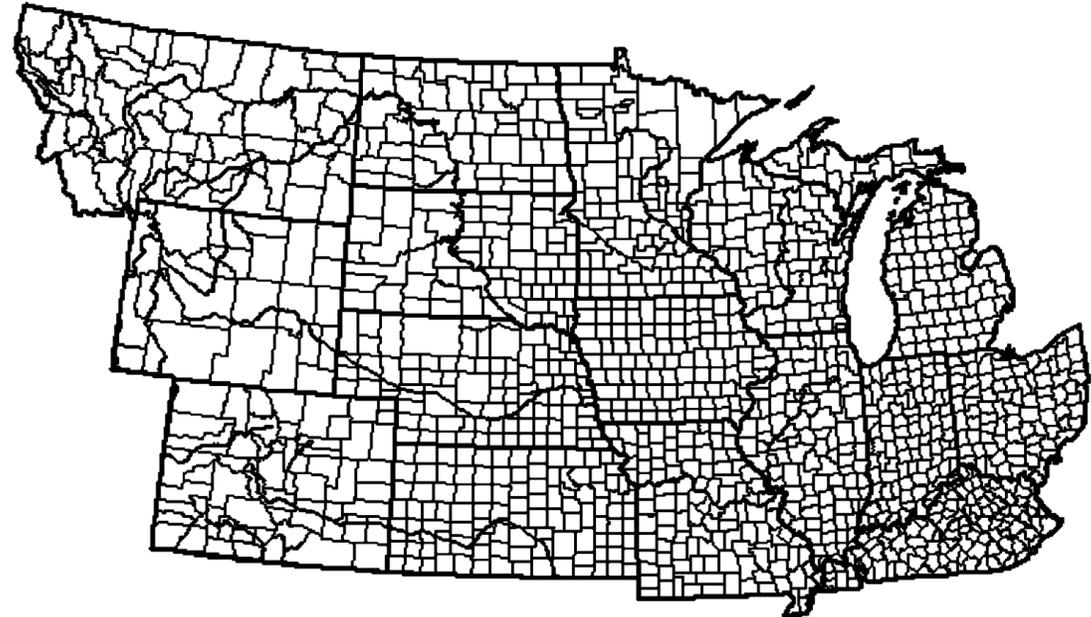
State Climatologists: <https://stateclimate.org/>

USDA Midwest Climate Hub:

<https://www.climatehubs.usda.gov/hubs/midwest>

Topics Covered

1. Recent Temperature & Precipitation
2. Events of Note
3. Impacts
4. Drought and Hydrological Conditions Info
5. Concerns and Outlook
6. Questions and Resources



Key Themes

1. Warm and dry October with expanding drought
2. In general, October not as extreme as September
3. First 2/3 November warm and wet with some precipitation extremes
4. Impacts have included fire, isolated flooding, and unusual plant activity
5. Near-term outlook cool and wet/stormy over much of region
6. Winter outlook still favors La Niña development



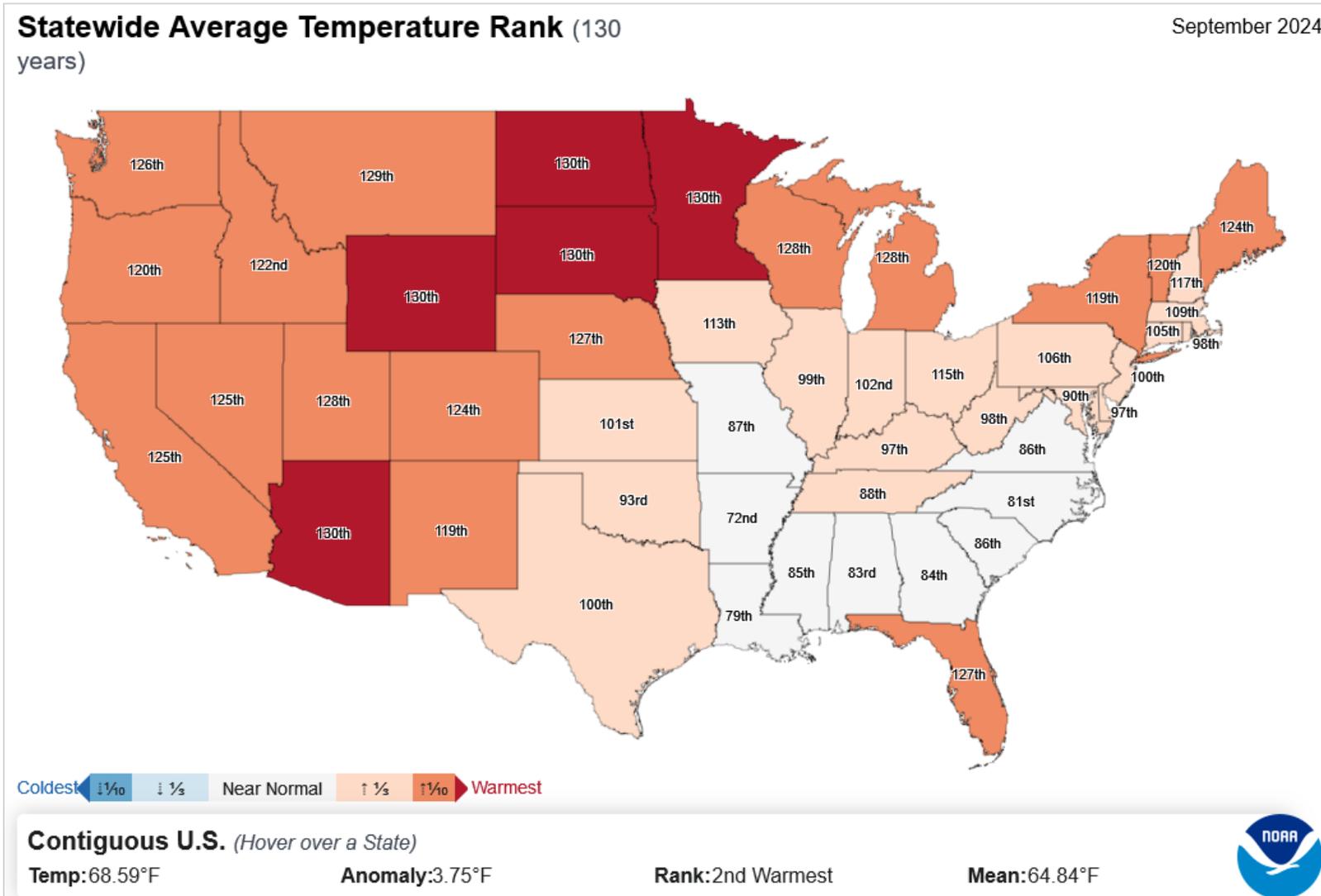


Final Sep-Oct Temperature and Precipitation

Generally warm and dry both months. September both warmest and driest some locations. October uniformly warm and dry but not as extreme.

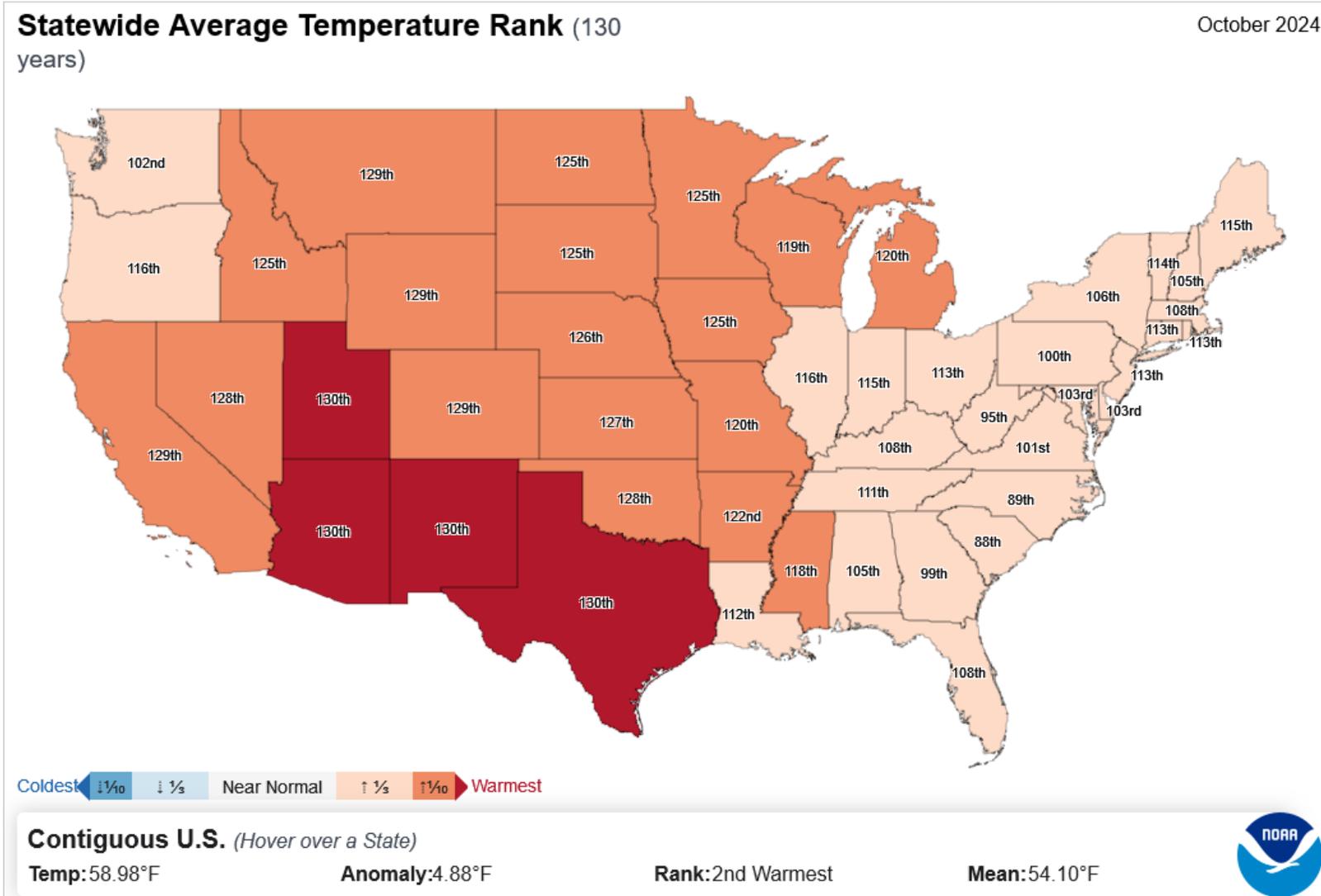


Final September Temperature Rank Map



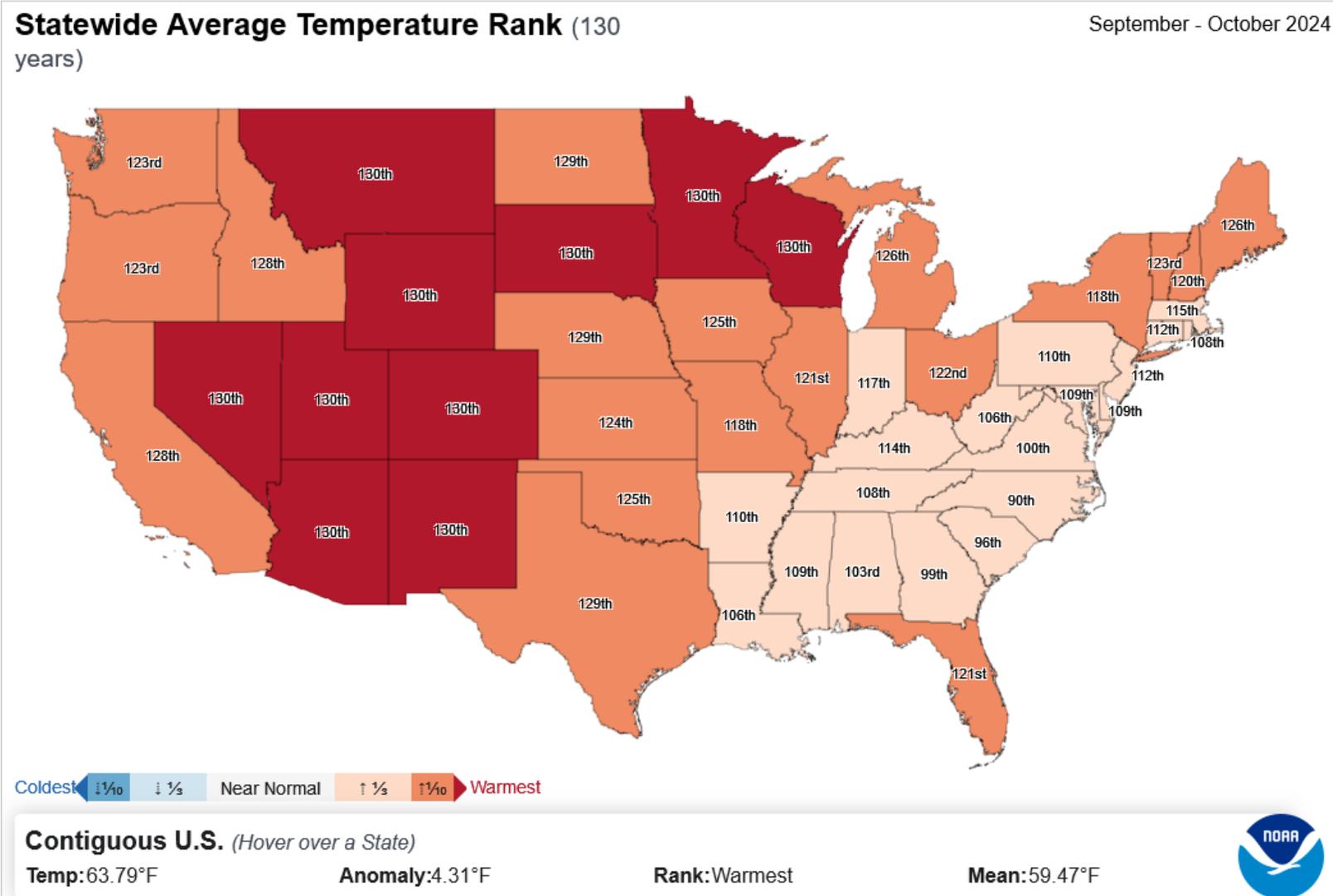
- Red / “130th” = warmest on record: MN, ND, SD, WY
- Many other states in Top-10
- Anomalies 1.7° F (MO) to 8.5° F (ND) above historical avg.

