



SOUTH DAKOTA STATE
UNIVERSITY EXTENSION

North Central U.S. Climate & Drought Outlook

October 2021

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Lilac in bloom in early Oct. 2021
Photo credit:
Ray Wolf



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 18, 2021

- 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

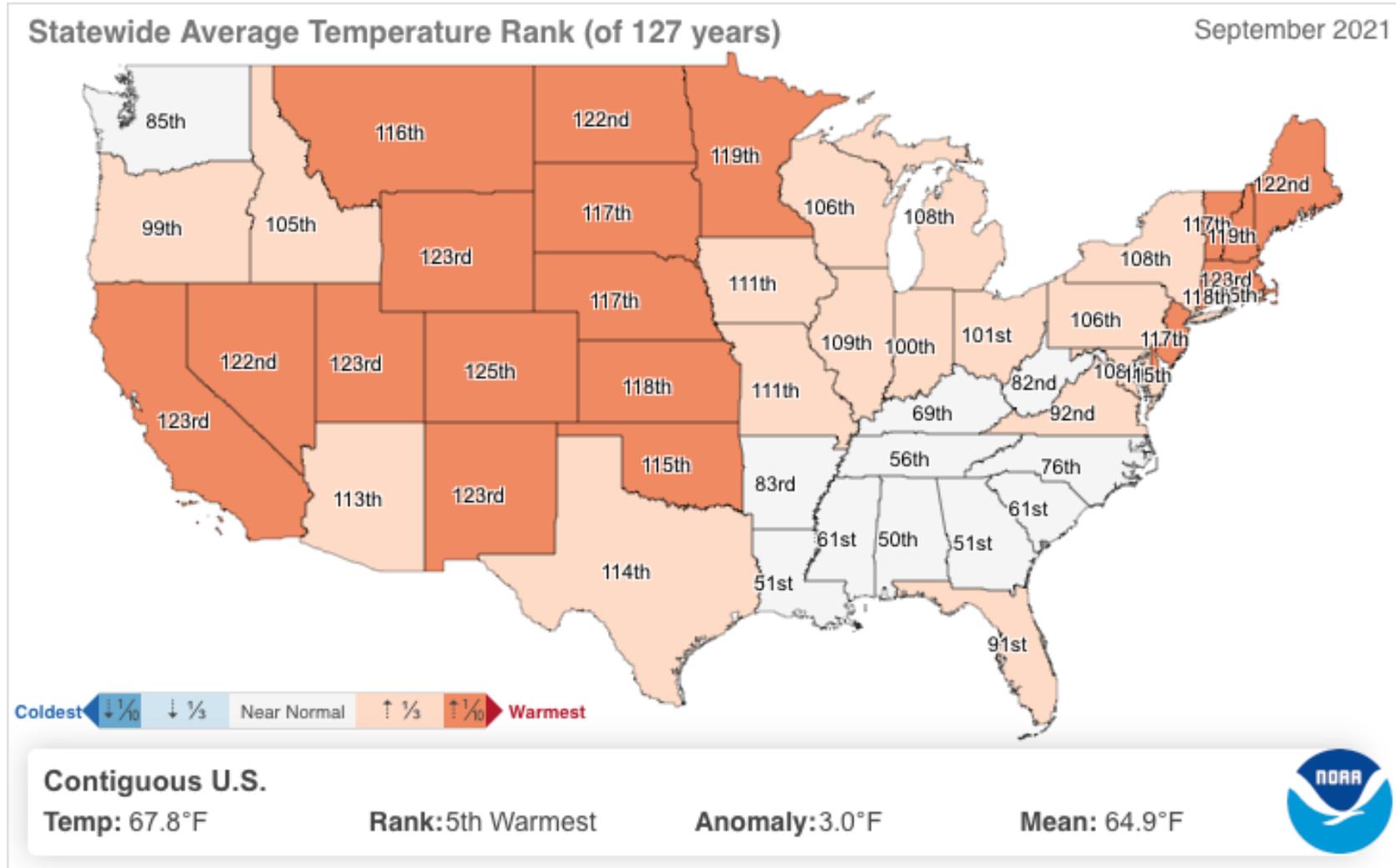
1-3 months

Winter season



October 2021, Mississippi River near Wabasha, MN. Photo credit: Pete Boulay

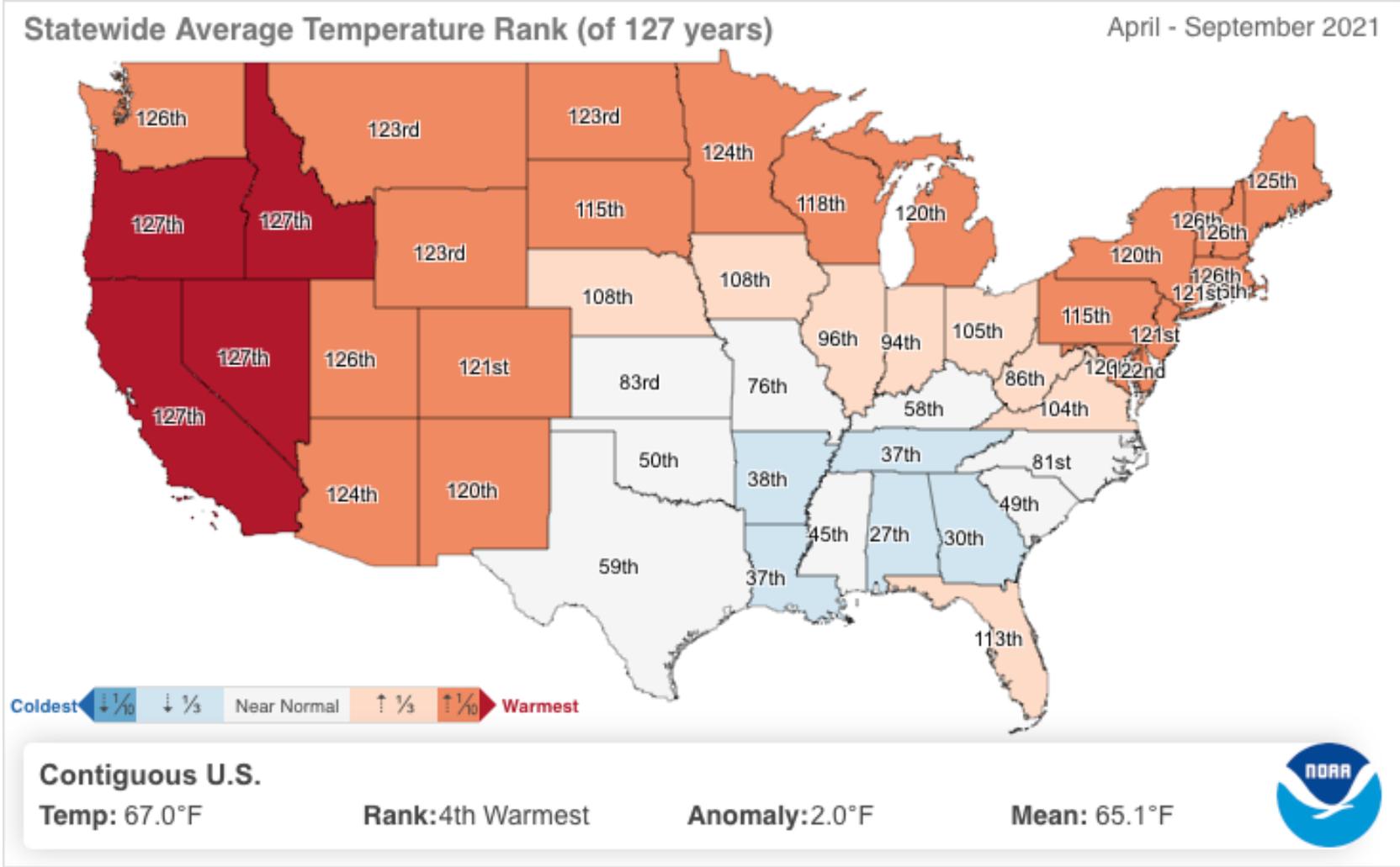
September Temperature Rankings



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

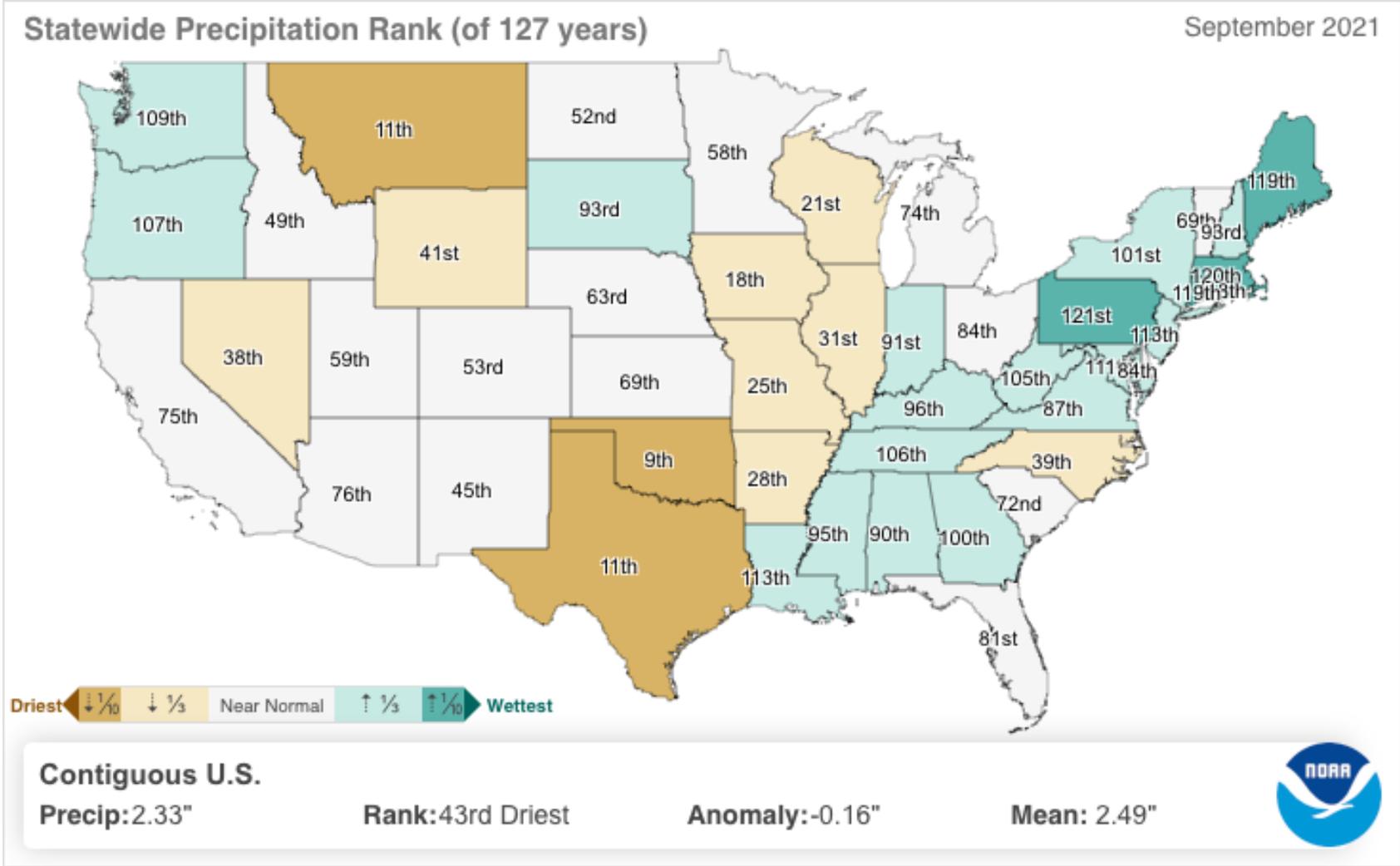
Growing Season Temperature Rankings



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

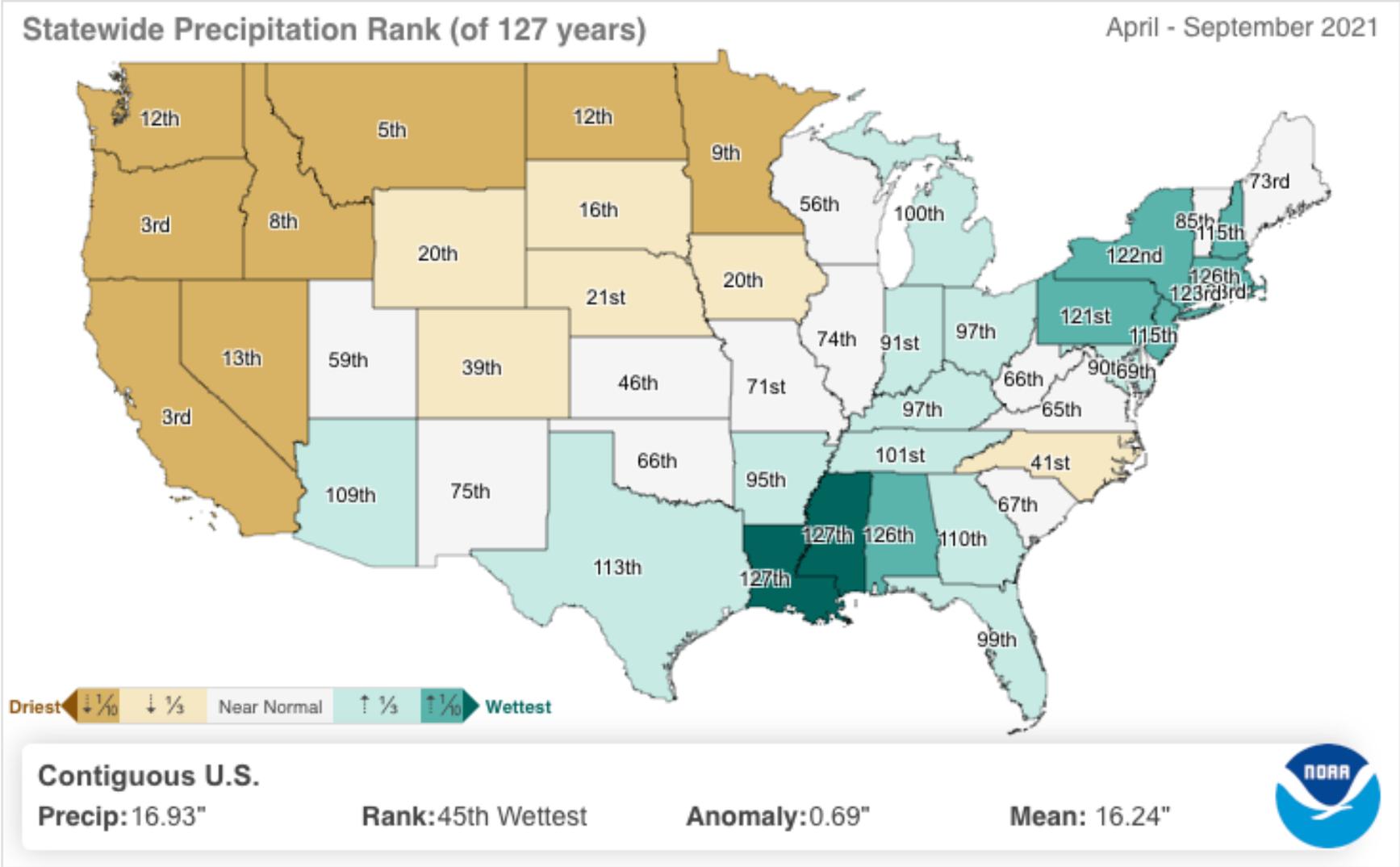
September Precipitation Rankings



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

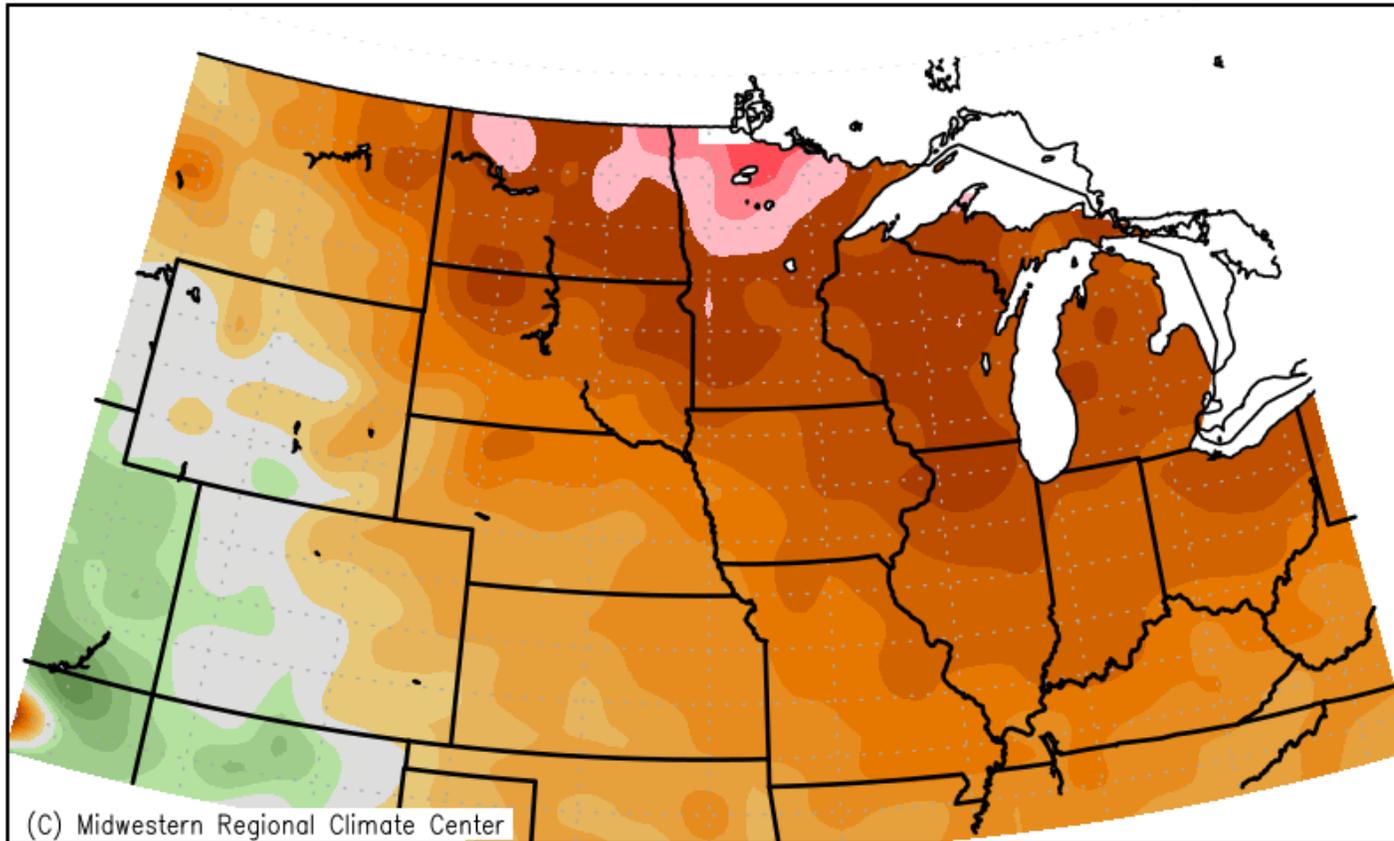
Growing Season Precipitation Rankings



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

Average Temperature (°F): Departure from Mean September 22, 2021 to October 19, 2021



