North Central U.S. Climate and Drought Outlook

16 May 2024

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General Information

- **Providing climate services to the Central Region**
  - Collaboration Activity Between:
    - State Climatologists/American Association of State Climatologists
    - NOAA NCEI/NWS/OAR/NIDIS
    - USDA Climate Hubs
    - Midwest and High Plains Regional Climate Centers
    - National Drought Mitigation Center

- **Next Regular Climate/Drought Outlook Webinar**
  - June 20, 2024 (1 PM CST): Presenter: Dr. Aaron Wilson, State Climatologist of Ohio
- **Access to Future Climate Webinars and Information**
- http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars
  - https://mrcc.purdue.edu/multimedia/webinars.jsp
  - https://hprcc.unl.edu/webinars.php
- **Open for questions at the end (enter them along the way).**

Presentation Outline

- Recent Conditions
  - Temperature and precipitation ranks
  - 30-day temperature and precipitation
  - Drought
- Planting/Growing Progress
- Impacts and Notable Events
- Outlooks
  - Rapid shift from strong El Niño to La Niña
  - Short-term
  - Summer

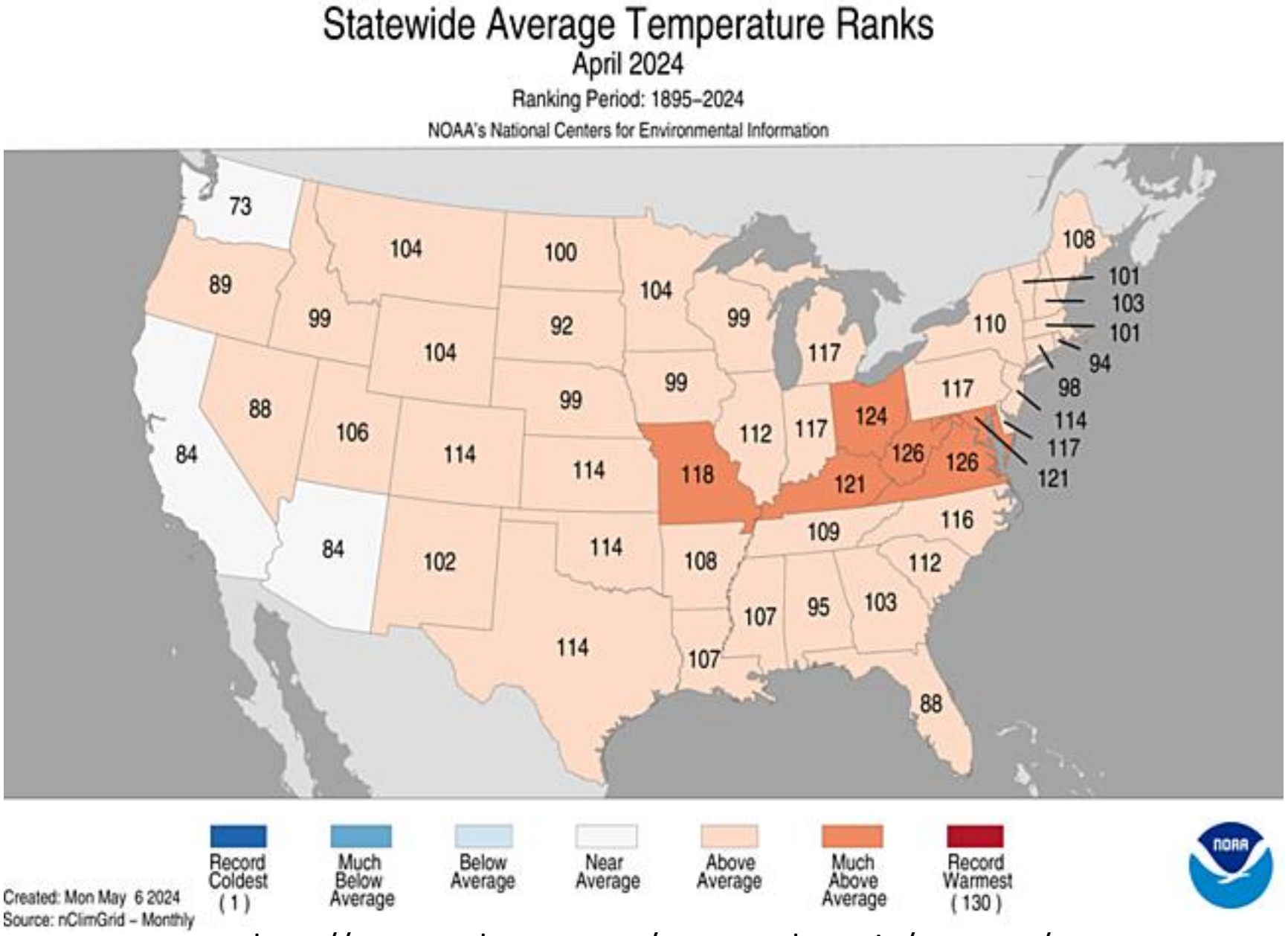
Recent Conditions

April Temperature and Precipitation Ranks
Year-to-Date (YTD) Temperature and Precipitation Ranks
Departure from Normal Temperature and Precipitation
Long-term Precipitation Departures
Soil Moisture, Streamflow and Drought

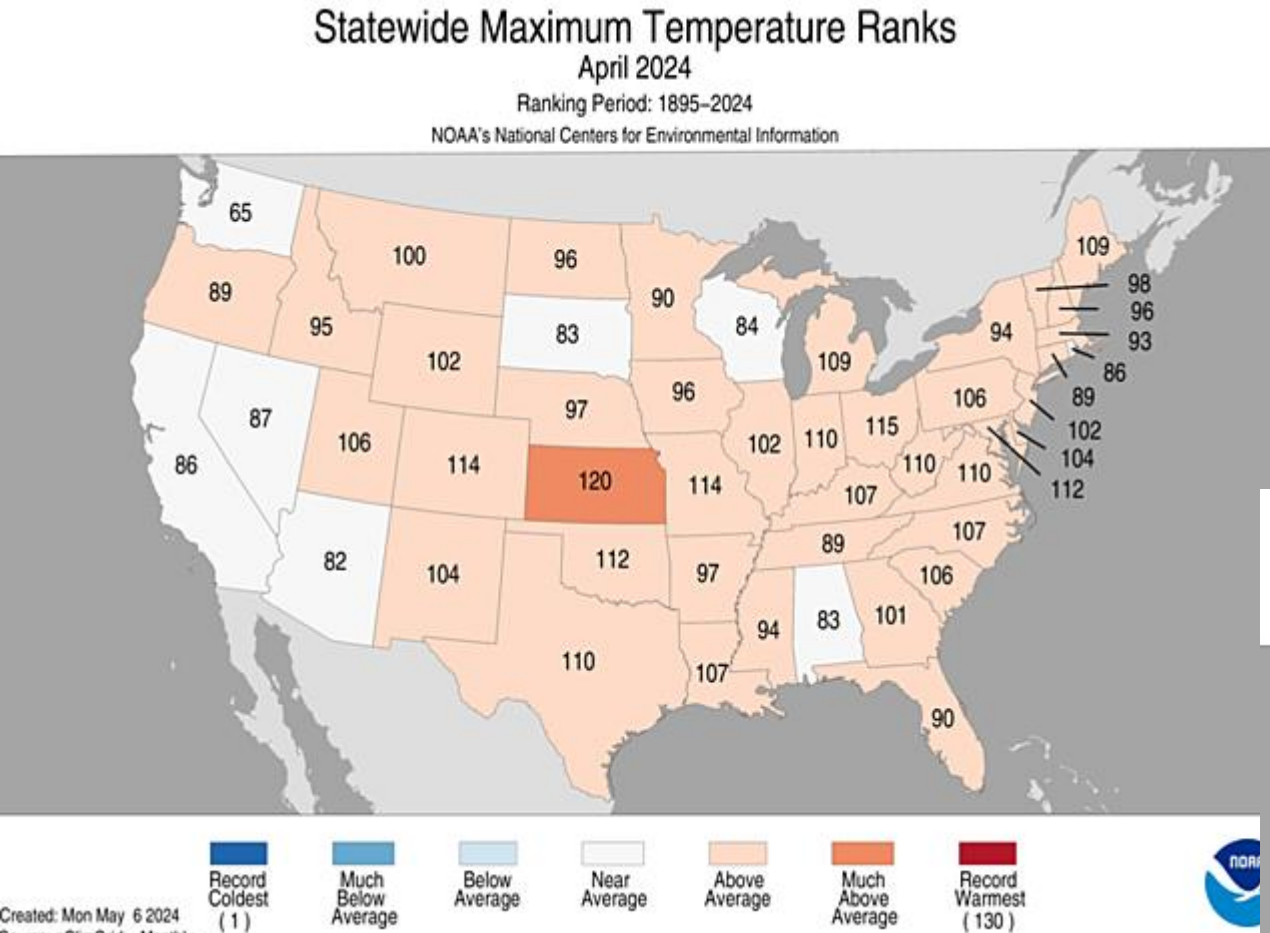
April Temperature Ranks

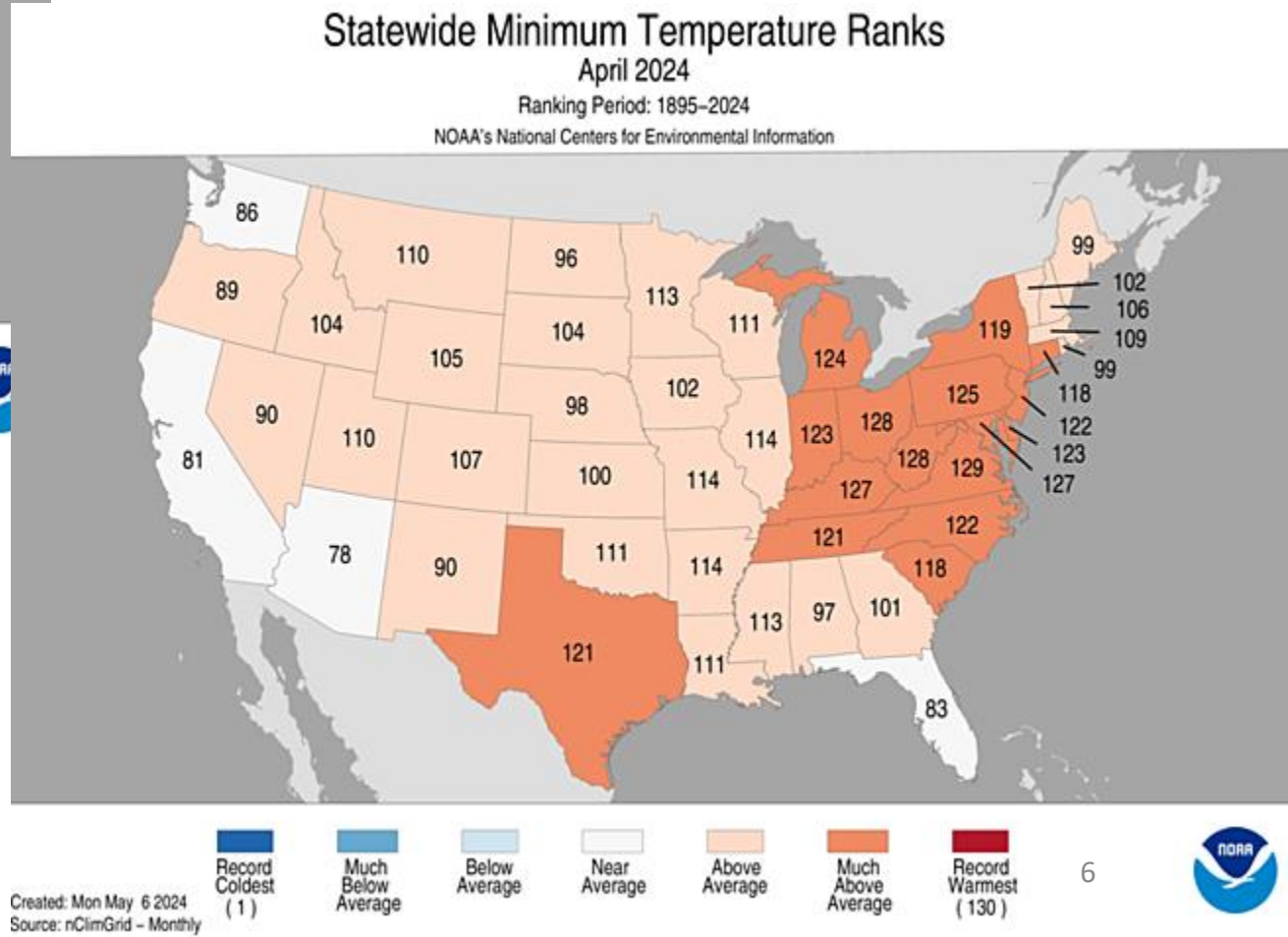
Unseasonably warm across the region, particularly south and east.

6th warmest OH



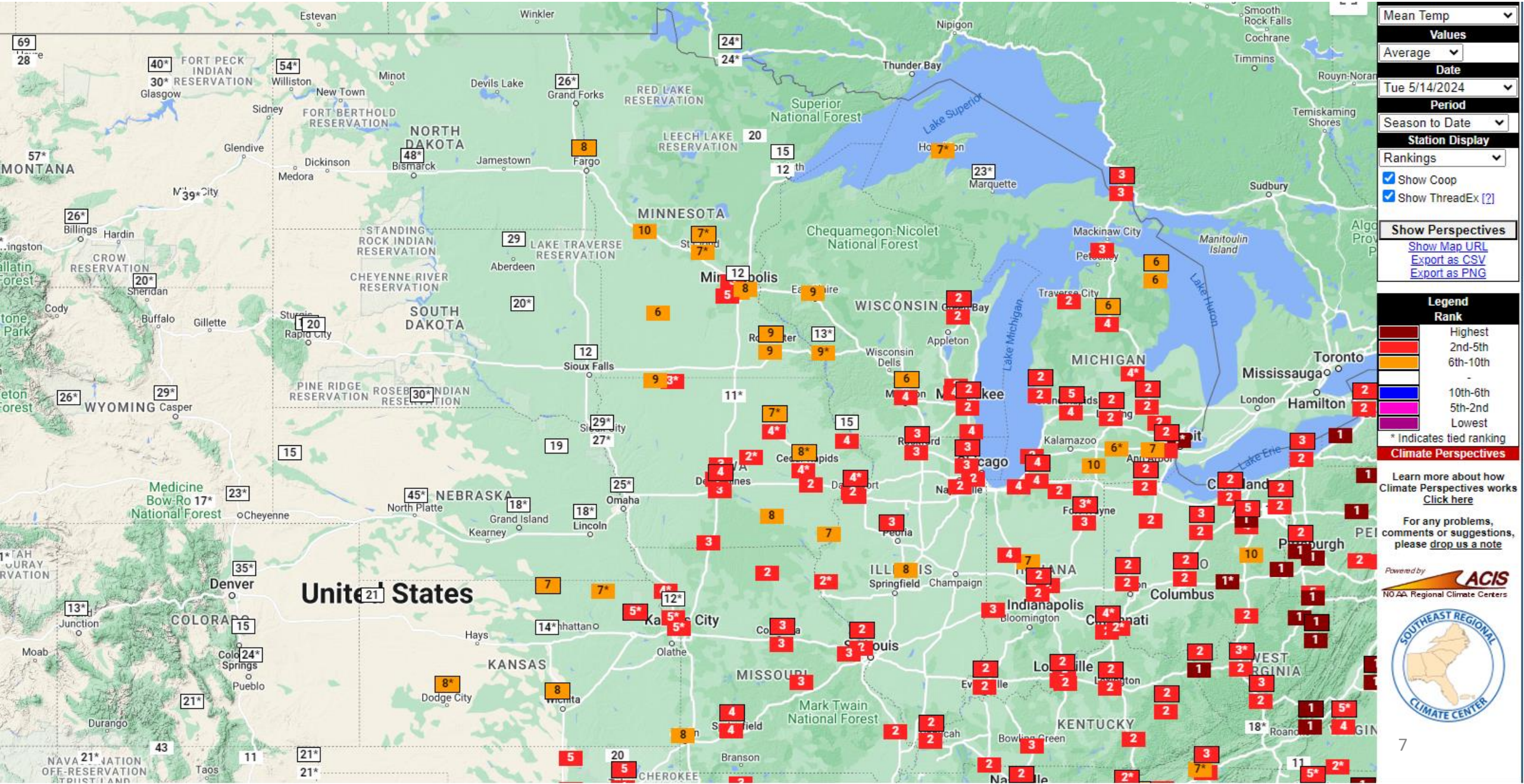
http://www.ncdc.noaa.gov/temp-and-precip/us-maps/





http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

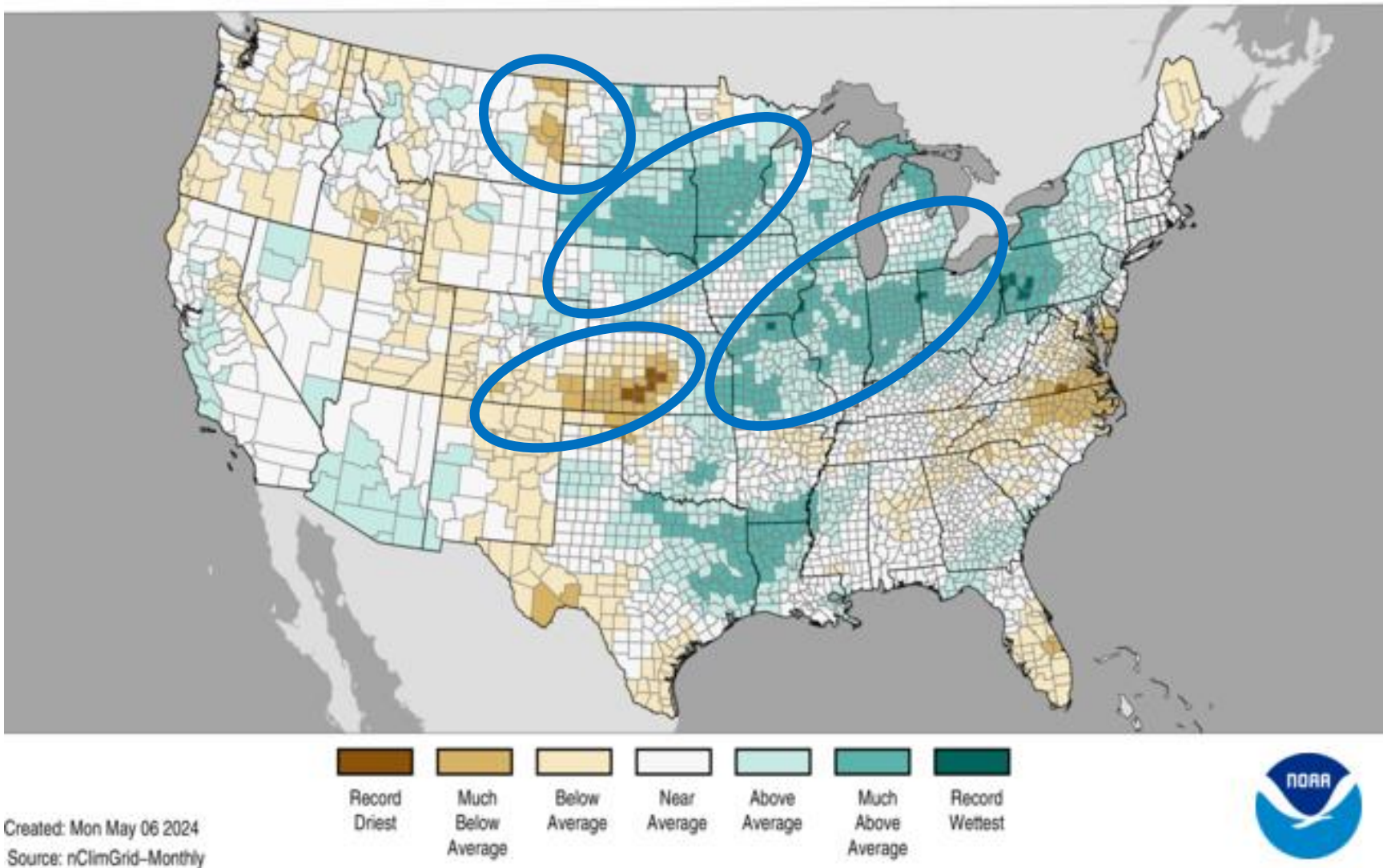
Meteorological Spring Average Temperature Departure Rank



April Precipitation Ranks

Wet conditions across the region; eastern Corn Belt

Near average in Montana.



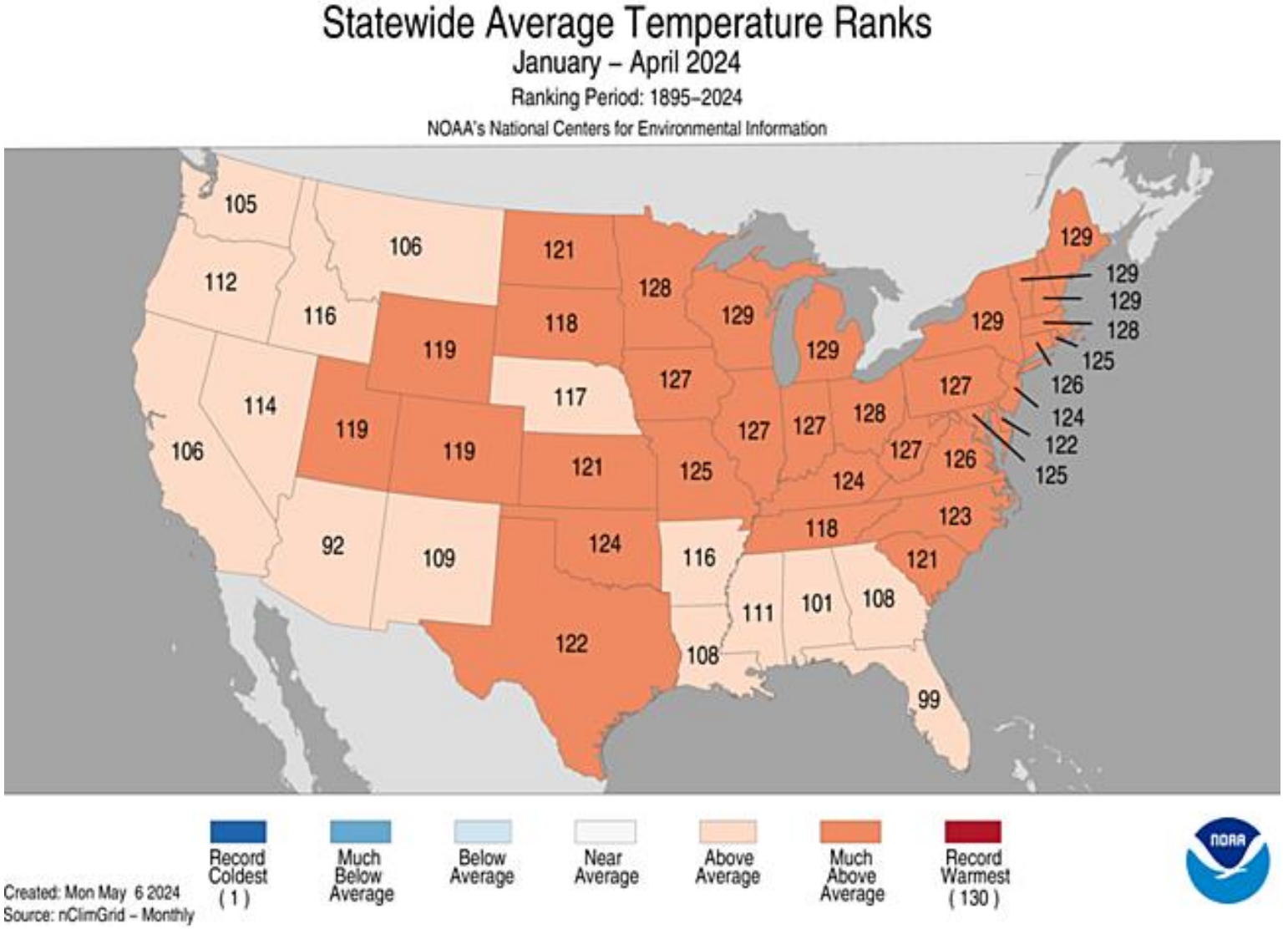
http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

January-April Temperature Recap

Very warm start to the year with many states in the top 5.

Close to the record in OH/MI/WI/MN.