Final October Temperature Rank Map



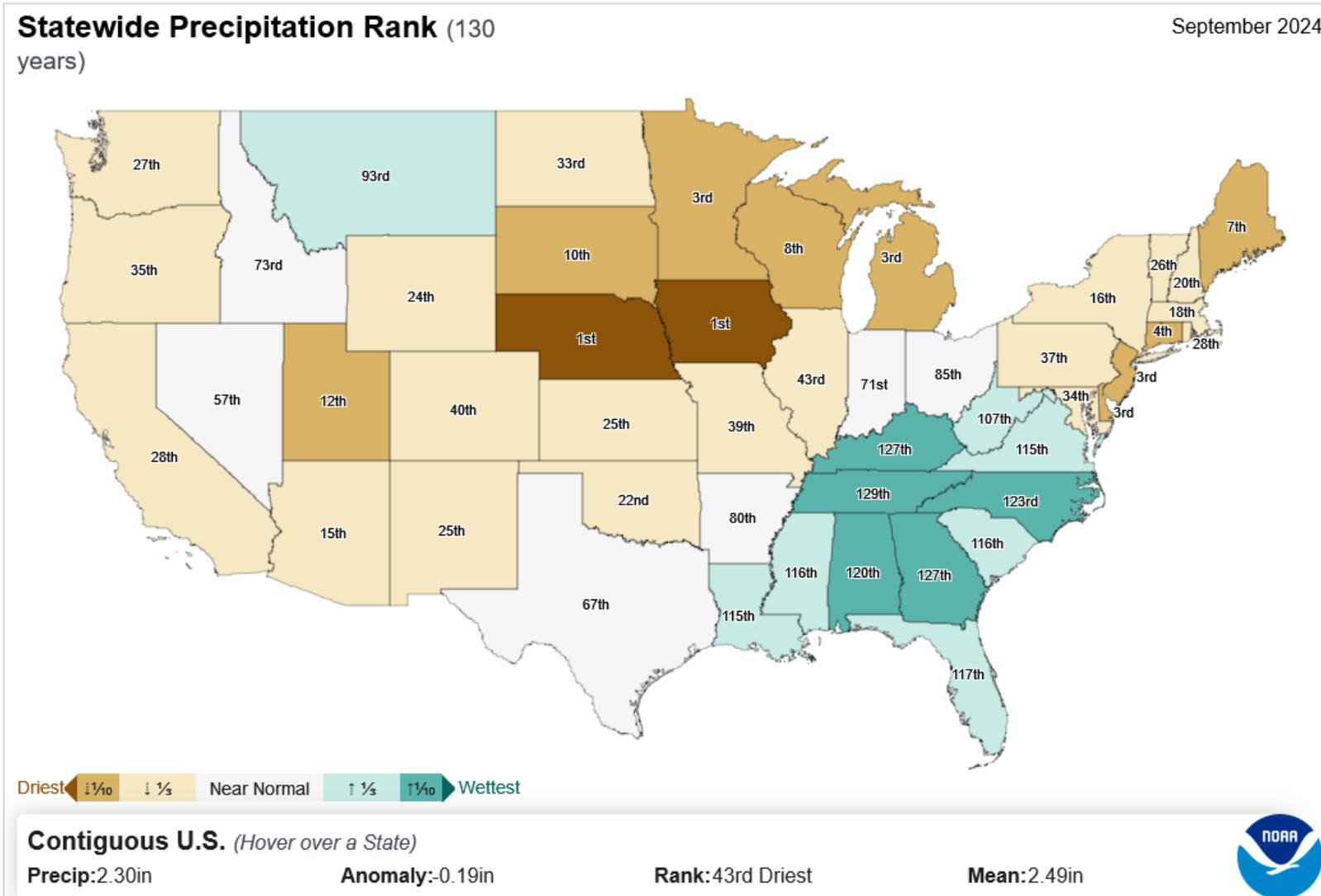
- No states warmest on record but...
- Most of region top-10 and all states in region top 25 (out of 130)
- Anomalies 2.9° F (KY) to 6.4° F (MN & WY) above historical avg.

Final Sep-Oct Temperature Rank Map



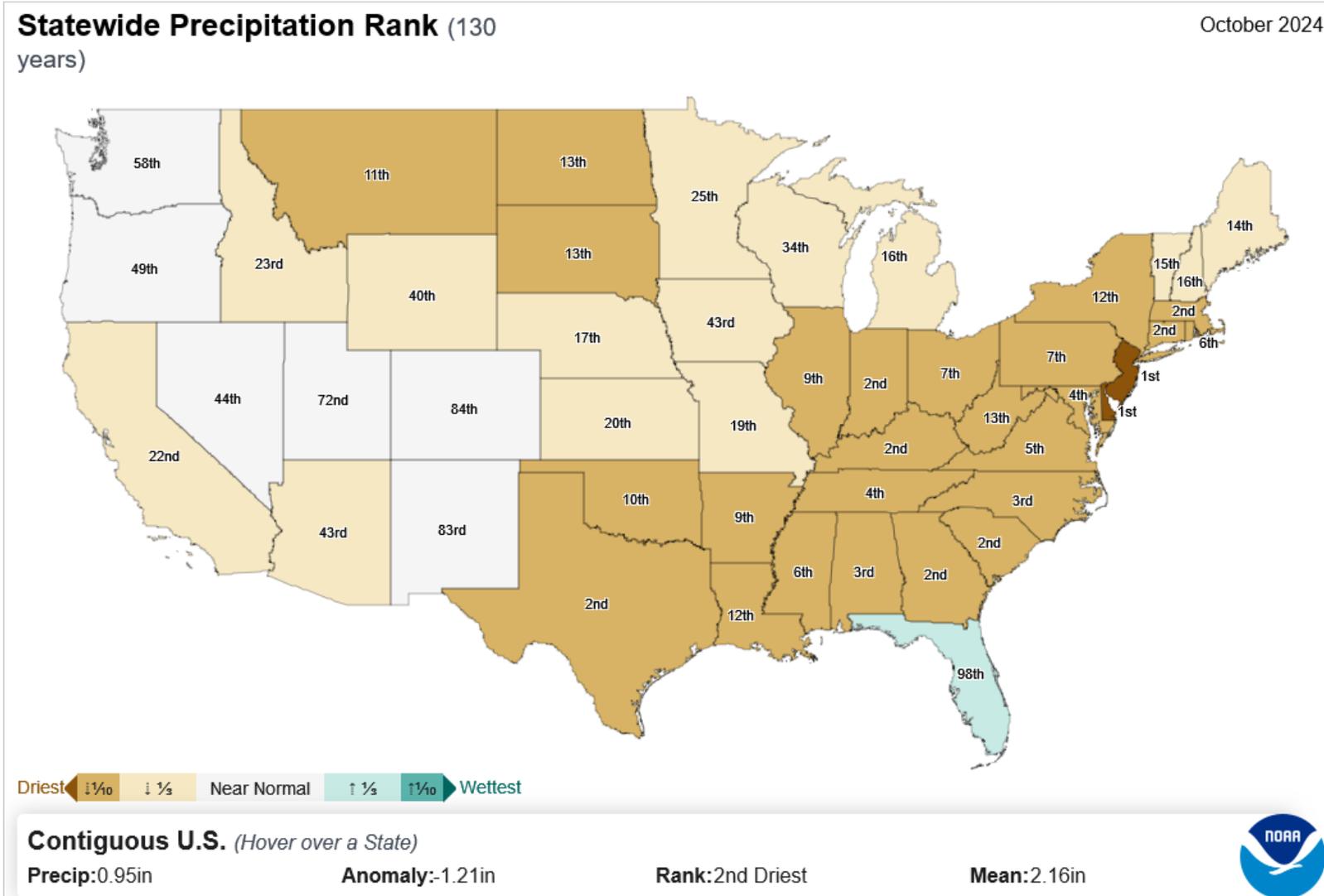
- Record or near-record warmth in west/north (MT and CO to WI)
- Only IN, KY, and MO not in Top-10
- Anomalies 2.5° F (KY) to 7.4° F (MN) above historical avg.

Final September Precipitation Rank Map



- Dark Brown / “1” = driest on record: IA, NE
- Most states dry to very dry
- MT wet and KY very wet (Helene)
- Anomalies -3 inches (IA) to 3+ inches (KY) from historical avg.

Final October Precipitation Rank Map

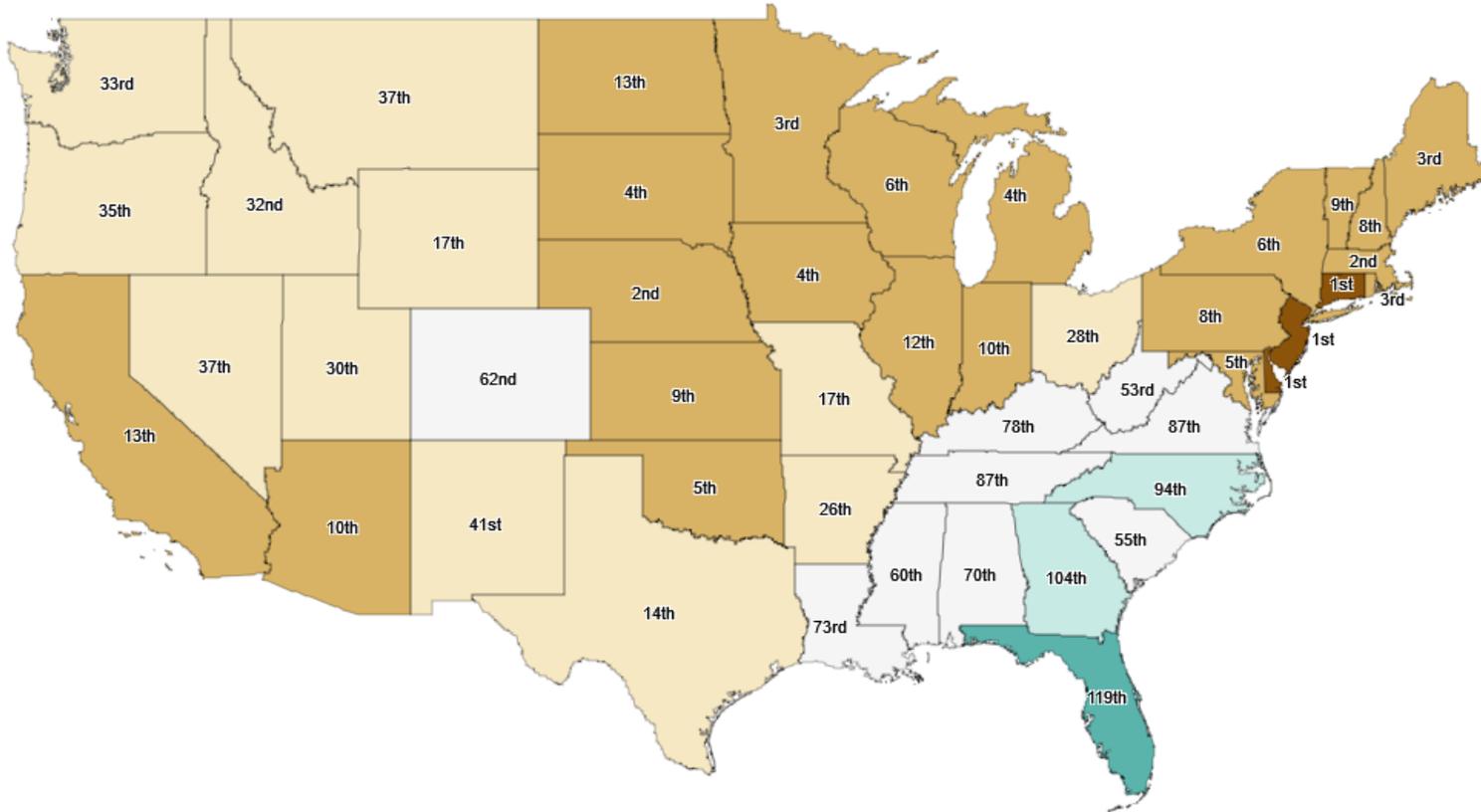


- Uniformly dry across region with top-10 dryness IL, IN, KY, OH
- Anomalies -0.67 inches (WI) to -2.59 inches (KY) from historical avg.

Final Sep-Oct Precipitation Rank Map

Statewide Precipitation Rank (130 years)

September - October 2024



Driest $\downarrow \frac{1}{10}$ $\downarrow \frac{1}{5}$ Near Normal $\uparrow \frac{1}{5}$ $\uparrow \frac{1}{10}$ Wettest

Contiguous U.S. (Hover over a State)

Precip: 3.25in

Anomaly: -1.40in

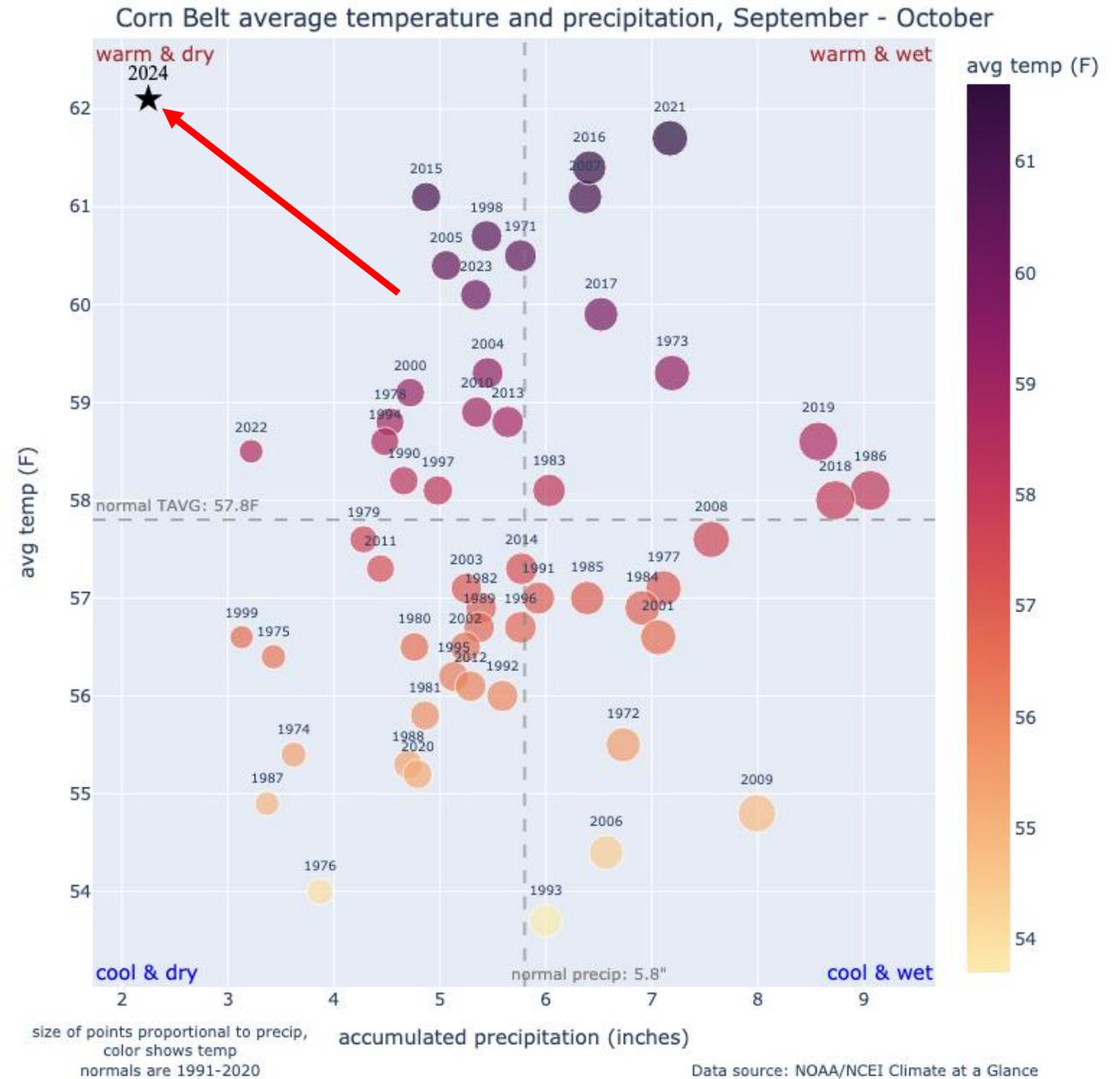
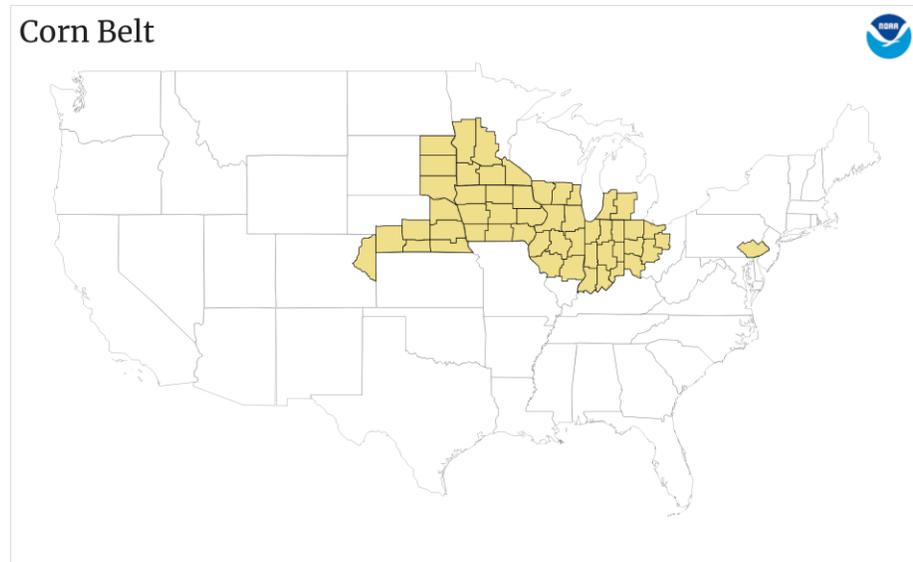
Rank: 7th Driest