Mean period is 1991–2020.

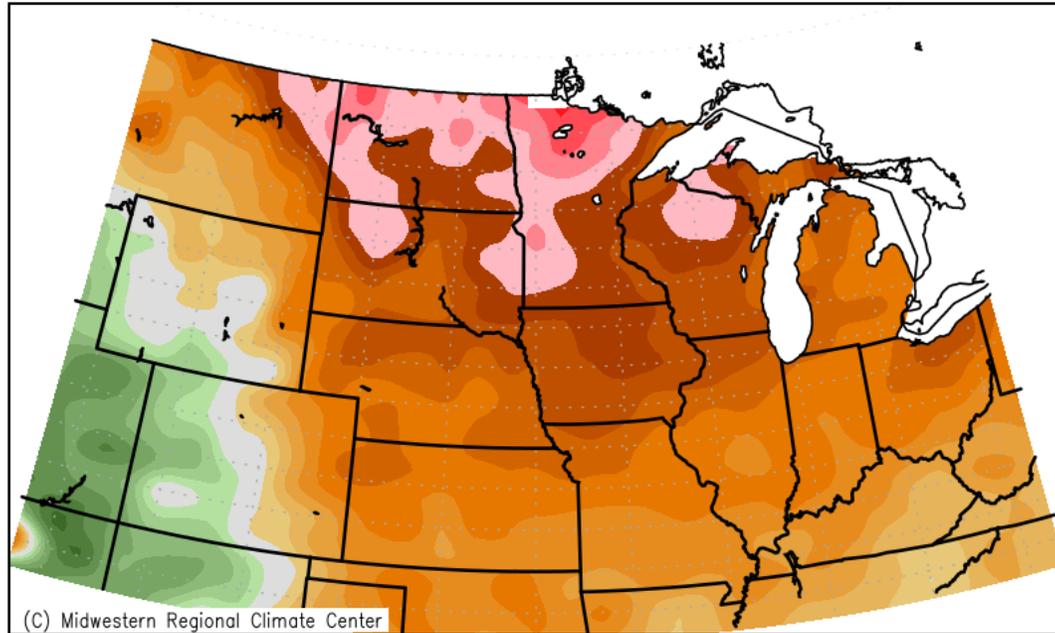


Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 10/21/2021 8:50:27 AM CDT

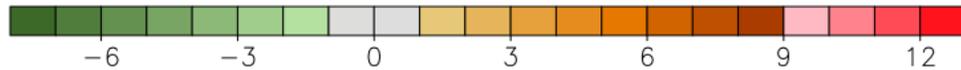


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Average Maximum Temp. (°F): Departure from Mean
September 22, 2021 to October 19, 2021

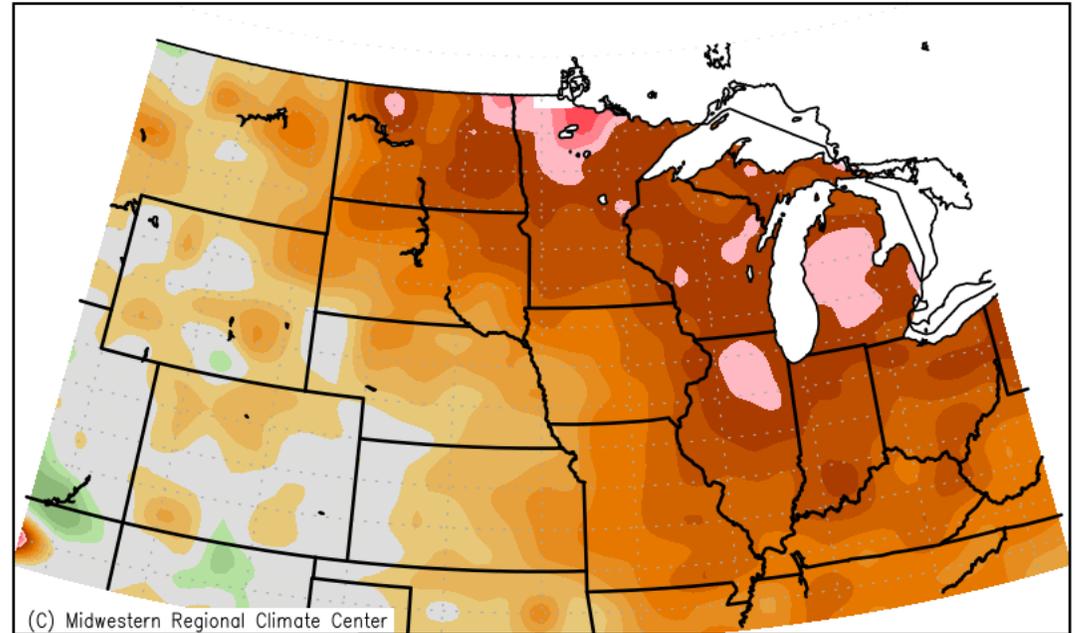


Mean period is 1991–2020.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 10/21/2021 8:51:18 AM CDT

Average Minimum Temp. (°F): Departure from Mean
September 22, 2021 to October 20, 2021

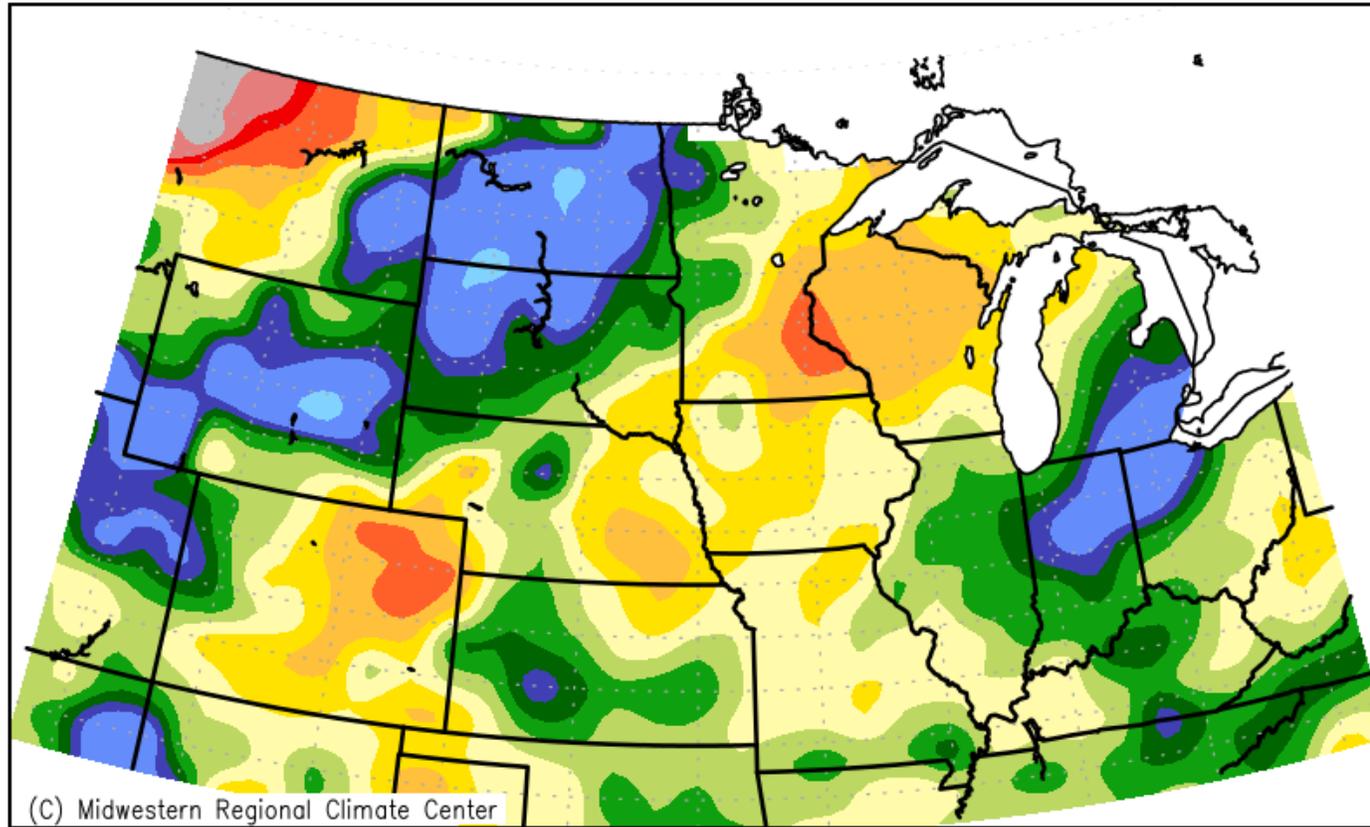


Mean period is 1991–2020.

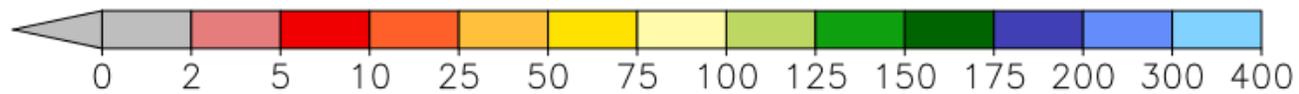


Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 10/21/2021 8:50:42 AM CDT

Accumulated Precipitation: Percent of Mean September 22, 2021 to October 20, 2021



Mean period is 1991-2020.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 10/21/2021 8:49:54 AM CDT

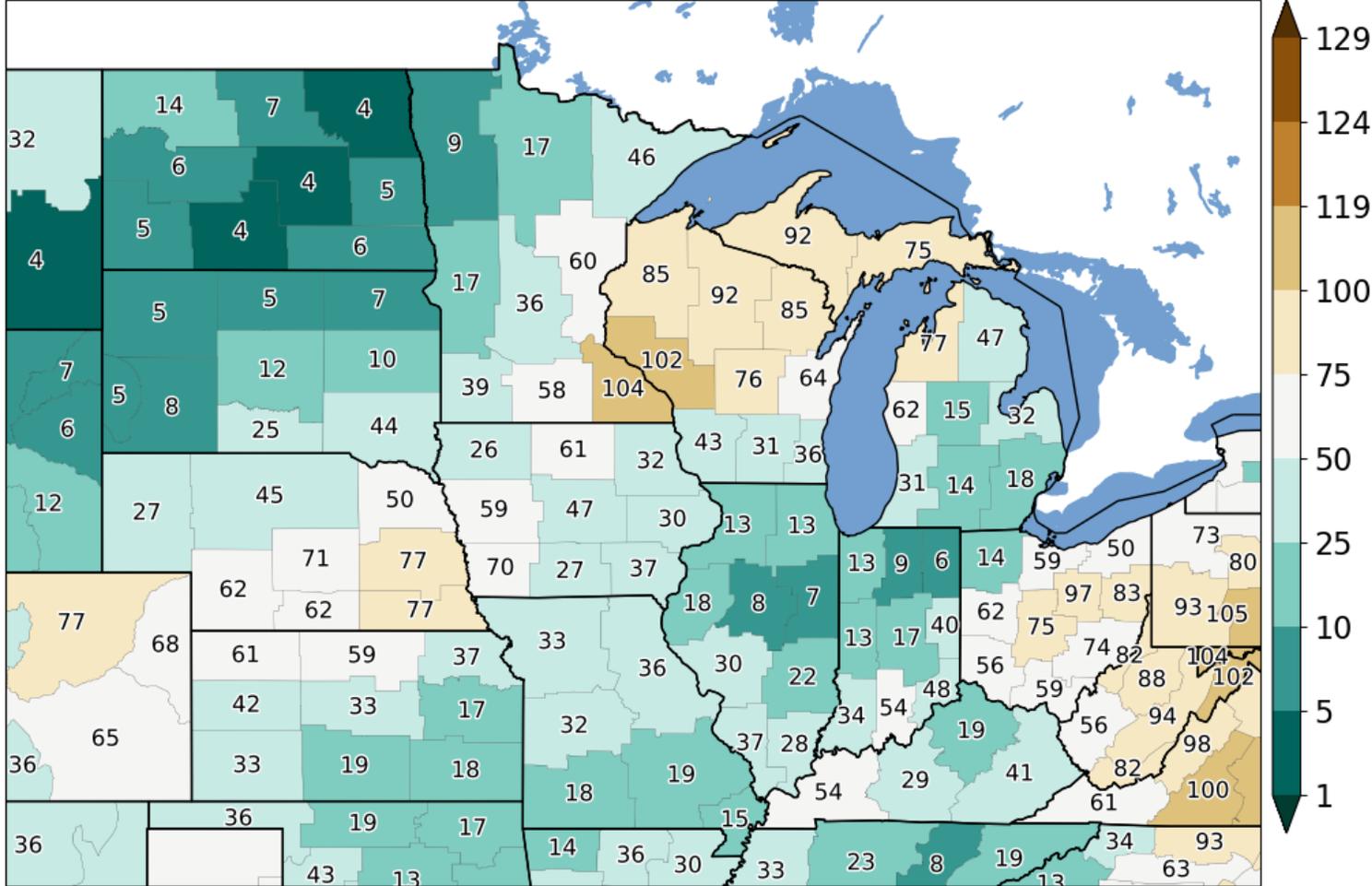


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October Preliminary Precipitation Ranking