11th consecutive month of record warmth globally



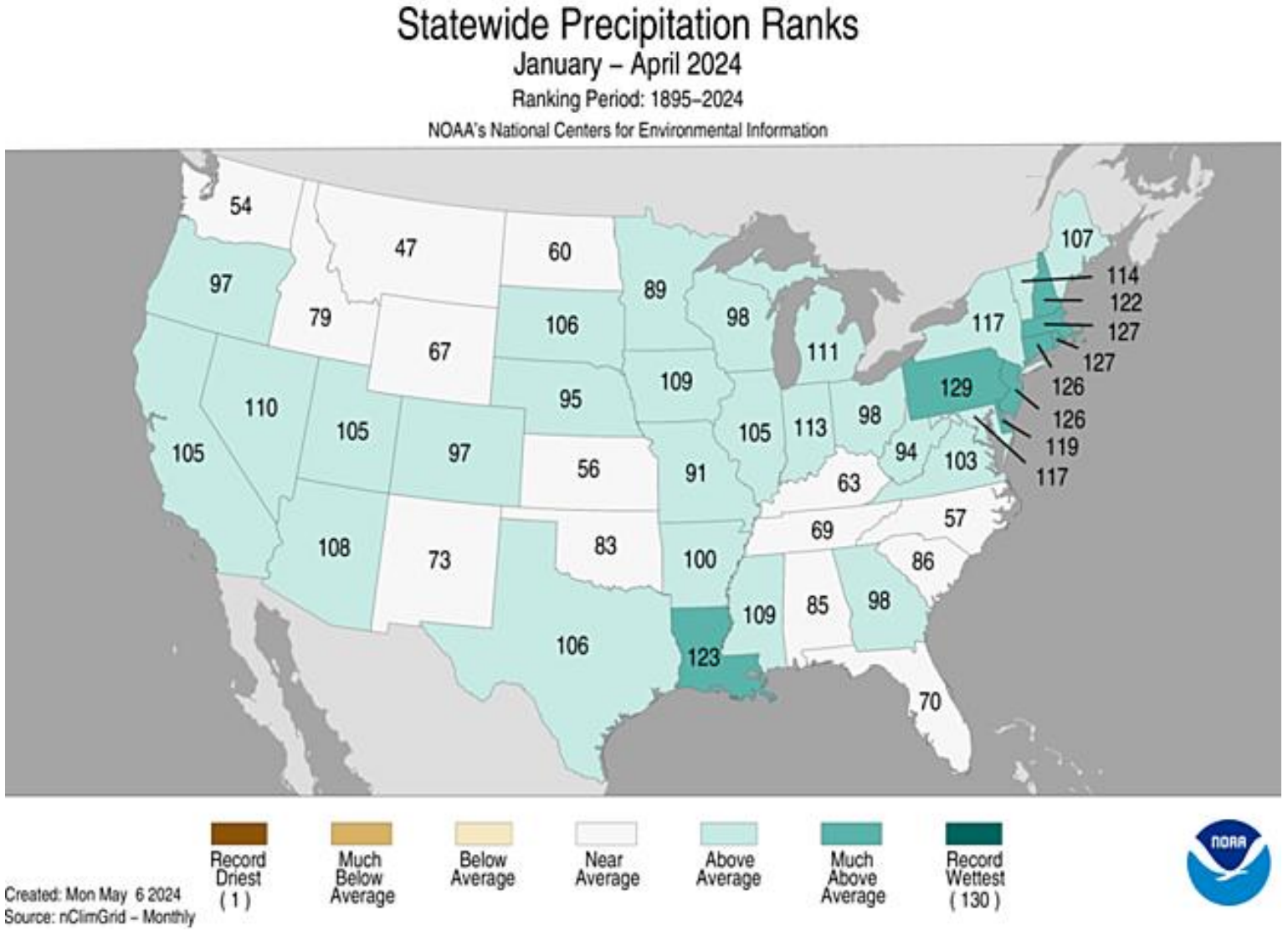
http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

January-April Precipitation Recap

Wetter conditions region for the Corn Belt

Near-normal conditions ND/MT

Drought risk that has built up over the last few years has been alleviated … at least temporarily



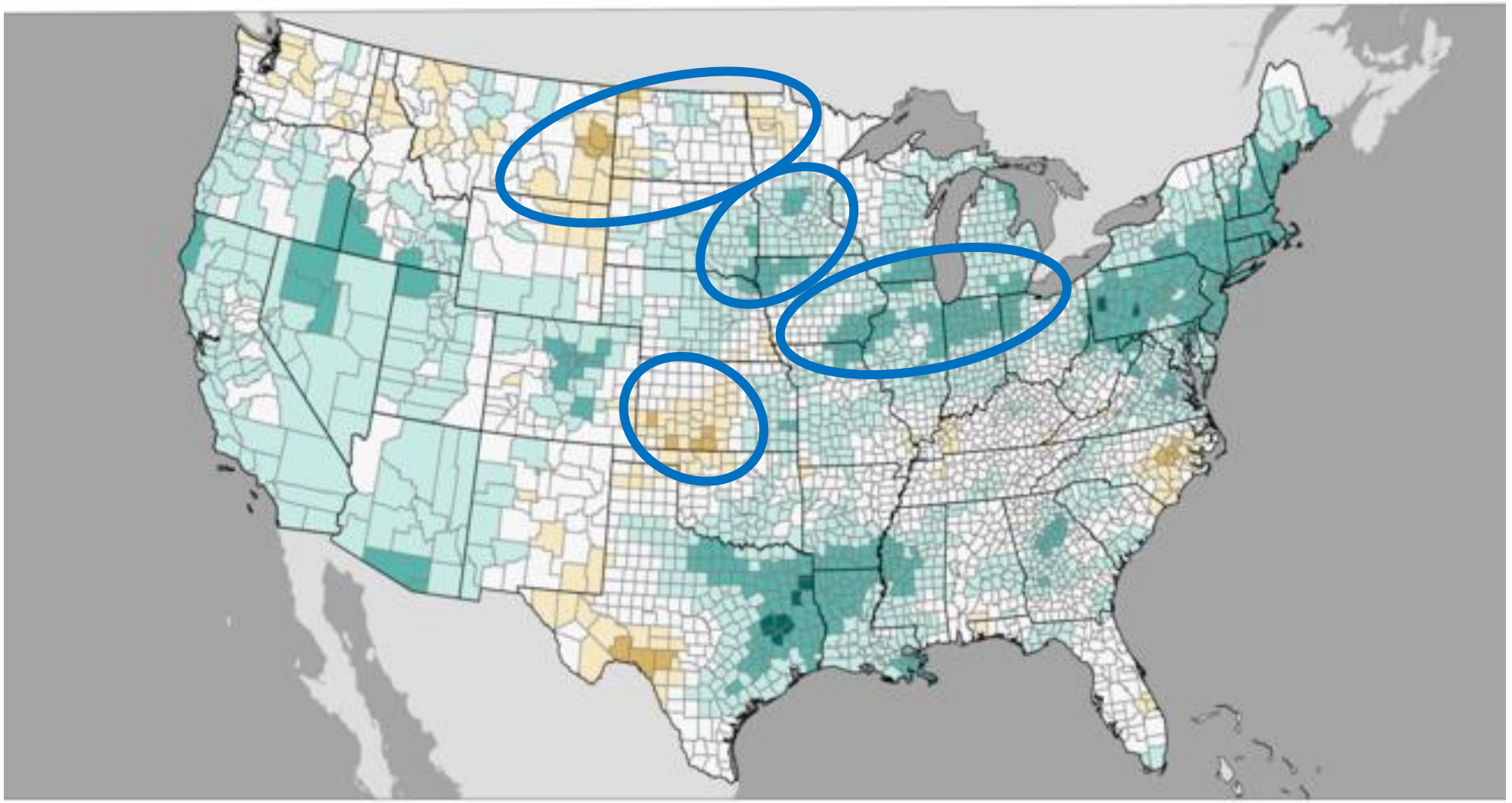
http://www.ncdc.noaa.gov/temp-and-precip/us-maps/

County Precipitation Ranks

January–April 2024

Ranking Period: 1895–2024

NOAA's National Centers for Environmental Information

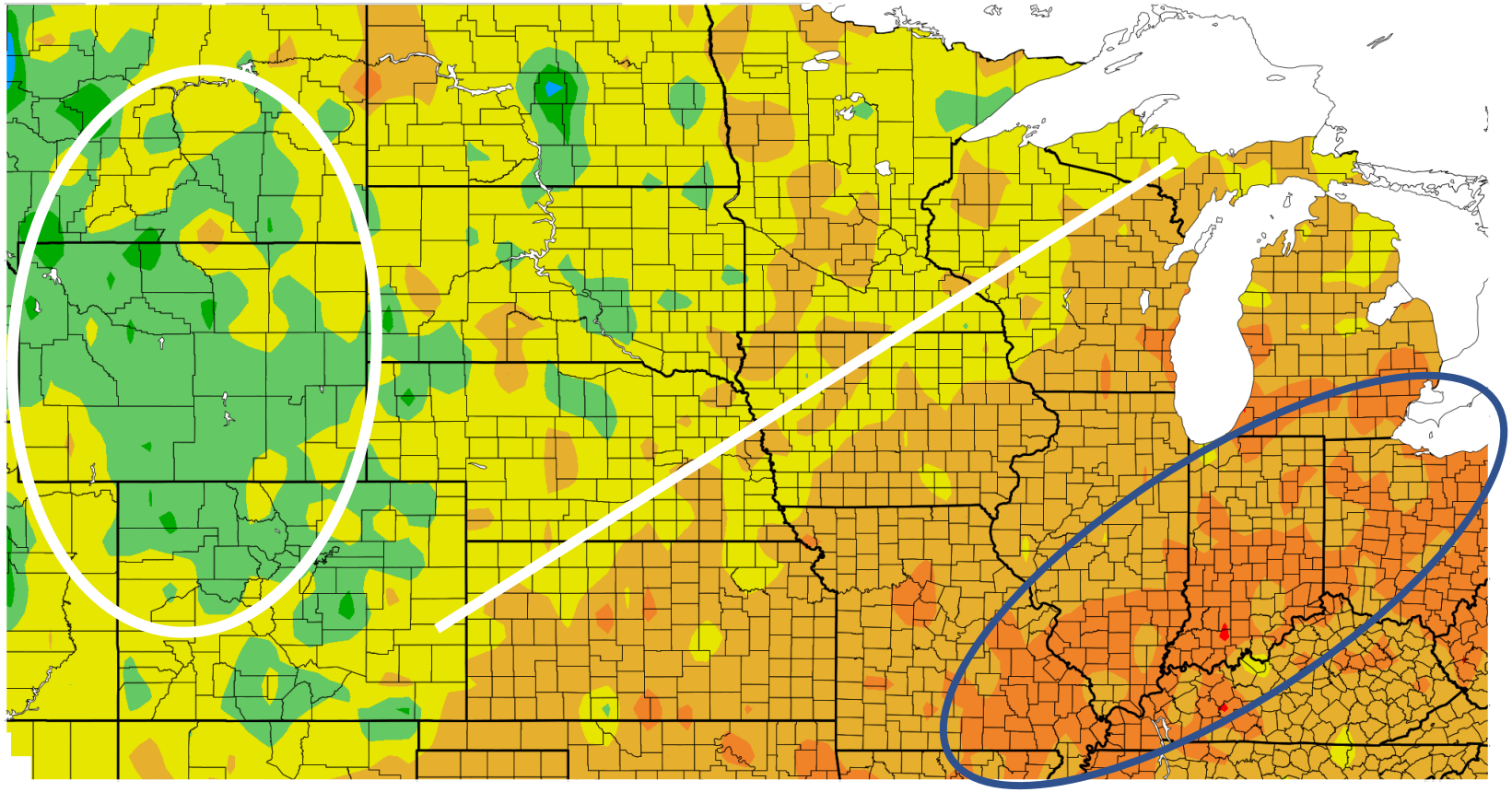


Record Driest | Much Below Average | Below Average | Near Average | Above Average | Much Above Average | Record Wettest

Created: Mon May 06 2024

Source: nClimGrid–Monthly

Departure from Normal Temperature (F)
4/15/2024 – 5/14/2024

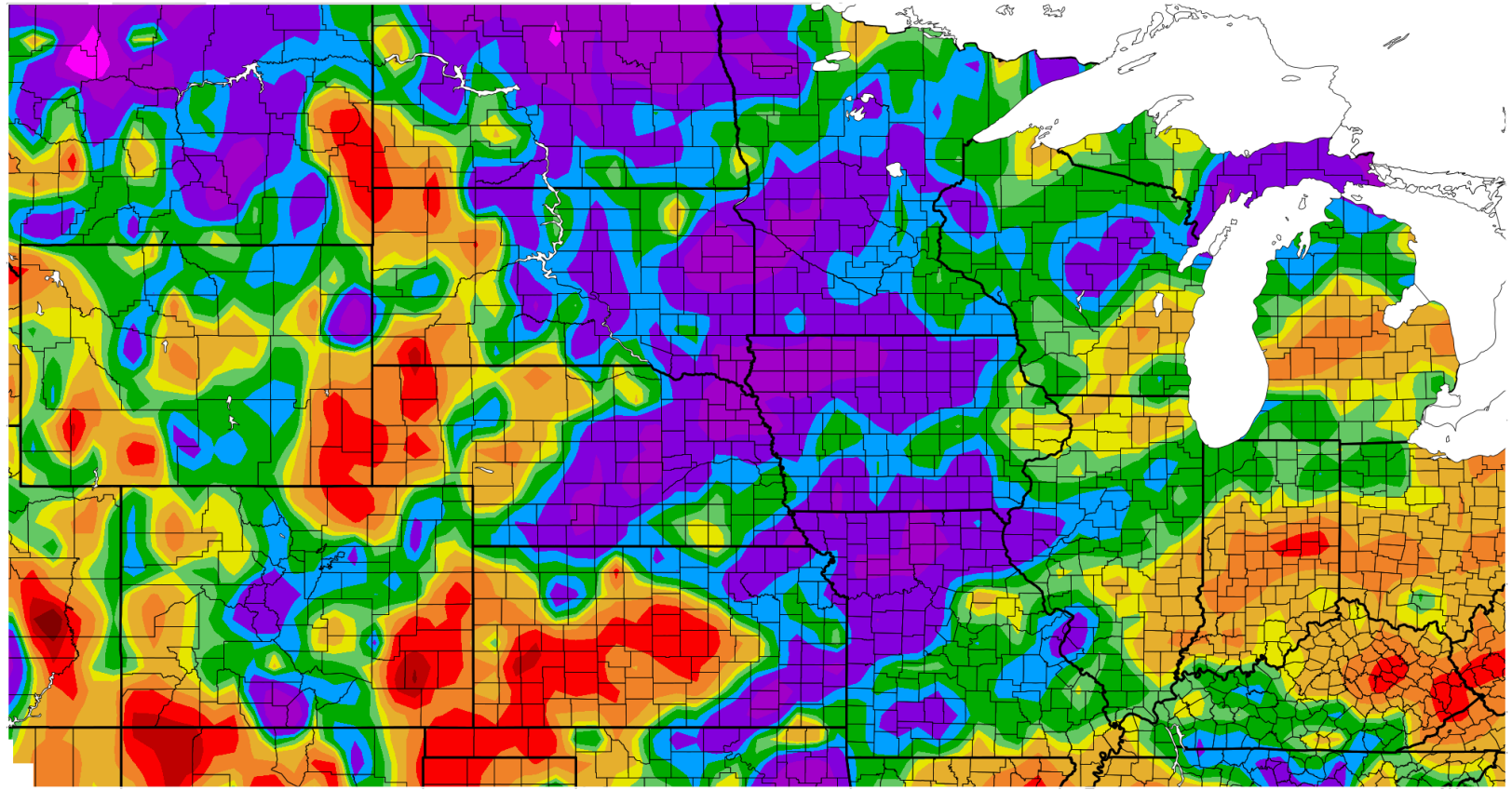


−10 −8 −6 −4 −2 0 2 4 6 8 10

Generated 5/15/2024 at HPRCC using provisional data. NOAA Regional Climate Centers

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

Percent of Normal Precipitation (%)
4/15/2024 – 5/14/2024

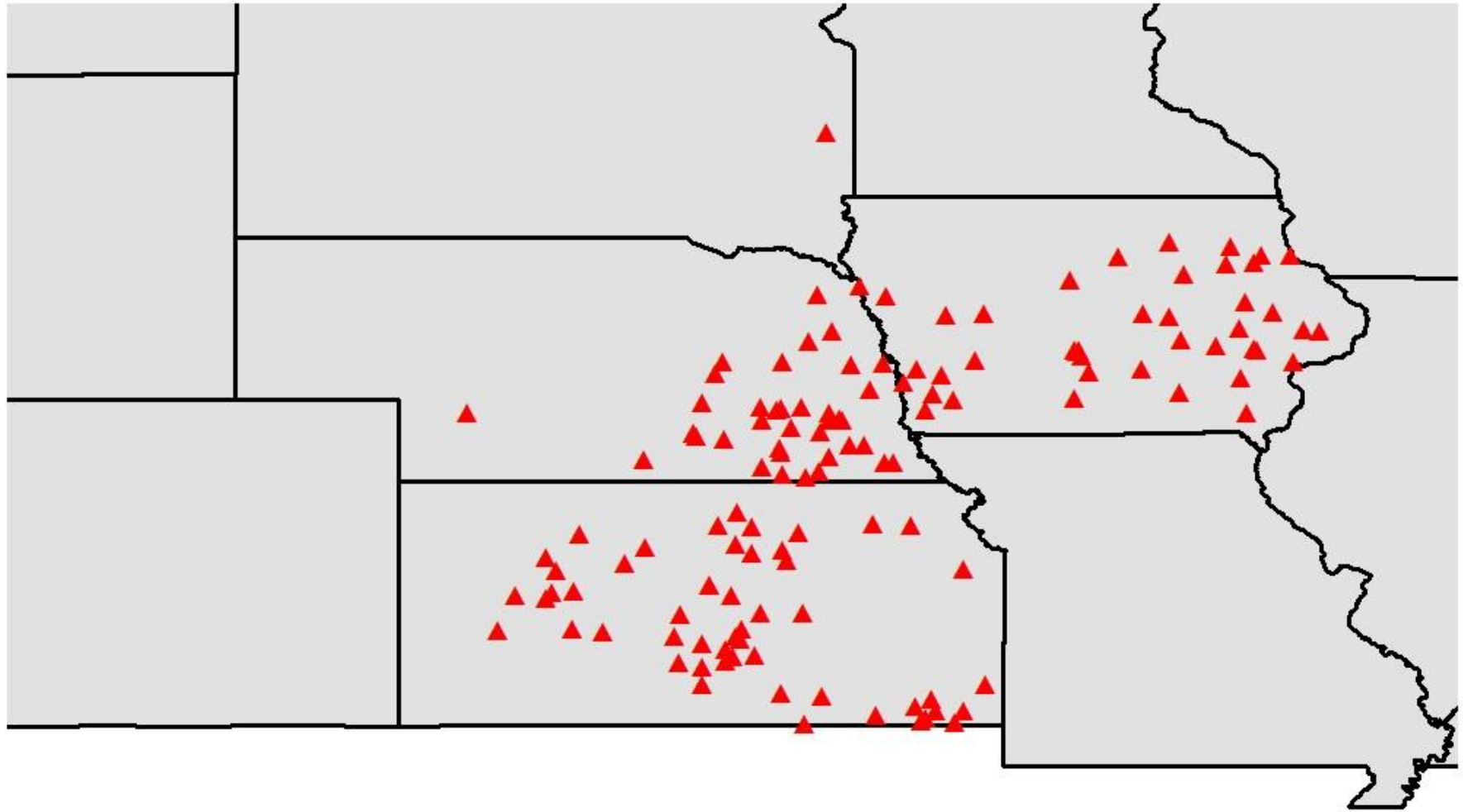


5 25 50 70 90 100 110 130 150 200 300

Generated 5/15/2024 at HPRCC using provisional data. NOAA Regional Climate Centers