Mean: 4.65in



- Uniformly dry across region (except KY) with top-10 dryness in half of states
- Anomalies -3.57 inches (IA) to +0.72 inches (KY) from historical avg.

September – October warmest and driest on record in Corn Belt



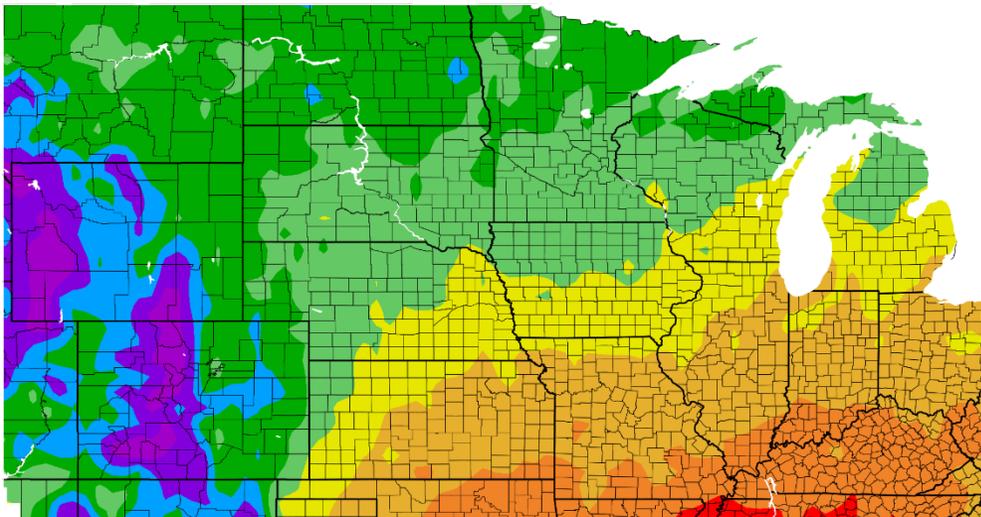


Preliminary November Temperature and Precipitation (thru Nov 20)

Continued warm, but much wetter in most of region, though with continuing dryness in far western areas.

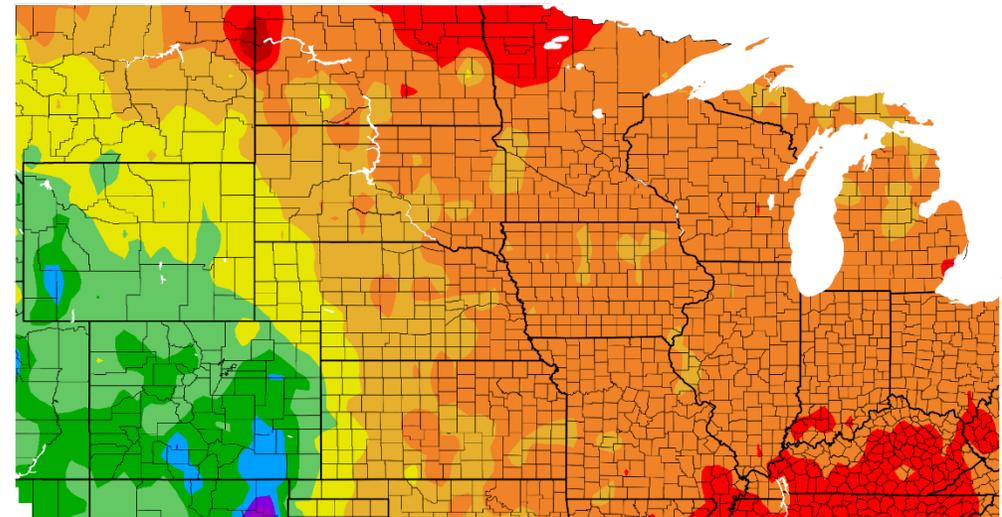
Early & mid-Nov very warm but cool/cold in CO & WY

Temperature (F)
11/1/2024 - 11/20/2024



Generated 11/21/2024 at HPRCC using provisional data. NOAA Regional Climate Centers

Departure from Normal Temperature (F)
11/1/2024 - 11/20/2024

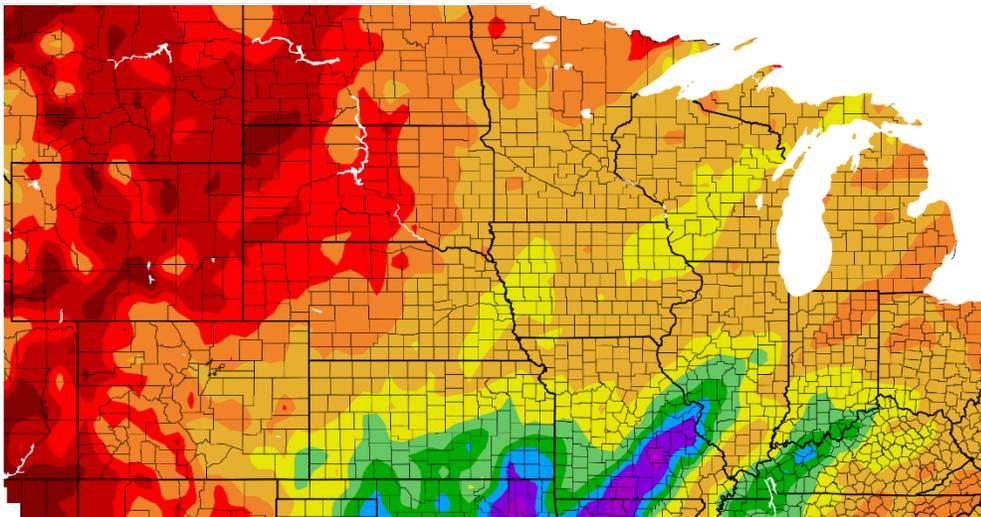


Generated 11/21/2024 at HPRCC using provisional data. NOAA Regional Climate Centers

Red areas at/near record warmth month-to-date

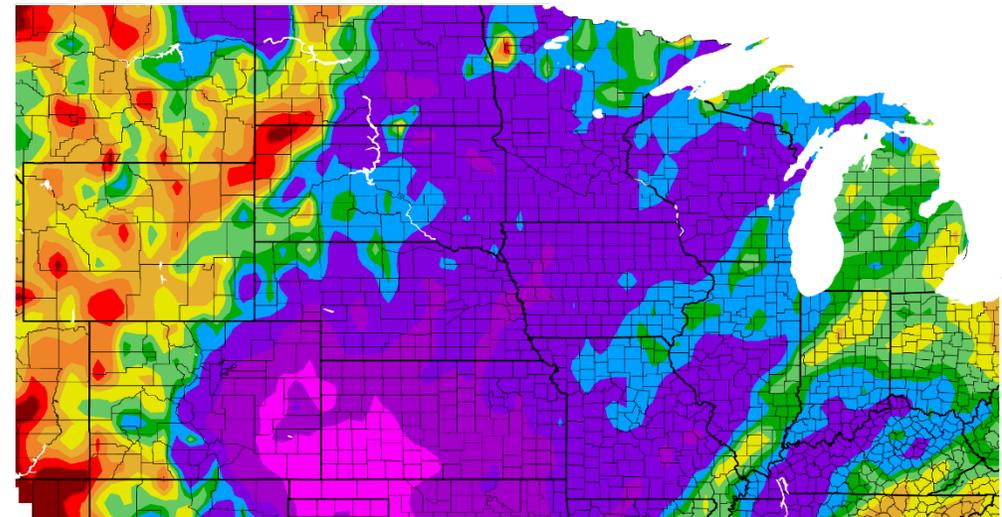
Early & mid-Nov very wet but dry in west

Precipitation (in)
11/1/2024 - 11/20/2024



0.1 0.5 1 2 3.5 5 6.5 8 9.5 11 12.5
Generated 11/21/2024 at HPRCC using provisional data. NOAA Regional Climate Centers

Percent of Normal Precipitation (%)
11/1/2024 - 11/20/2024



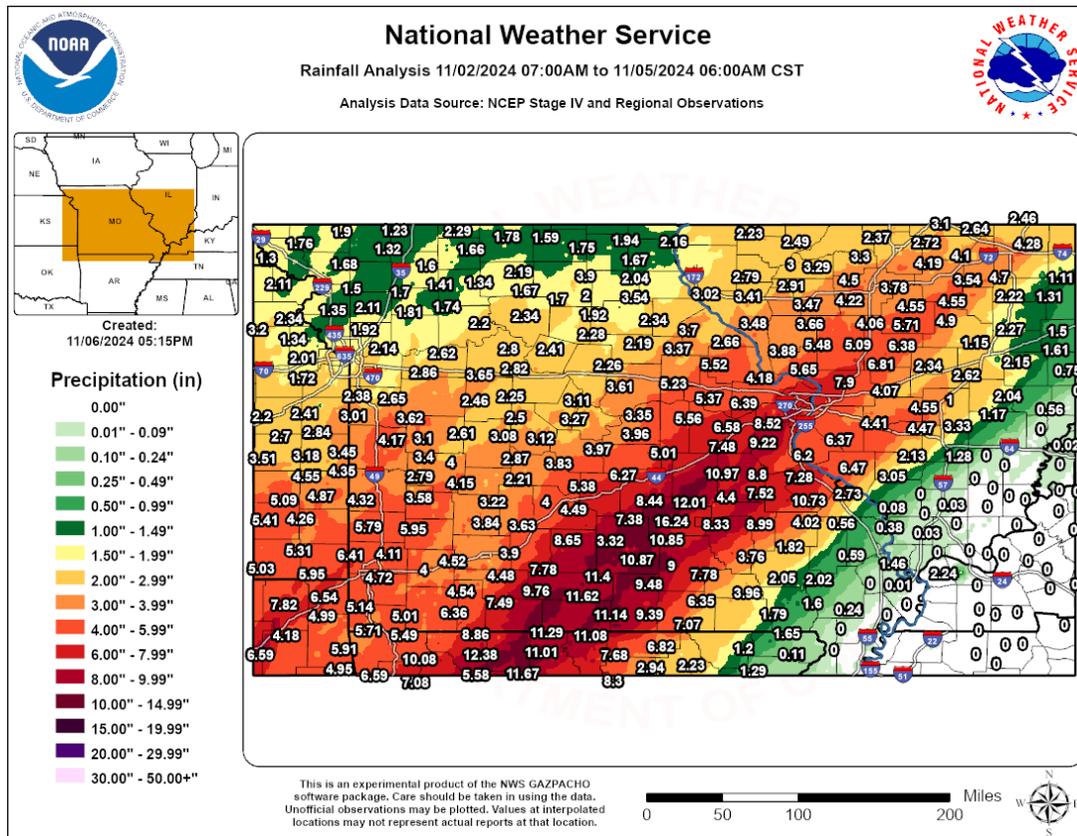
2 5 25 50 75 100 125 150 200 400 800
Generated 11/21/2024 at HPRCC using provisional data. NOAA Regional Climate Centers

Some areas at/near record wetness for month

Events and Impacts

Multiple precipitating weather systems since late October, with rainfall extremes in southern areas, a “whopper” snowstorm in Colorado, and additional heavy rain in the Ohio River area.