30 Sep 2021 ~7 AM till 20 Oct 2021 ~7 AM Total Precipitation Ranks by Climate District
 Based on IEM Estimates, 1 is wettest out of 129 total years (1893-2021)



Iowa Environmental Mesonet :: generated 21 October 2021 11:41 AM
 Generated at 21 Oct 2021 11:41 AM CDT in 15.82s

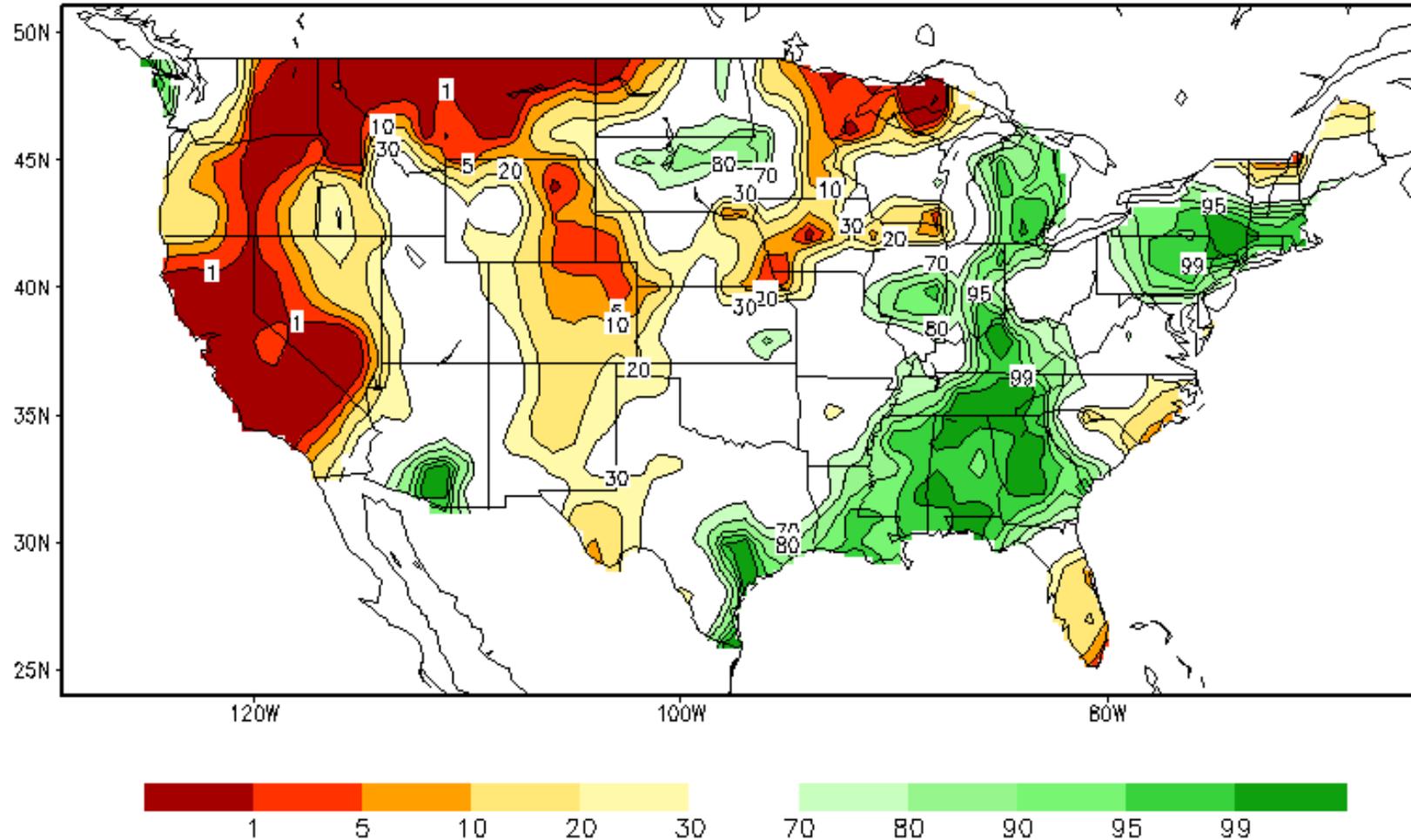
IEM Autoplot App #24



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Soil Moisture

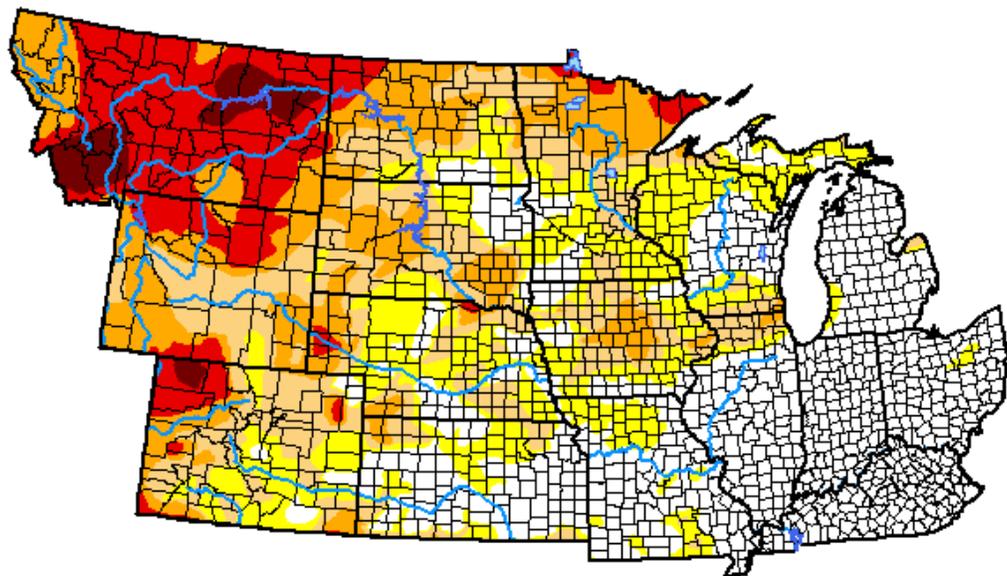
Calculated Soil Moisture Ranking Percentile
OCT 20, 2021



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U.S. Drought Monitor NWS Central

October 19, 2021
(Released Thursday, Oct. 21, 2021)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	33.69	66.31	48.16	30.73	14.36	2.47
Last Week <i>10-12-2021</i>	32.88	67.12	49.78	34.59	18.07	2.99
3 Months Ago <i>07-20-2021</i>	39.95	60.05	48.83	35.53	16.60	2.84
Start of Calendar Year <i>12-29-2020</i>	30.52	69.48	46.07	24.23	12.18	2.52
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>10-20-2020</i>	24.26	75.74	45.08	23.25	10.87	1.97

Intensity:

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

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

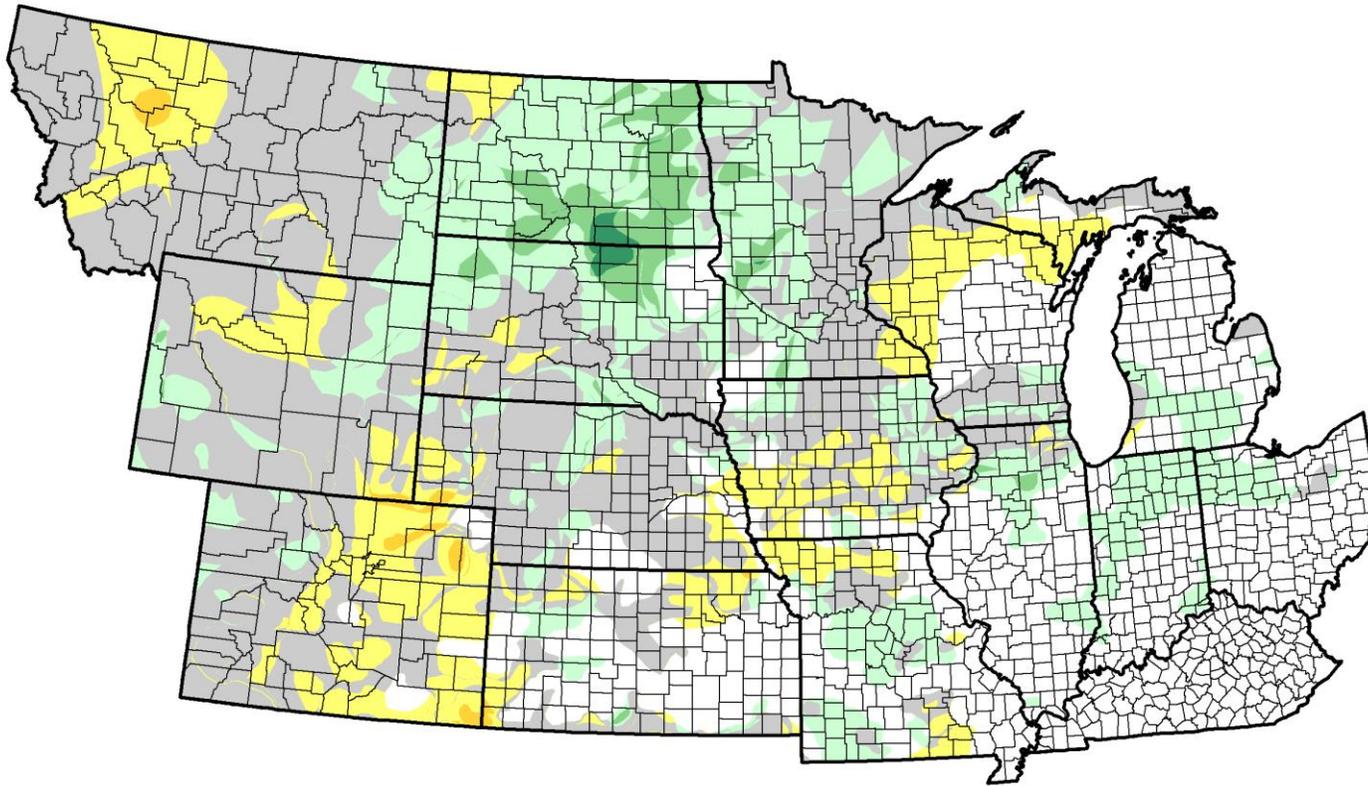
Author:
Brad Pugh
CPC/NOAA



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droughtmonitor.unl.edu

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



October 19, 2021
compared to
September 21, 2021

droughtmonitor.unl.edu



-  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



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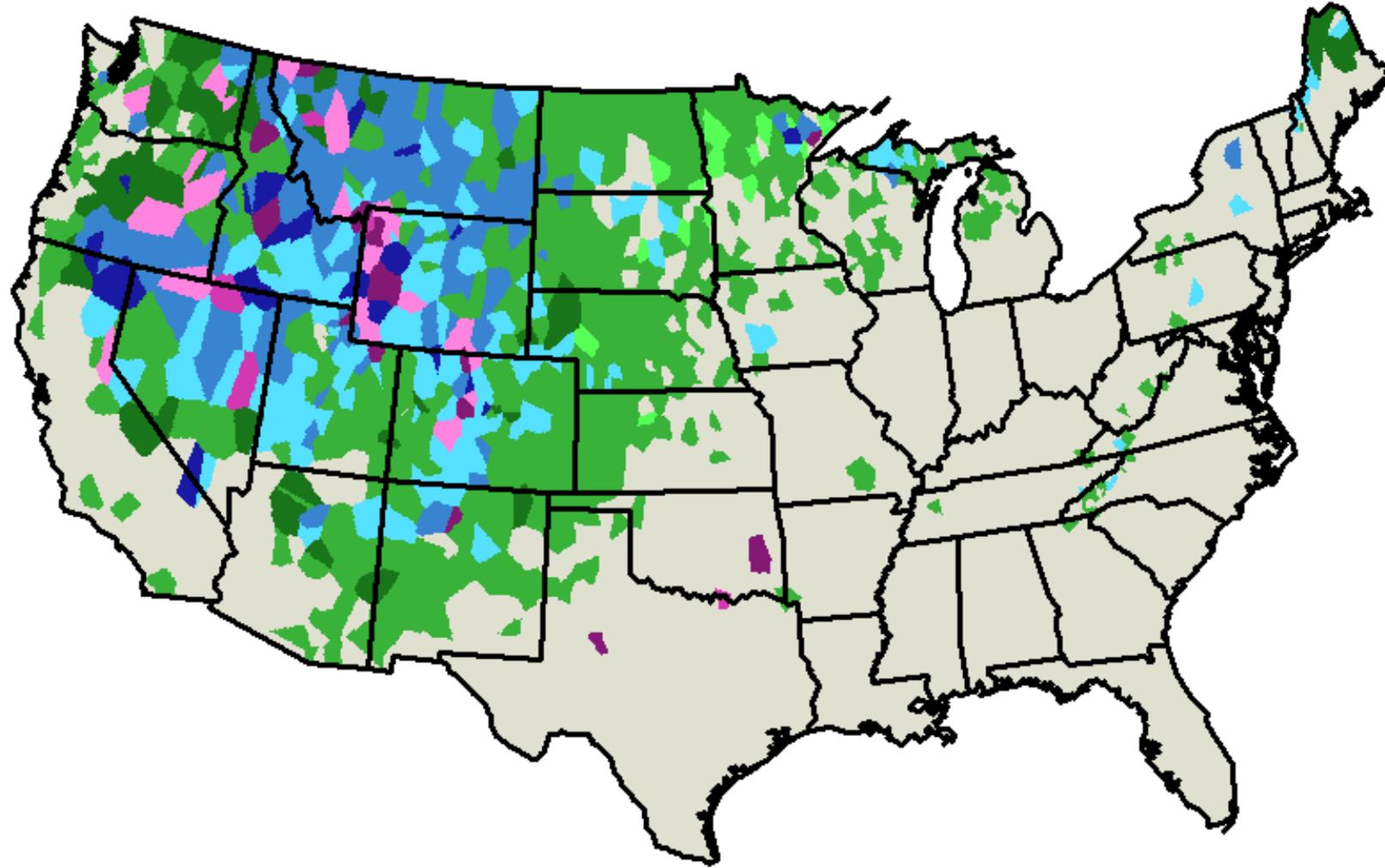
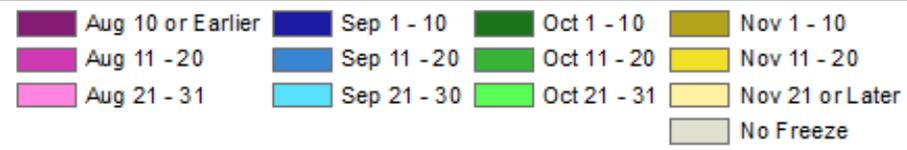