https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

20+ Inch Precipitation Deficit Over the Past 3 Years as of May 13th

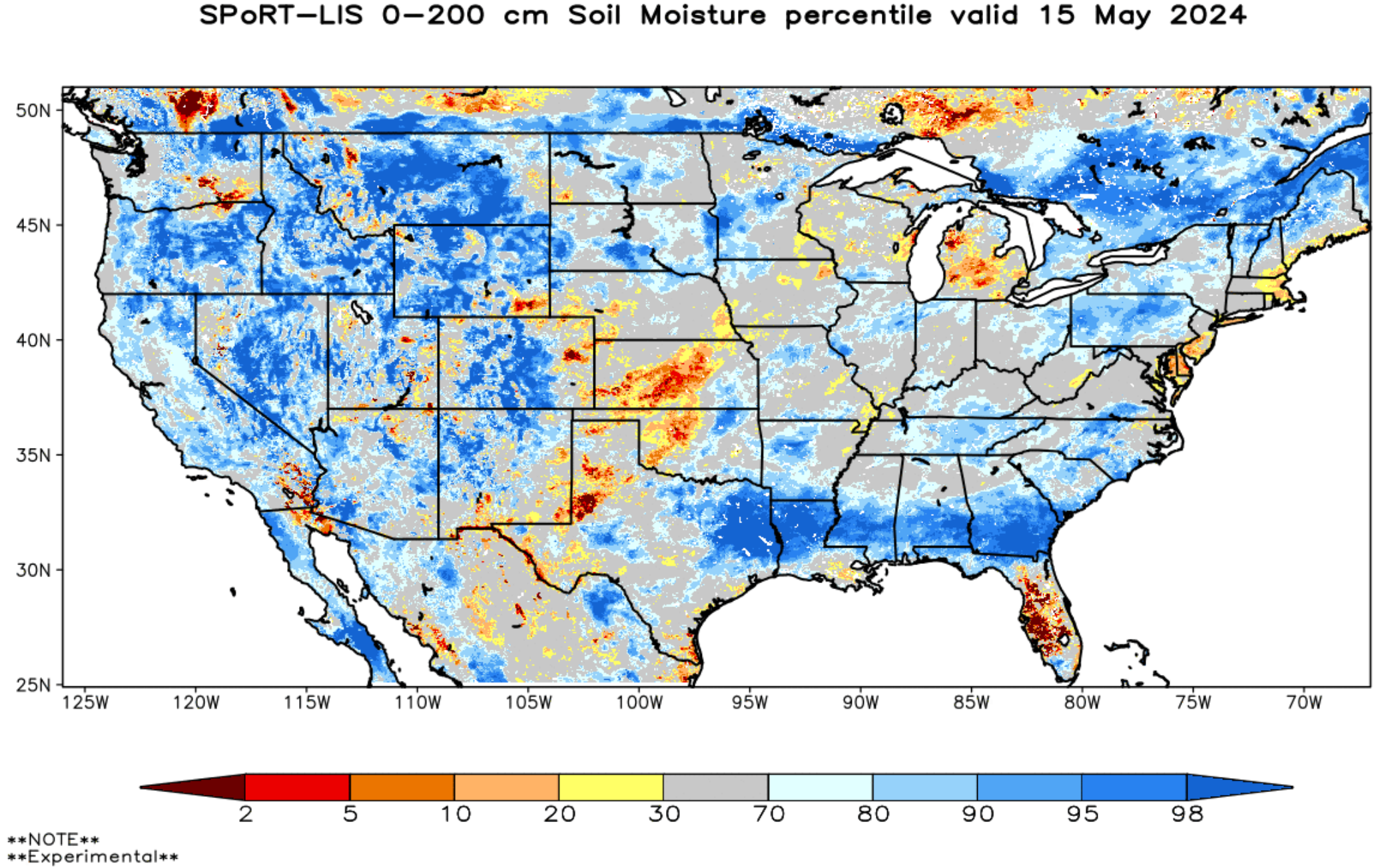


Total Stations: 135
Stations Above 30 inches: 12

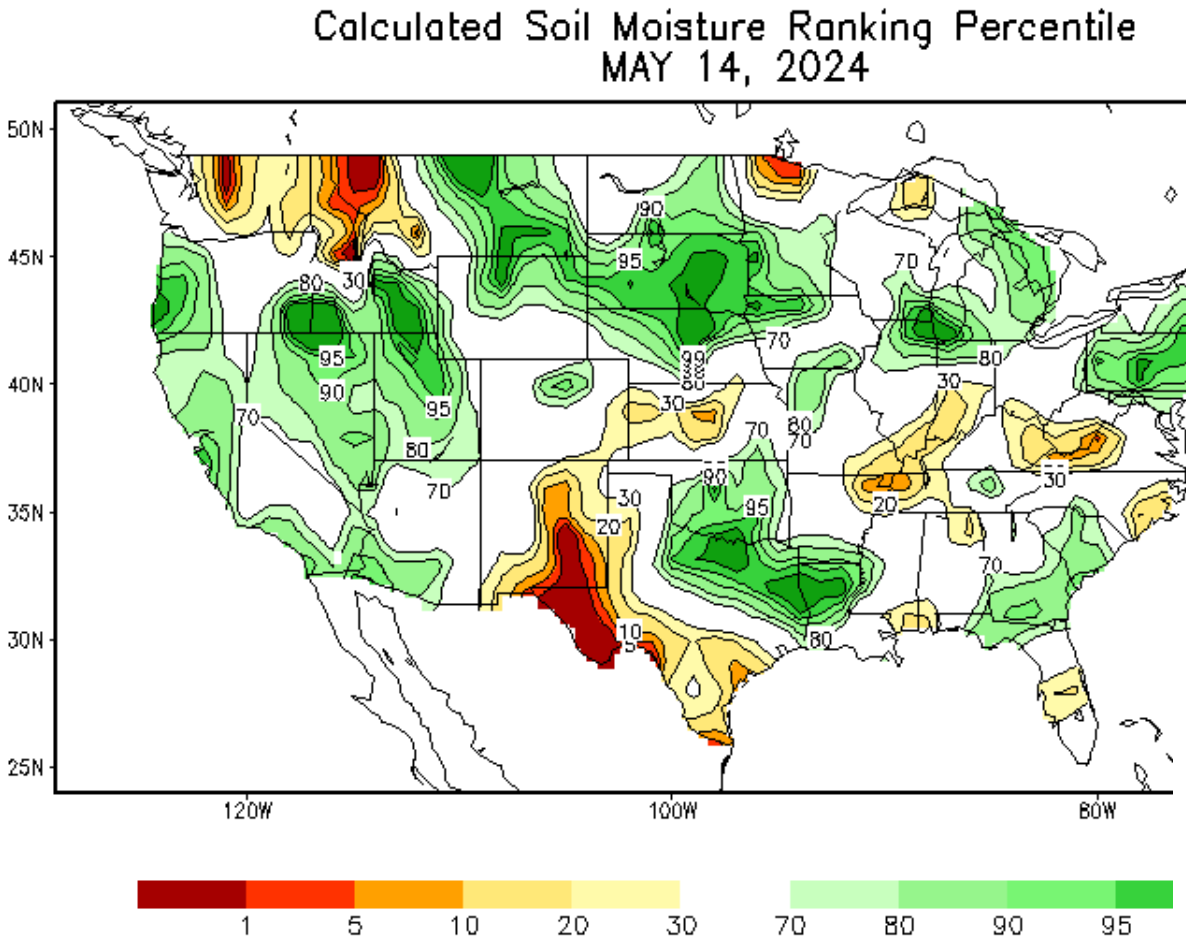
HPRCC

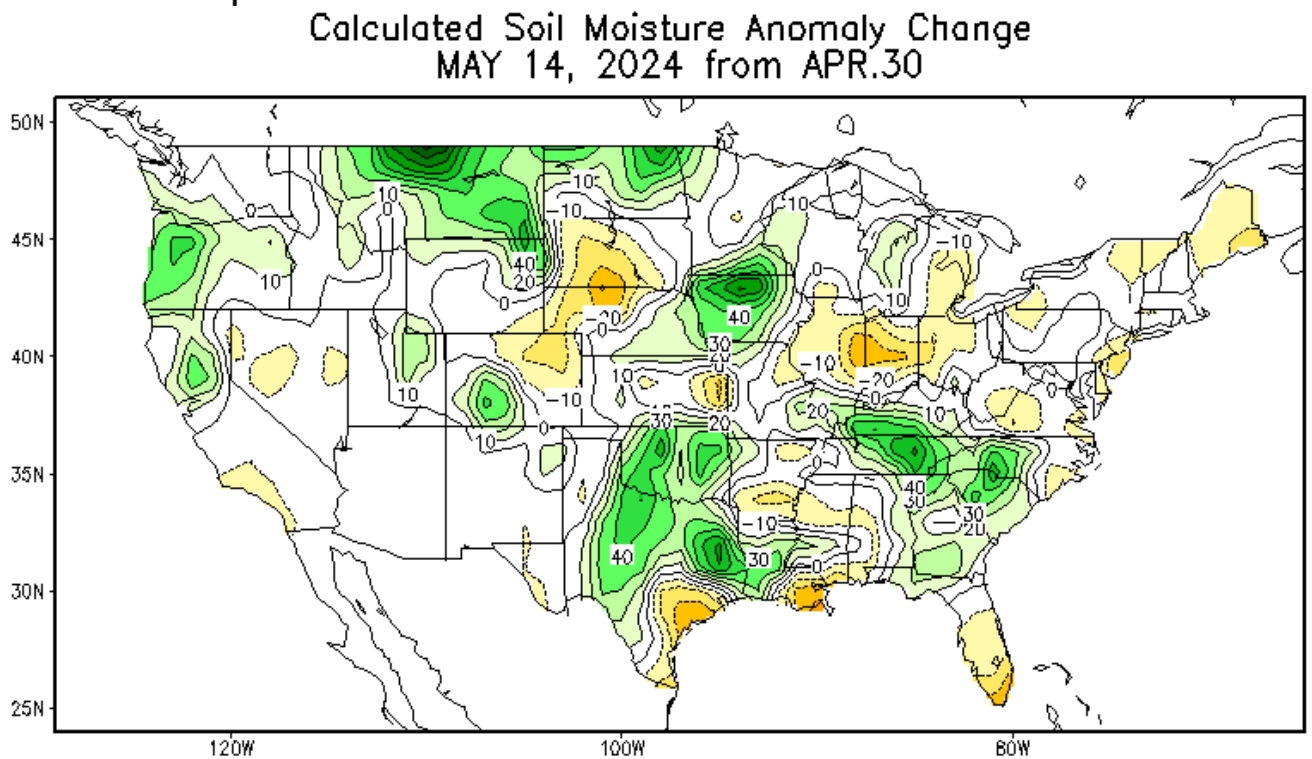
Powered by ACIS
Regional Climate Centers

Minimum 30 years of data, maximum of 25 missing days
All Reports Are Considered Preliminary



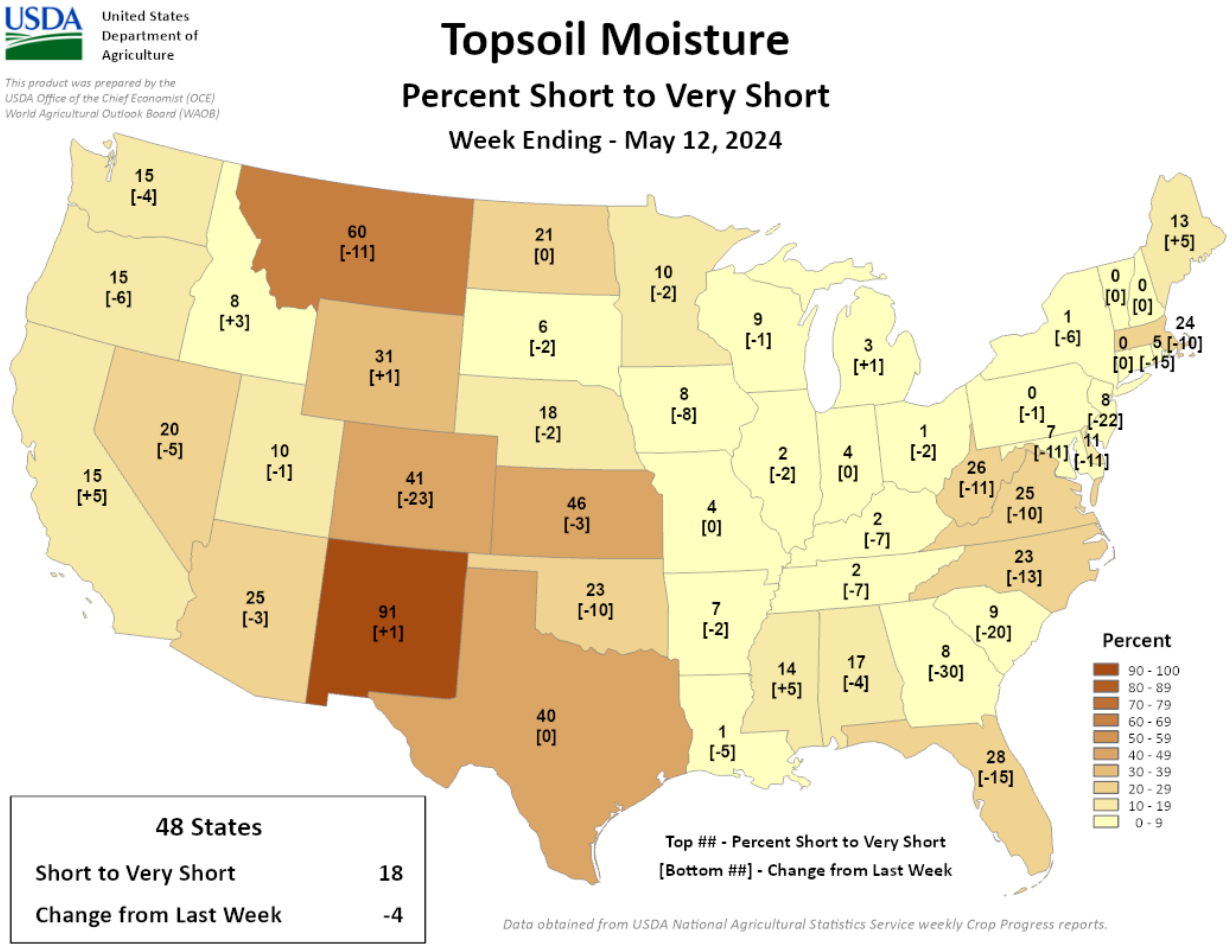
https://weather.msfc.nasa.gov/cgi-bin/basicLooper.pl?category=lis_CONUS&initialize=first&regex=vsm0-200percent_20201118



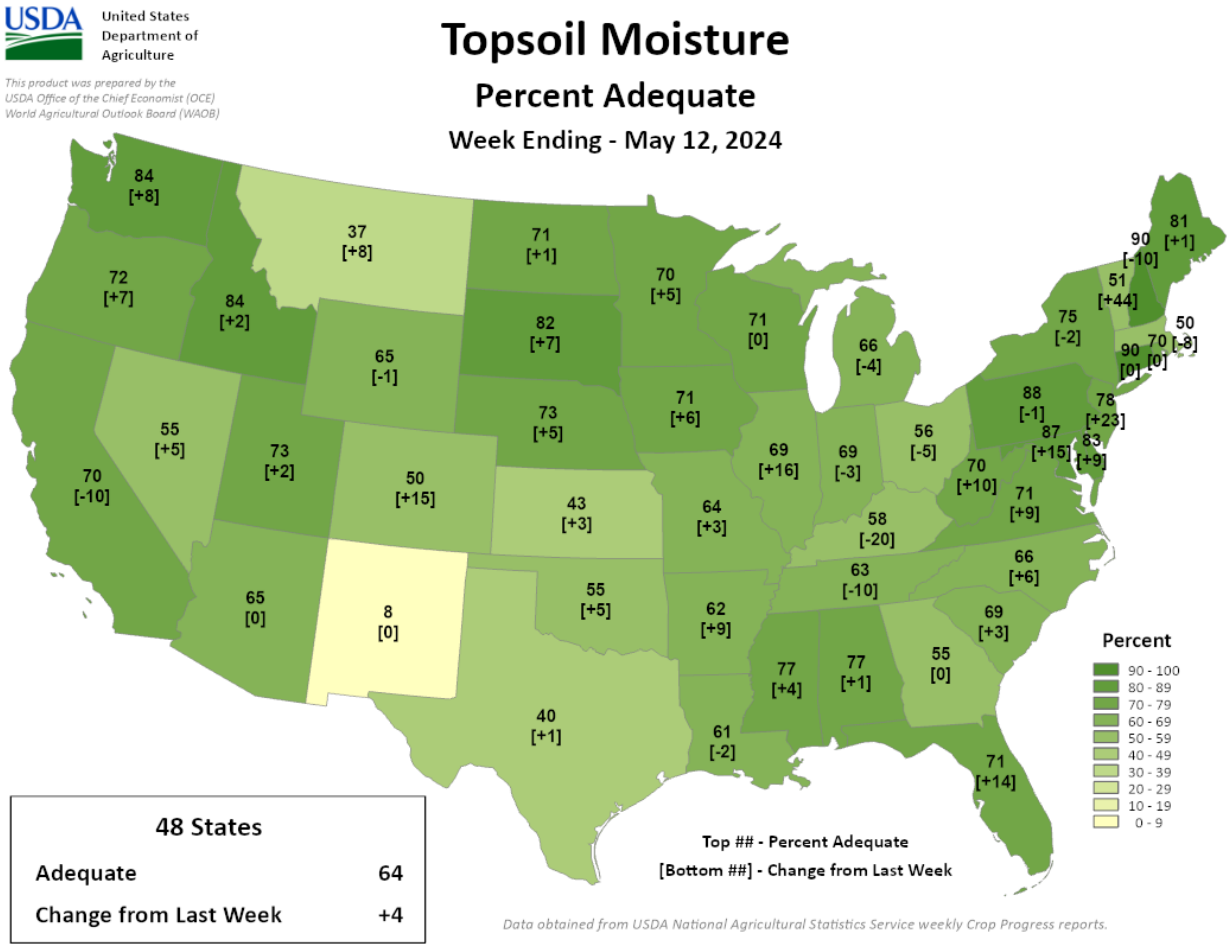


https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Soilmst/Soilmst.shtml#

USDA NASS – Topsoil Moisture



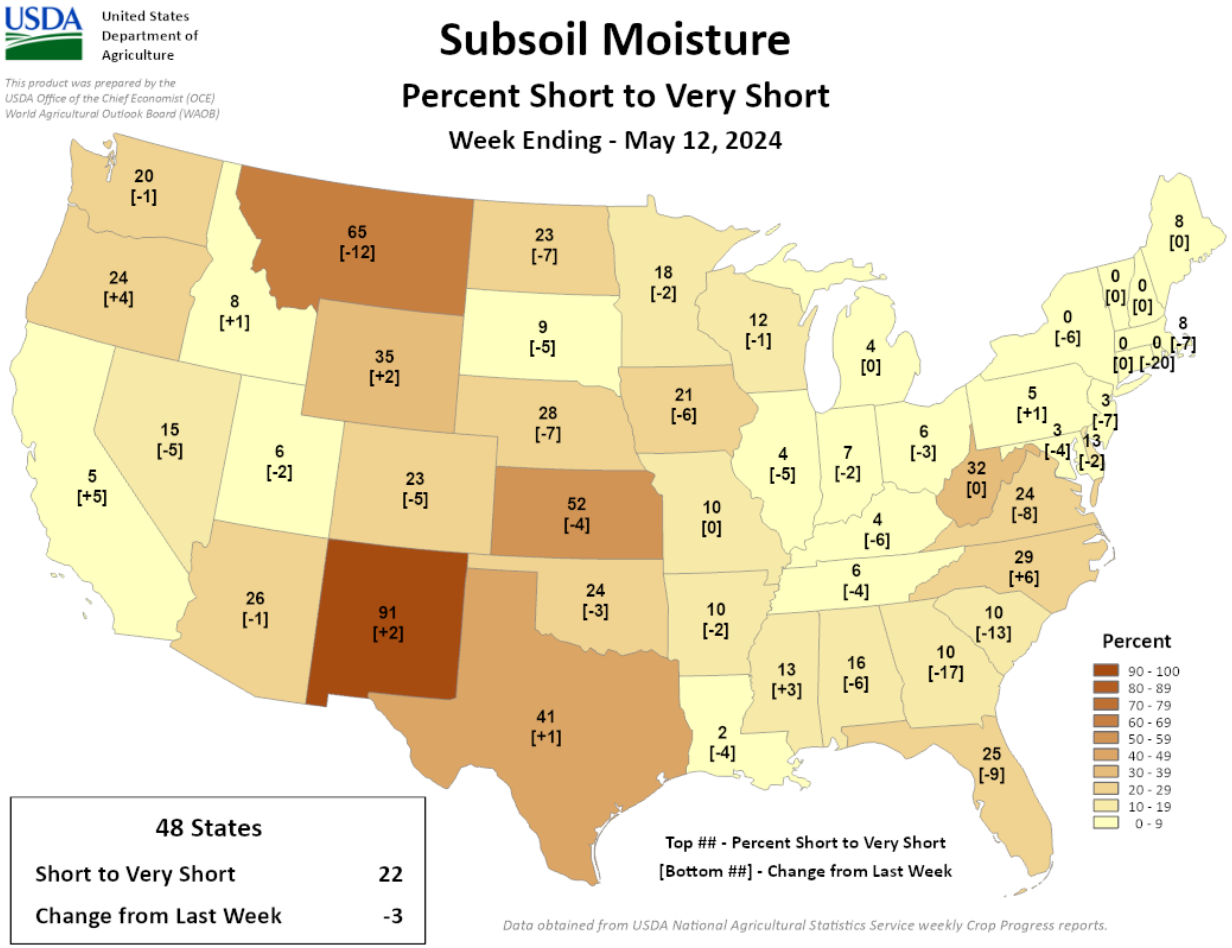
48 States	
Short to Very Short	18
Change from Last Week	-4



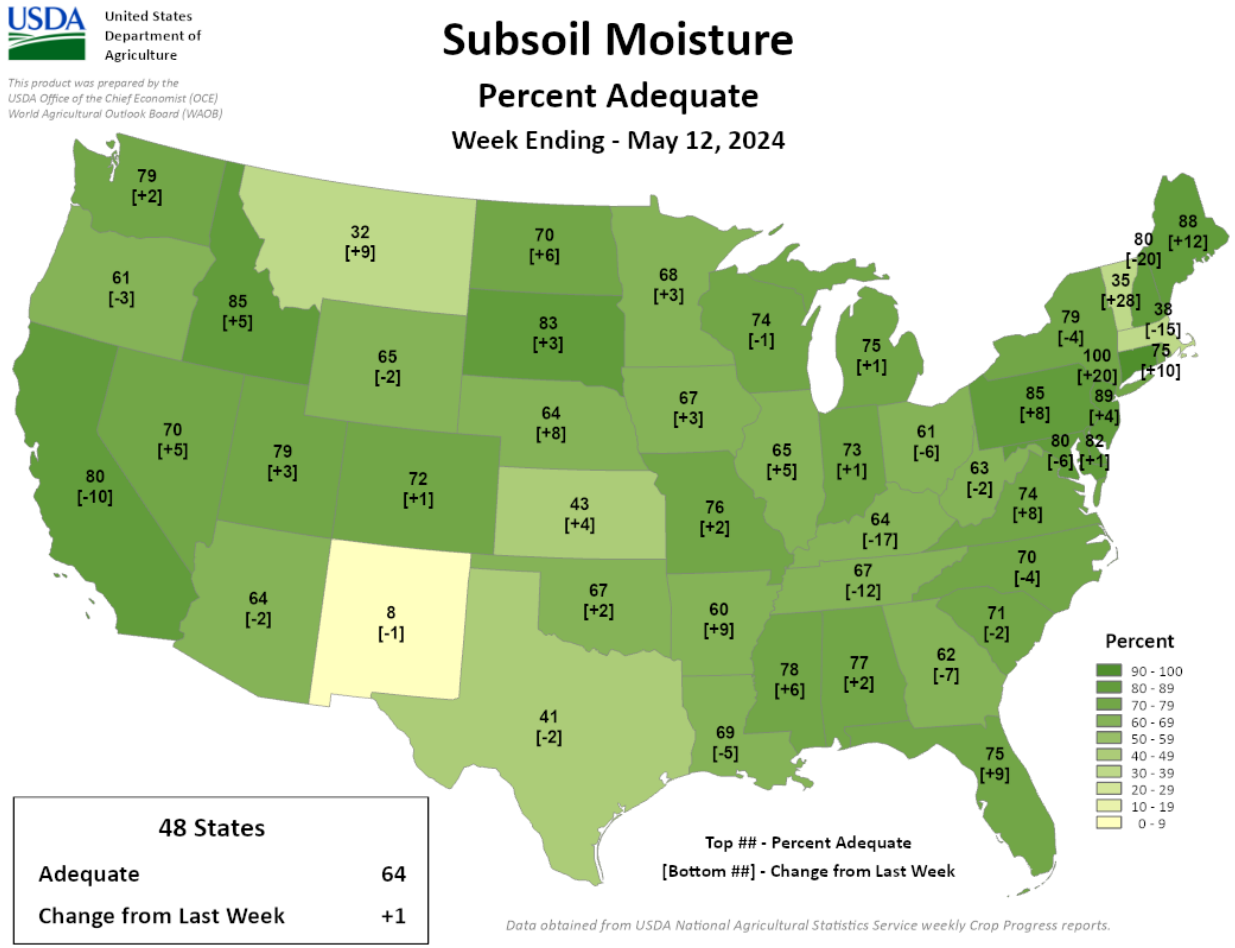
48 States	
Adequate	64
Change from Last Week	+4

https://agindrought.unl.edu/Other.aspx

USDA NASS – Subsoil Moisture



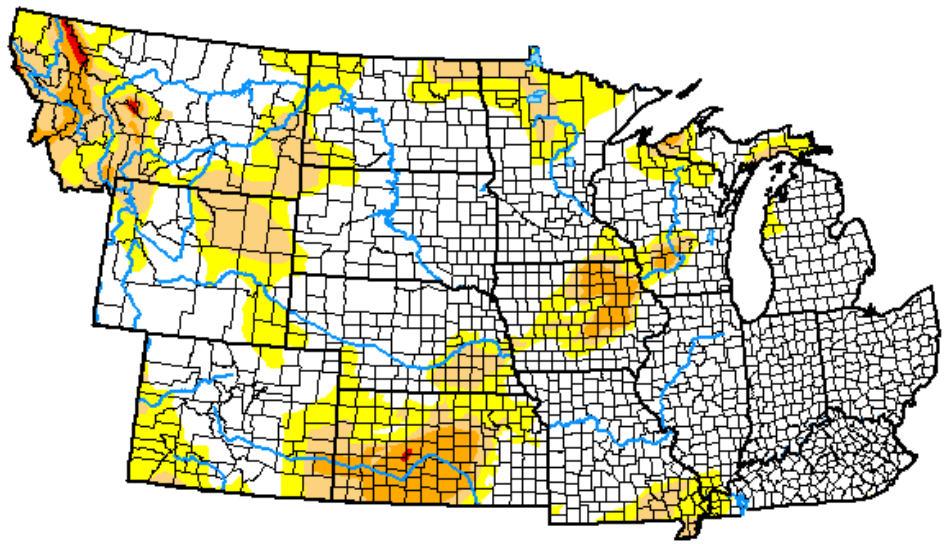
48 States	
Short to Very Short	22
Change from Last Week	-3



48 States	
Adequate	64
Change from Last Week	+1

https://agindrought.unl.edu/Other.aspx

U.S. Drought Monitor
NWS Central



May 14, 2024
(Released Thursday, May. 16, 2024)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	66.09	33.91	15.48	4.56	0.21	0.00
Last Week *05-07-2024*	59.68	40.32	17.40	5.12	0.19	0.00
3 Months Ago *02-13-2024*	47.36	52.64	23.06	8.62	0.92	0.00
Start of Calendar Year *01-02-2024*	39.12	60.88	34.11	13.18	2.68	0.01
Start of Water Year *09-26-2023*	39.86	60.14	40.32	19.88	6.29	0.49
One Year Ago *05-16-2023*	55.54	44.46	22.11	11.65	5.53	2.88

Intensity:

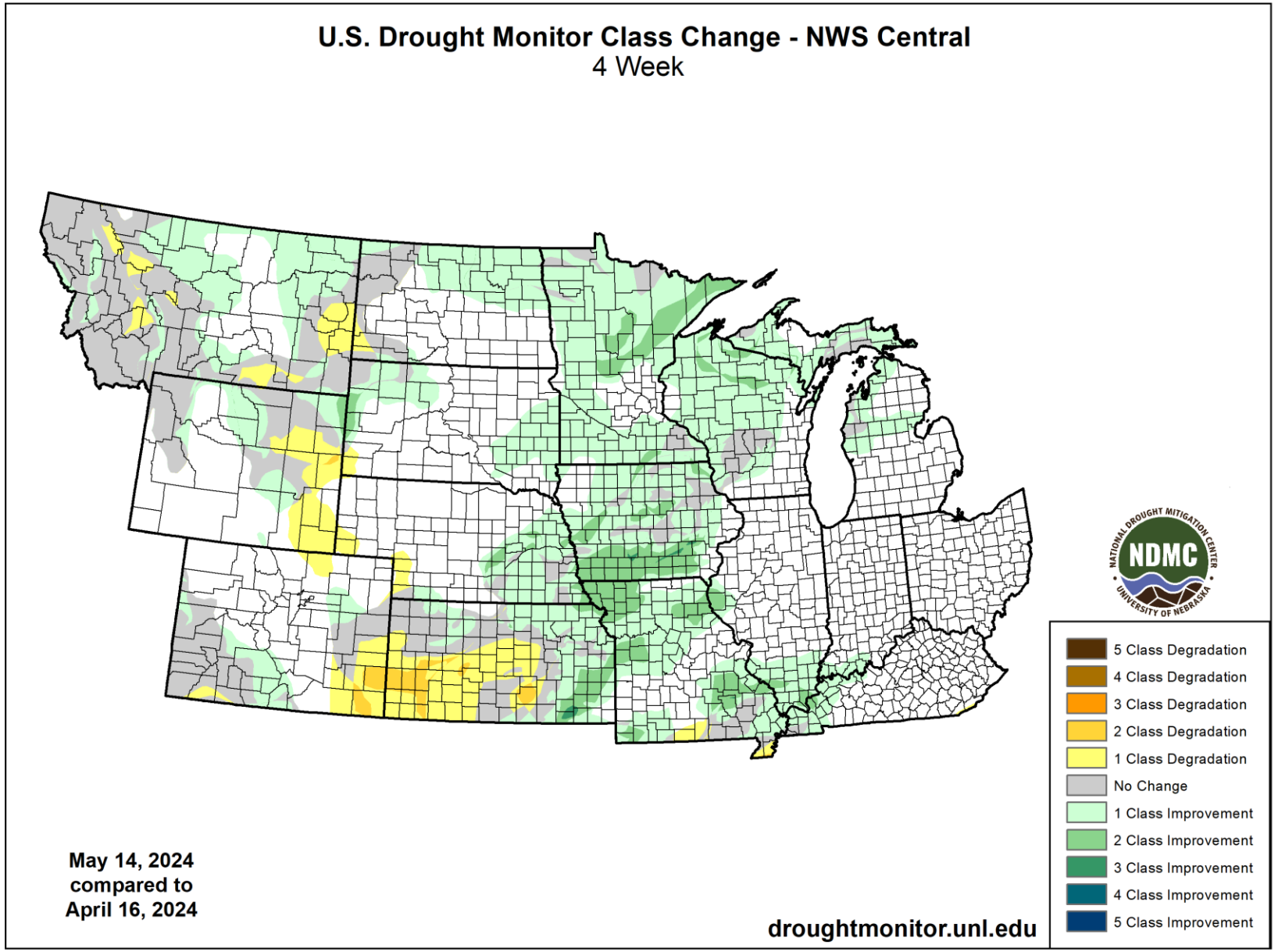
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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:
Lindsay Johnson
National Drought Mitigation Center

droughtmonitor.unl.edu

https://droughtmonitor.unl.edu/



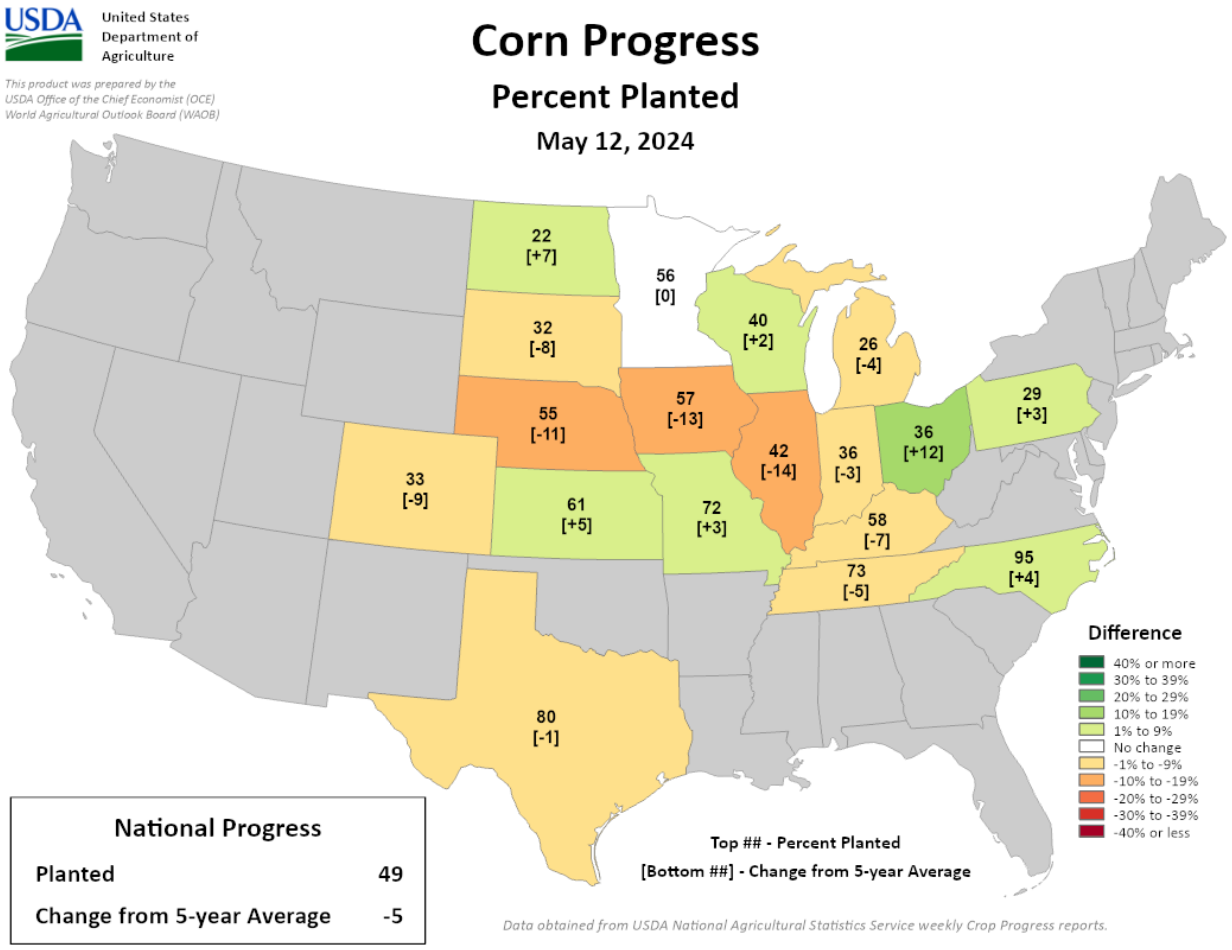
https://droughtmonitor.unl.edu/Maps/ChangeMaps.aspx