Heavy rains KS, MO, IL from Nov 2-5

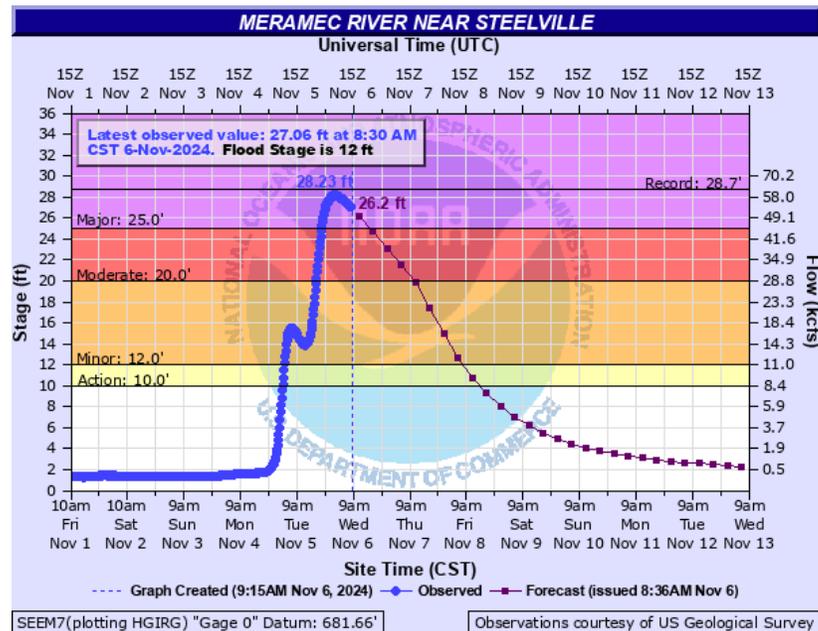


https://www.weather.gov/lx/11_4_2024

- Multi-day totals in southern MO 4-10 inches common, with higher amounts
- New 2-day statewide precip record of 12.50 inches (old record 9.74")
- Wettest November on record in MO?
- 2-6 inches common back through southern and eastern KS
- Amounts broke many calendar day and November daily precipitation records

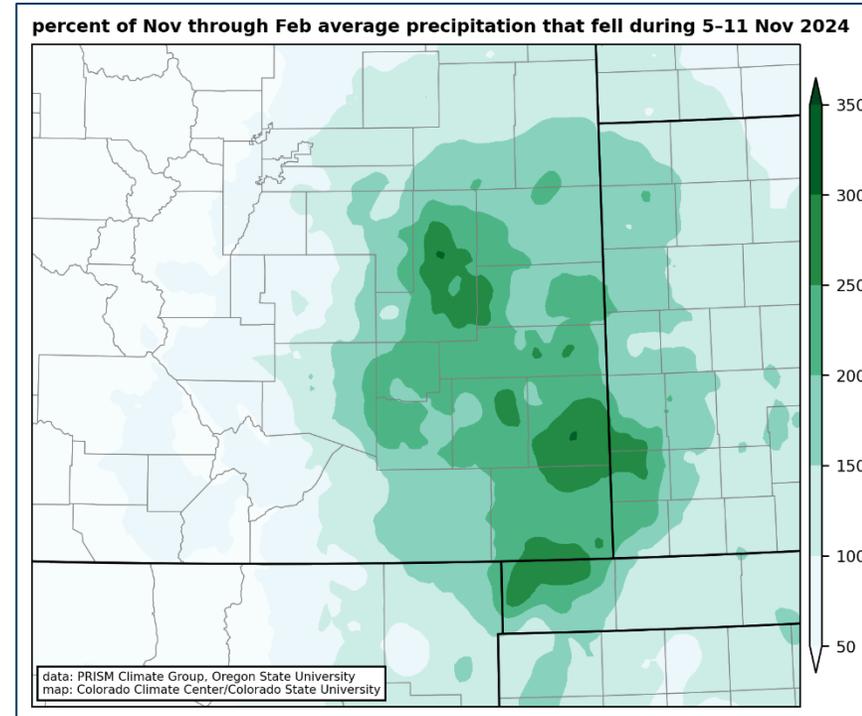
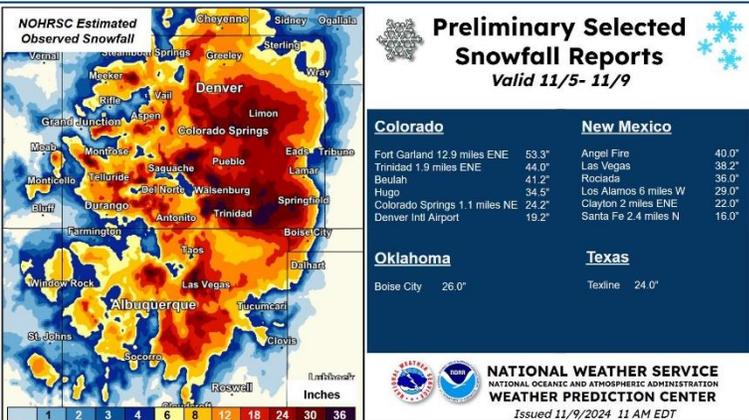
→ More heavy precip near Ohio R since then

- Flooding with fatalities St. Louis area and other parts of Missouri
- Moderate to major stream flooding

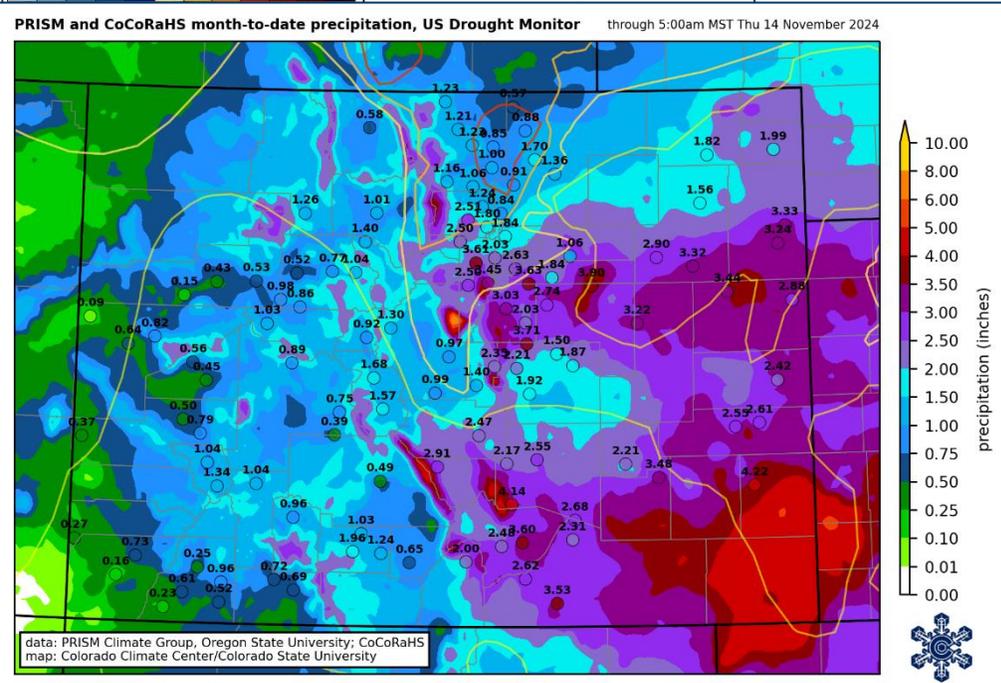


Courtesy STLPD

“Whopper” Colorado Snowstorm(s) Nov 4-10



mi DEPARTMENT OF NATURAL RESOURCES
State Climatology Office

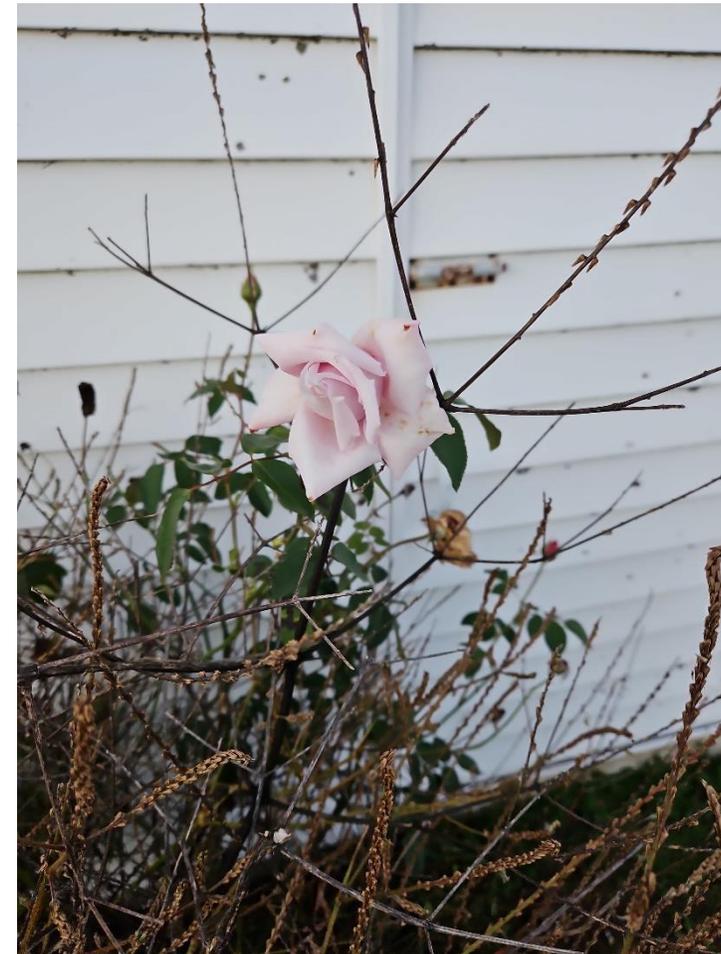


- Unusually heavy low-elevation snow
- Event exceeded normal Nov-Feb precipitation in many areas

<https://climate.colostate.edu/blog/index.php/2024/11/18/a-whopper-of-a-snowstorm/>

Other impacts

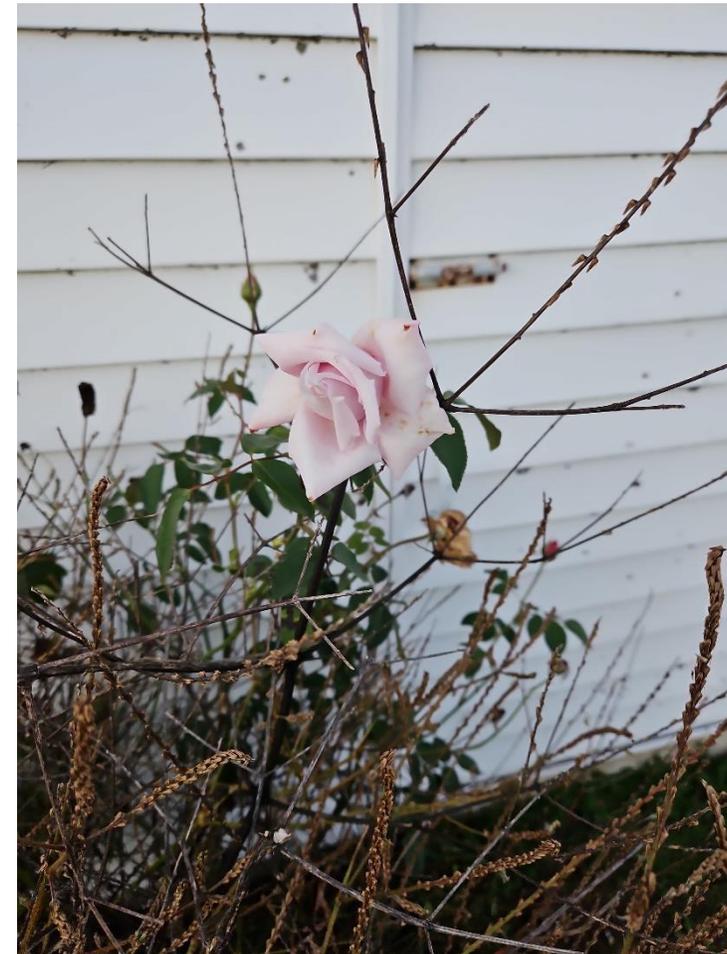
- Some wildfires including many agricultural fire (and combine fires)
- Great Lakes temperatures $\sim 5^\circ\text{F}$
 - Lake-effect snow potential
- Late freezes leading to active fall vegetation throughout region
 - Odd second blooms including lilacs in MN, roses in IN, and various trees and perennials elsewhere



Courtesy H. Schmitz

Other impacts

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Courtesy H. Schmitz, Purdue Extension

Other impacts



Remnants of an October field fire from Parke County, Indiana.
Courtesy K. Lanzone, Purdue Extension Parke County

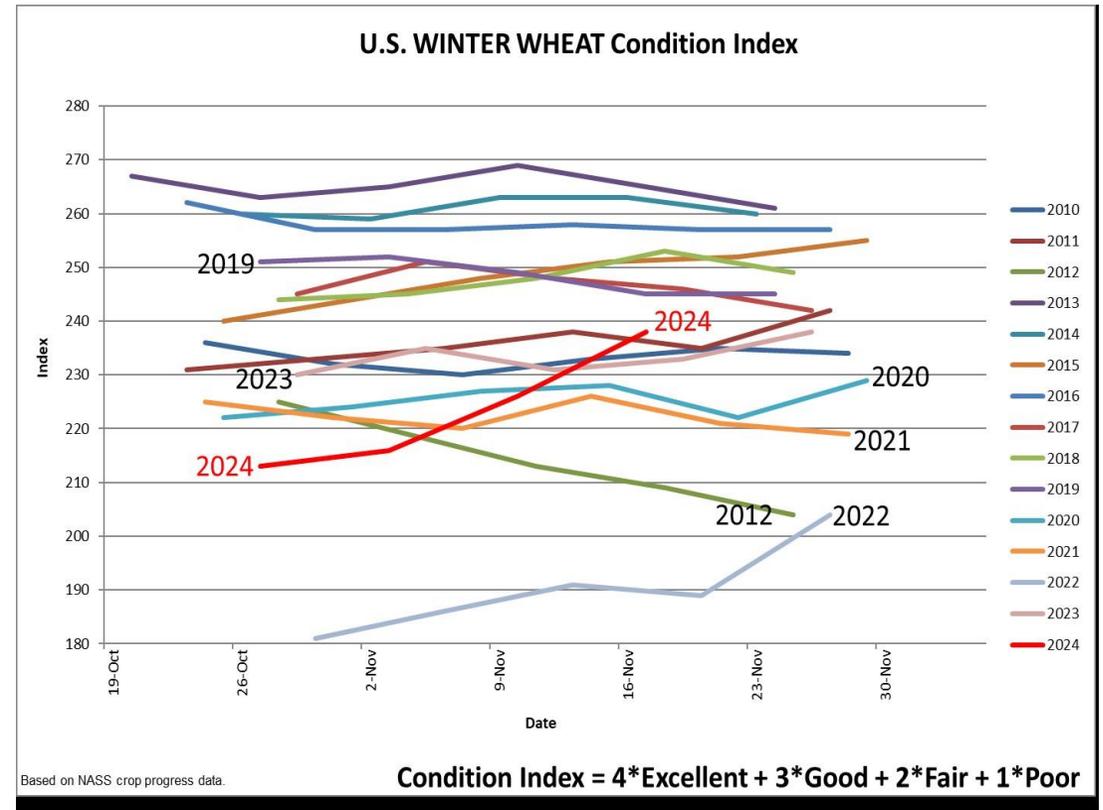


October 21, 2024 dry creek in Happy Hollow Park located in Lafayette, Indiana.
Courtesy A. Adair, Purdue Extension

Recent rains helped improve wheat emergence and growth



Pasture regrowth in Ohio.
Courtesy A. Wilson, State Climate Office of Ohio



Courtesy B. Rippey, USDA

Drought and Hydrology

General easing of drought, except in western area



US Drought Monitor, Nov 19

November 19, 2024

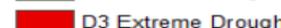
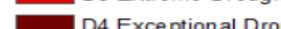
(Released Thursday, Nov. 21, 2024)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	20.64	79.36	56.39	23.92	7.19	0.28
Last Week <i>11-12-2024</i>	15.46	84.54	58.78	31.16	6.74	0.30
3 Months Ago <i>08-20-2024</i>	50.17	49.83	21.87	7.52	1.68	0.11
Start of Calendar Year <i>01-02-2024</i>	39.12	60.88	34.11	13.18	2.68	0.01
Start of Water Year <i>10-01-2024</i>	20.79	79.21	36.88	12.04	3.20	0.40
One Year Ago <i>11-21-2023</i>	46.15	53.85	30.93	13.25	2.82	0.25