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Climate Impacts



Date of First 32°F Freeze for period 7/1/21 to 10/21/21

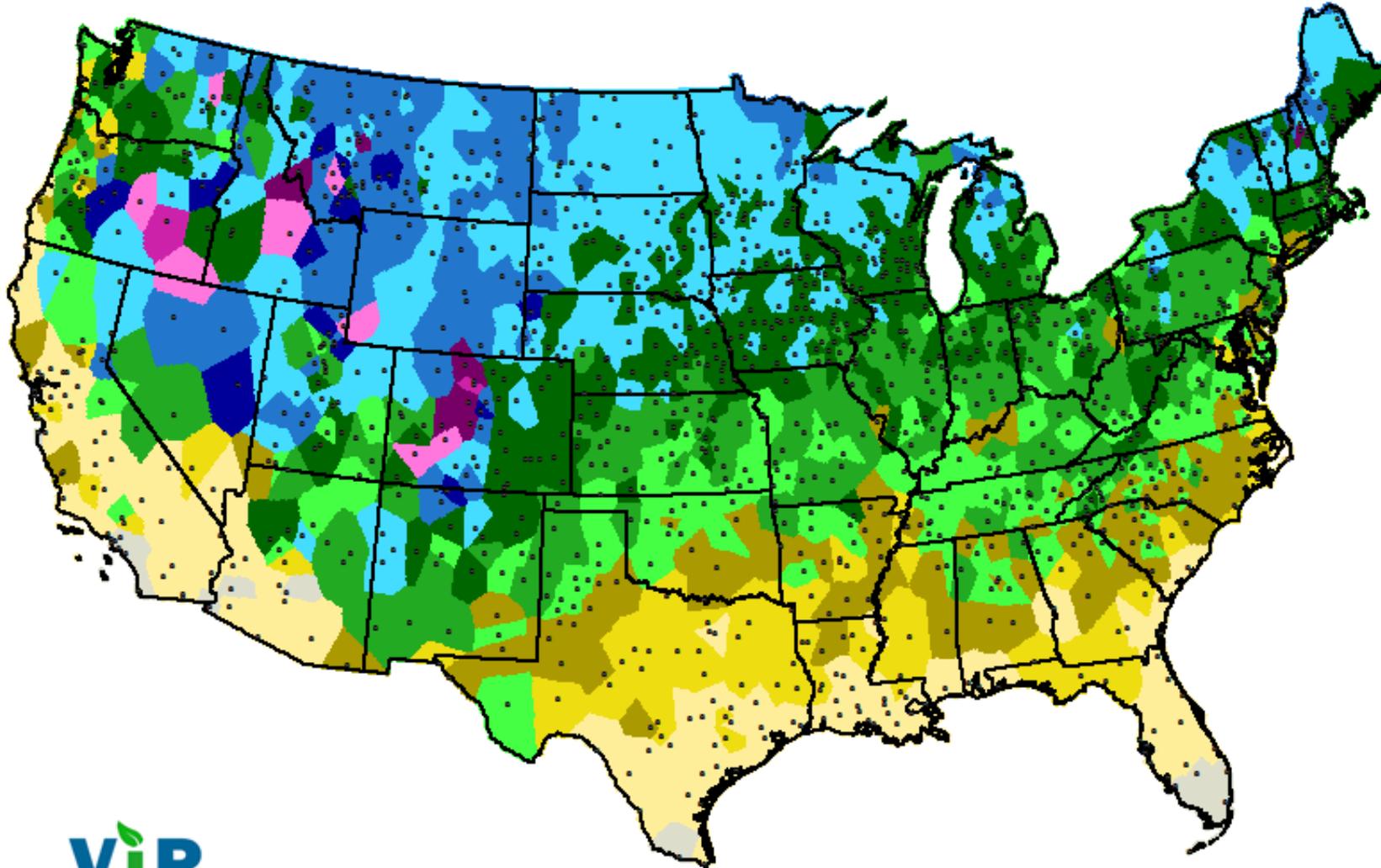
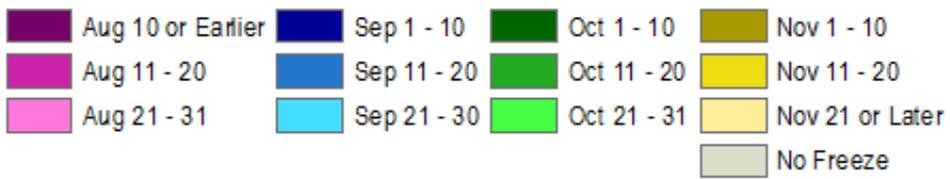


MRCC Experimental Freeze Guidance:
These experimental maps may be utilized as a guide to local and regional
freeze conditions but should NOT be used by themselves for decision processes.



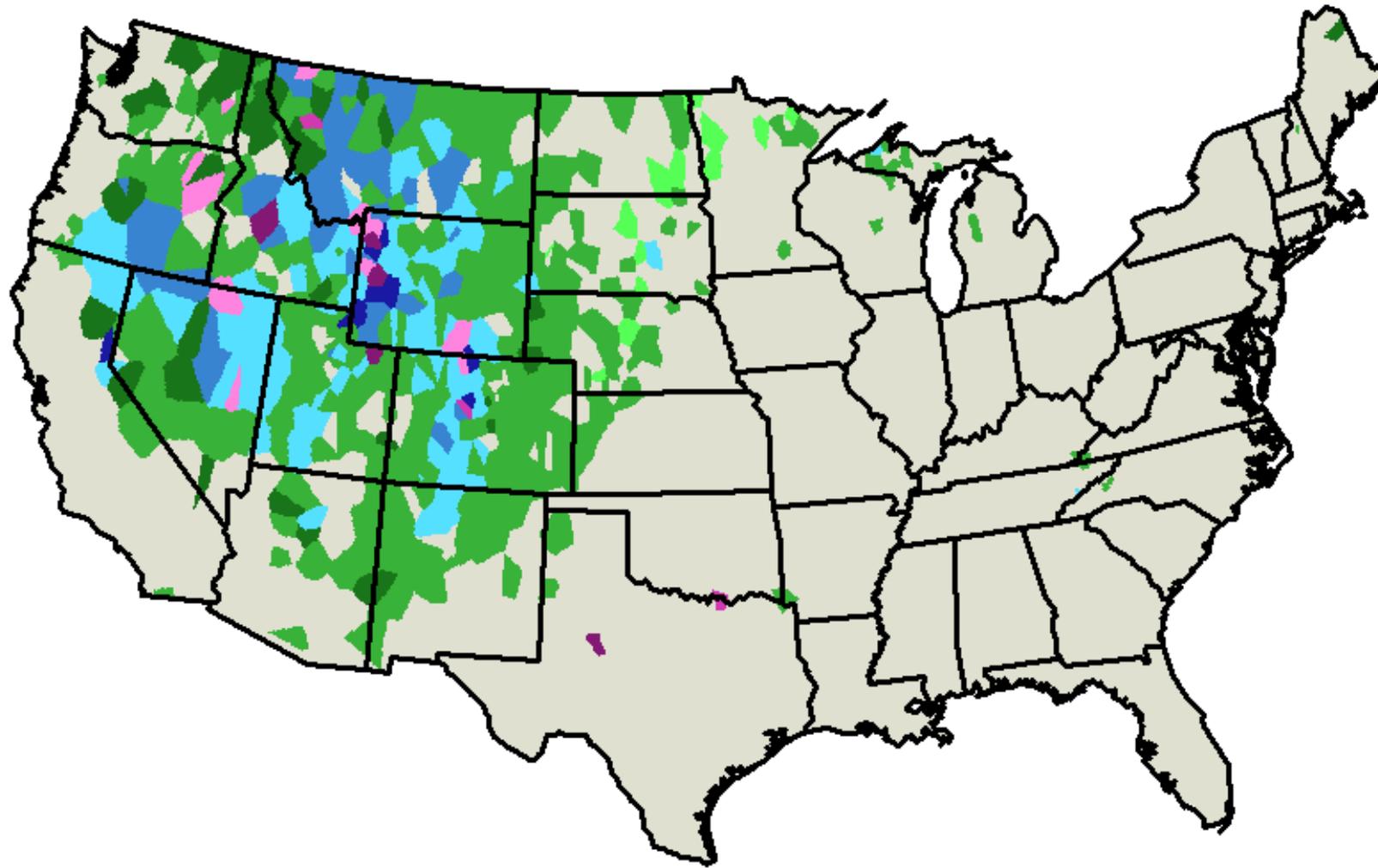
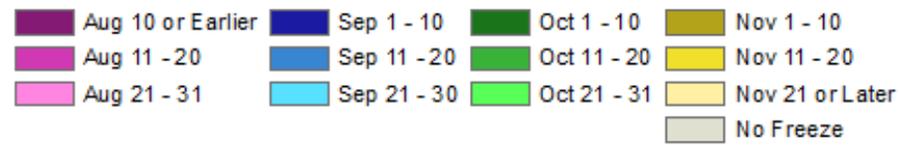
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Climatological Date of Median First 32°F Freeze
For years 1980-81 to 2009-10
Freeze year beginning July 1st
Median defined as the 50th Percentile



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Date of First 28°F Freeze for period 7/1/21 to 10/21/21



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.



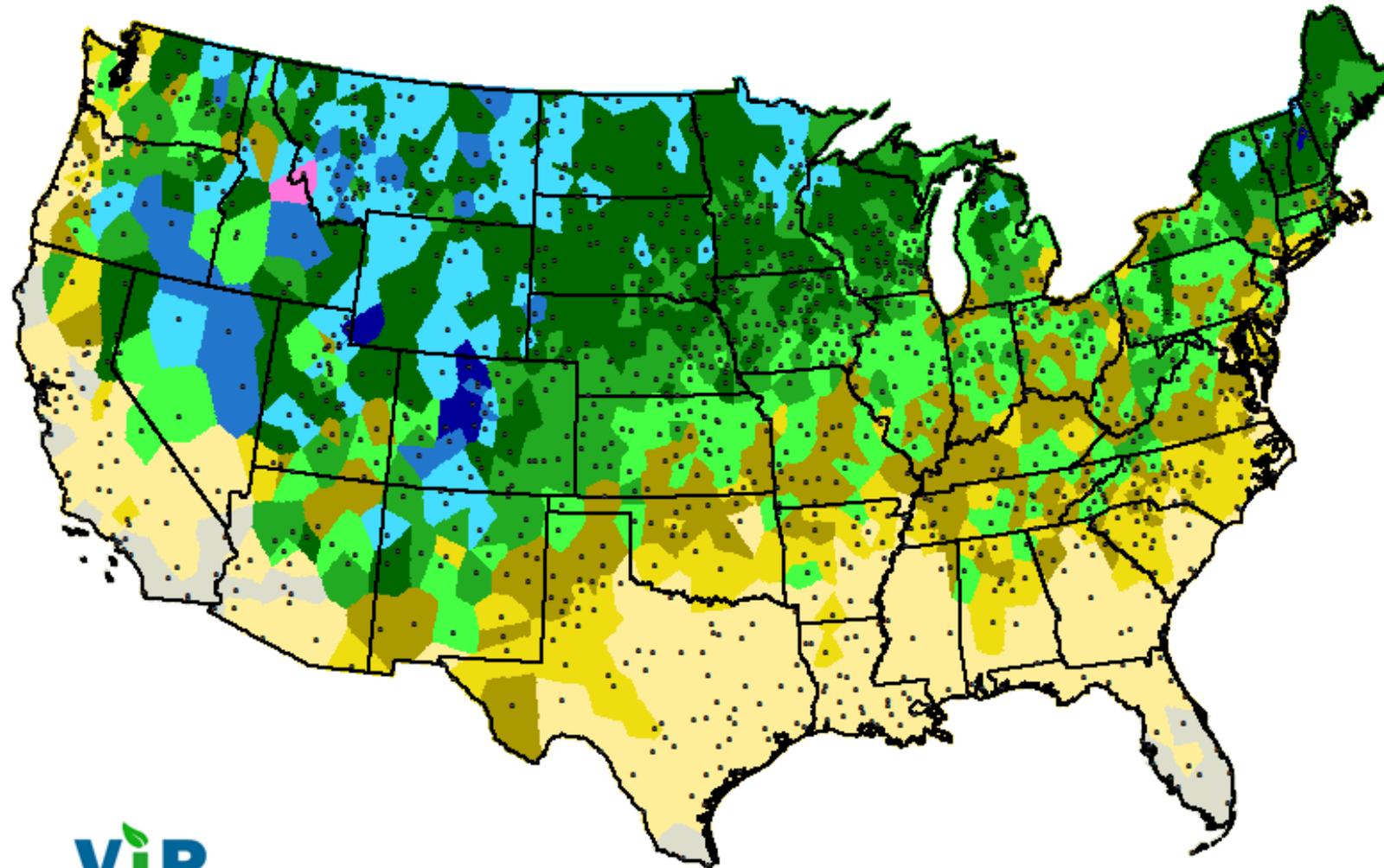
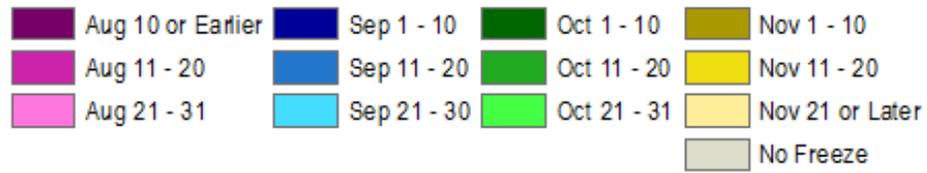
**SOUTH DAKOTA STATE
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Climatological Date of Median First 28°F Freeze