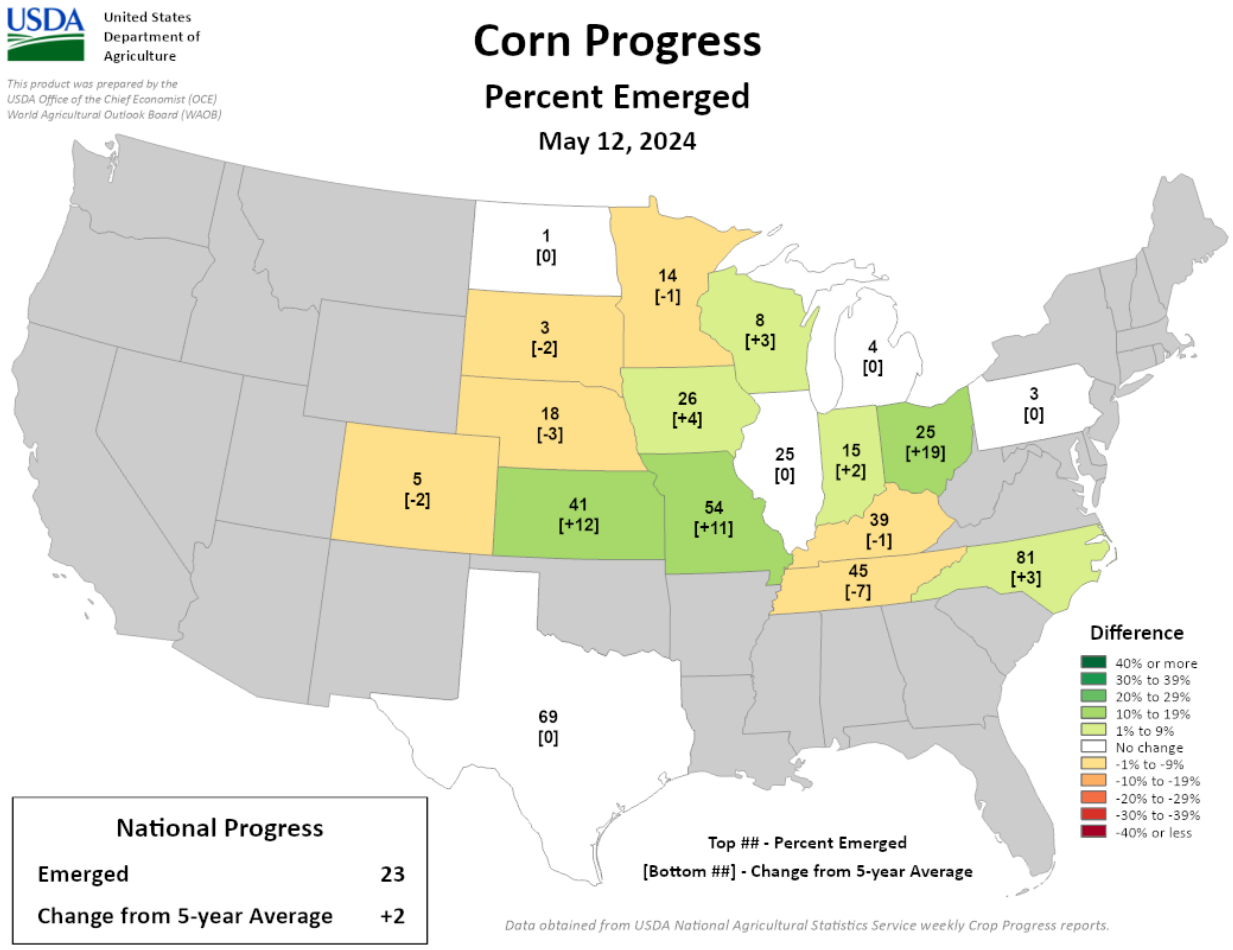
Photo Credit: OSU Extension

Photo Credit: Hans Schmitz

Growing Season Progress

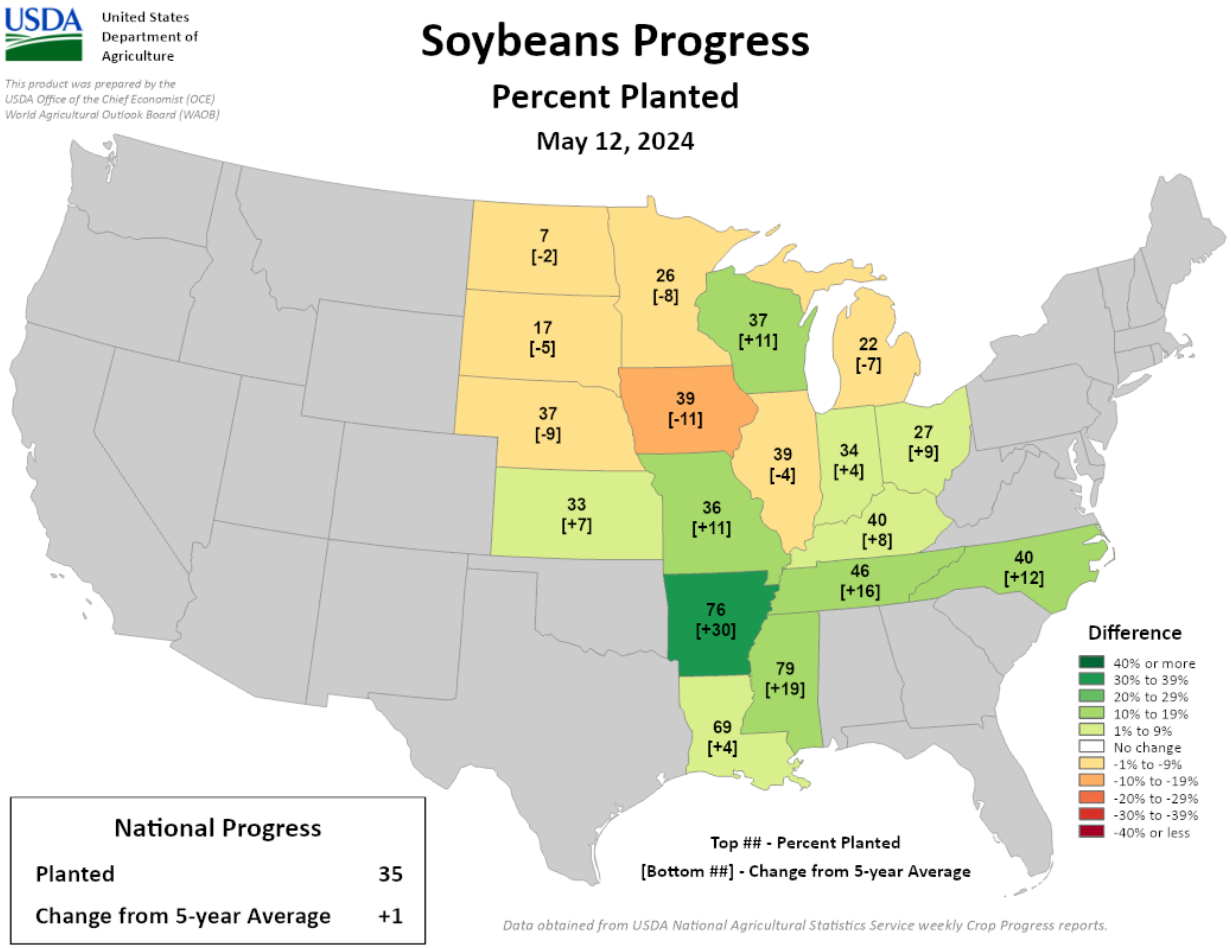
USDA NASS – Corn Progress

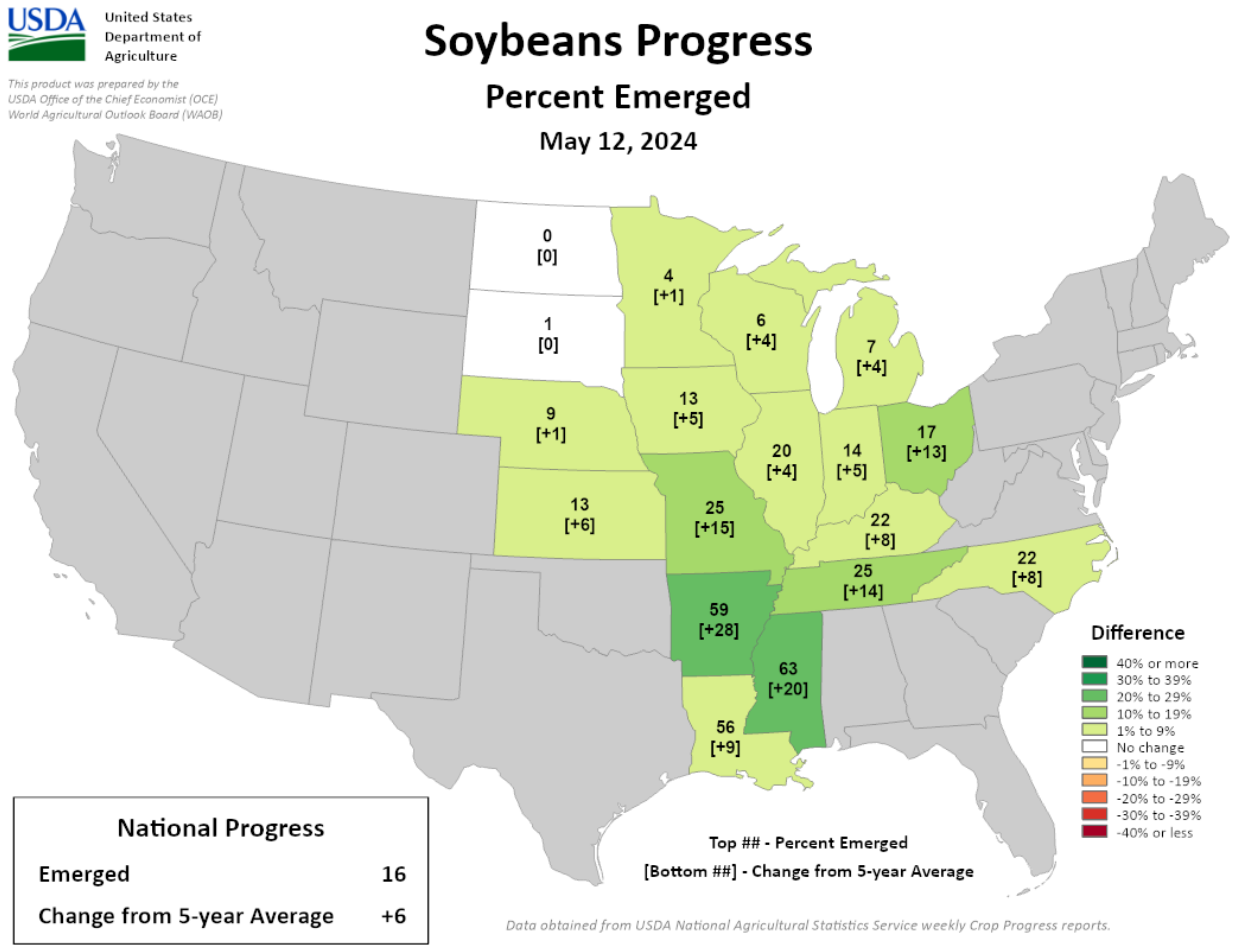




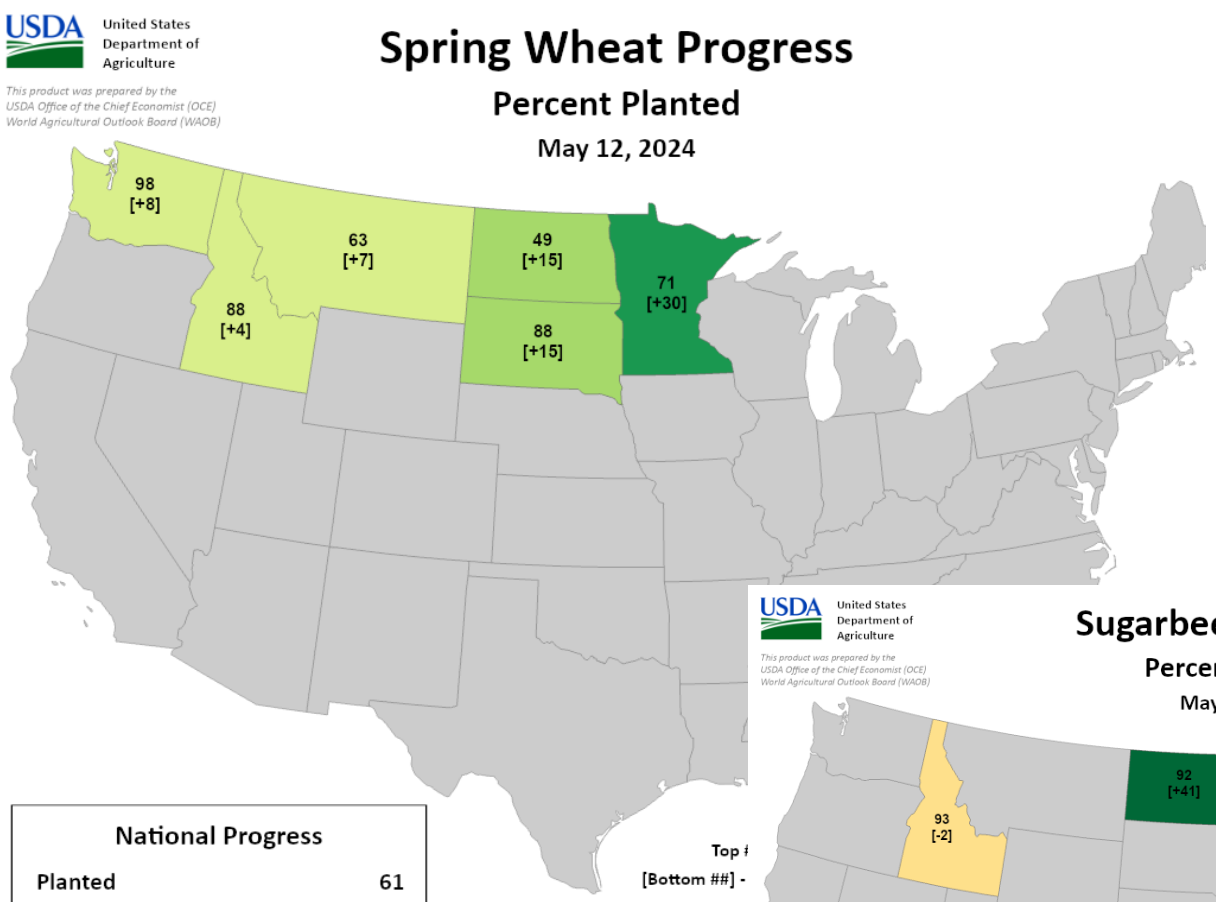
https://agindrought.unl.edu/Other.aspx

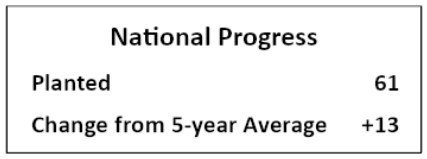
USDA NASS – Soybean Progress

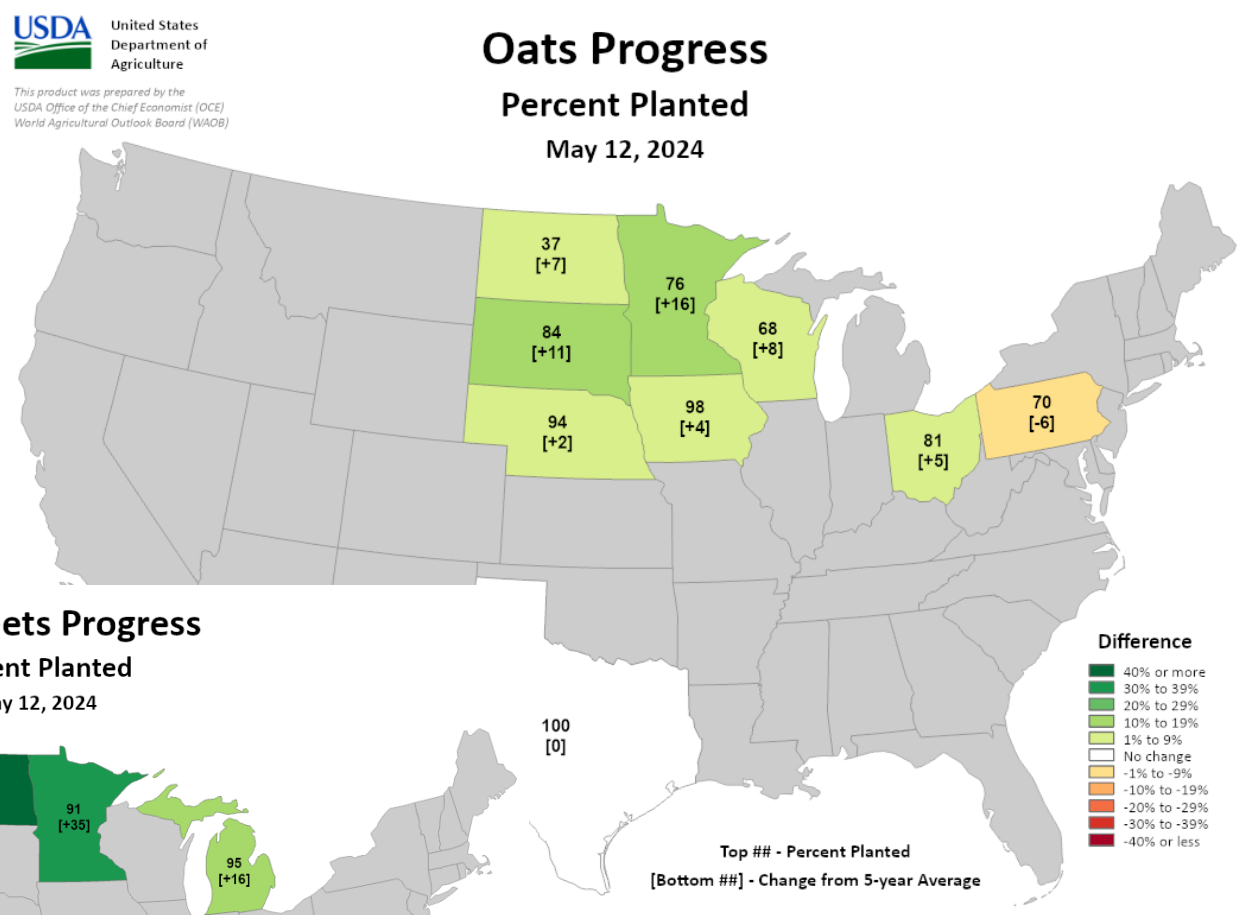


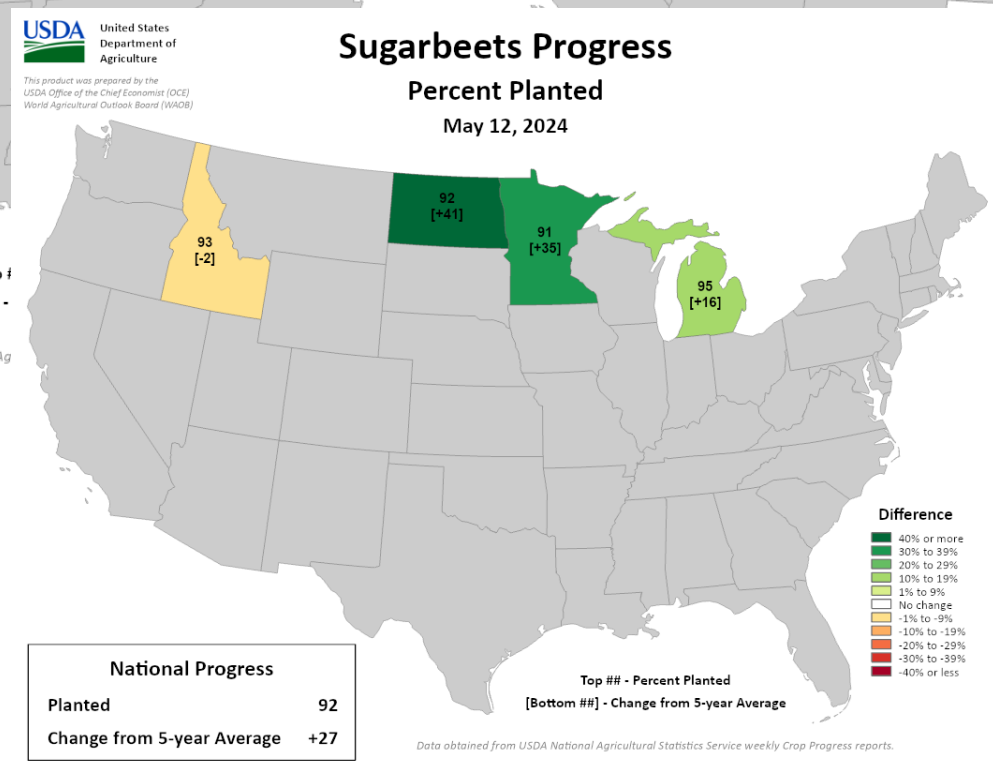


https://agindrought.unl.edu/Other.aspx





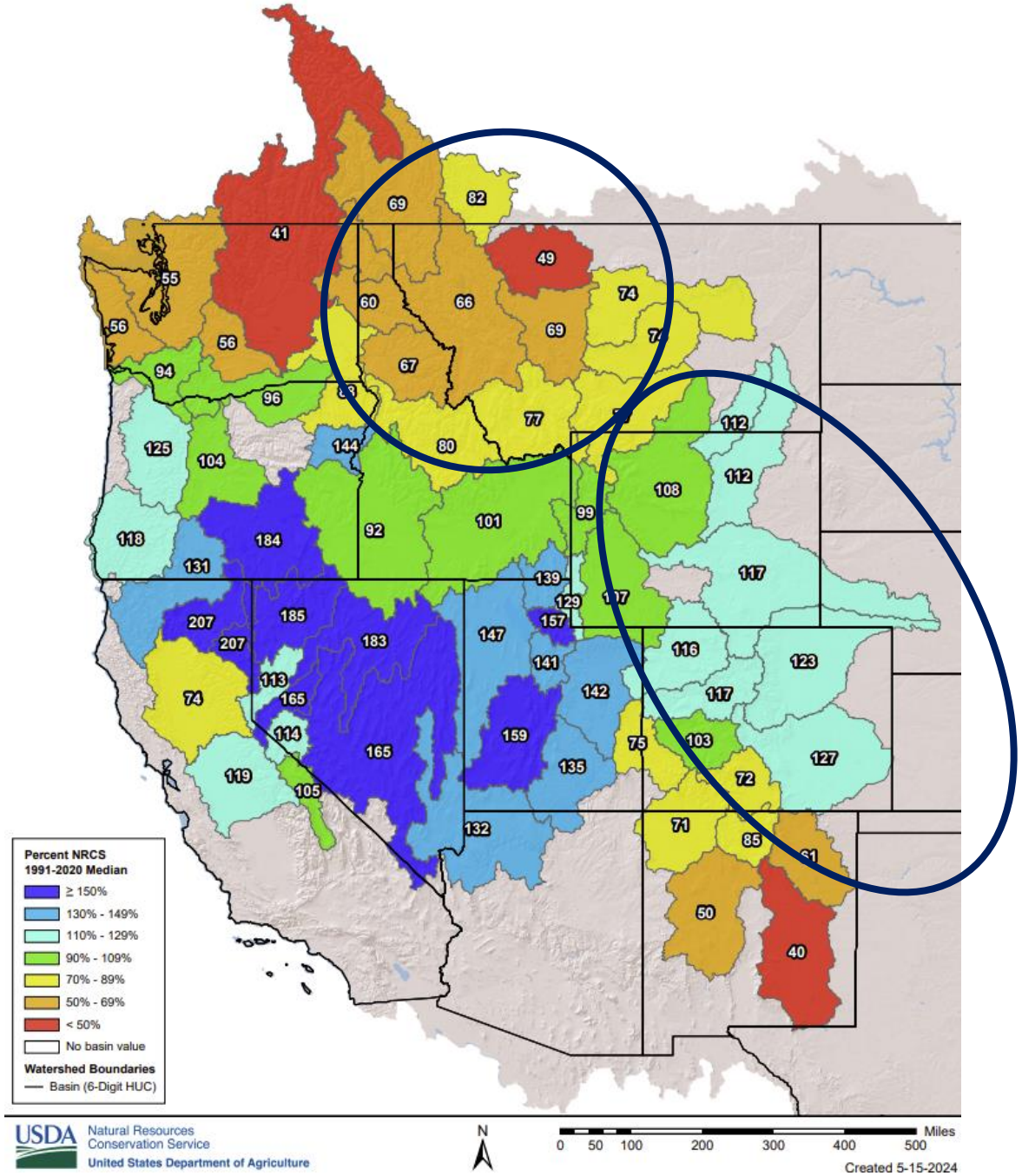




https://agindrought.unl.edu/Other.aspx

Snow, Fire, Rivers and Lakes

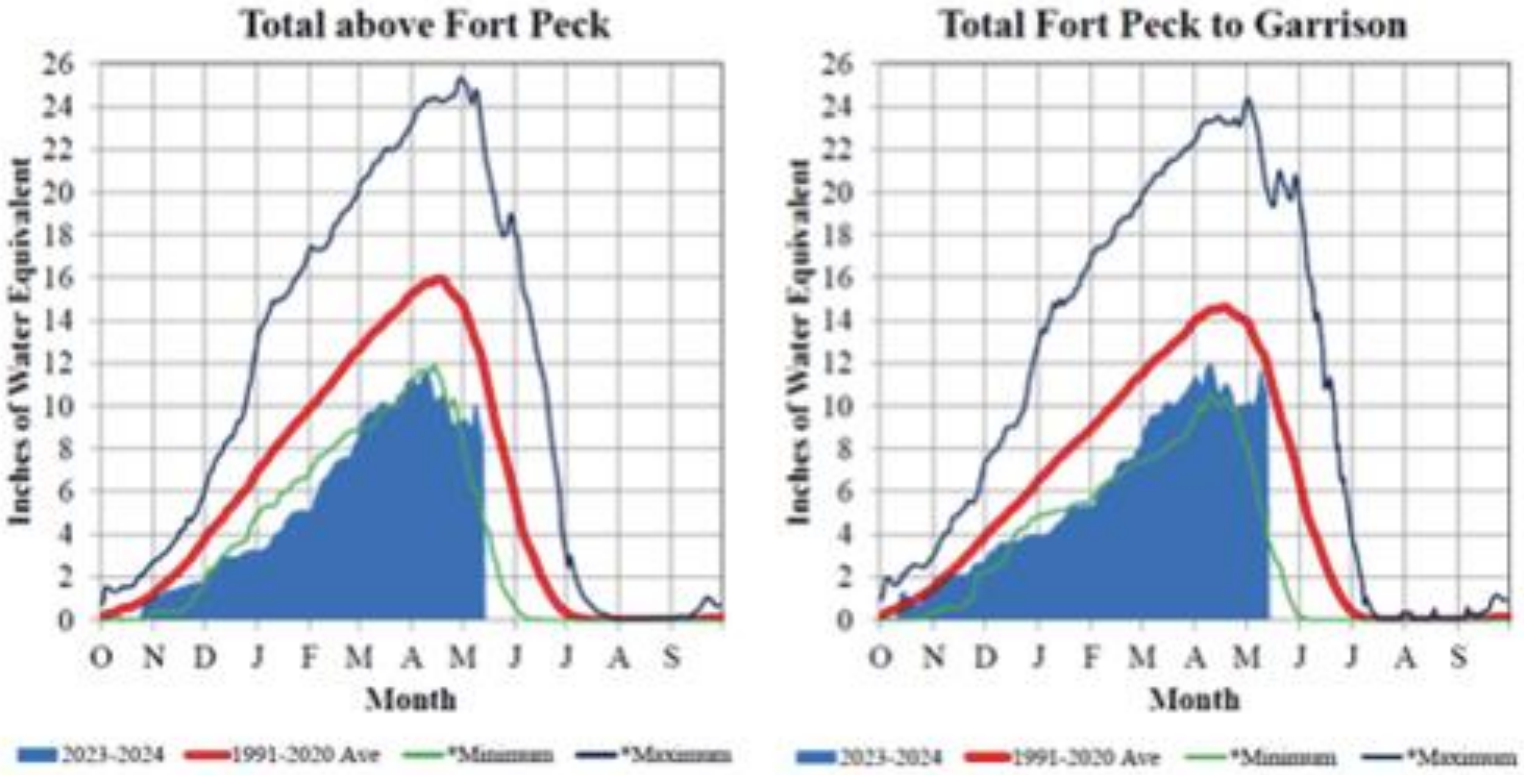
Missouri Basin Snow Water Equivalent



- Overall, snow water equivalent (SWE) percentages range from 100% to near 130% southeast.
- SWE below 70% northwest.
- SWE percentages can be misleading this time of year.
- Higher elevations are holding on to snowpack while pack below 8500’ has melted.
- Cooler outlooks will hold off advance melting, but there will be melting over the next few weeks.

https://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_swepctnormal_update.pdf

Missouri River Basin Mountain Snowpack, May 13

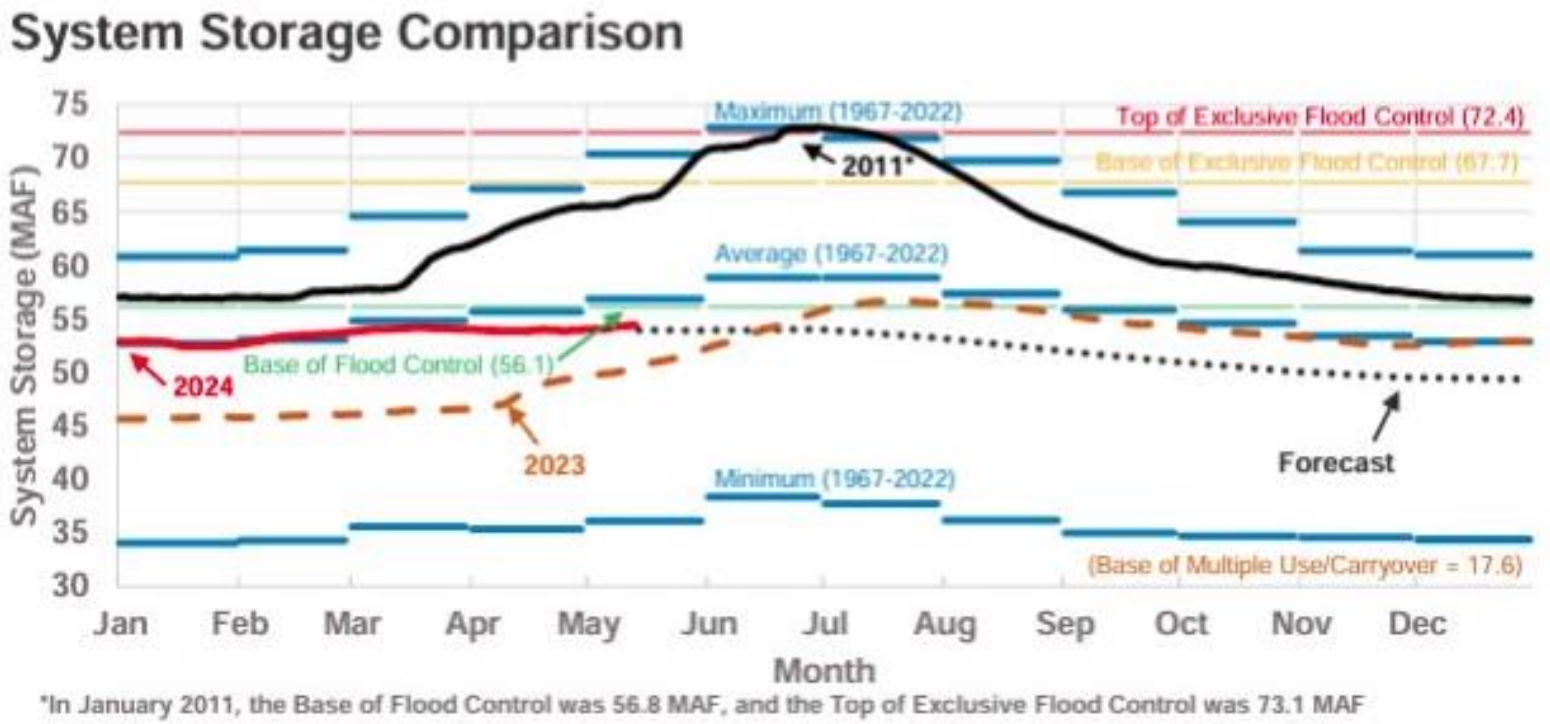


- Mountain snowpack had another uptick thanks to late-season accumulation.
- As of May 13, the reach above Fort Peck has 9.9” of SWE and 81% of annual peak remains. (normal peak is 17 Apr.)
- The reach between Fort Peck and Garrison had 10.4” of SWE and 73% of peak remaining.

Missouri River System Storage

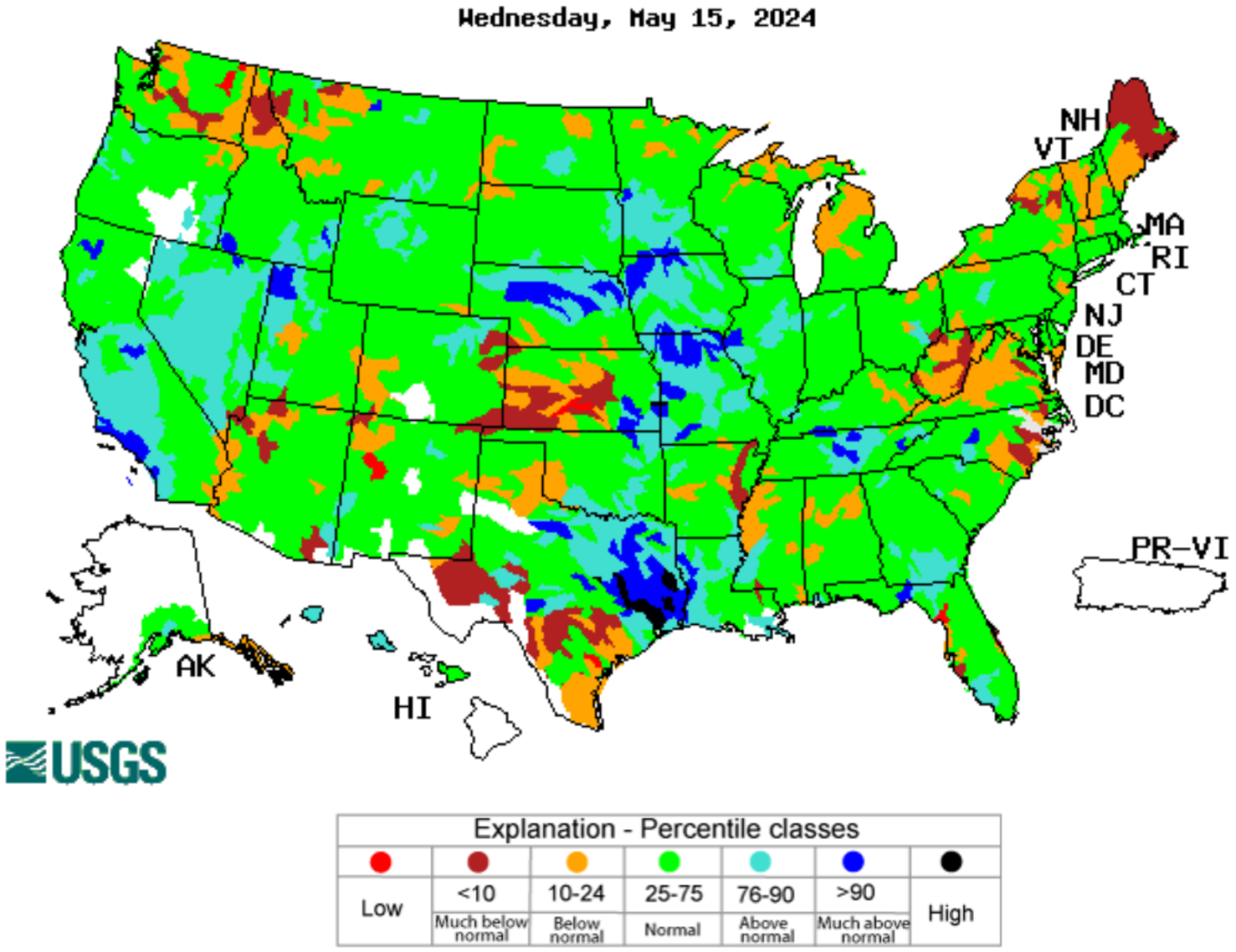
Missouri Mainstem Reservoir Status (as of 5/14/24):

- Over the last week, much of Montana received 2.00-5.00”+ of above-average precipitation.
- System storage is 54.3 million-acre feet, still below the 1969-2022 average but 0.3 MAF more than last week and around 3 MAF more than last year at this time.
- The Gavins Point release is currently 24,500 cfs and will be adjusted as needed to meet downstream nav. targets



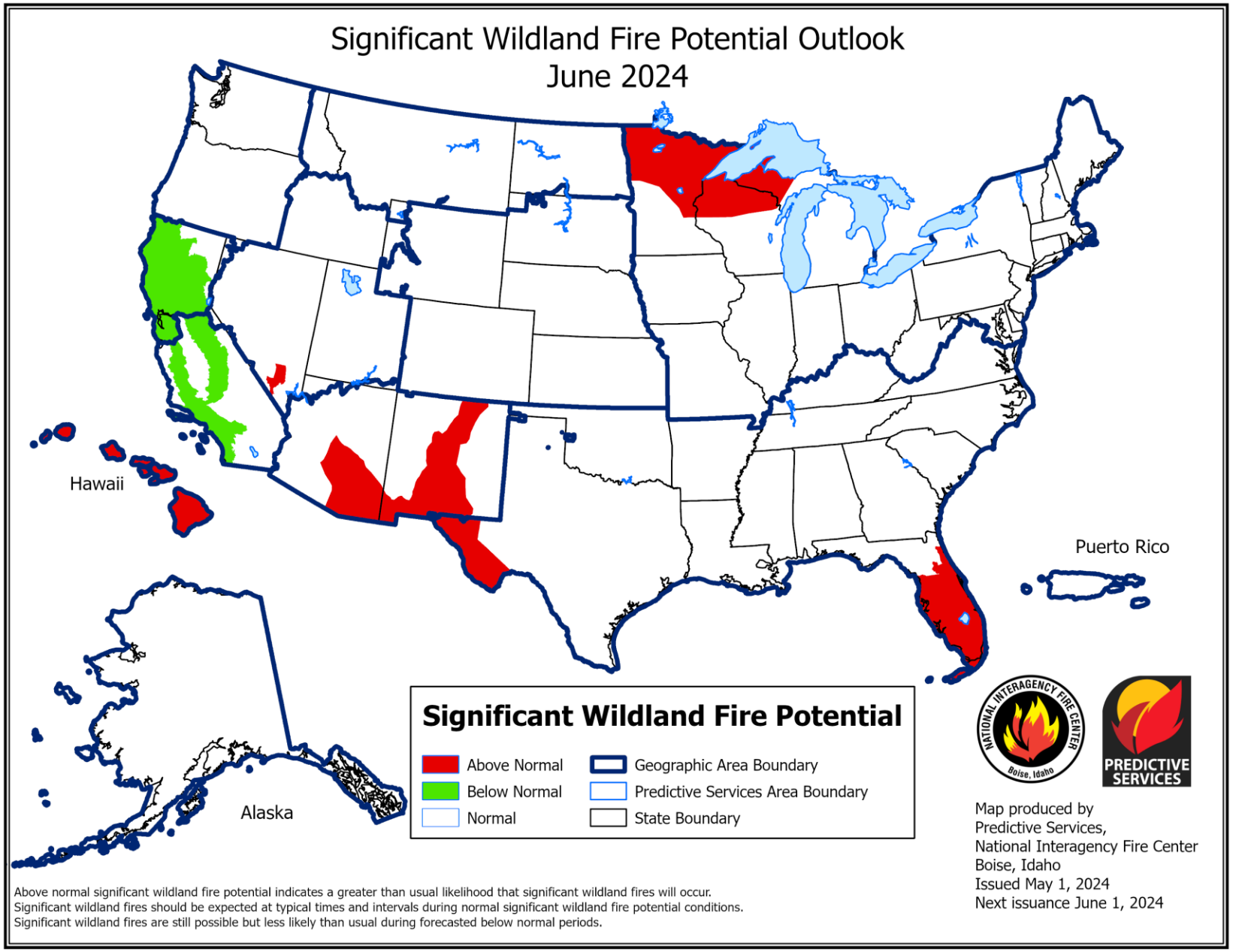
http://www.nwd-mr.usace.army.mil/rcc/reports/pdfs/weeklyupdate_previous.pdf

28-day Average Streamflow



http://waterwatch.usgs.gov/index.php?id=pa07d

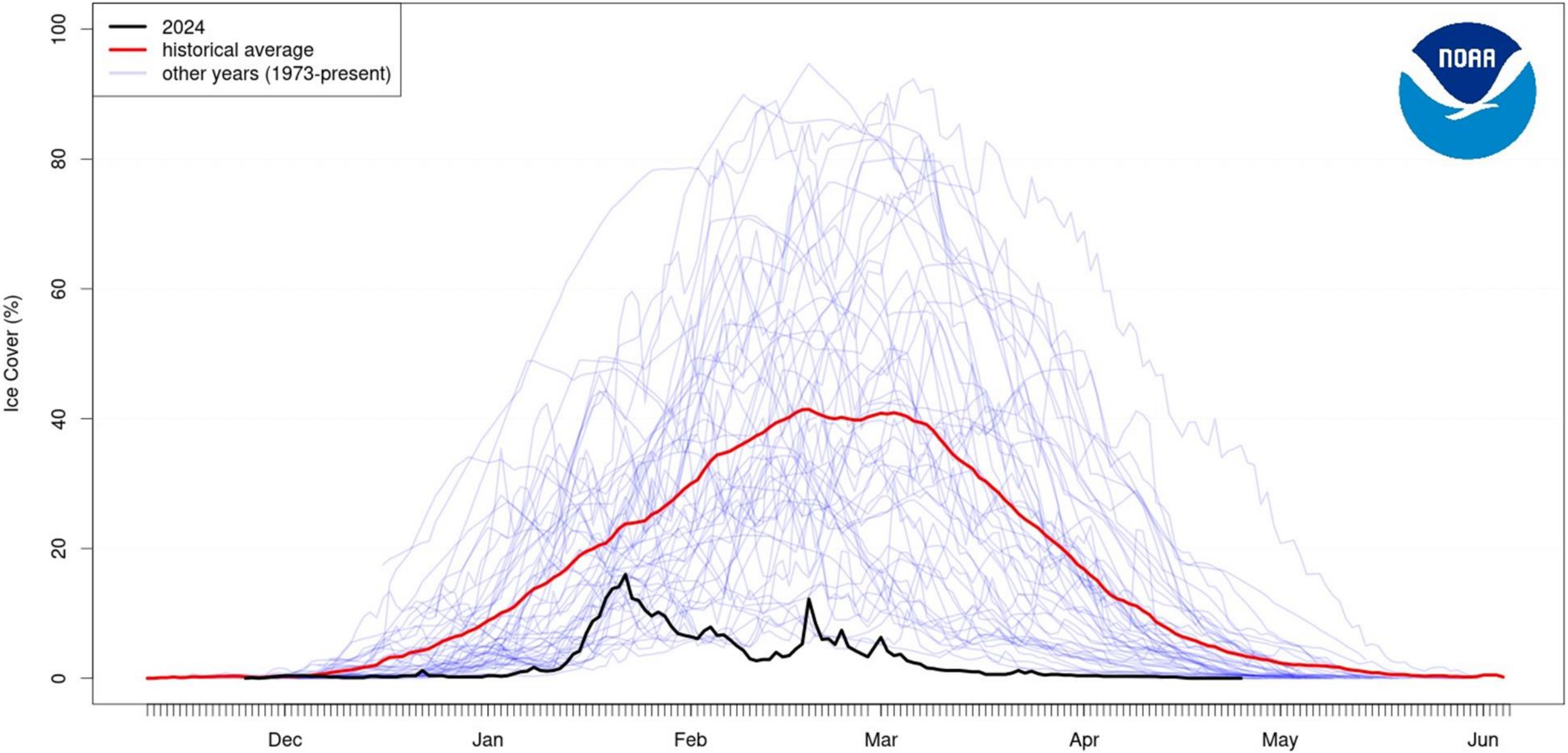
- Above-normal to much above-normal levels across central/western Corn Belt.
- Eastern Corn Belt generally near-normal.
- Below normal northern MI, parts of northern MN/ND.
- Much-below KS … similar conditions to a year ago as well.