Intensity:

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

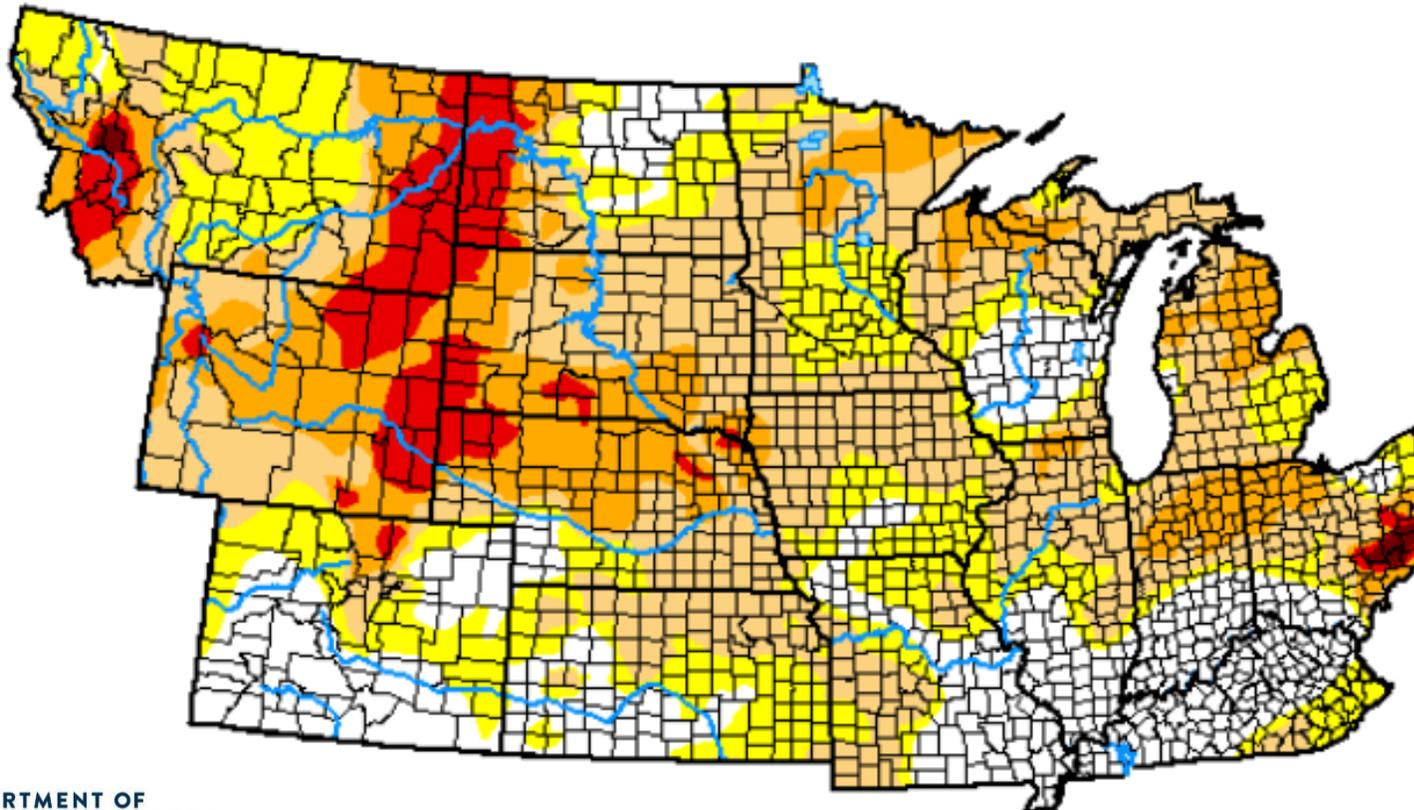
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

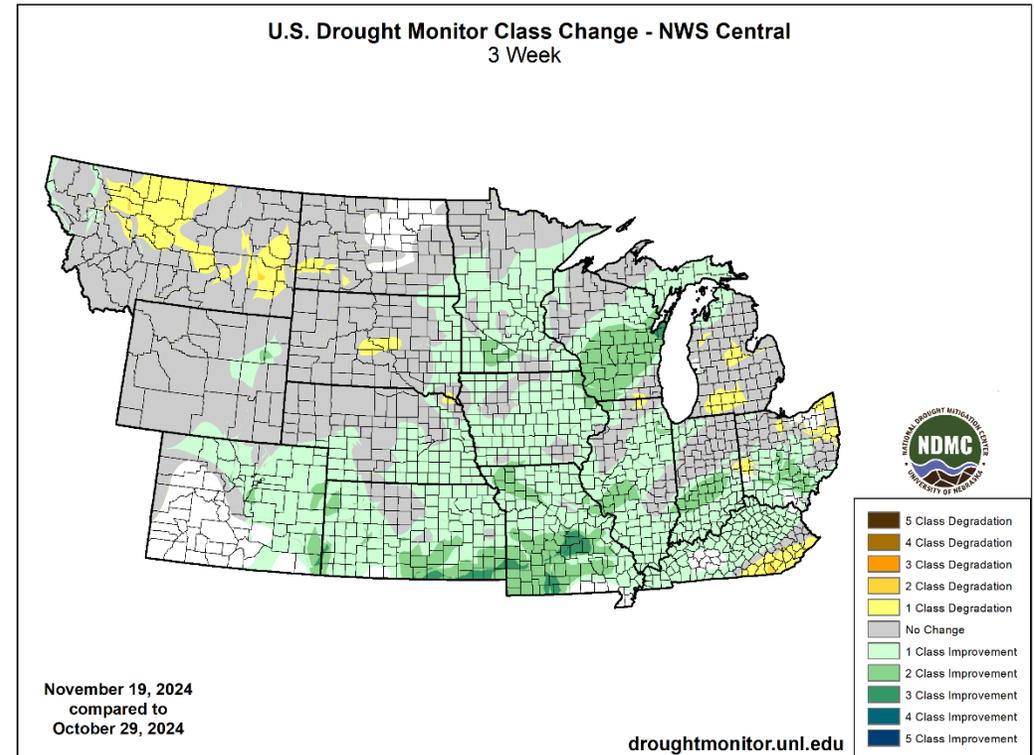
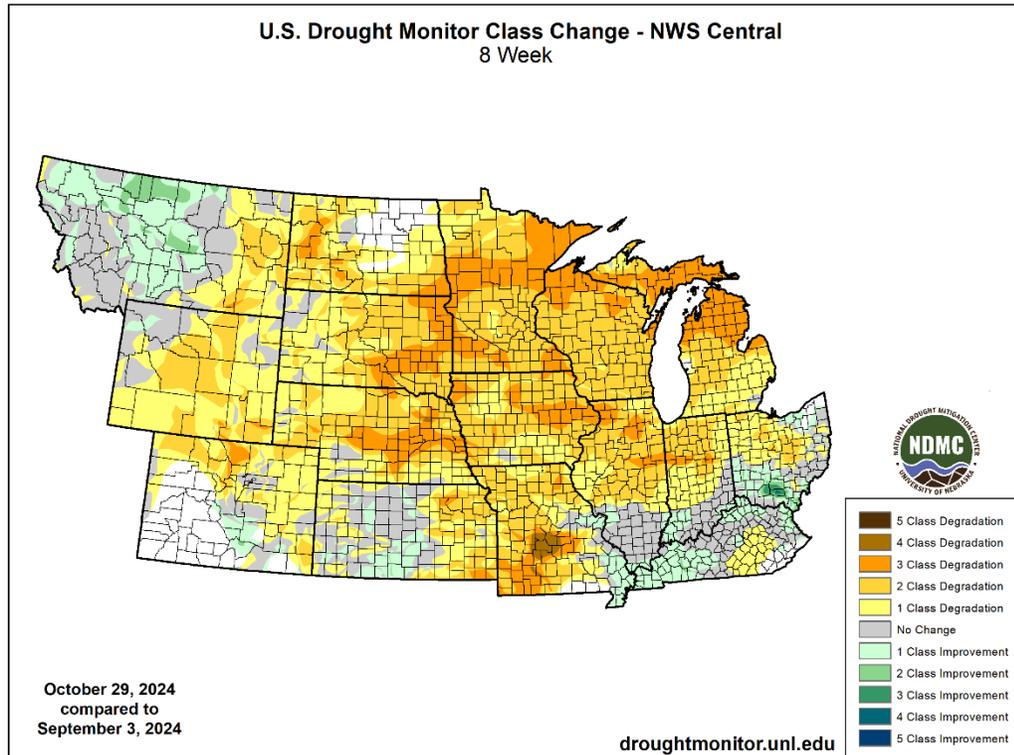
Richard Tinker
CPC/NOAA/NWS/NCEP