For years 1980-81 to 2009-10

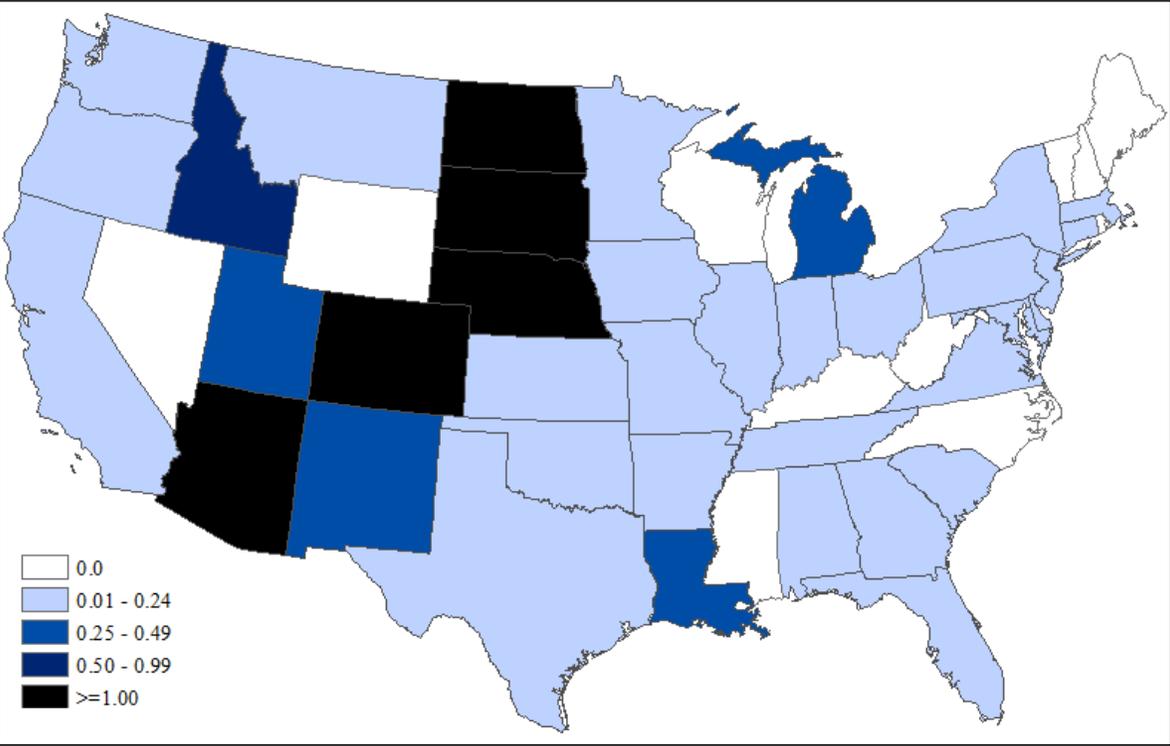
Freeze year beginning July 1st

Median defined as the 50th Percentile

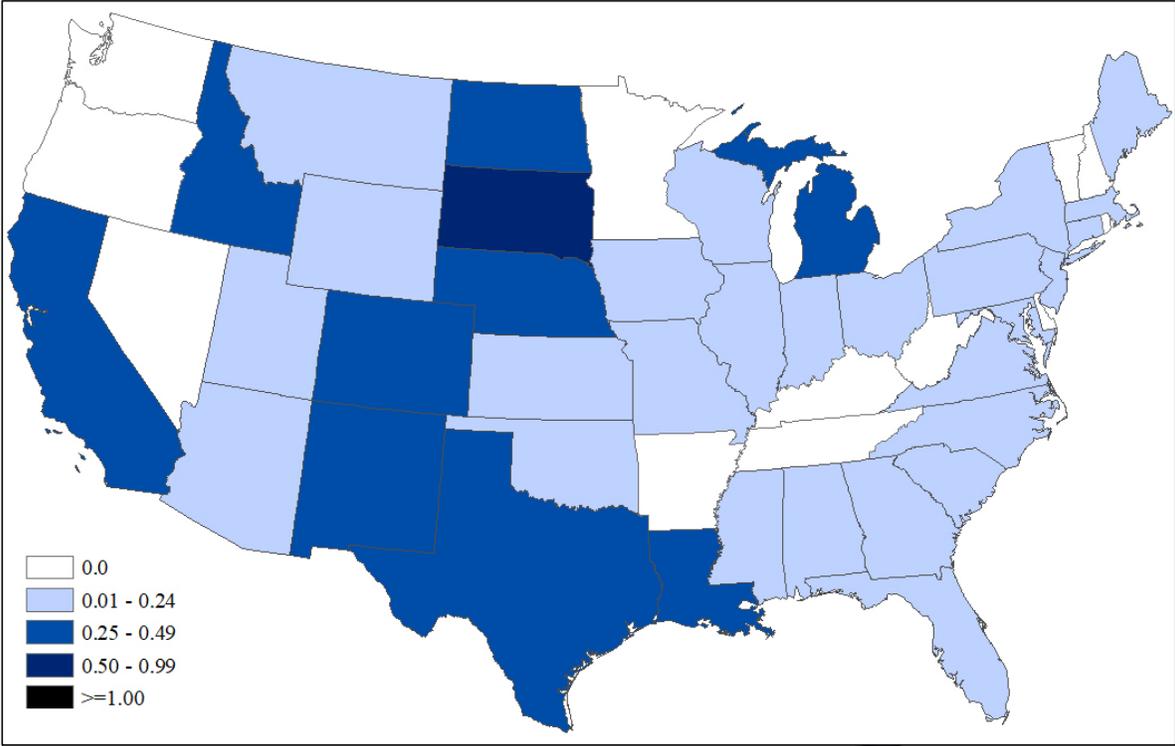


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West Nile Virus Neuroinvasive Disease Incidence, per 100,000 population



2021



2020

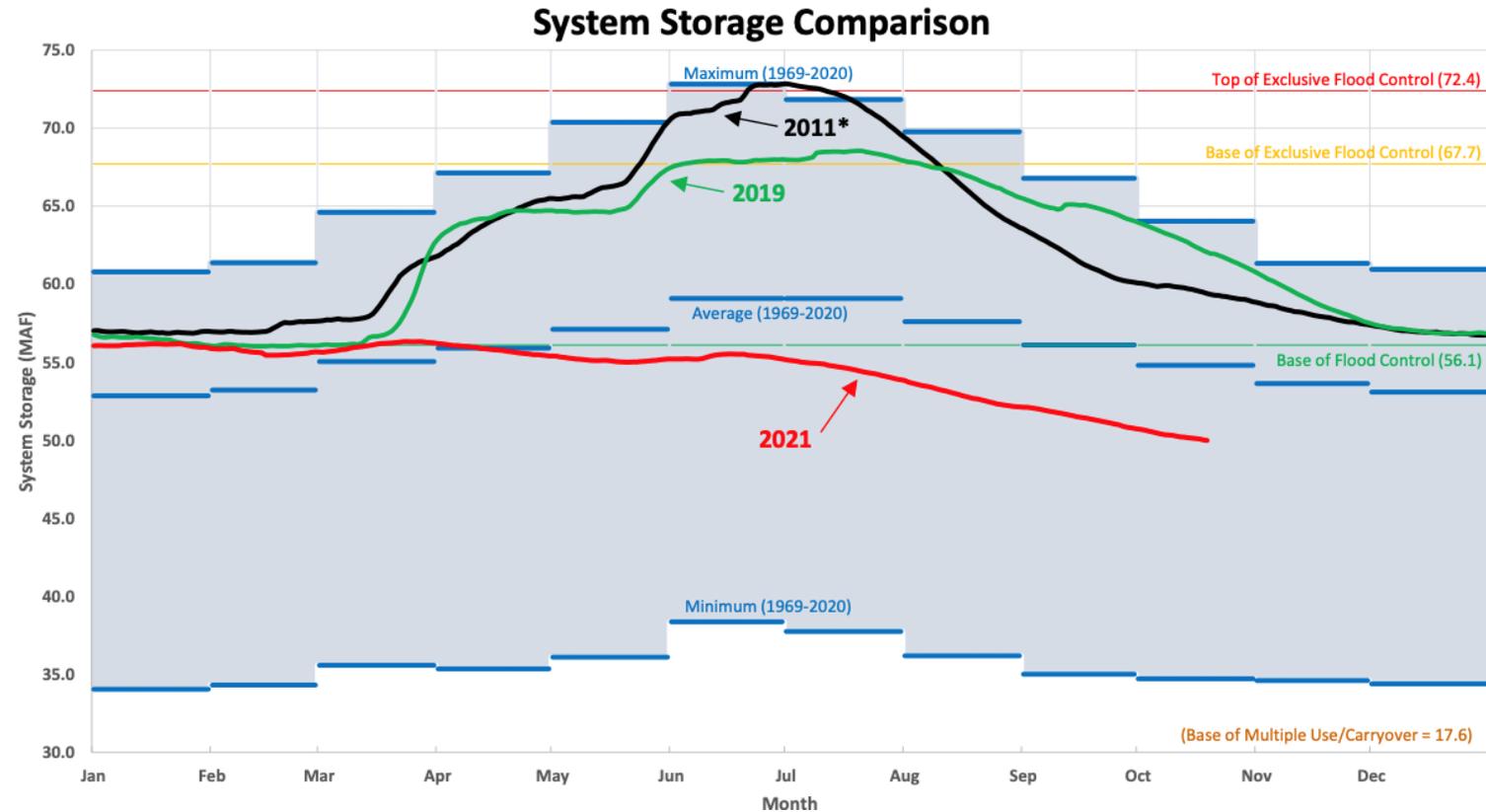


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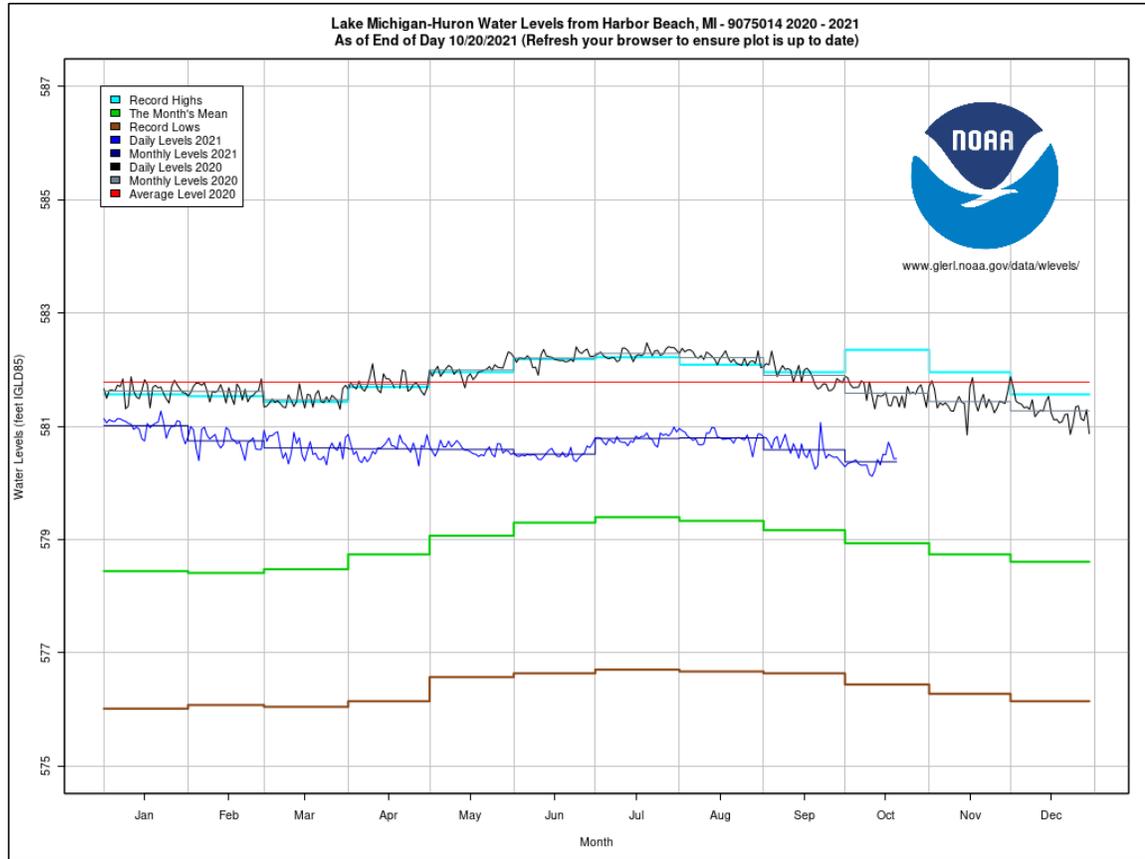
Missouri River

- Missouri Mainstem Reservoir Status (as of 10/12/21):
- Current system storage is 50.3 million acre-feet
- 2021 runoff forecast = 57% of average, 14.8 million acre-feet
- Fall public meetings planned for next week