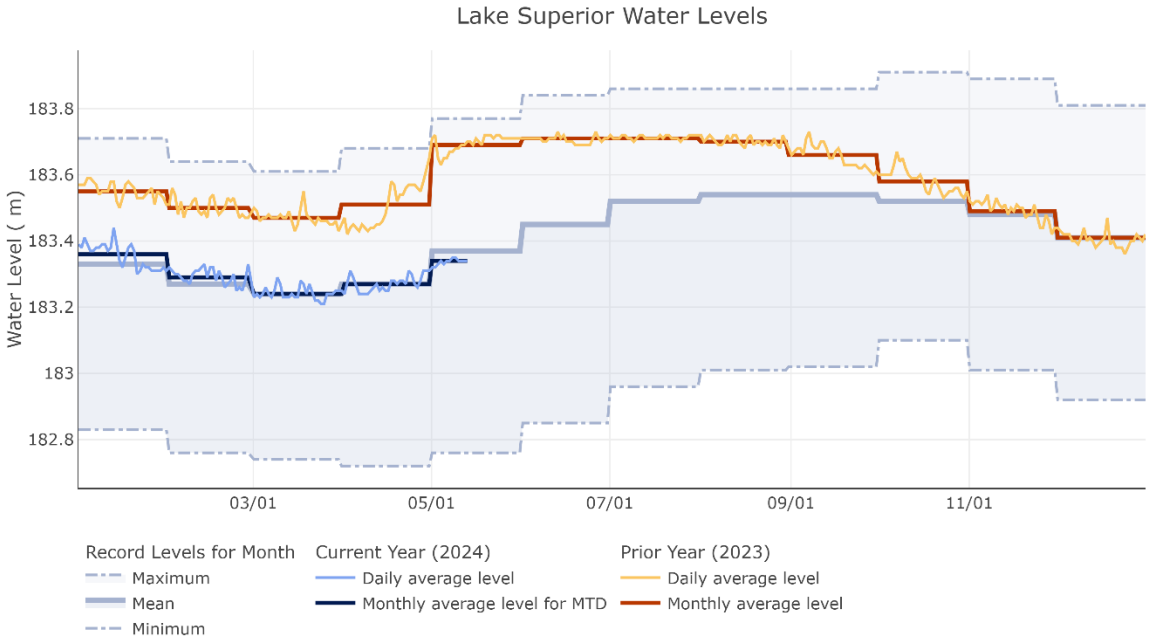
- No significant wildland fire potential through the end of May.
- Above-normal potential across portions of the MN, WI, UP MI in June

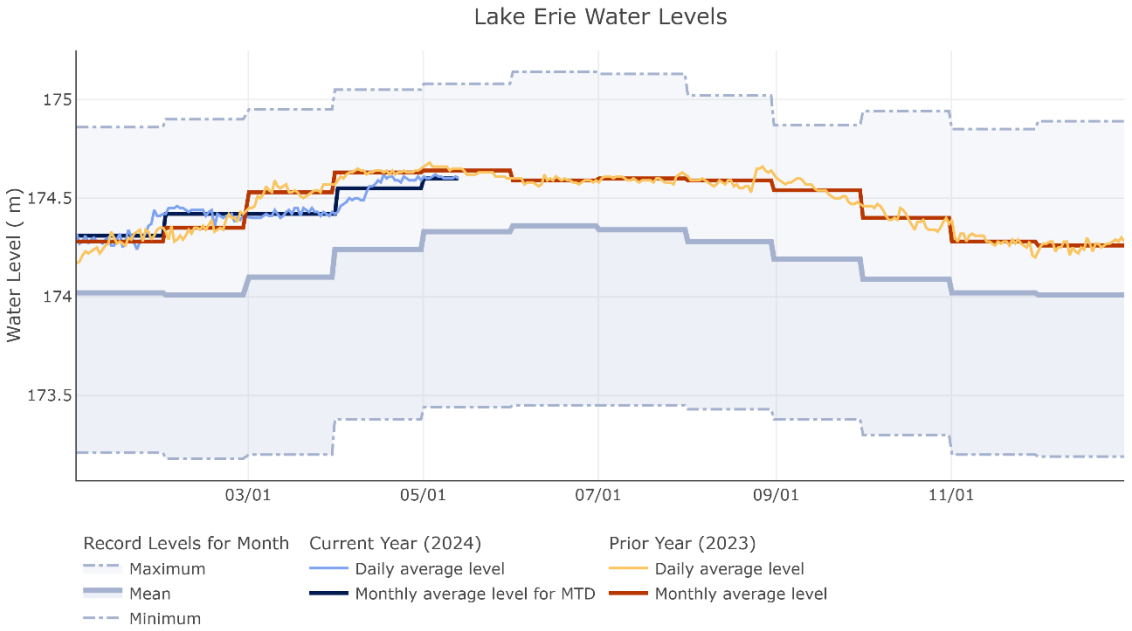
https://www.nifc.gov/nicc/predictive-services/outlooks

Great Lakes Average Ice Cover



Great Lakes Water Levels





- All Great Lakes have risen since last month by 4-6” and all lakes are below levels from a year ago:
  - Michigan-Huron and Erie are 1-4” below last year.
  - Superior and Ontario are 13” and 17” below last year’s levels, respectively.
- Water levels are above their May long-term average levels on Lakes Michigan-Huron and Erie.
- Lakes Superior and Ontario are below their May average levels by 2 to 3 inches.
- By next month, Lakes Superior, Michigan-Huron, and Ontario are forecast to rise by 2-3”, Lake Erie is expected to remain near its current level

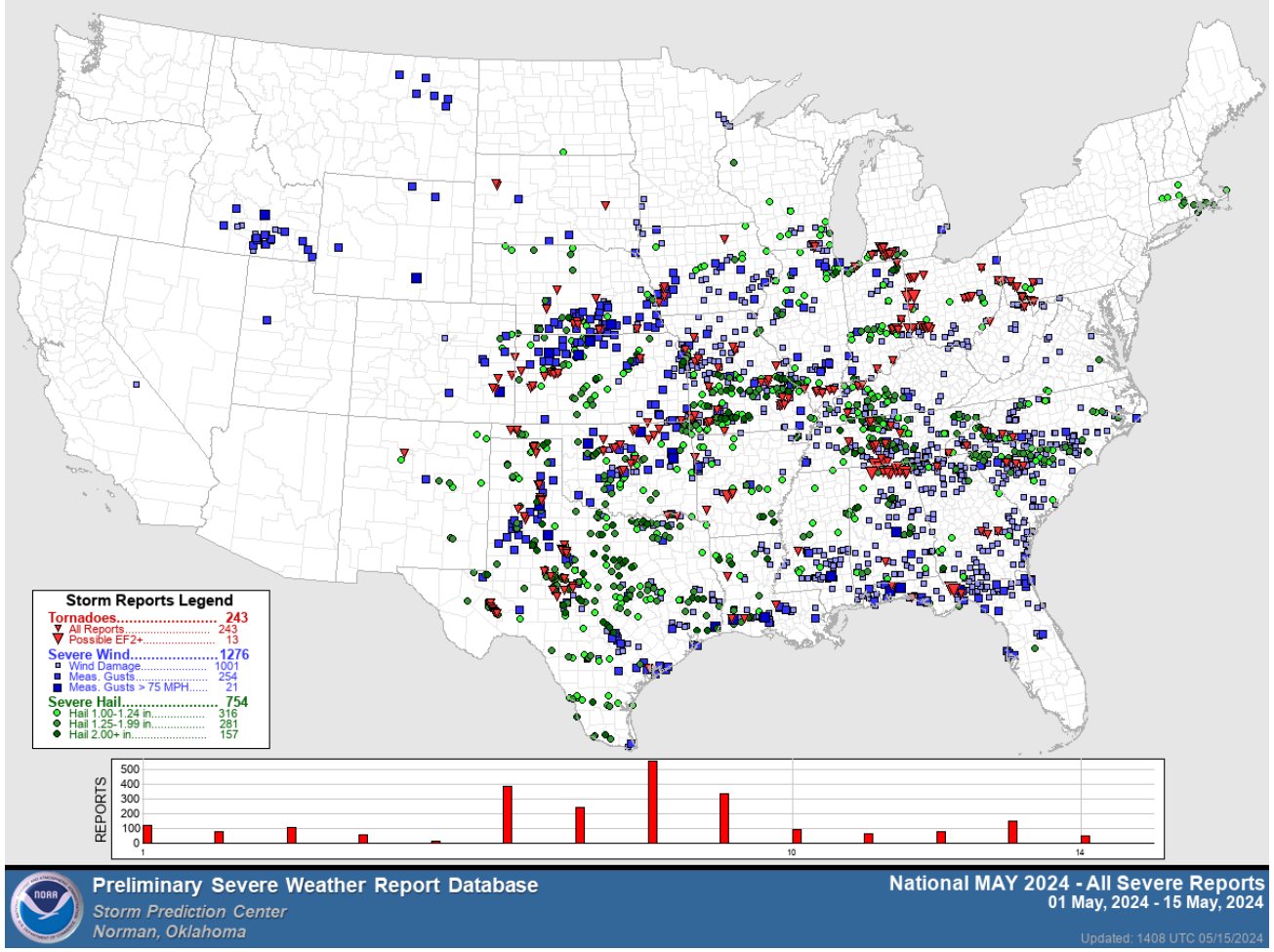
https://www.glerl.noaa.gov/data/wlevels/dashboard/#mastergauge

Impacts and Notable Events

Photo Credit: Pete Boulay

Severe Weather Season So Far …

- 2436 severe weather reports in April (108 more than last Apr. and +300 Apr. 2022)
- Several rounds of large hail across the eastern part of the region.
- Widespread events:
  - 16th (NE-IA-MO-IL-WI)
  - 18th (MO-IL-IN)
  - 26-27th (NE-IA-KS-MO tornado outbreak)
  - 30th (KS-NE-IA-MO)
  - 3rd (NE/KS)
  - 6-8th Midwest/Ohio Valley wind and tornadoes



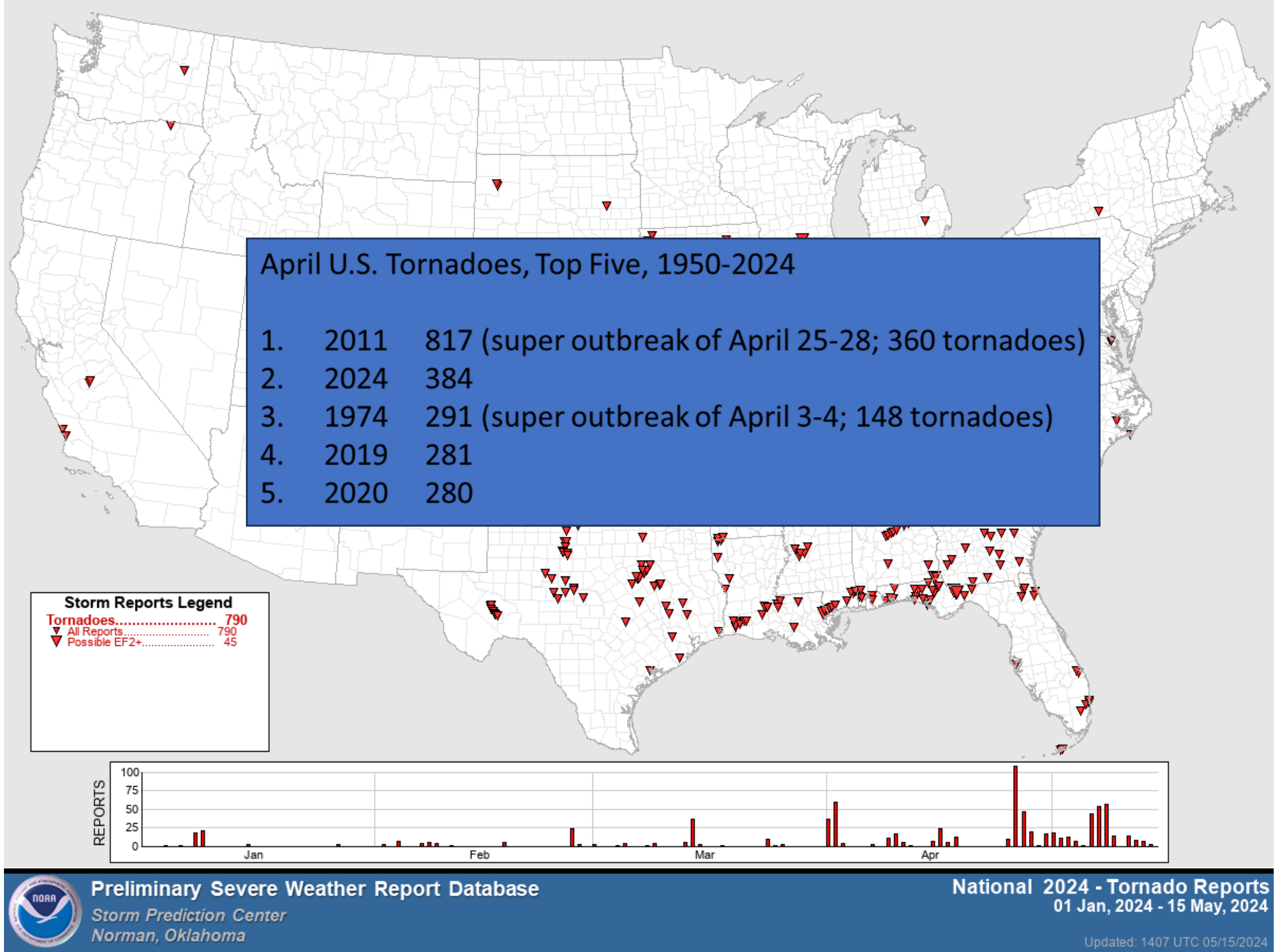

April U.S. Tornadoes, Top Five, 1950-2024
1. 2011 817 (super outbreak of April 25-28; 360 tornadoes)
2. 2024 384
3. 1974 291 (super outbreak of April 3-4; 148 tornadoes)
4. 2019 281
5. 2020 280
Storm Reports Legend
Tornadoes..... 790
All Reports..... 790
Possible EF2+..... 45
REPORTS
100
75
50
25
0
Jan
Feb
Mar
Apr
Preliminary Severe Weather Report Database
Storm Prediction Center
Norman, Oklahoma
National 2024 - Tornado Reports
01 Jan, 2024 - 15 May, 2024
Updated: 1407 UTC 05/15/2024


Photo Credit: N


Photo credit: The Des Moines Register


Photo Credit: NWS Wilmington

Nearly 50 homes in Michigan county were destroyed by storms last week

The National Weather Service confirmed four tornadoes in the region on May 7, including one in the Kalamazoo area.

BY:
ASSOCIATED PRESS
| 05/15/2024 06:41 AM EDT

TOP STORY

Beloit's pump house destroyed due to storms

Corey Moen Apr 17, 2024

Drought lingers in parts of the Midwest and Great Plains. 'You have to have some hope'

Harvest Public Media | By Grant Winterer
Published May 13, 2024 at 4:00 AM CDT

NEWS

RAINS IMPROVE DRY SOILS, MORE RAIN NEEDED IN GROWING SEASON

May 3, 2024 By Carah Hart Filed Under: 2024 Planting Season, Drought, News

NEWS

LA NINA TRANSITION COULD BRING MOISTURE TO CORN BELT

April 24, 2024 By Brent Barnett Filed Under: 2024 Planting Season, Ag Weather, Agriculture, Crops, Drought, Human Interest, News, weather

Western Canada wildfire grows as more people nearby told to leave

The British Columbia Wildfire Service said the blaze spans 32 miles. On Monday, it was about 21 miles in size.

BY:
ASSOCIATED PRESS
| 05/14/2024 04:21 PM EDT

Commodities in Drought: More on the shrinking levels we haven't seen in years

May 07, 2024 12:53 PM • Amber Weaver

Solar Storm Crashes GPS Systems Used by Some Farmers, Stalling Planting

5 weareiowa.com

Minden, Iowa to receive FEMA assistance after EF-3 tornado

MINDEN, Iowa — The mayor of Minden, where two tornadoes have hit in less than two weeks, is asking for urgent help from the federal...

Successful Farming

Corn planting progress falls shy of the halfway mark

The USDA released its seventh Crop Progress report of the 2024 growing season on May 13. Here's a look at the most recent corn, soybean,...


Photo Credit: Gannon Rush

Ohio:

- Warmest start to the year Jan 1-May 15 for Dayton and Youngstown areas, 2nd warmest for Toledo, 3rd for Cleveland, 4th for Columbus, Mansfield, and Akron/Canton
- 3.00-10.00" of rain across the state during the month of April
  - 7.94" in Toledo – new record (1929)
  - Much drier conditions in May for all but the NW Corner of Ohio; running 50-100% of normal for the bulk of the state – **beneficial to planting season**
- May 7-8, 2024: 20 tornadoes in the state; 3 EF-2s; the 3rd largest outbreak for Ohio records since 1950

Kansas:

- 1st fatality from a tornado in Kansas (Westmoreland) in more than a decade.
- Fredonia (Wilson County, KS) – 8.50" over 24 hours, 2nd highest total on record (42 years).

Michigan:

- Unusually warm winter threatens significant economic losses to peaches, grapes and other fruits
- 12 tornadoes reported on May 7th in southwest MI with 1 EF-2; first "Tornado Emergency" ever issued for the state.
- 50 homes destroyed in St. Joseph County.

Illinois:

- Extension and producers are continuing to assess peach damage from January cold and late March freeze.
  - Likely little to no crop north of I-70, and 20-30% crop farther south.
  - Most likely the biggest loss statewide since 2007 or 2012.
- Apples look okay so far, and strawberries have been going gangbuster with the heat and moisture.

State Impacts

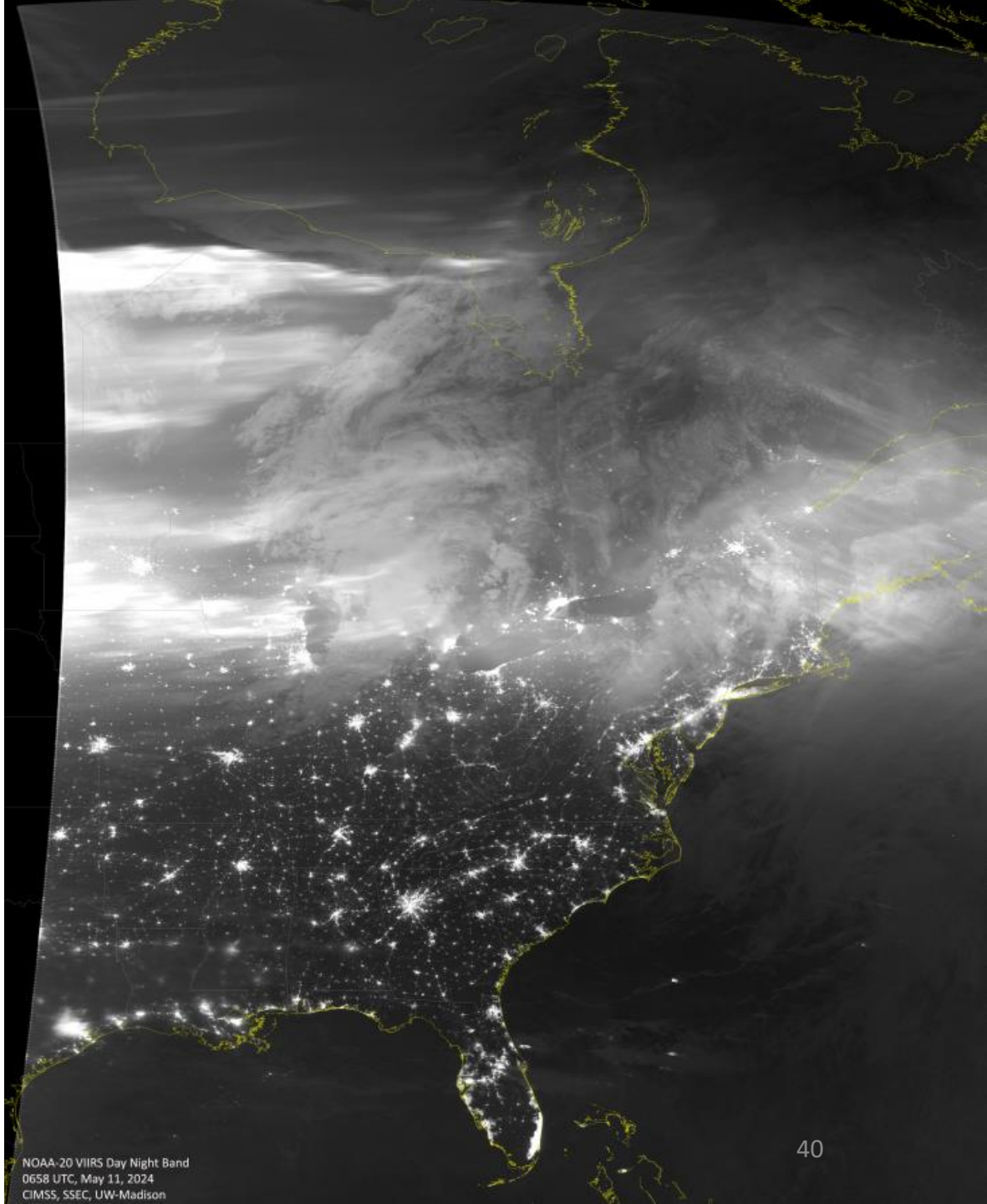

Photo Credit: Aaron Wilson

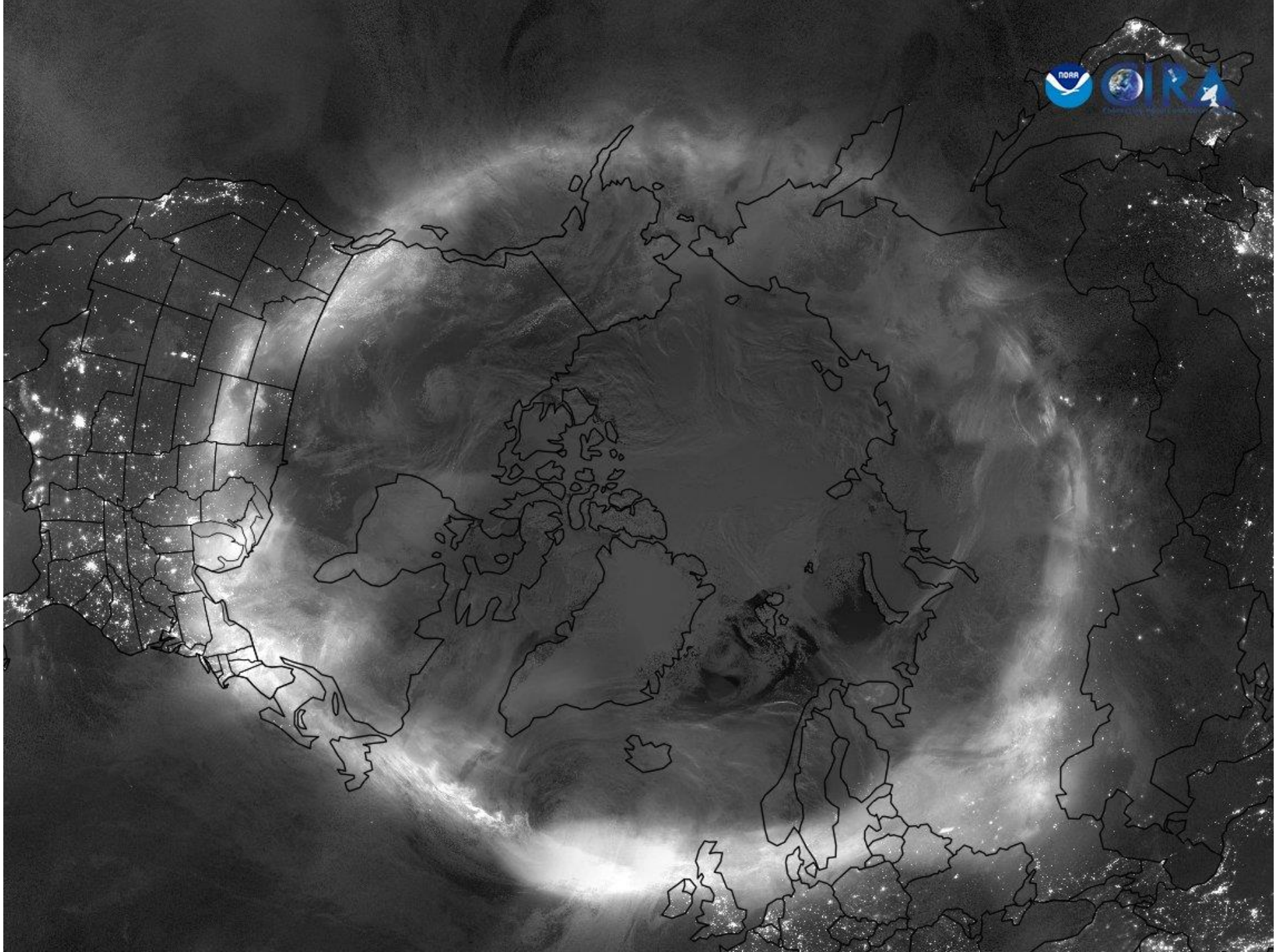

Photo Credit: Matt Sittel


Photo Credit: Matt Sittel

- Row crop planting generally ahead of the five-year average with some states lagging. Lots of variability.
- Pastures and rangeland looking better than over the last few years given wetter conditions
- Microburst damages historic building in Beloit, WI; drought eases
- Winter/spring wheat looking great in SD as a result of above-average precip.
- Freeze damage at IL/MI peach orchards
- Early warmth has pushed small grain planting well ahead of average in northern states
- An unusually warm winter along with cold snaps threatens significant economic losses to peaches, grapes and other fruits in Michigan/Illinois
- In April there was some moderate to major flooding in the upper Ohio River basin which impacted and restricted navigation
- 202nd consecutive week of Moderate Drought (D1) somewhere in Iowa; longest drought since 1954-1959