droughtmonitor.unl.edu

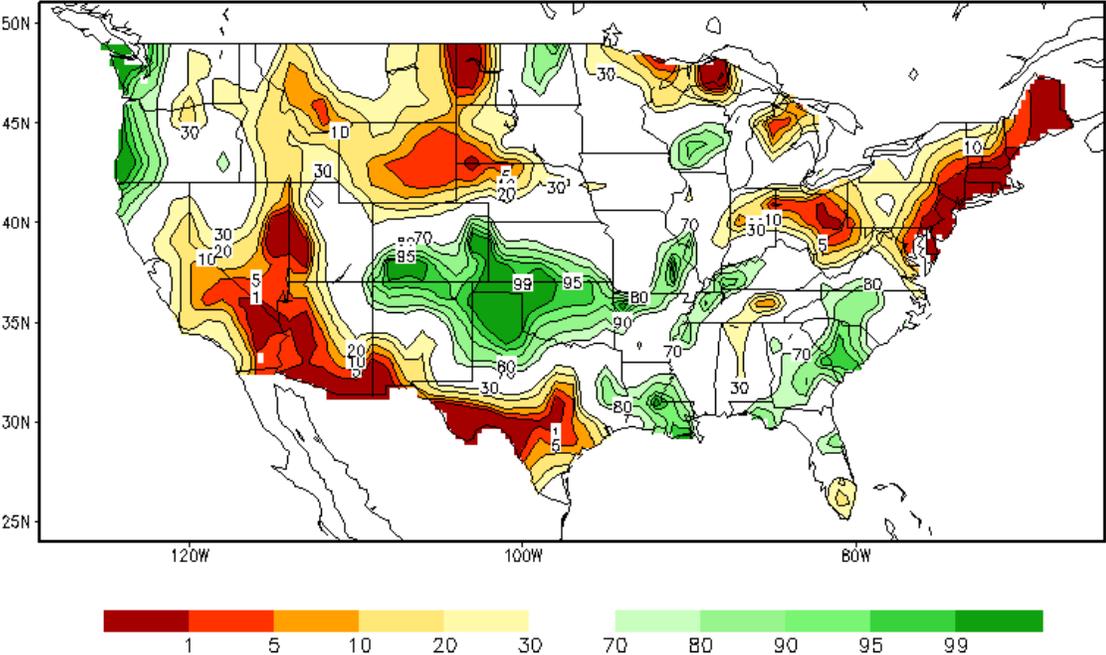


Drought Change



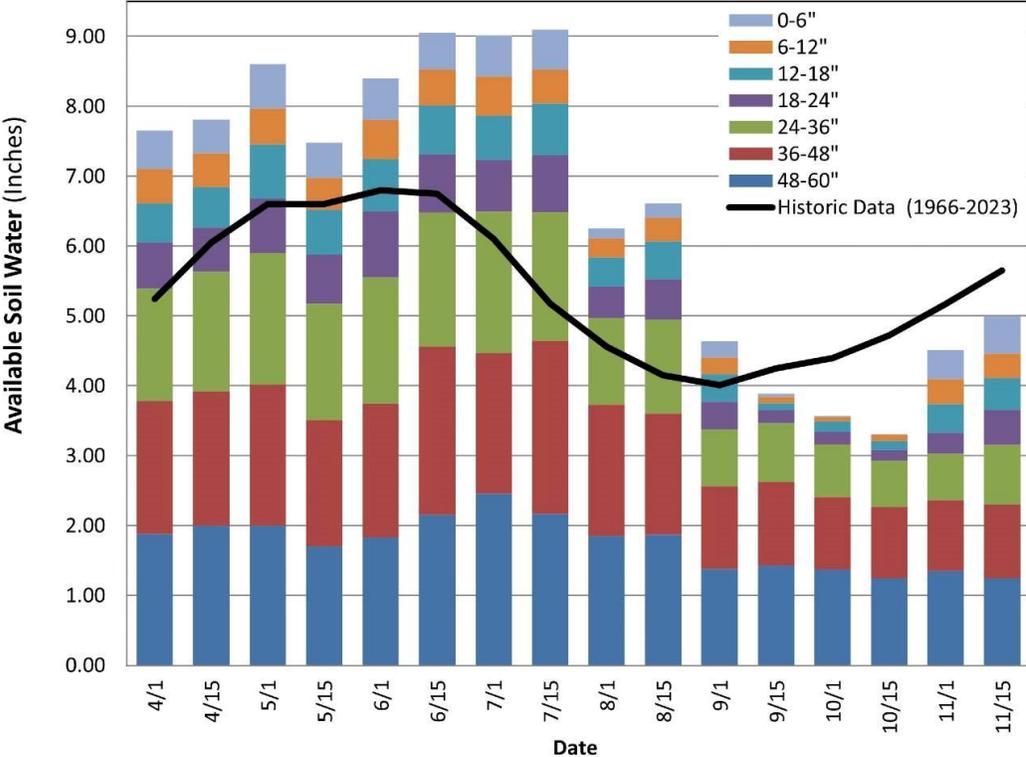
Soil Moisture

Calculated Soil Moisture Ranking Percentile
NOV 20, 2024



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

SWROC Available Soil Water - 2024



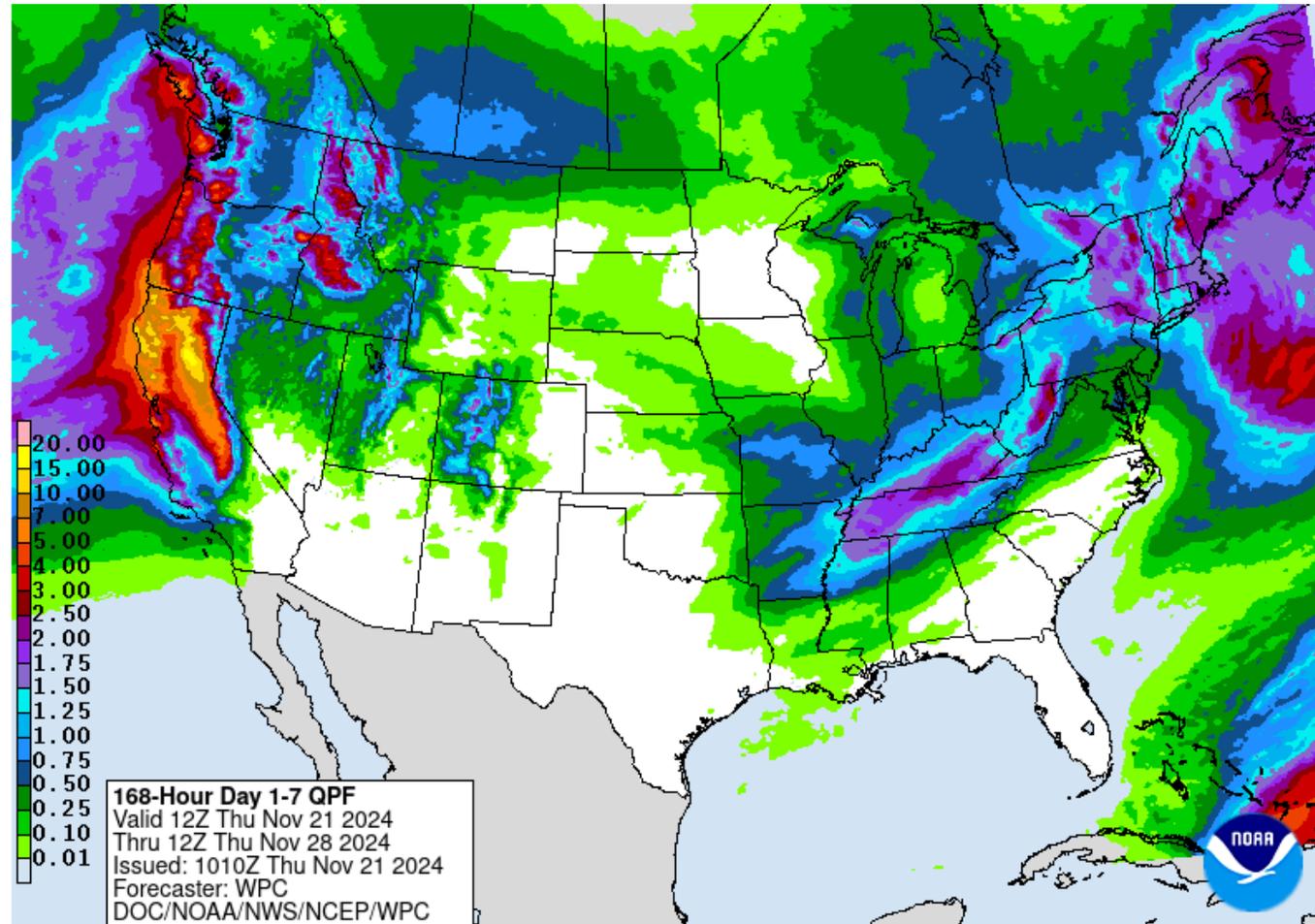
<https://swroc.cfans.umn.edu/weather/graphs>



Outlooks

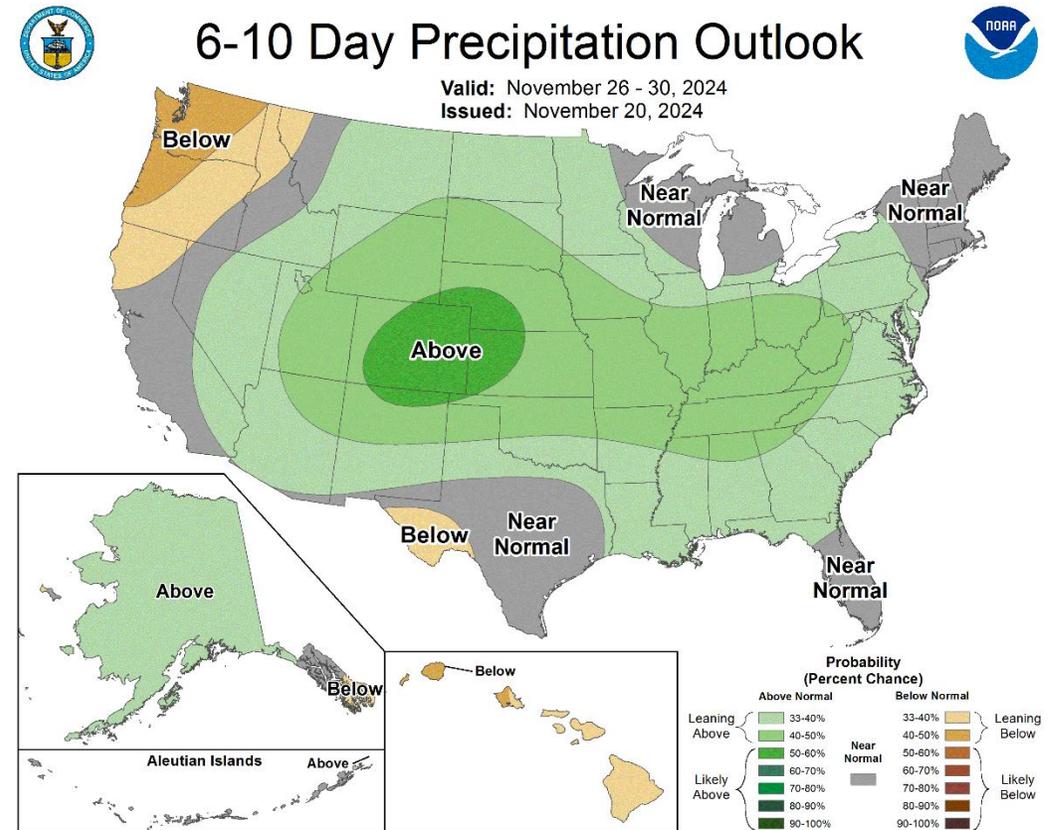
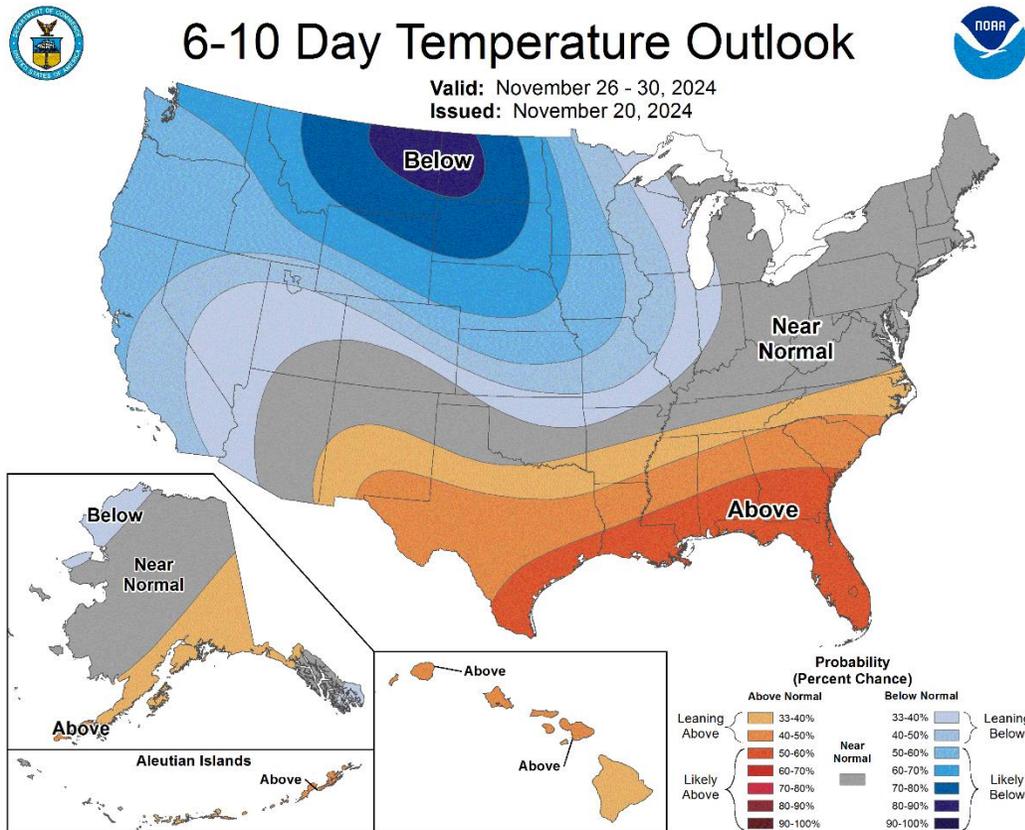
Cool and wet near-term with La Niña influence for winter

7-day forecast precipitation



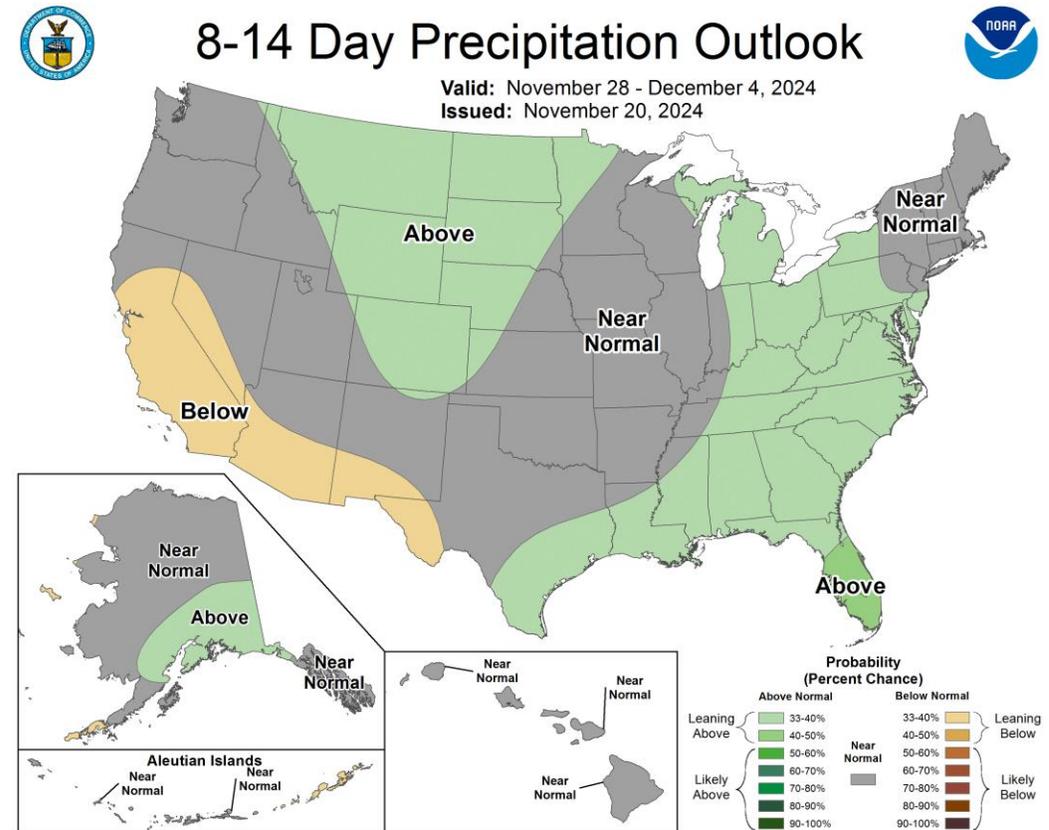
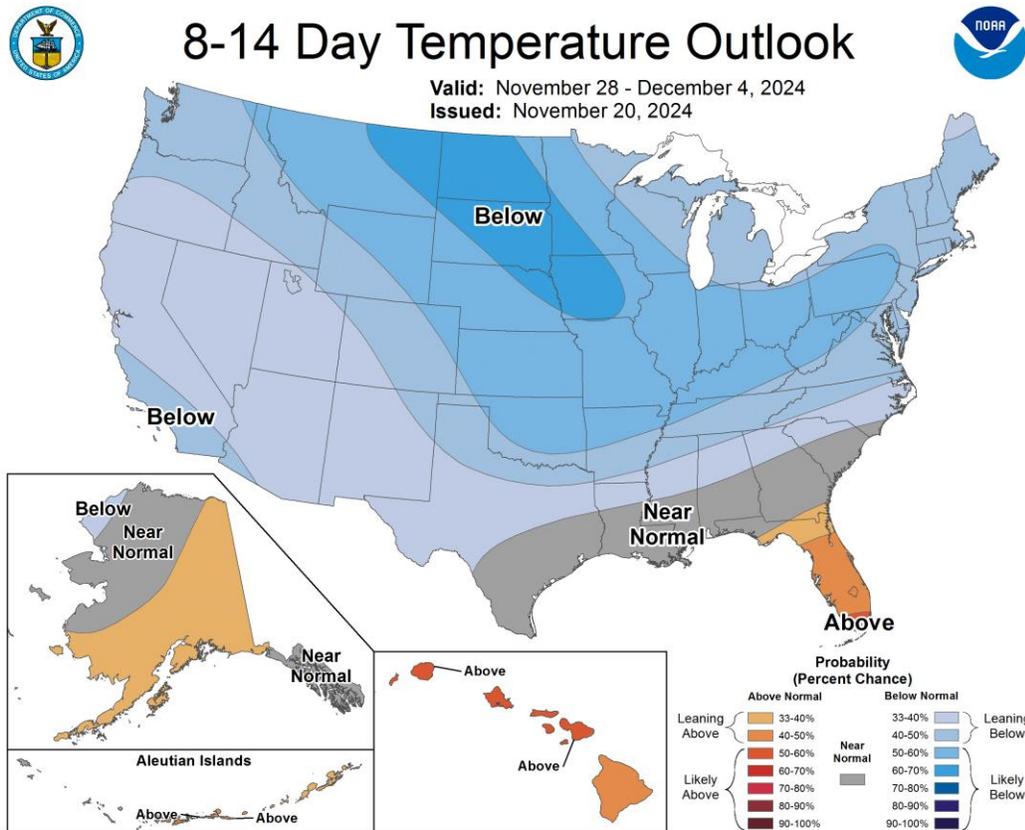
Climate Prediction Center 6-10 day outlook