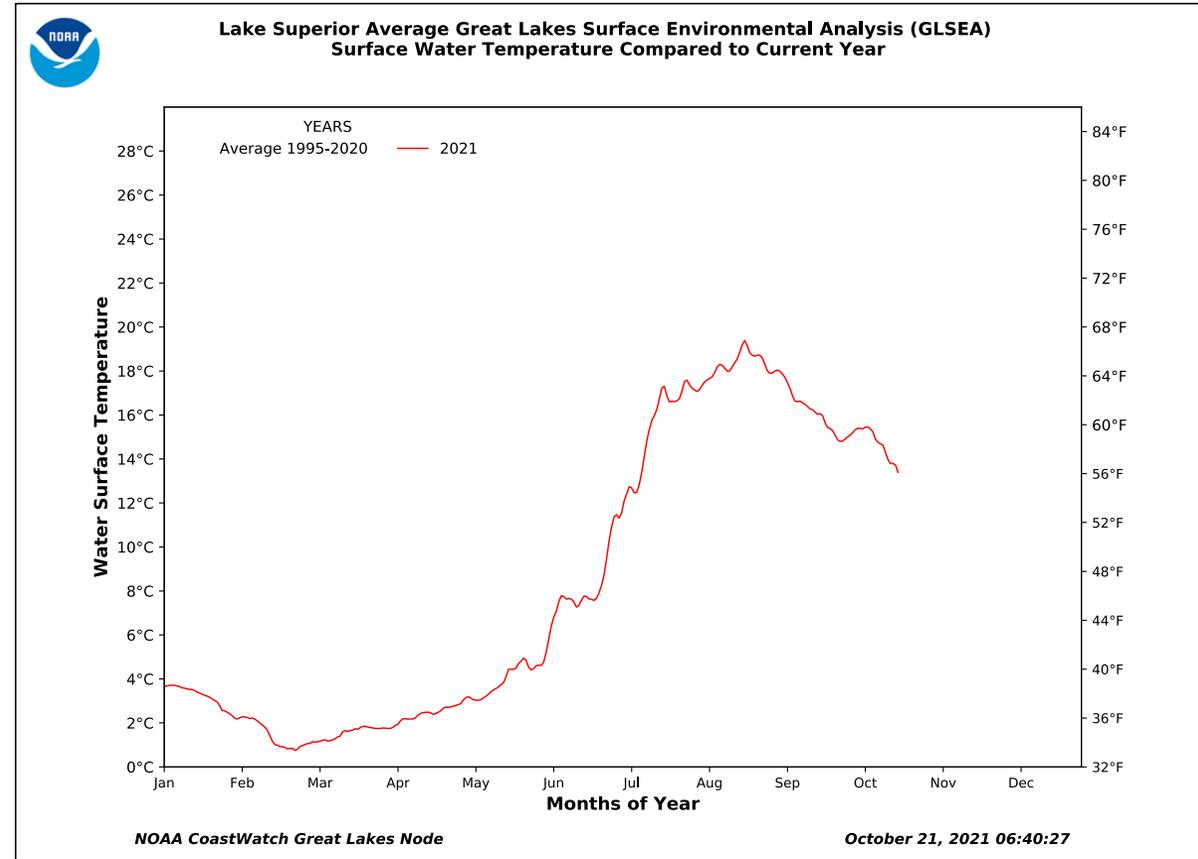




Great Lakes



<https://www.glerl.noaa.gov/data/wlevels/levels.html#observations>



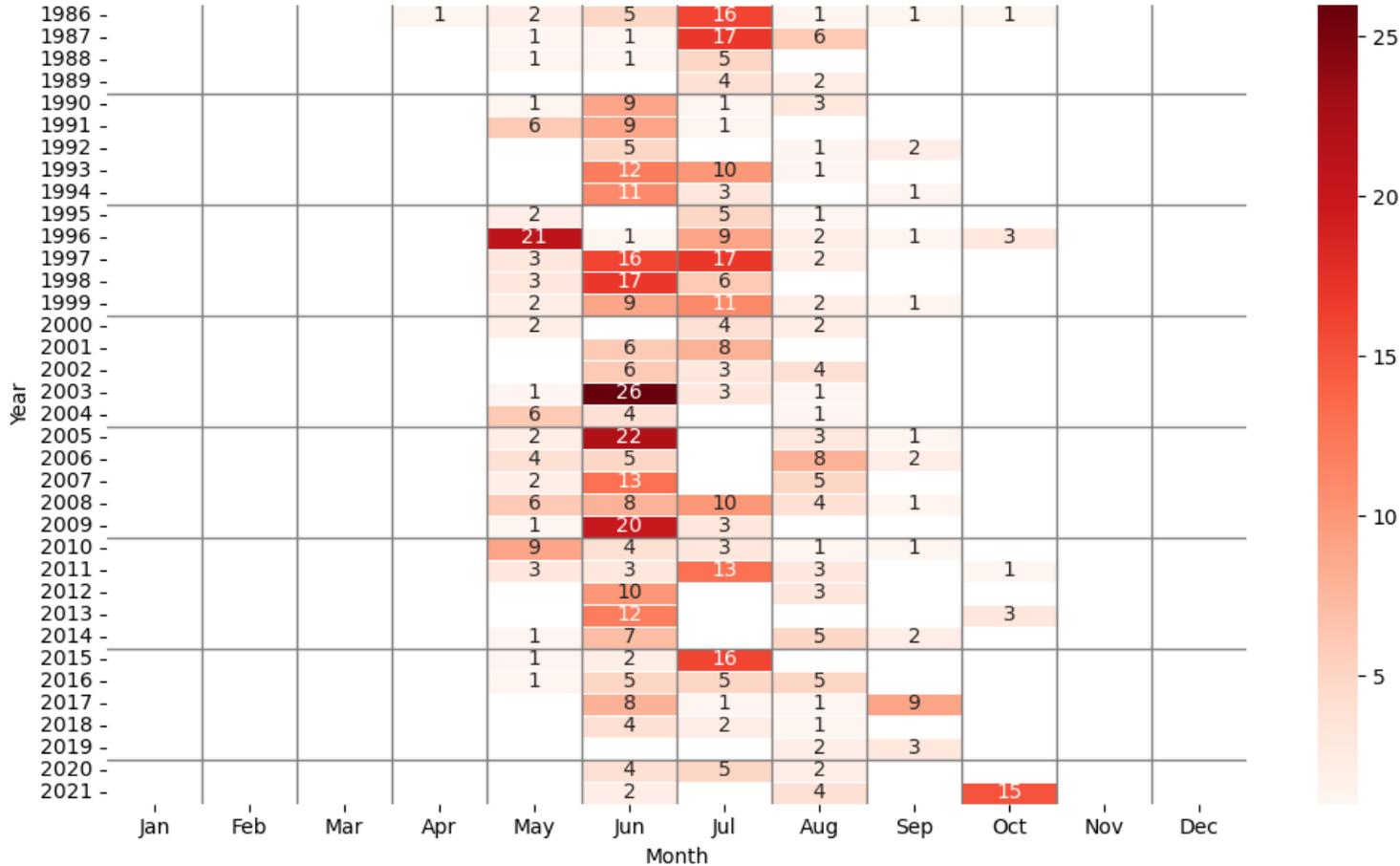
<https://coastwatch.glerl.noaa.gov/statistic/statistic.html>

October Tornadoes



NWS Aberdeen

Tornado Warning (TO.W) Issued by Year, Month



Generated at 13 Oct 2021 9:13 PM CDT in 1.53s

IEM Autoplot App #171

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- 15 Tornado warnings issued in Oct for northeastern SD & west central MN, more typical of June or July.
- 2nd highest # in Oct. w/14 tornadoes reported, 7 in SD and 7 in MN.
- Only 18 tornadoes in SD, 29 in MN in all previous Octobers
- 10/26/1996 had largest outbreak w/24 (10 in SD, 14 in MN)



Highlights

- First frost is occurring days to weeks later than average this fall with near record warm minimum temps
 - Extending gardening season, and also weeds and insect pests.
 - Flies, mosquitoes, ticks, grasshoppers and midges are all active until frost/freeze
- Some record or near-record GDD accumulations this year
- Dry and then wet & warm has allowed new growth in gardens: beans, tomatoes (Dakotas, MN)
- Dry conditions/moderate rainfall has allowed good fall harvest progress in central/eastern states
- Wet conditions slowed corn & soybean harvest in the Dakotas
 - Watertown, SD now 2nd wettest October so far. 6.14", record was 1971 with 8.10"
- Re-blooming of typical spring vegetation: lilacs, flowers (WI, KS)
- Summer season drought in SD has led to buy-back of deer licenses due to EHD in western counties
- Some fall grass fire activity in Kansas, hay bale & harvest fires in SD



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Climate outlooks

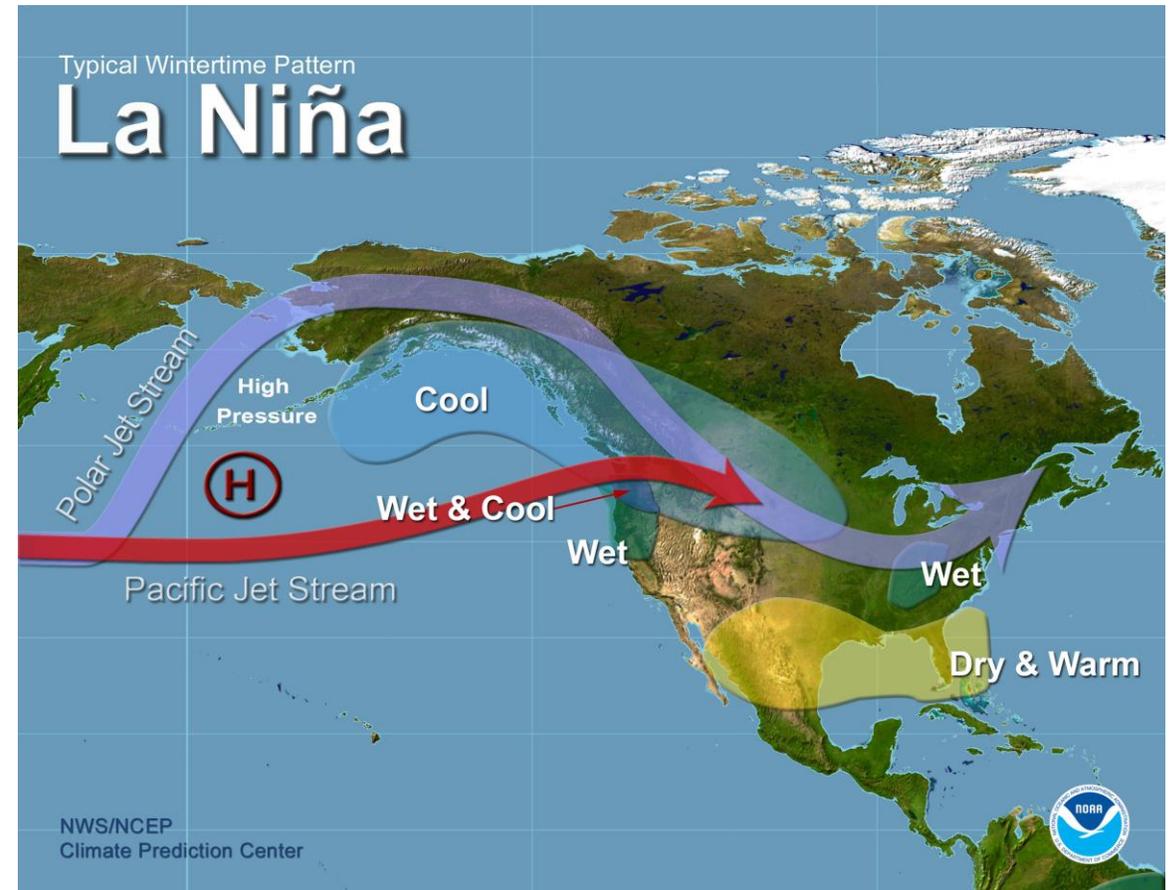
- La Niña
- 7-day precipitation forecast
- 8-14 day outlook
- November temperature and precipitation
- Winter season temperature and precipitation



Photo by Laura Edwards

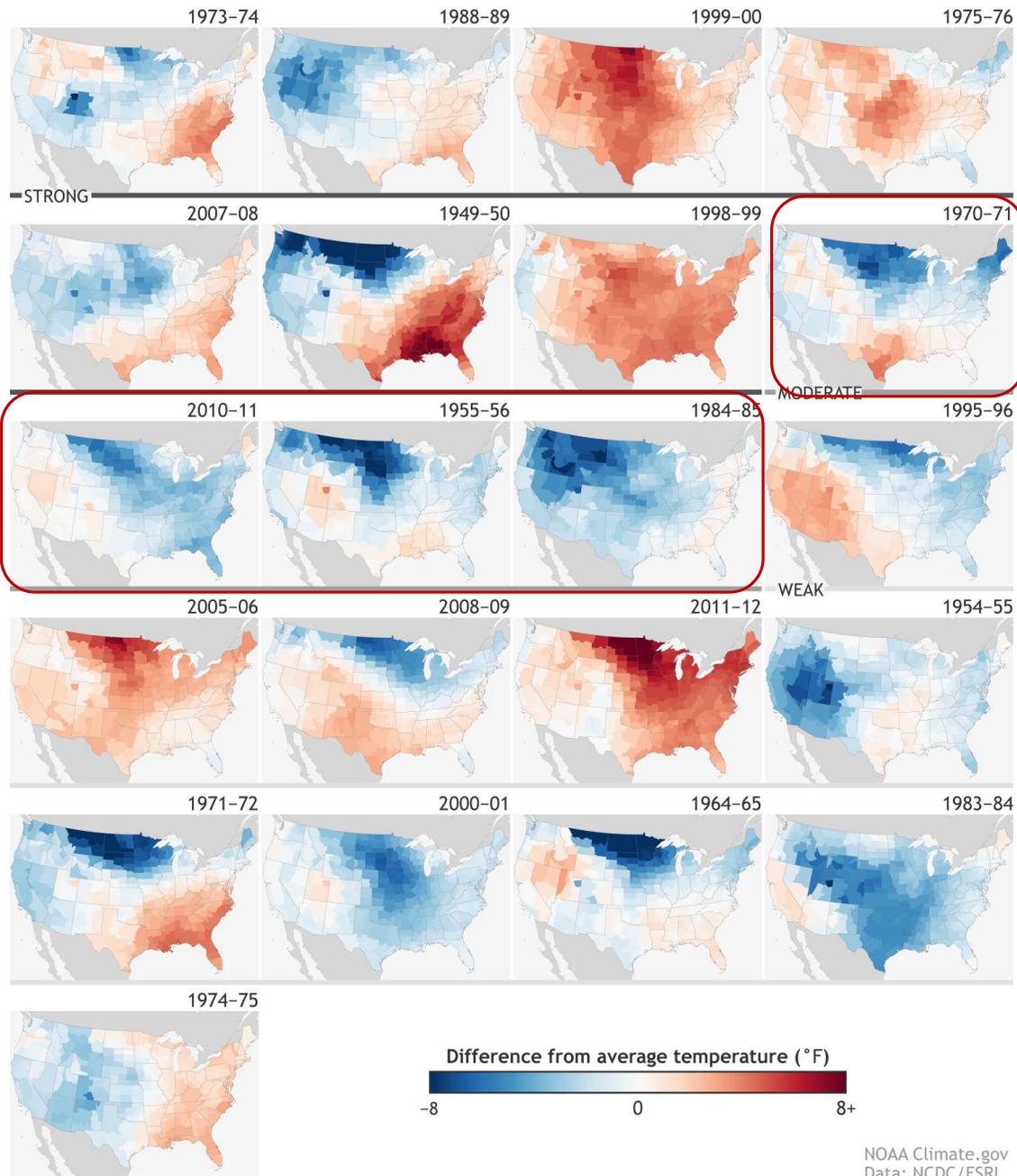
La Nina Advisory

- 87% chance of continuing this winter
- 2nd La Nina winter in a row
- More coordinated atmosphere & ocean this year vs. last year
- Slower ramp up vs. last year, but has now met the criteria per NOAA CPC



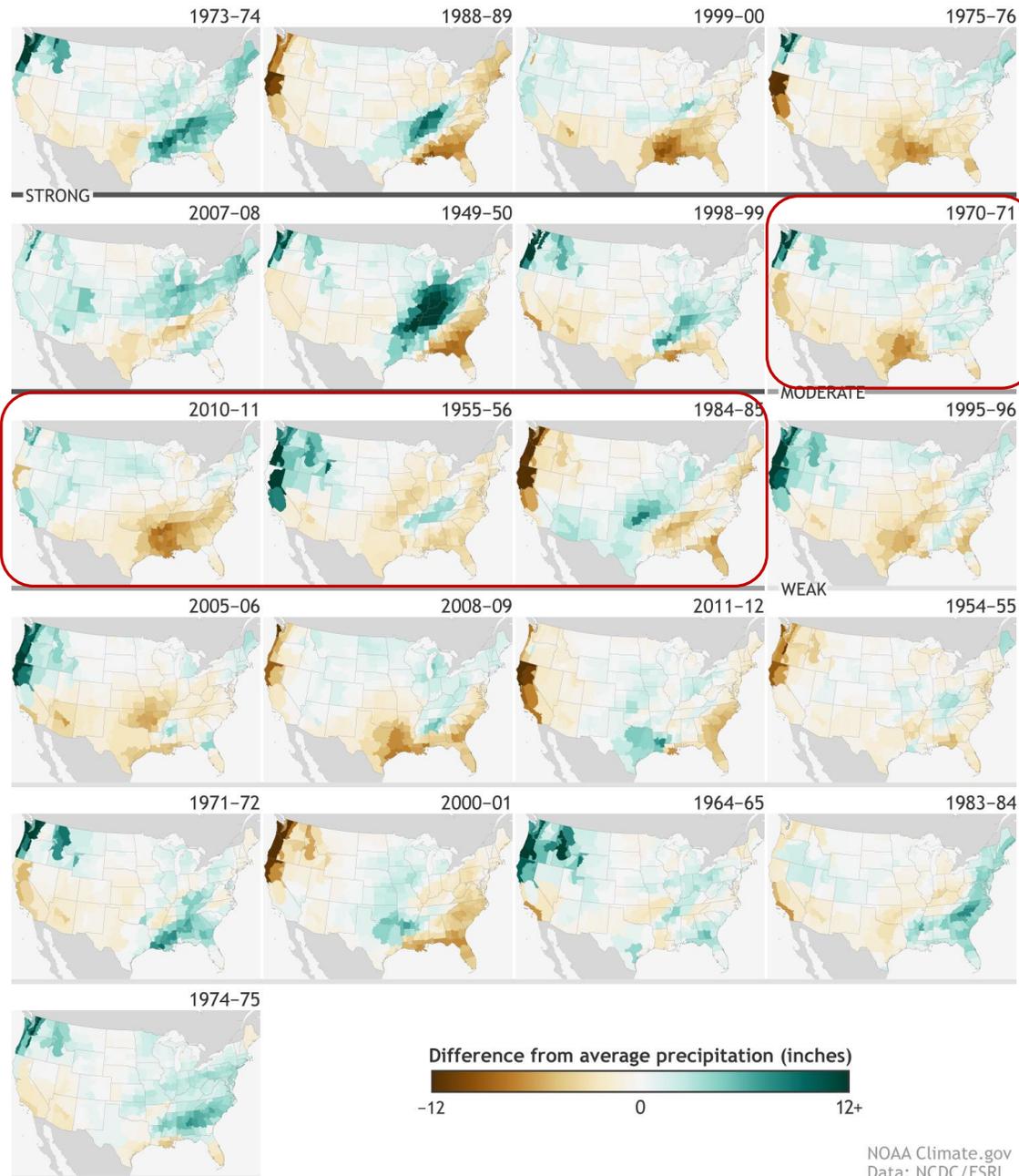
Winter (December-February) temperature during strong, moderate, and weak La Niñas since 1950