- https://cimss.ssec.wisc.edu/satellite-blog/archives/

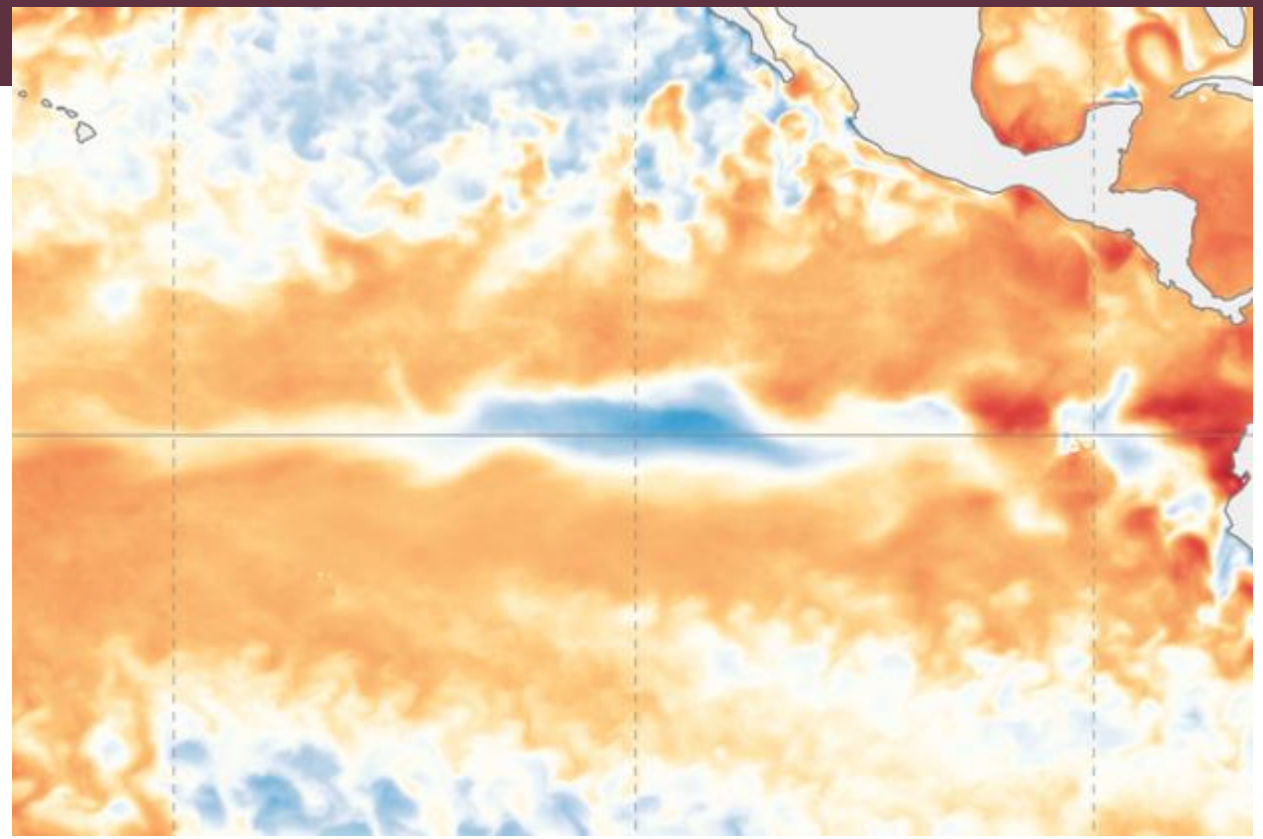




Climate Outlooks

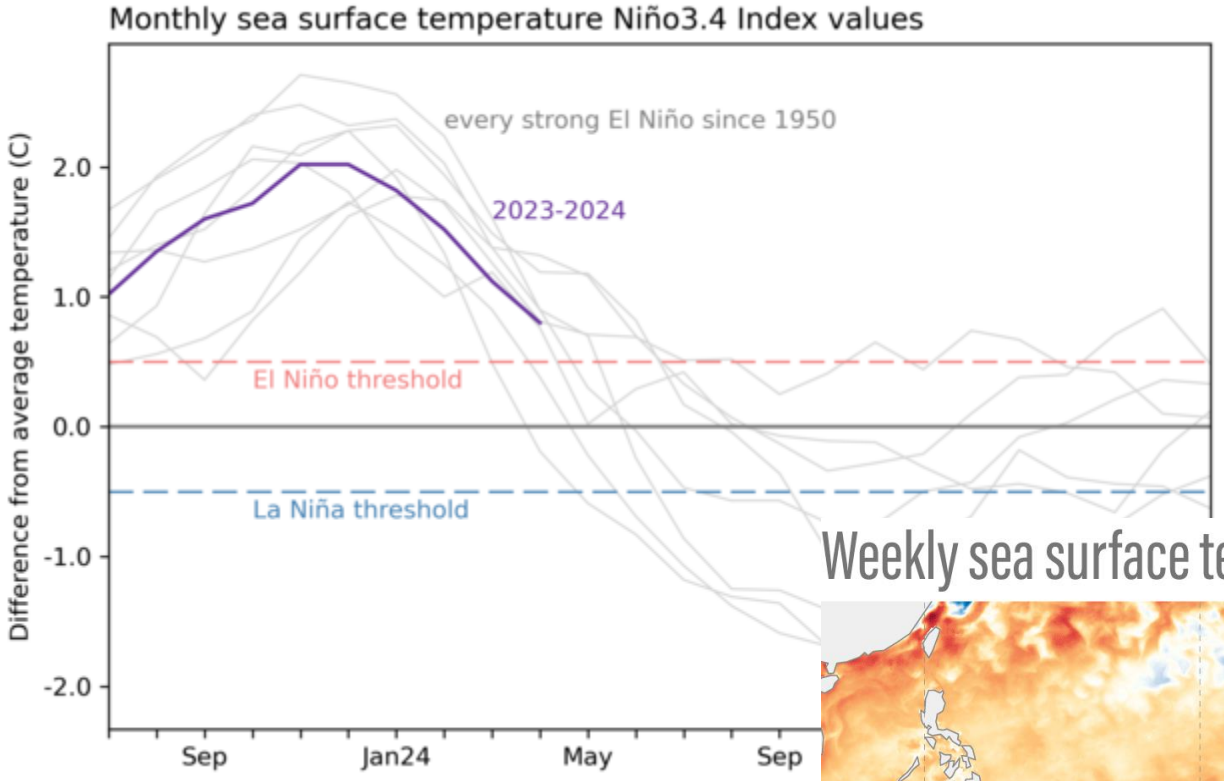
- El Niño Advisory/ La Niña Watch
- 7-day Precipitation Forecast
- 8 – 14 day Outlook
- May/Initial June Outlooks
- JJA temperature and precipitation

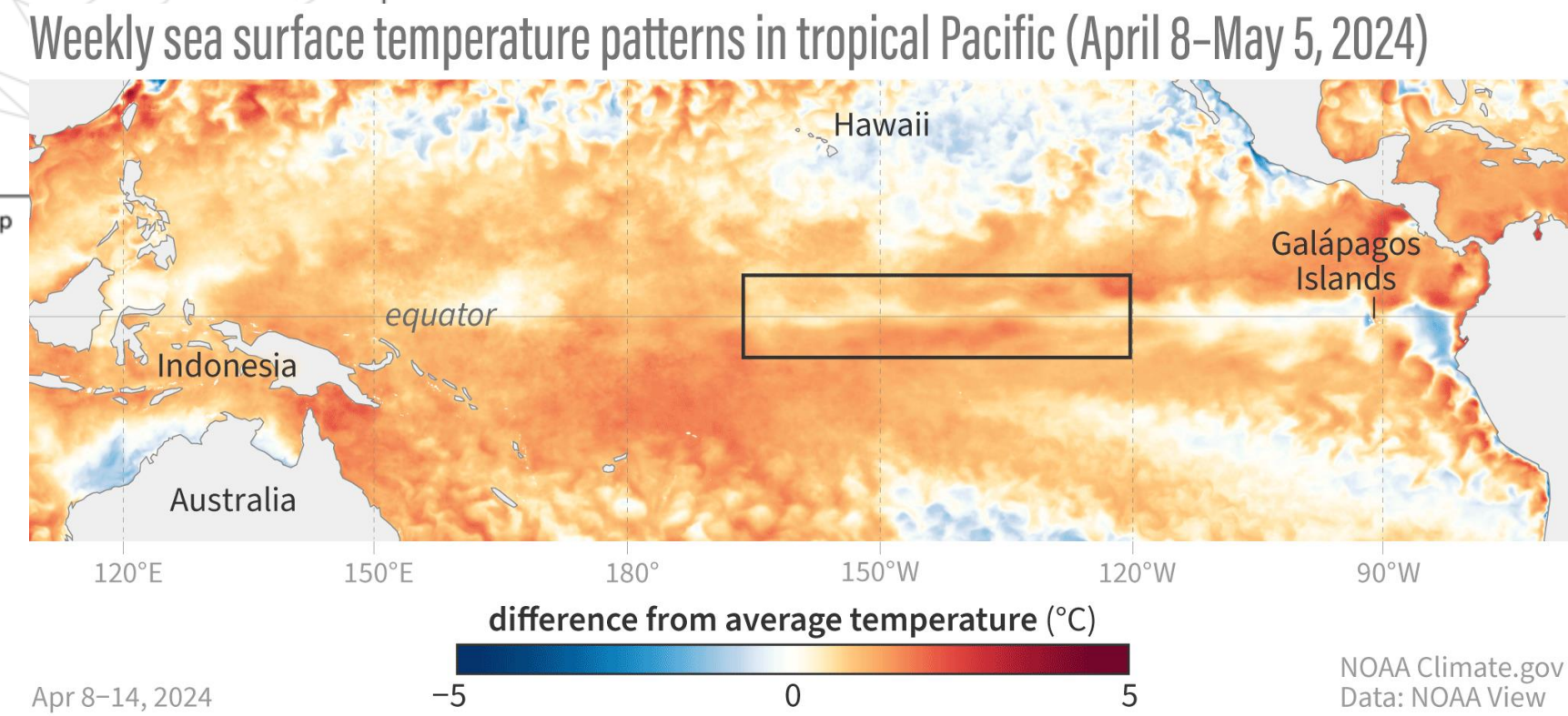
El Niño Advisory/La Niña Watch



- Transition to ENSO-neutral conditions appears to be imminent.
- Sea surface temperatures (SSTs) trending cooler and atmospheric appears to be decoupling.
- A transition to La Niña is expected (69%) in July-September time frame with equal chances in June-August. and continue across the Northern Hemisphere winter.

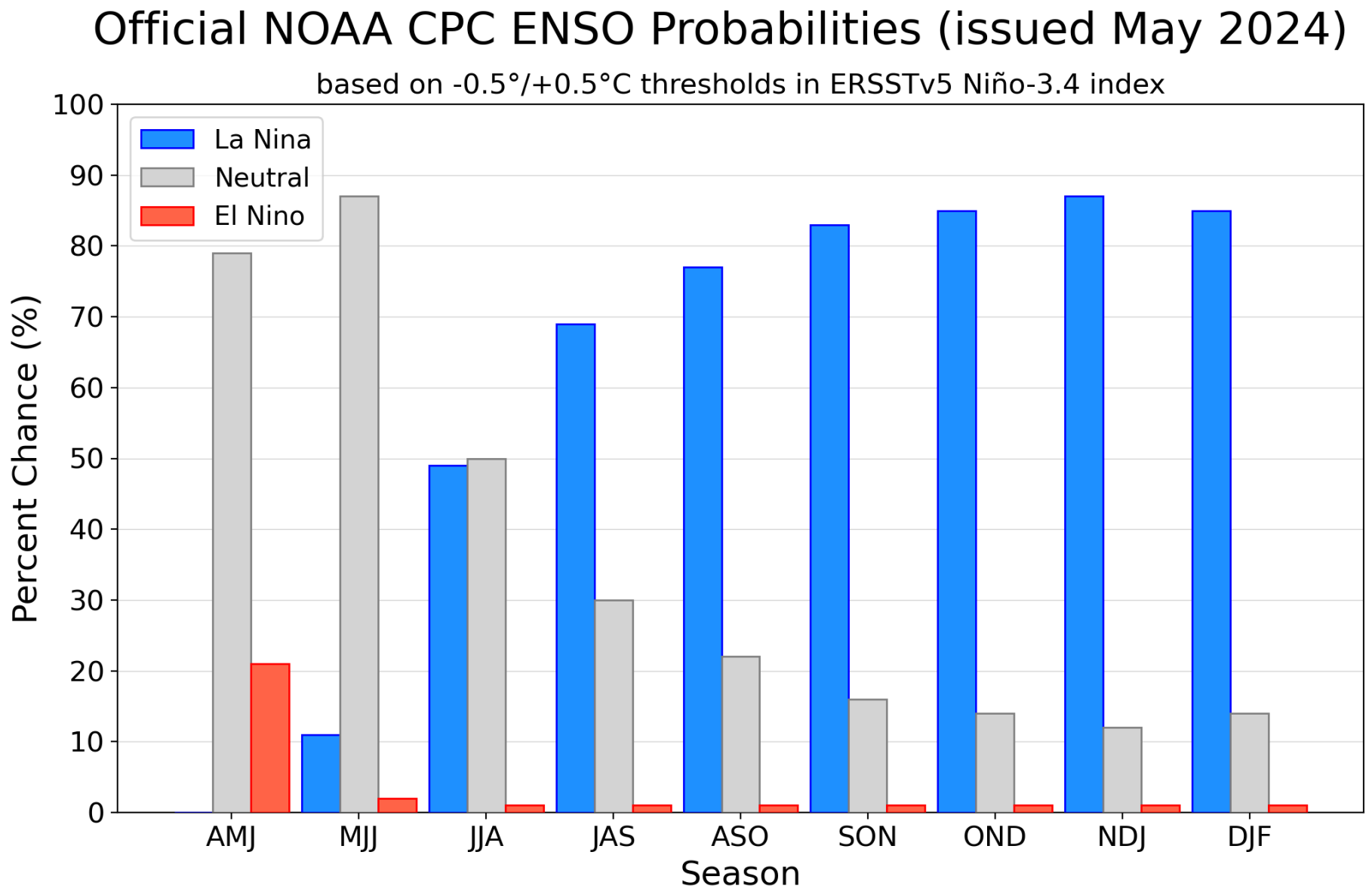
https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml





https://www.climate.gov/news-features/blogs/enso/may-2024-enso-update-were-10

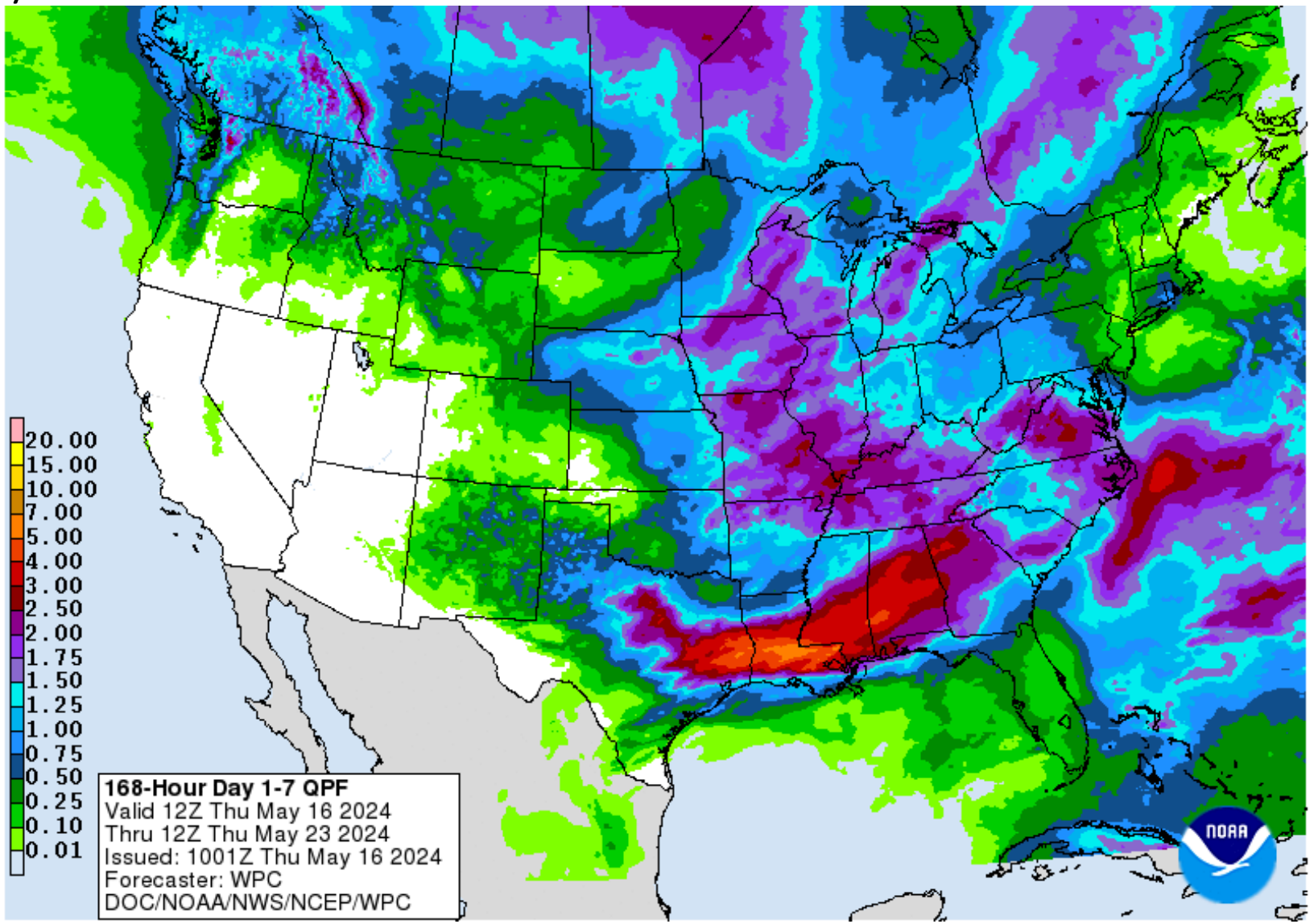
ENSO Probabilities



https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_plume

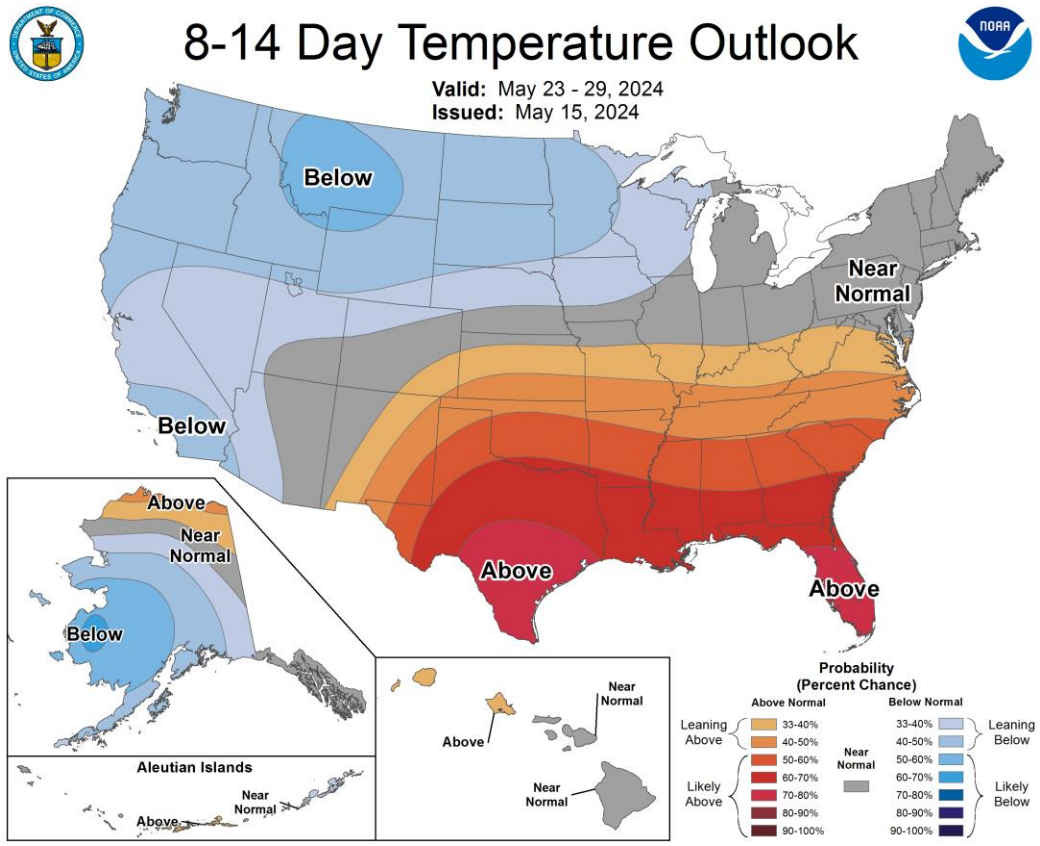
7-day Cumulative Precipitation Forecast

Valid: May 16 - 23

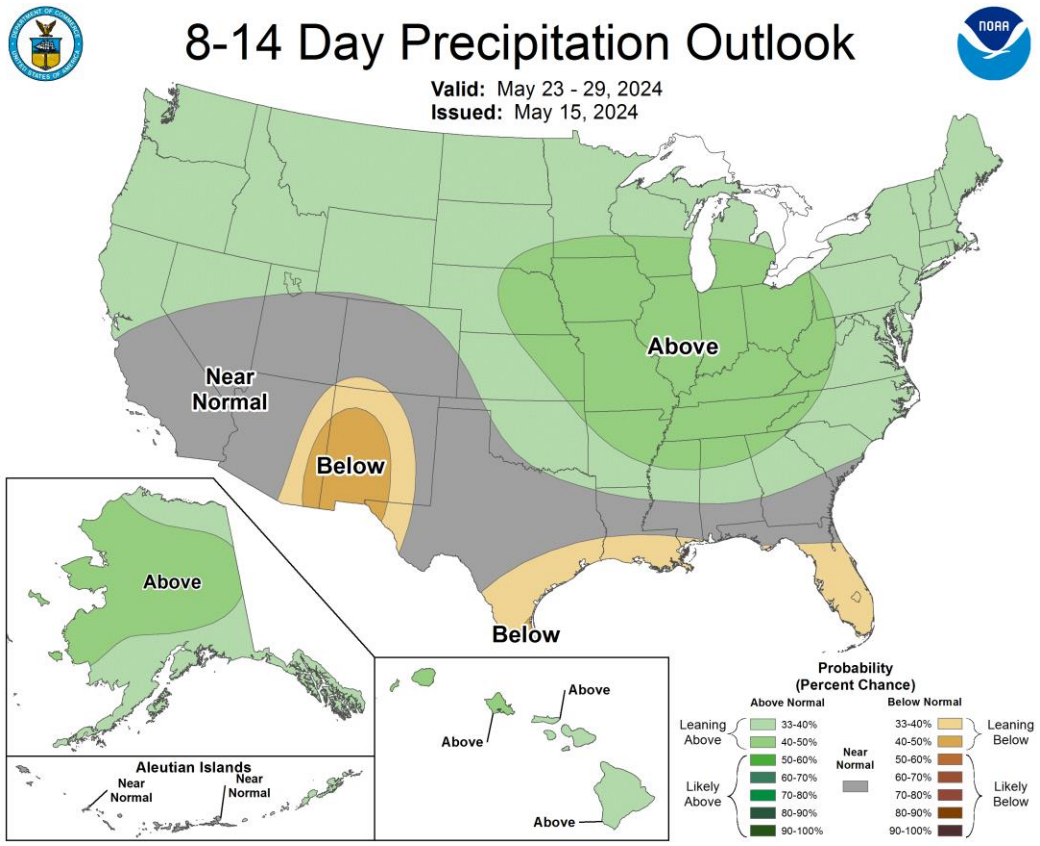


https://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml

8-14 Day Outlooks (Valid May 23 - 29)