<https://www.cpc.ncep.noaa.gov/index.php>



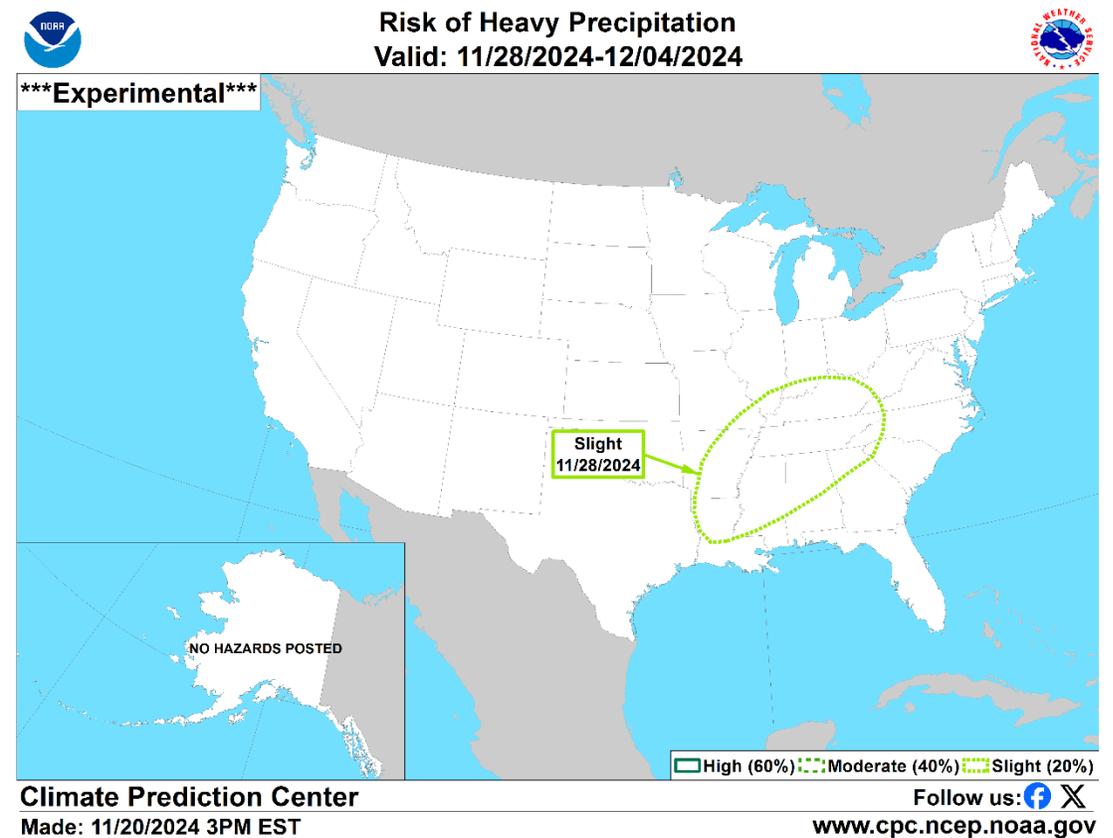
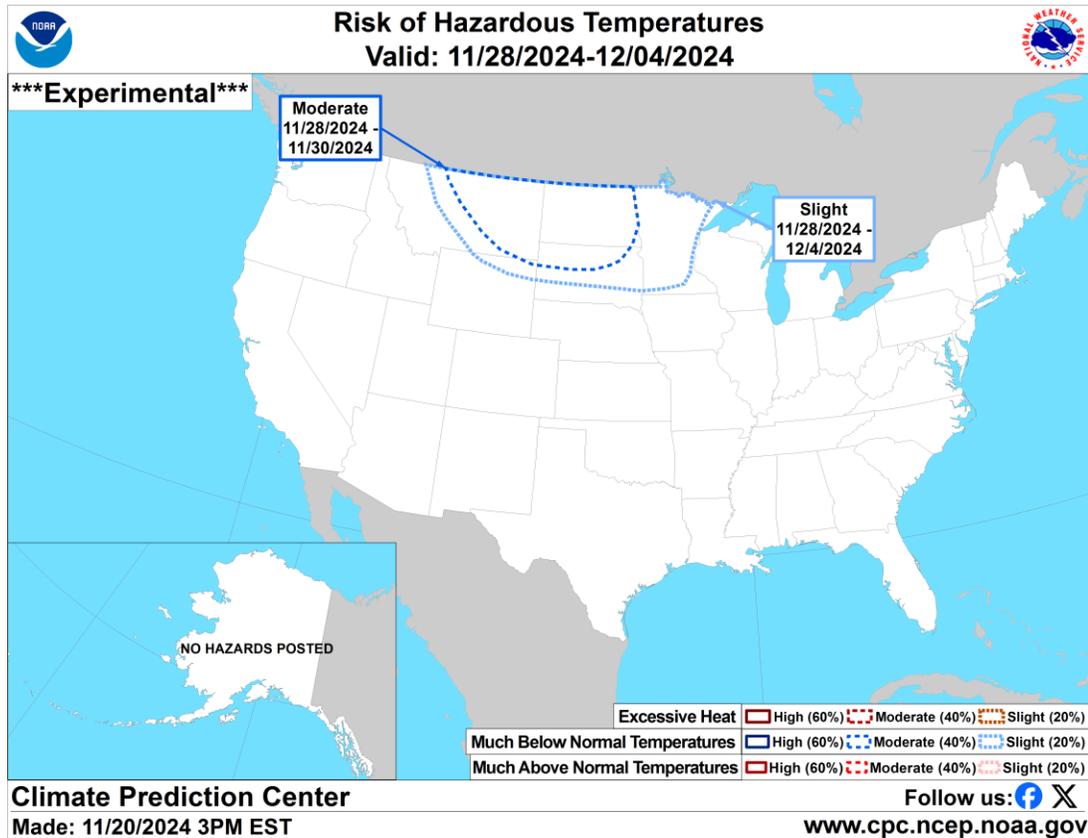
Climate Prediction Center 8-14 day outlook

<https://www.cpc.ncep.noaa.gov/index.php>



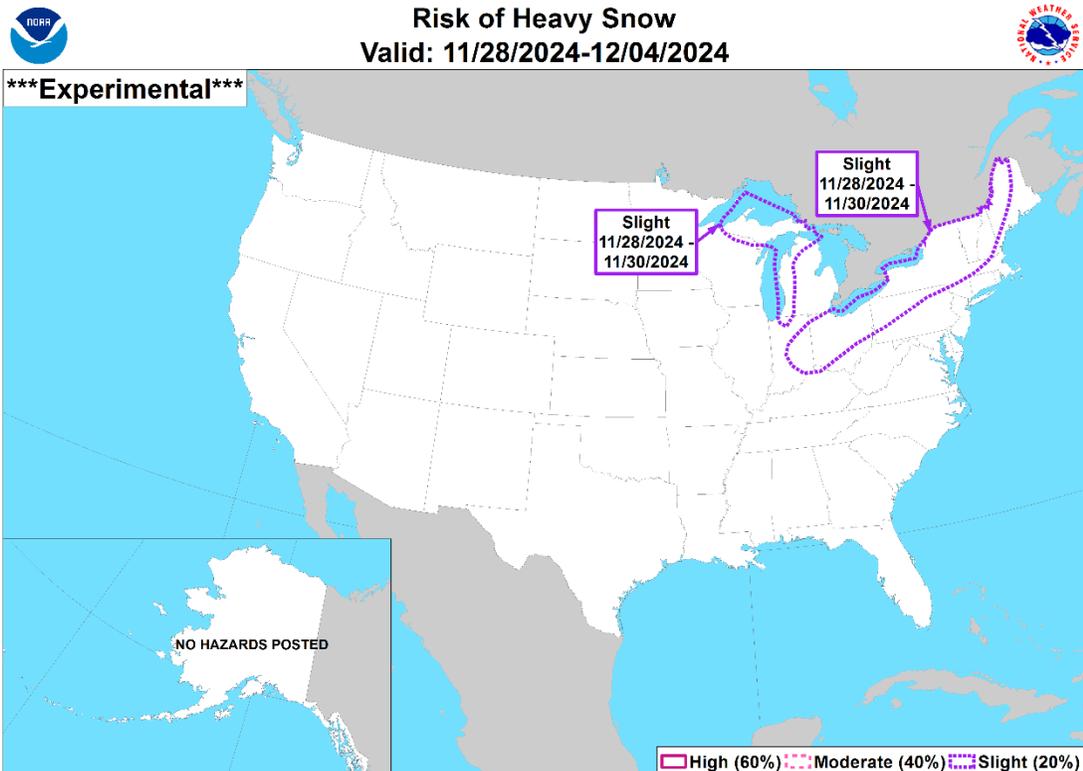
Climate Prediction Center 8-14 day Temperature and Precipitation Hazards

<https://www.cpc.ncep.noaa.gov/products/predictions/threats/threats.php>



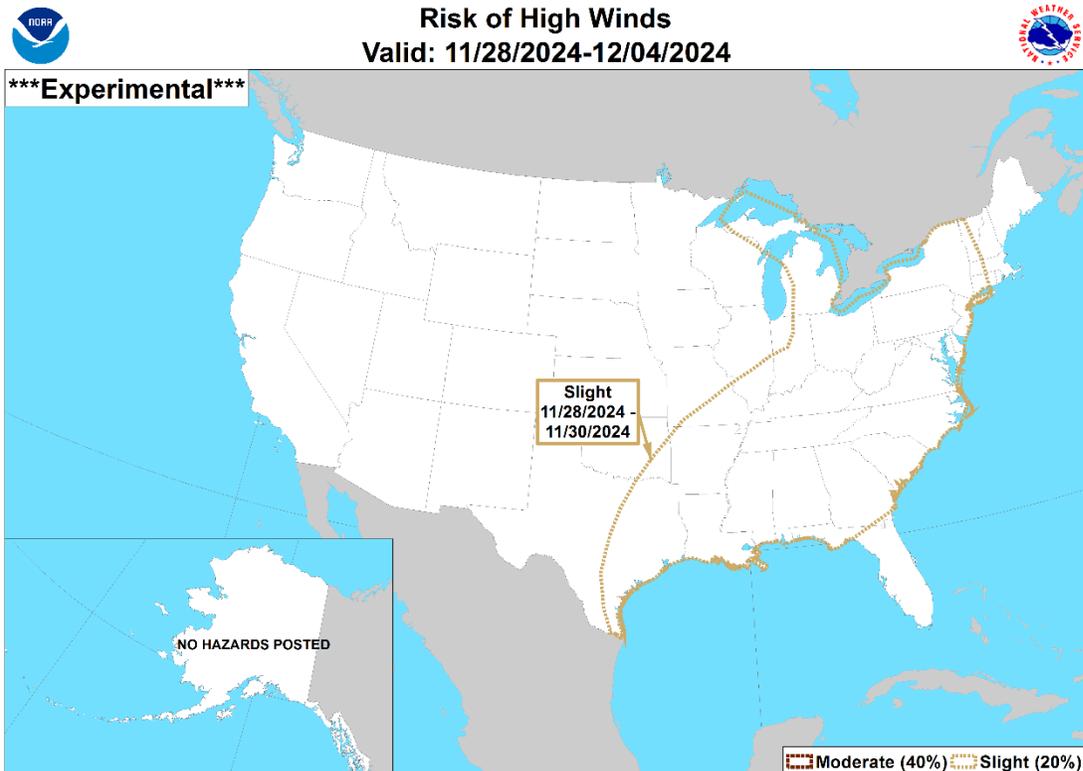
Climate Prediction Center 8-14 day Snow and Wind Hazards

<https://www.cpc.ncep.noaa.gov/products/predictions/threats/threats.php>



Climate Prediction Center
Made: 11/20/2024 3PM EST

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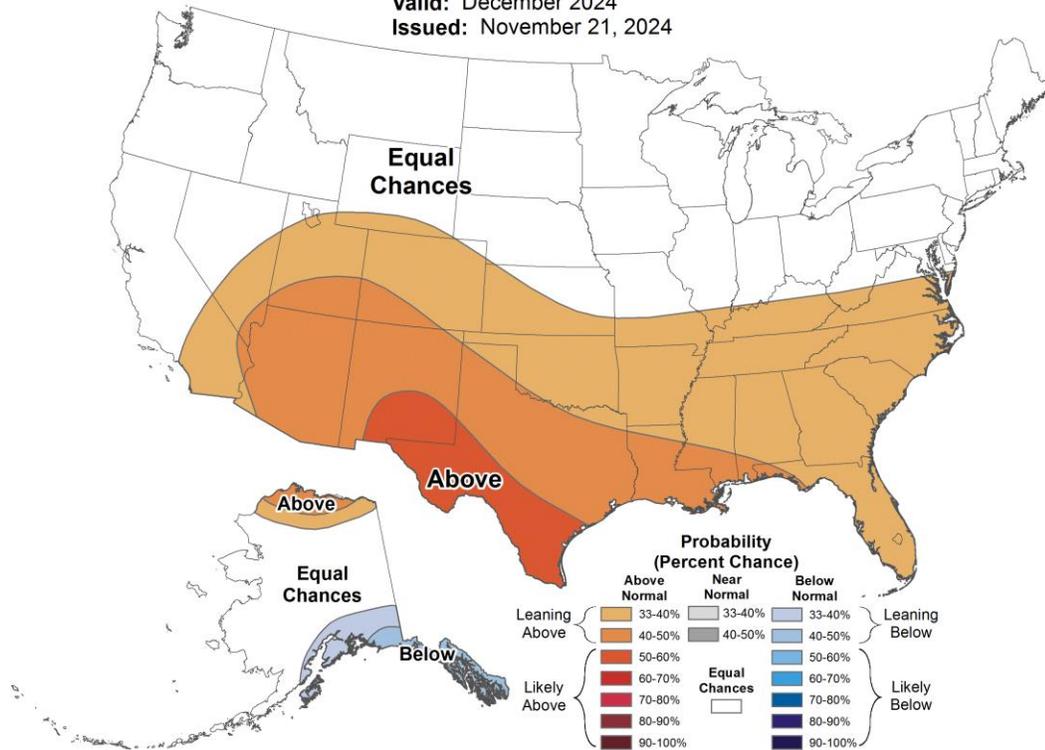
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Monthly Temperature Outlook



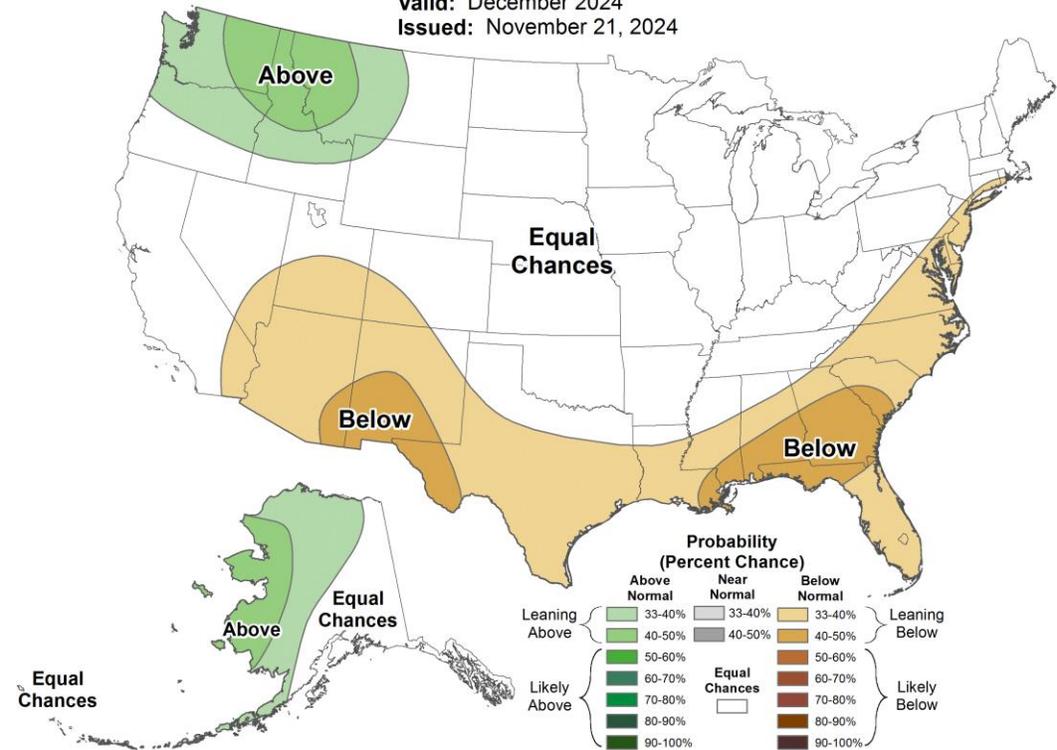
Valid: December 2024
Issued: November 21, 2024