La Nina Winter Temperature



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



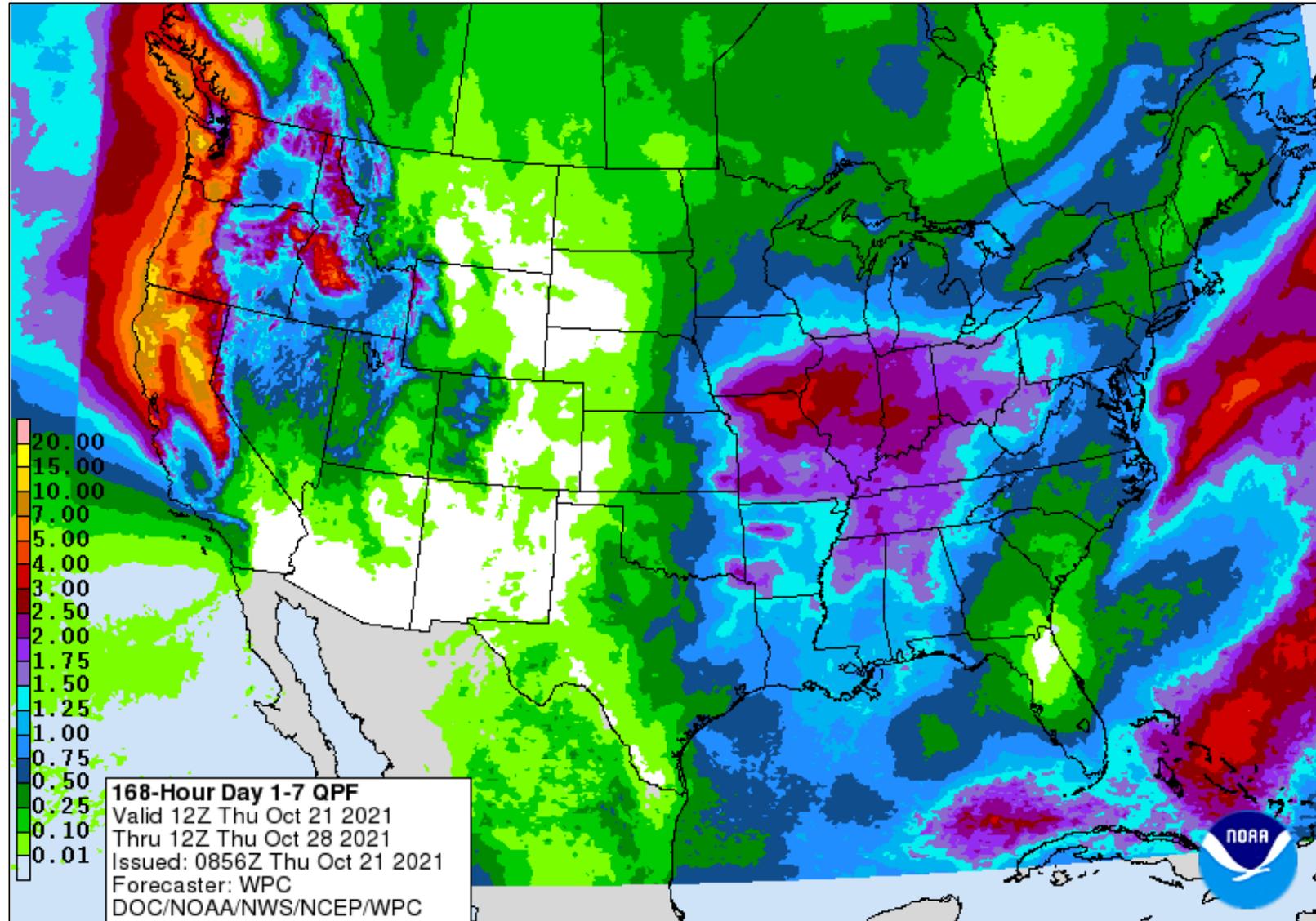
La Niña Winter Precipitation



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7-day Quantitative Precipitation Forecast

Valid: 21 Oct - 28 Oct



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



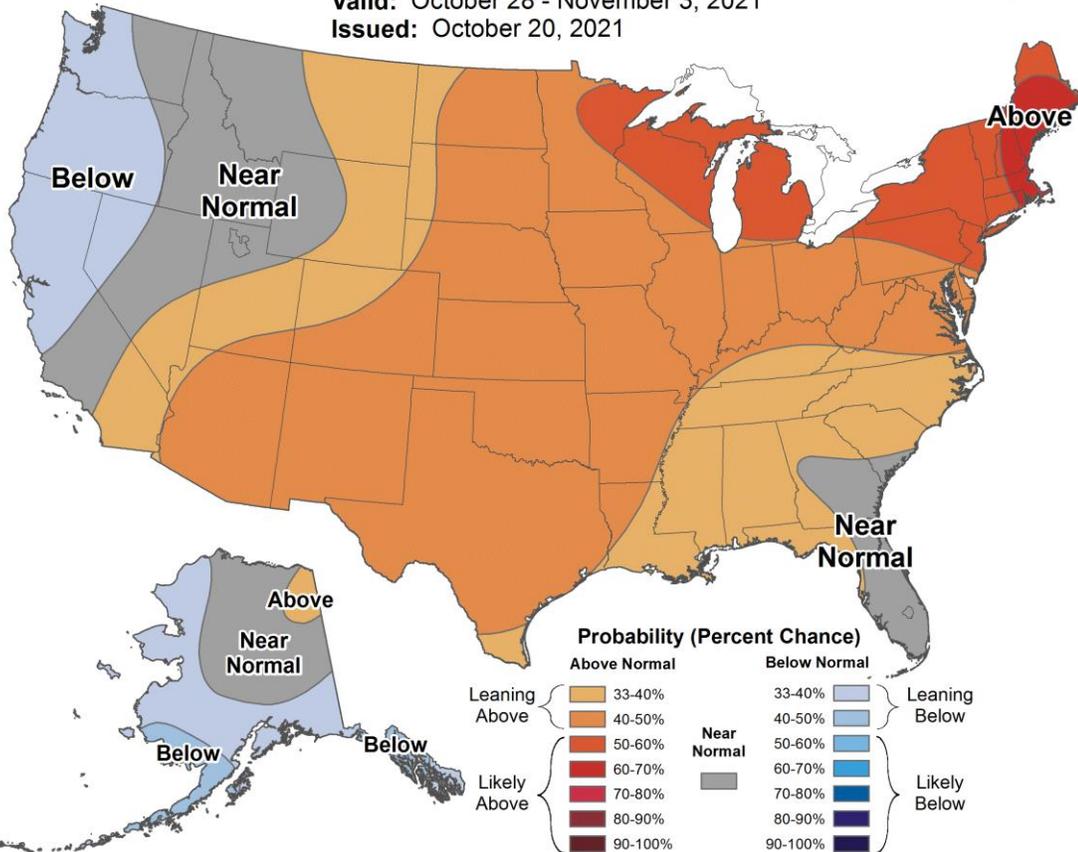
8-14 Day Outlook



8-14 Day Temperature Outlook



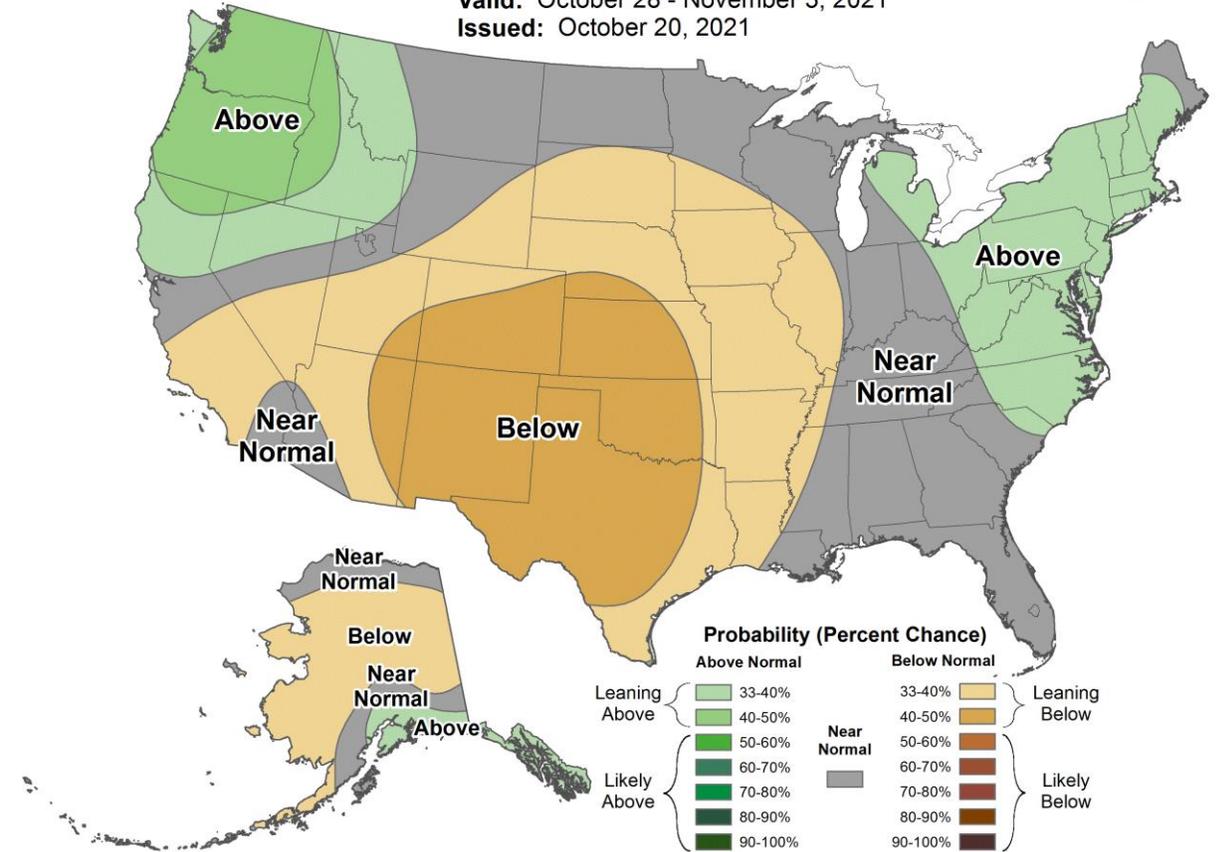
Valid: October 28 - November 3, 2021
Issued: October 20, 2021



8-14 Day Precipitation Outlook



Valid: October 28 - November 3, 2021
Issued: October 20, 2021





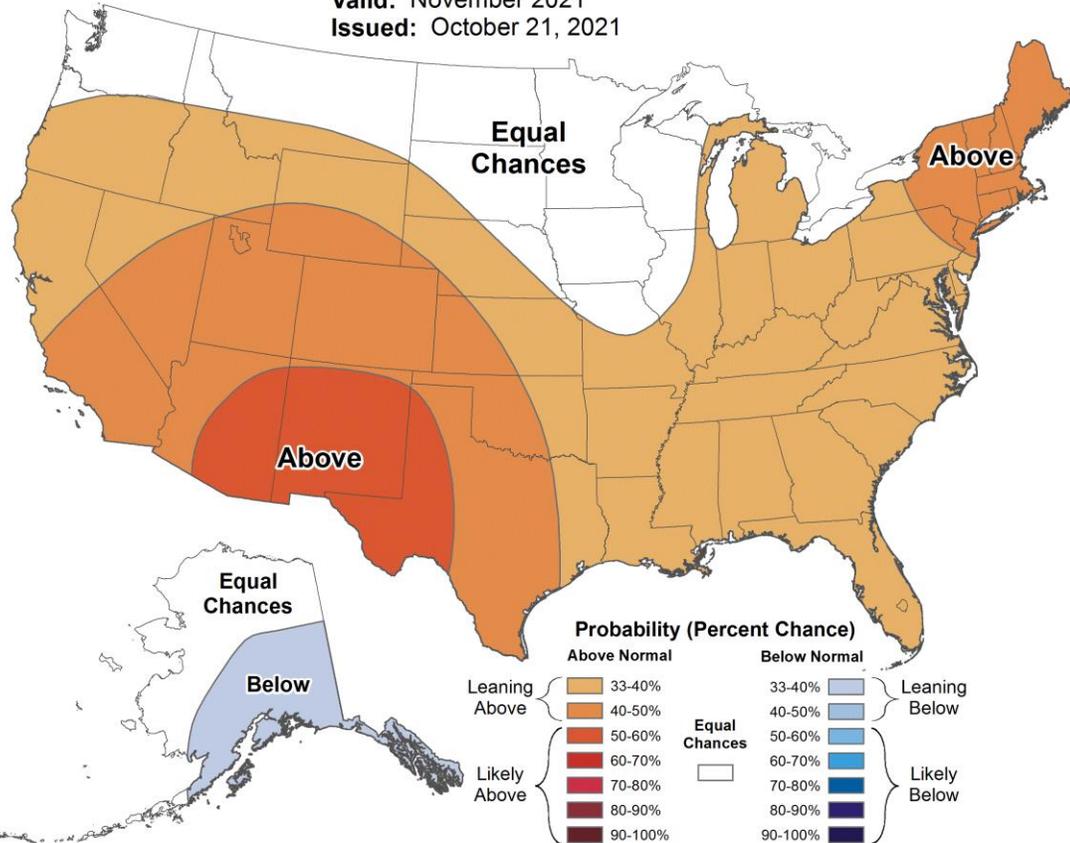
November 2021 Outlook



Monthly Temperature Outlook



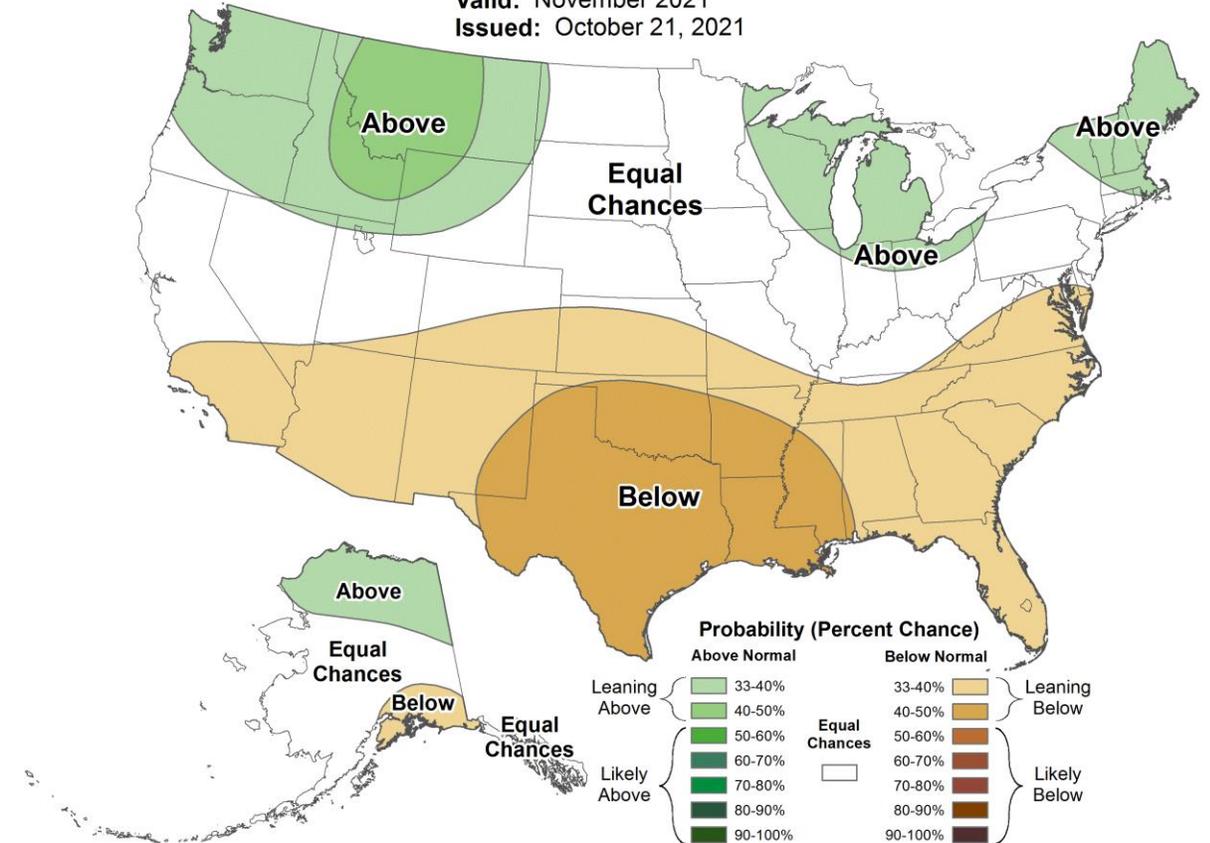
Valid: November 2021
Issued: October 21, 2021



Monthly Precipitation Outlook



Valid: November 2021
Issued: October 21, 2021





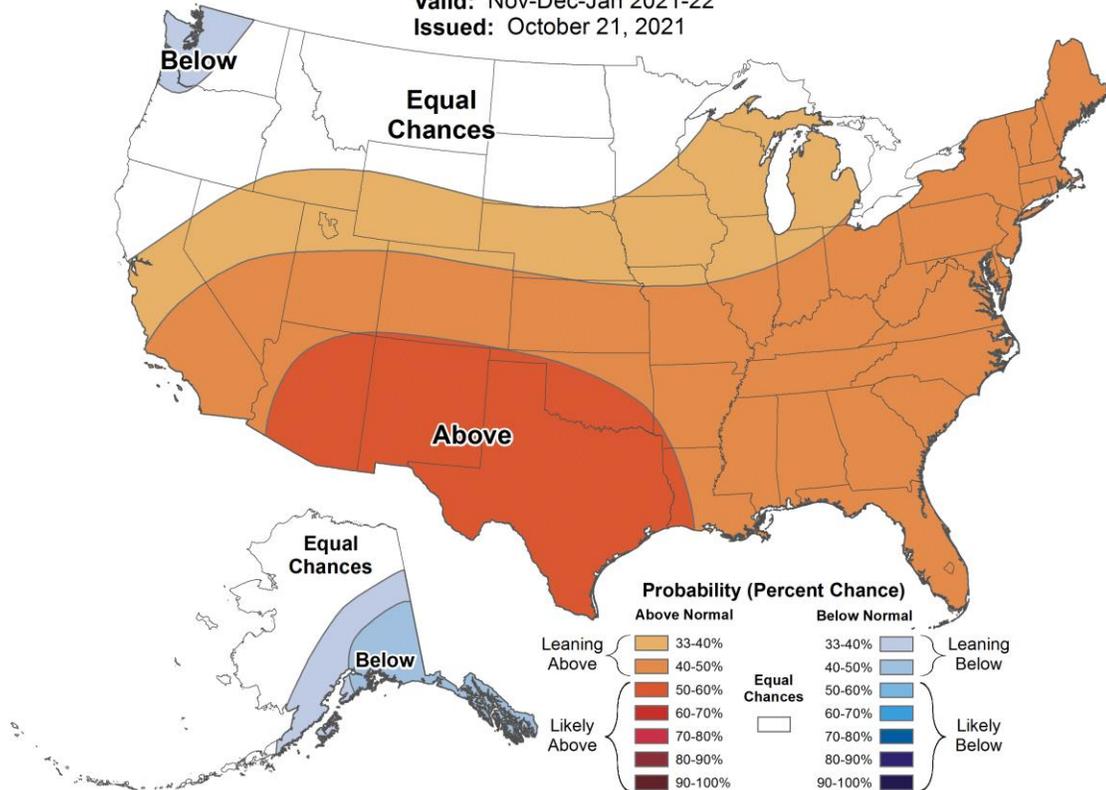
November-January Outlook



Seasonal Temperature Outlook



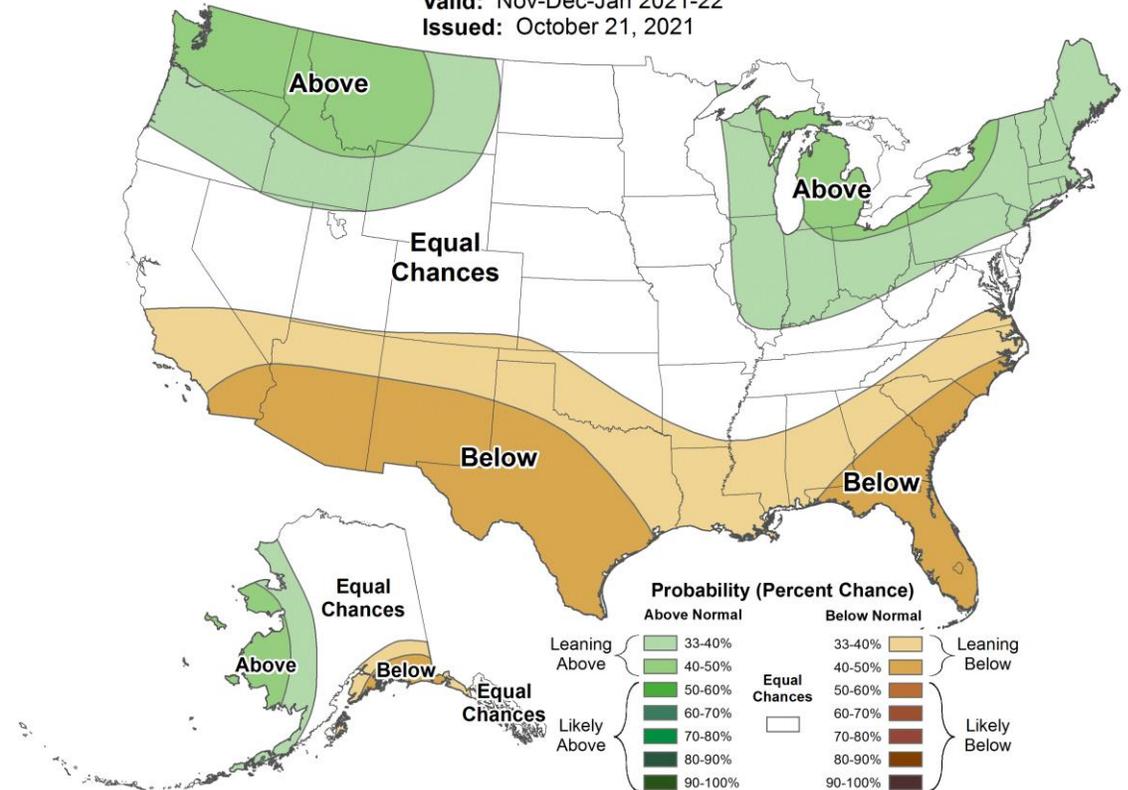
Valid: Nov-Dec-Jan 2021-22
Issued: October 21, 2021



Seasonal Precipitation Outlook



Valid: Nov-Dec-Jan 2021-22
Issued: October 21, 2021





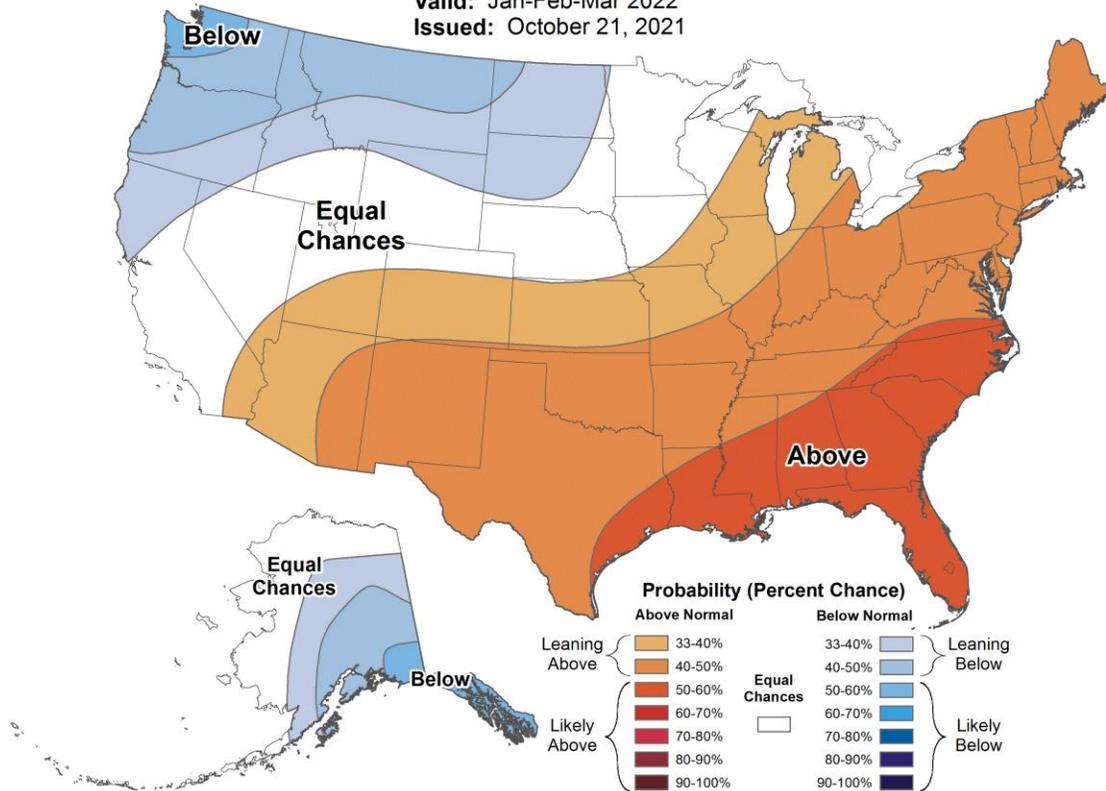
January-March Outlook



Seasonal Temperature Outlook



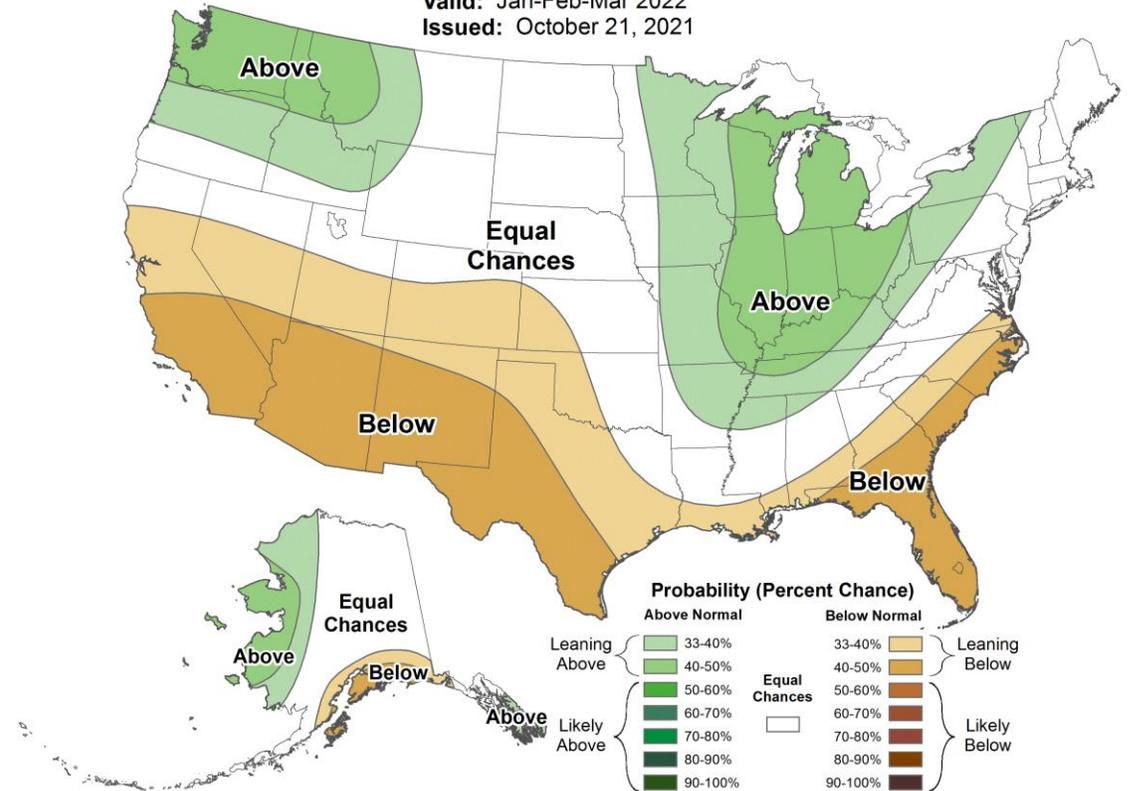
Valid: Jan-Feb-Mar 2022
Issued: October 21, 2021



Seasonal Precipitation Outlook



Valid: Jan-Feb-Mar 2022
Issued: October 21, 2021





Key Messages

- Recent drought recovery in Dakotas & eastern MN. Worsening in Colorado, mixed elsewhere.
- Much prolonged frost-free season this year, near record warm minimum temps in eastern Corn Belt. Several impacts related to farms, gardens, insects, etc.
- Drought lingering across region. Generally limited improvement in cold season
- Missouri River and Great Lakes water levels below average for this time of year.
- La Niña expected to peak at moderate strength this winter. Indicators show more coordinated atmospheric and oceanic behavior than last year.

Thank You!

- Questions:
 - **Climate:**
 - Laura Edwards: laura.edwards@sdstate.edu, 605-626-2870
 - Dennis Todey: dennis.todey@ars.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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