Monthly Precipitation Outlook



Valid: December 2024
Issued: November 21, 2024



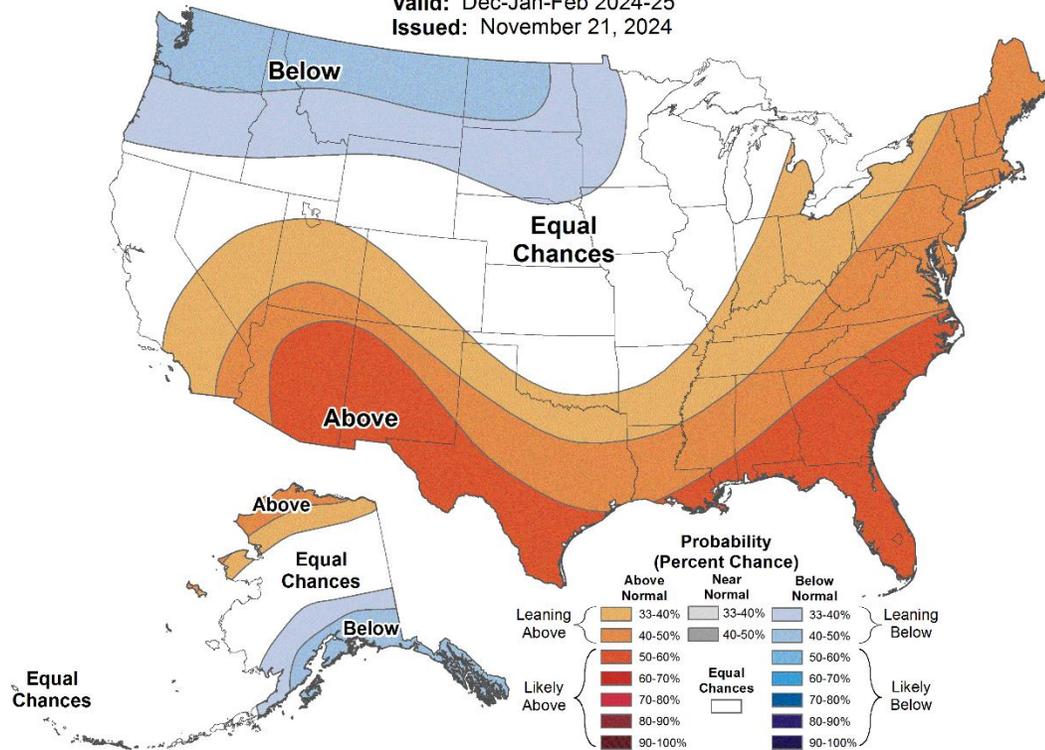
December 2024 thru Feb 2025



Seasonal Temperature Outlook



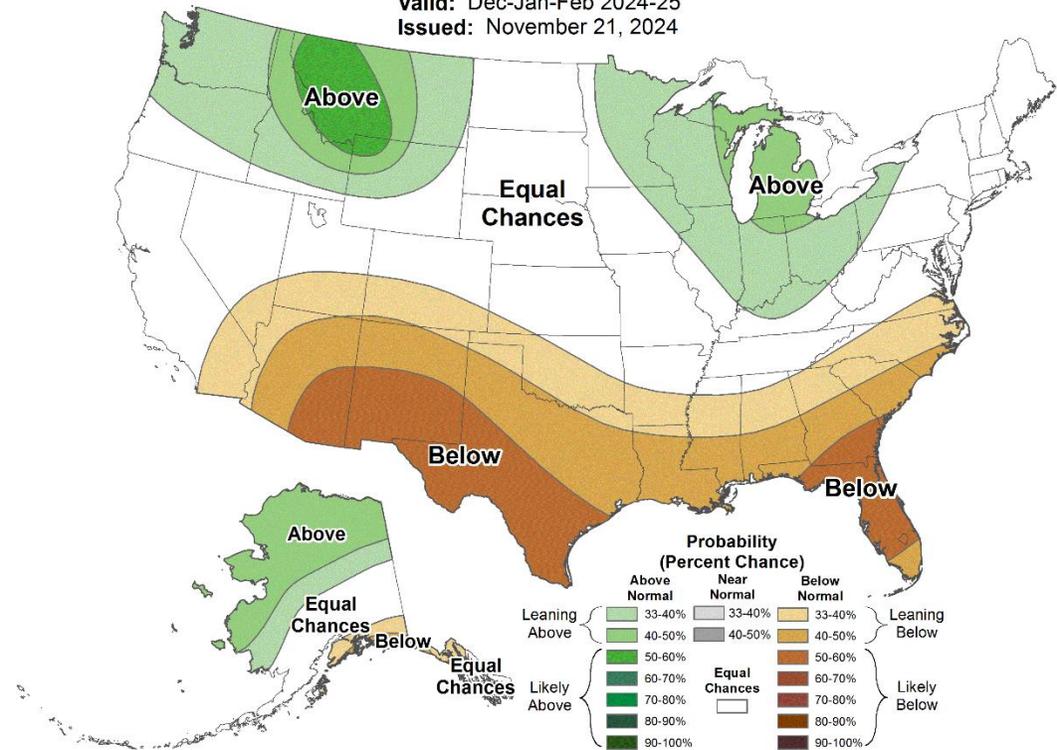
Valid: Dec-Jan-Feb 2024-25
Issued: November 21, 2024



Seasonal Precipitation Outlook



Valid: Dec-Jan-Feb 2024-25
Issued: November 21, 2024

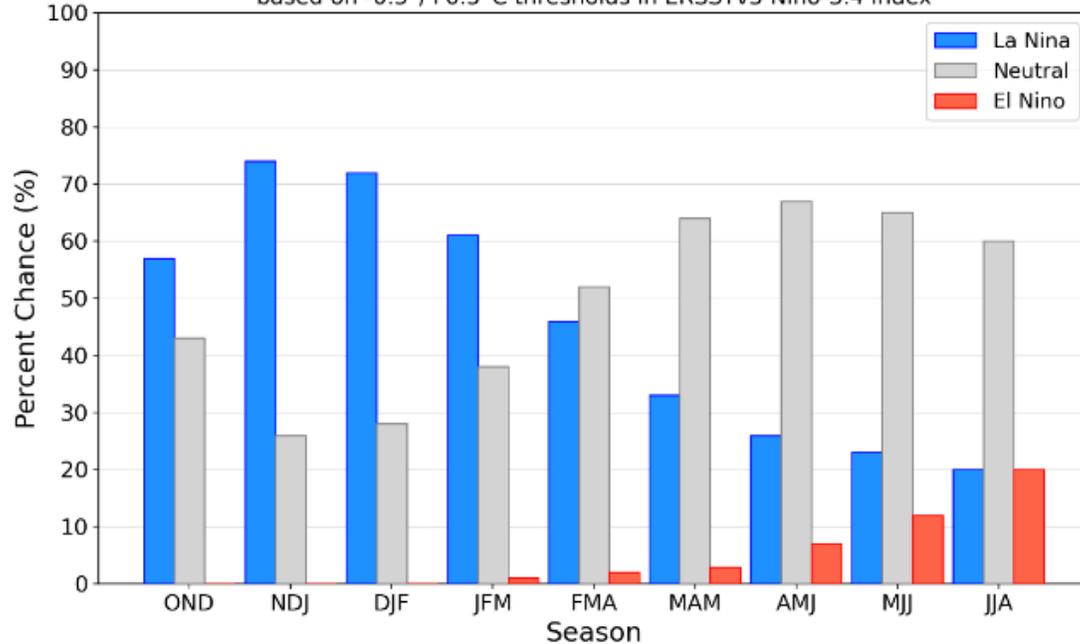


La Niña Outlook

- Winter 2024-25 outlook influenced by La Niña, expected to develop during early or mid-winter

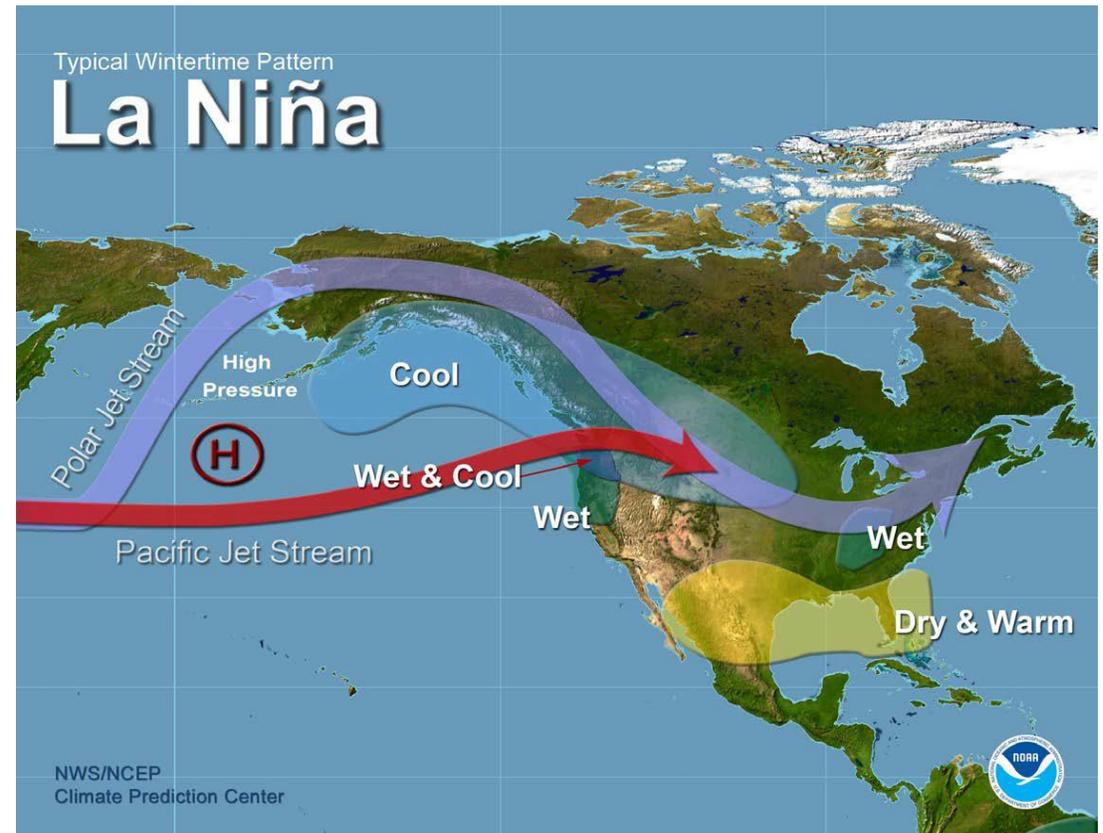
Official NOAA CPC ENSO Probabilities (issued November 2024)

based on $-0.5^{\circ}/+0.5^{\circ}\text{C}$ thresholds in ERSSTv5 Niño-3.4 index



<https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml#discussion>

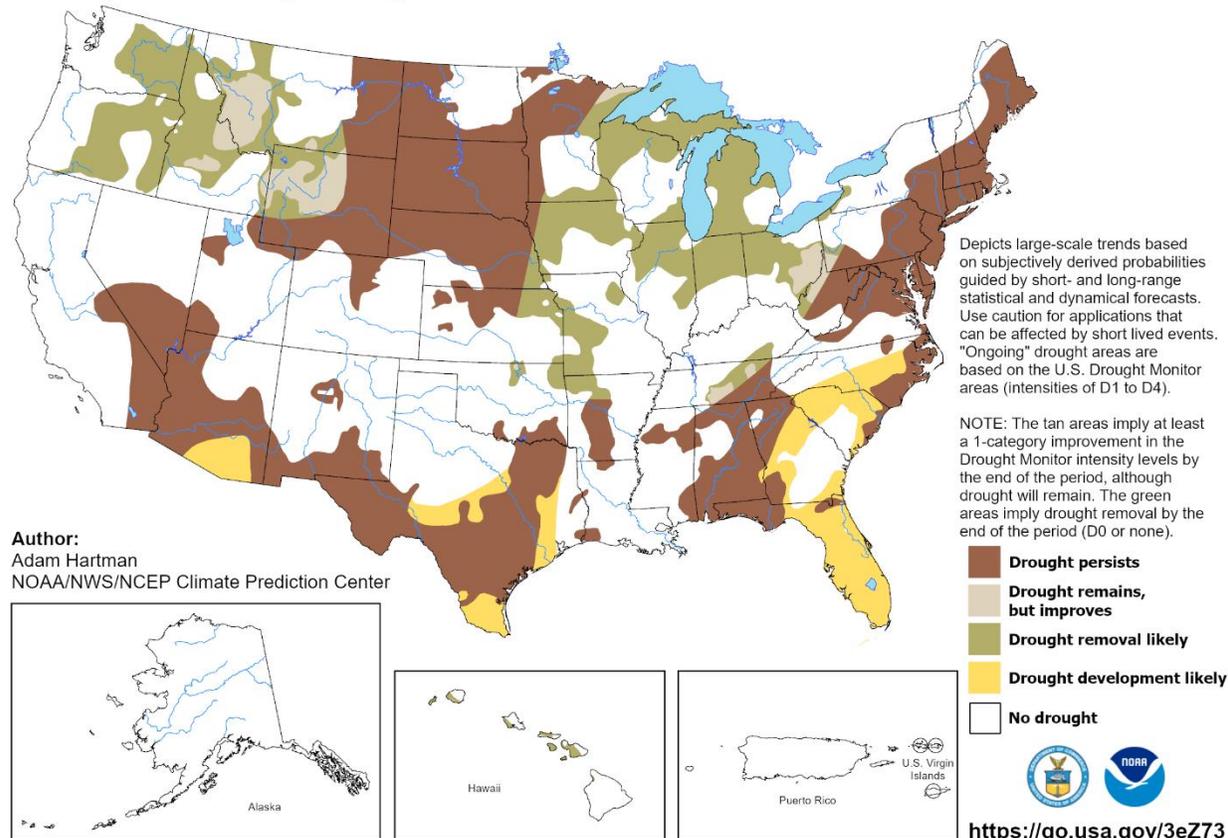
- La Niña often associated with cool and sometimes wet (snowy) conditions in the northern US.



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

Seasonal Drought Outlook

U.S. Seasonal Drought Outlook Valid for November 21, 2024 - February 28, 2025 Drought Tendency During the Valid Period Released November 21, 2024



Thank You!

Climate

- Kenny Blumenfeld: kenneth.Blumenfeld@state.mn.us
- Dennis Todey: dennis.todey@usda.gov
- Doug Kluck: doug.kluck@noaa.gov
- Gannon Rush: grush2@unl.edu
- Melissa Widhalm: mwidhalm@purdue.edu
- Brian Fuchs: bfuchs2@unl.edu
- Molly Woloszyn: molly.woloszyn@noaa.gov



Lake Superior from the Duluth MN Lakewalk/trail

Courtesy K. Blumenfeld