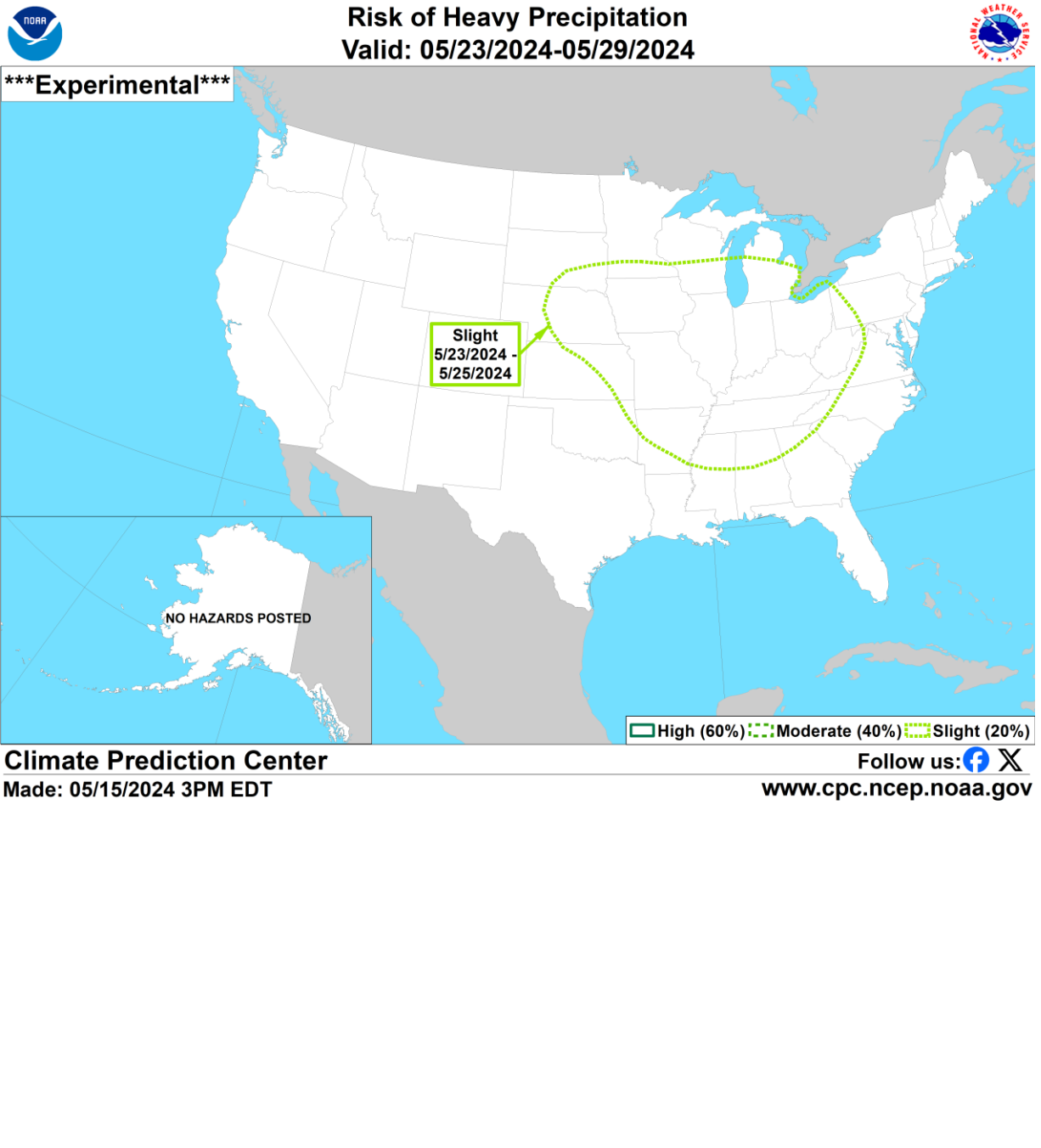


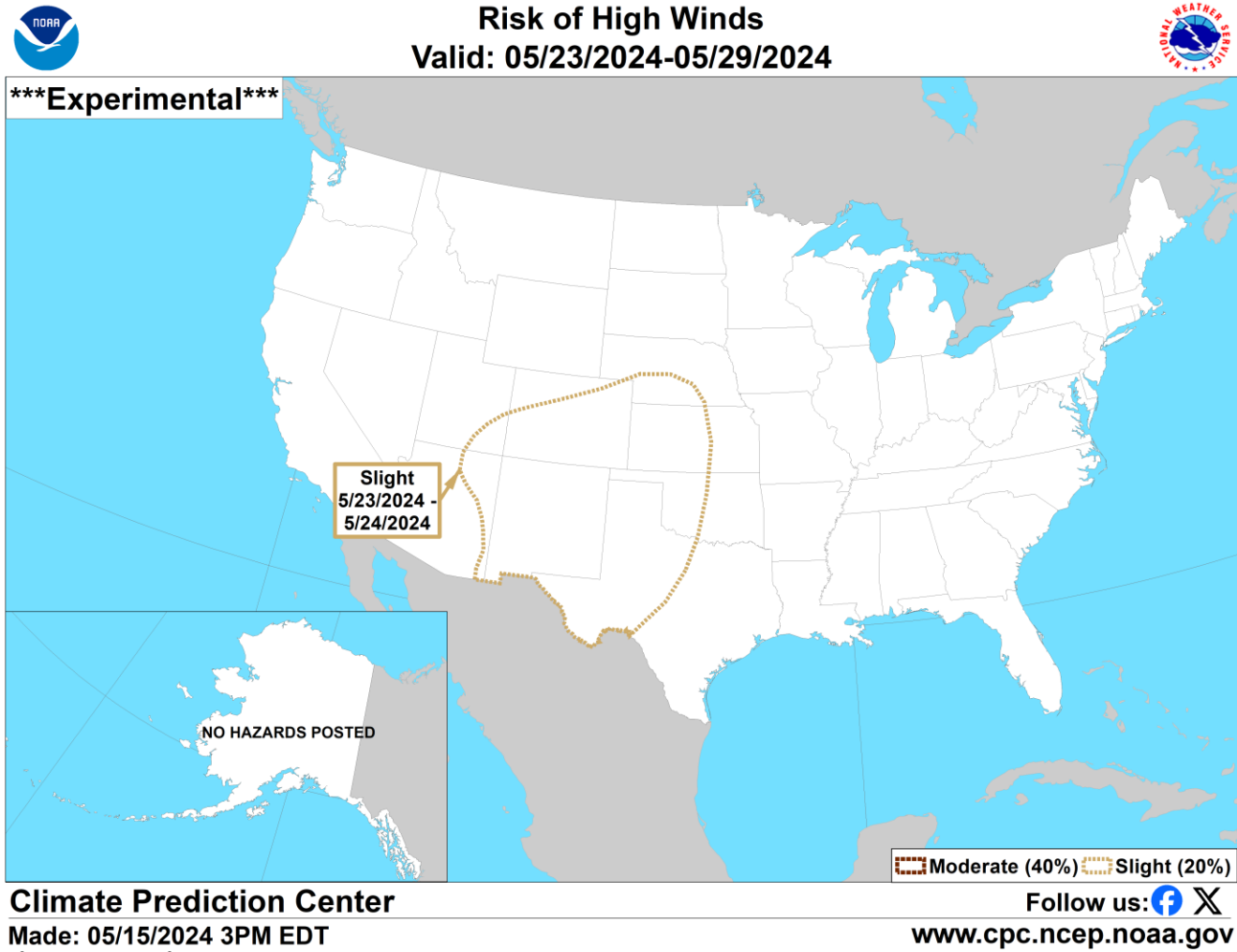
Temperature



Precipitation

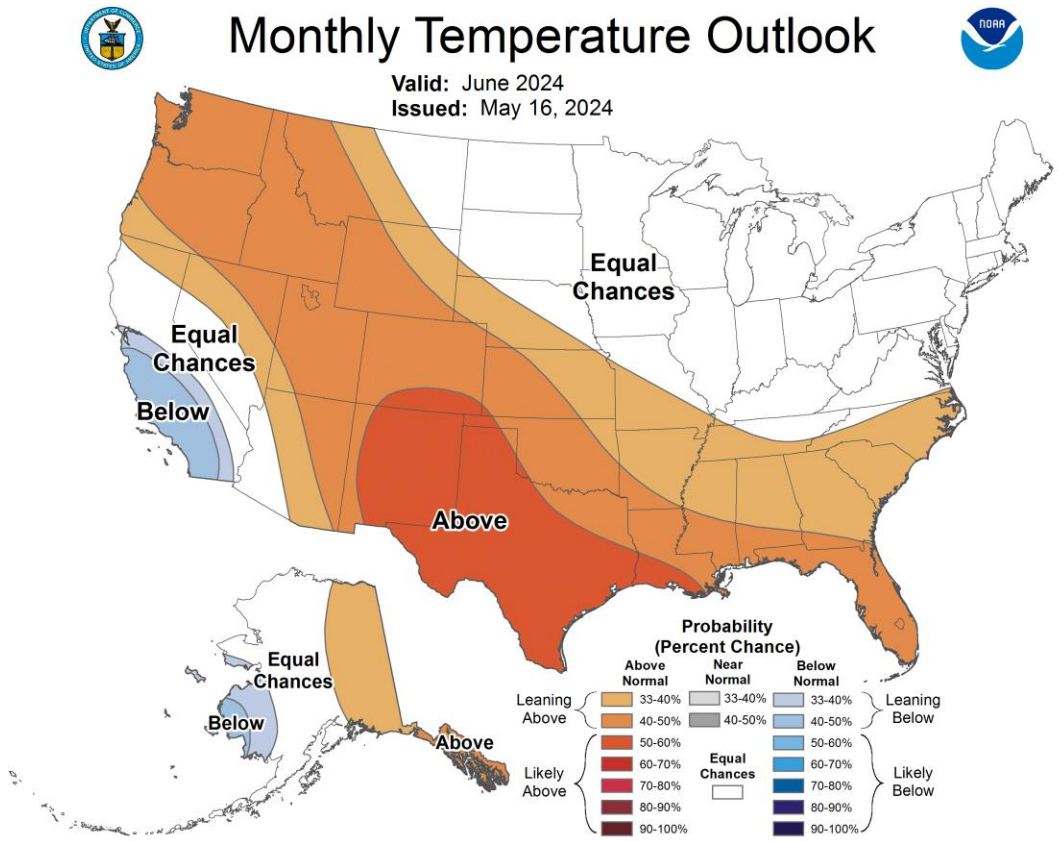
http://www.cpc.ncep.noaa.gov/products/predictions/814day/



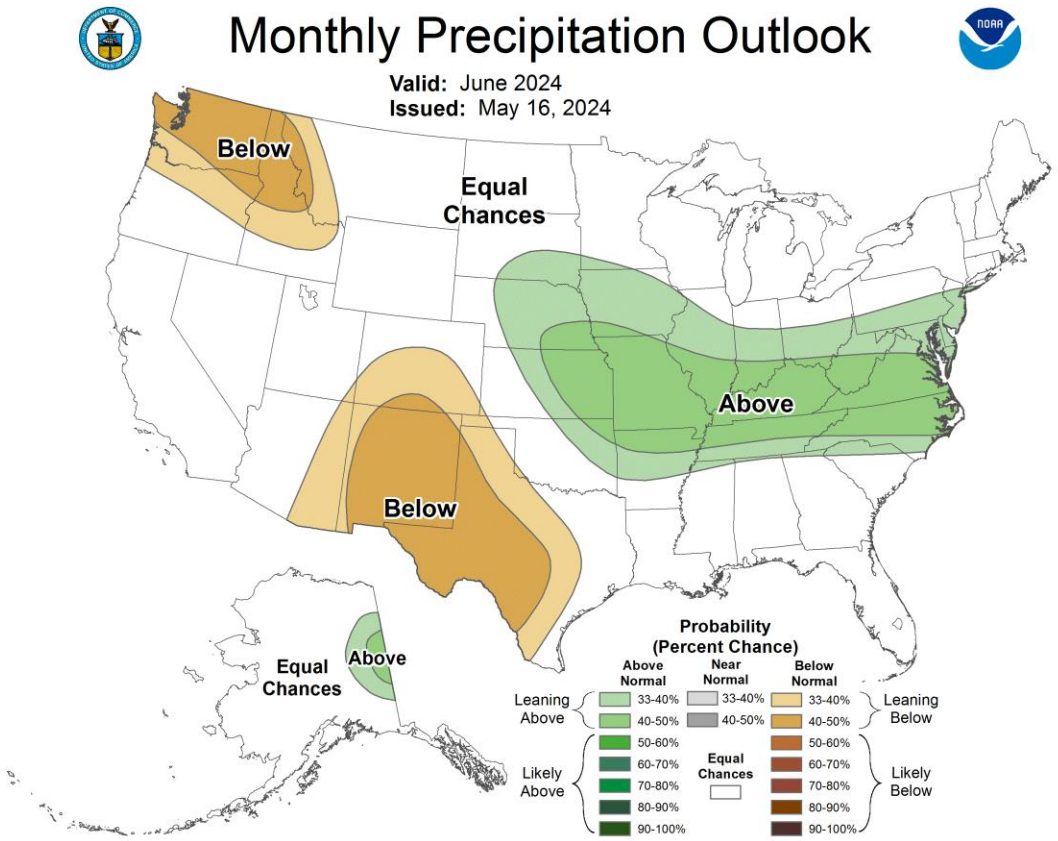


https://www.cpc.ncep.noaa.gov/products/predictions/threats/temp_probhazards_d8_14_contours.png

Initial June Outlooks



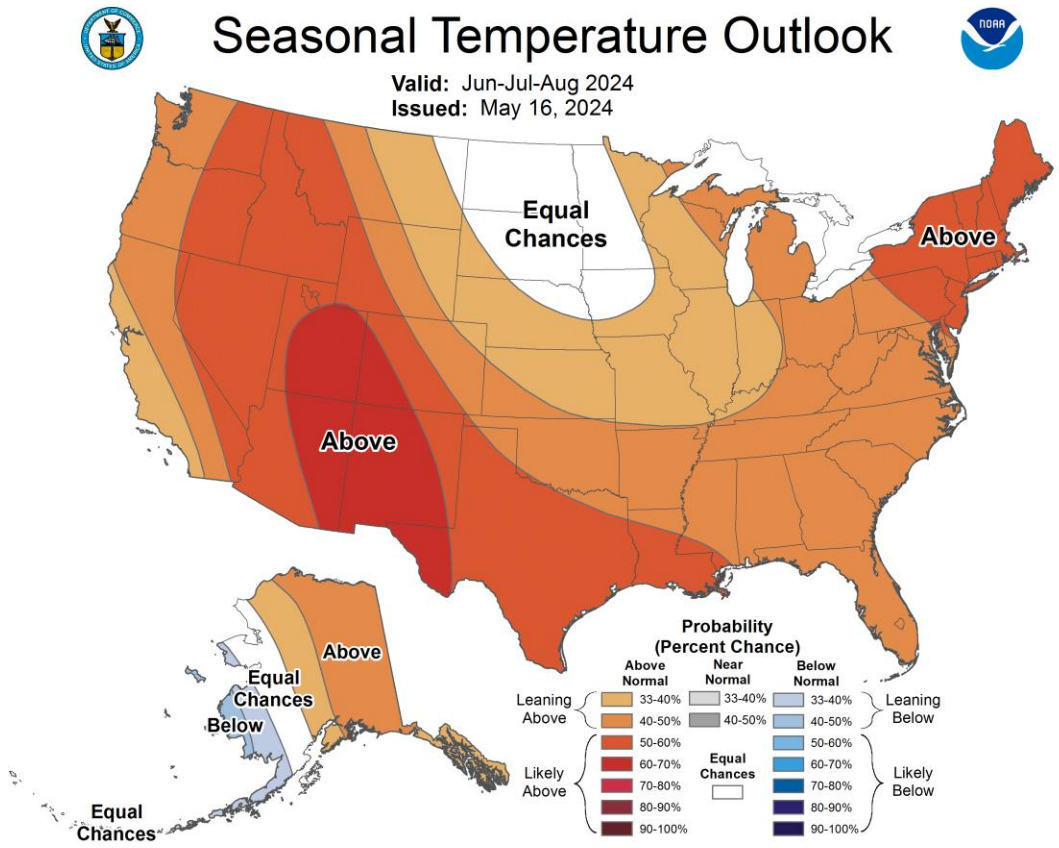
Temperature

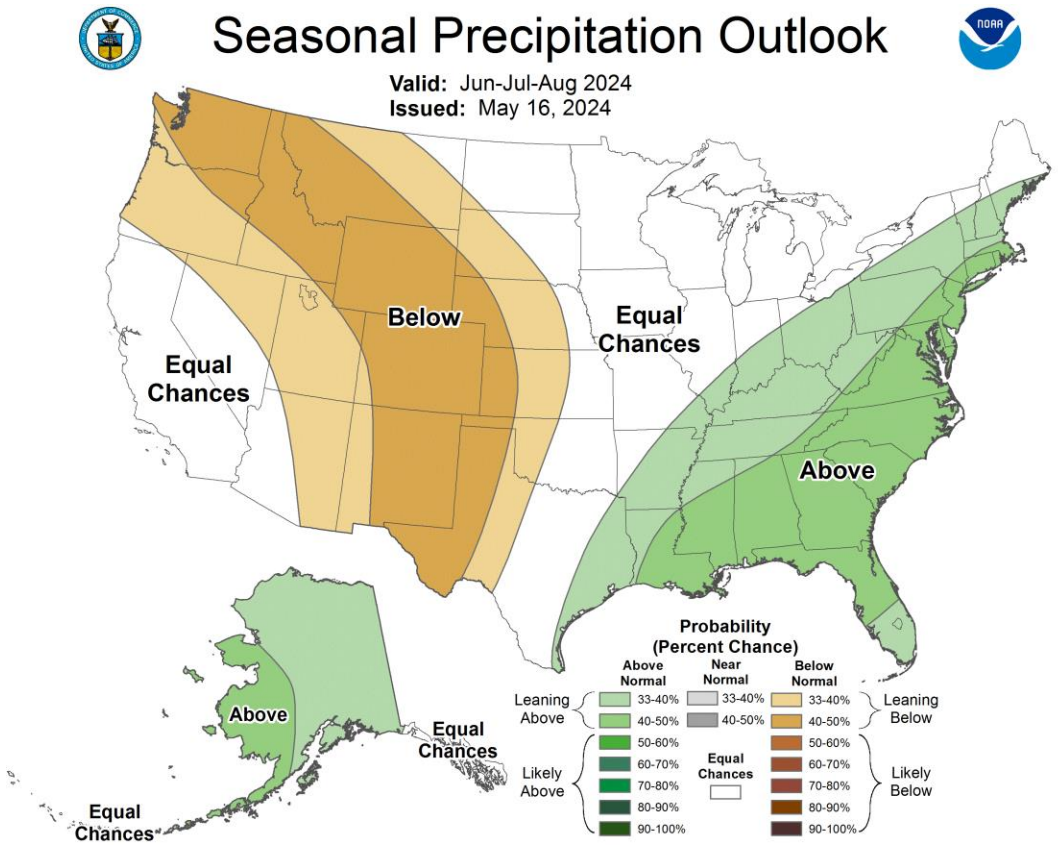


Precipitation

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead14/

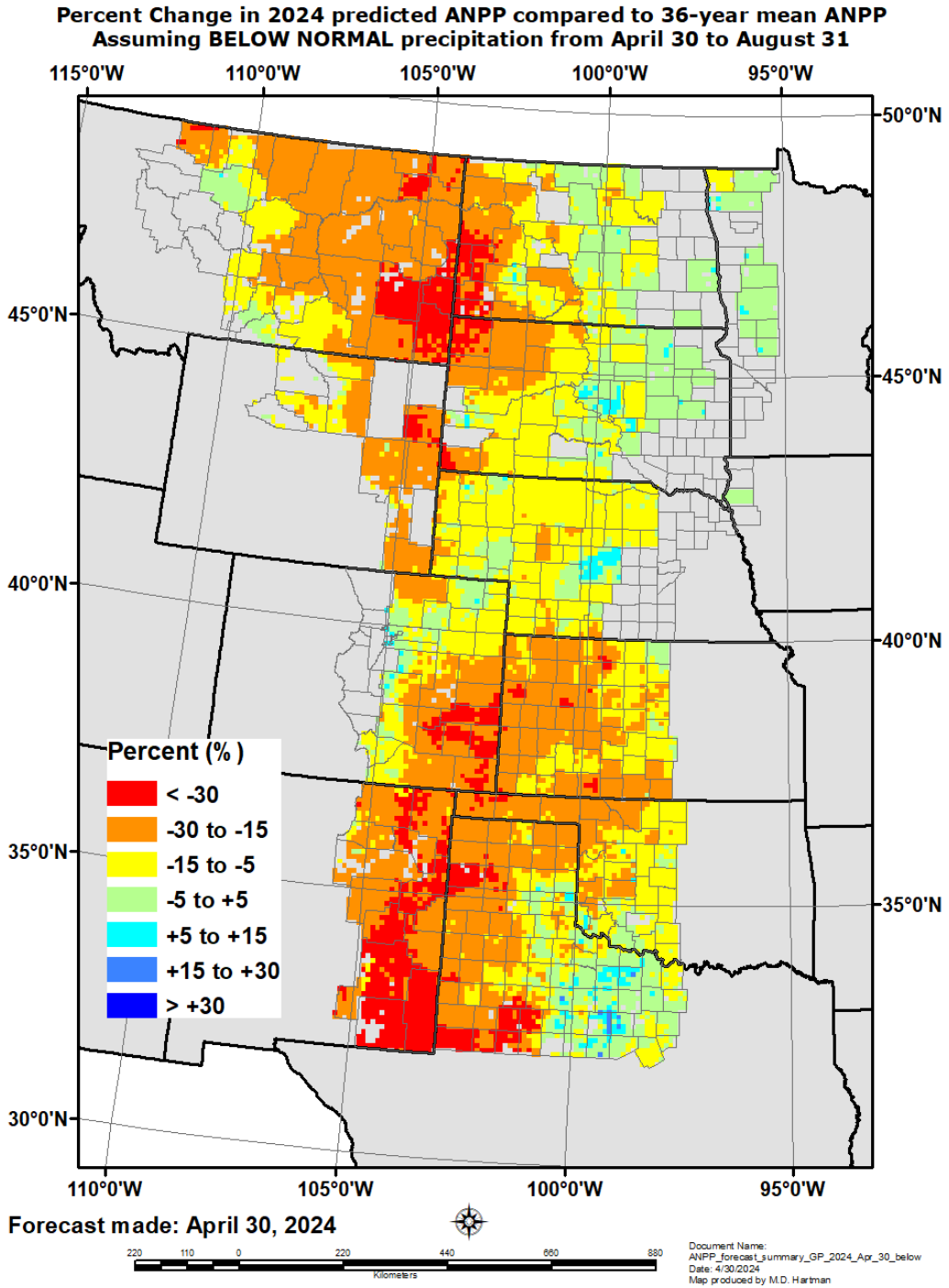
June-July-August Outlooks





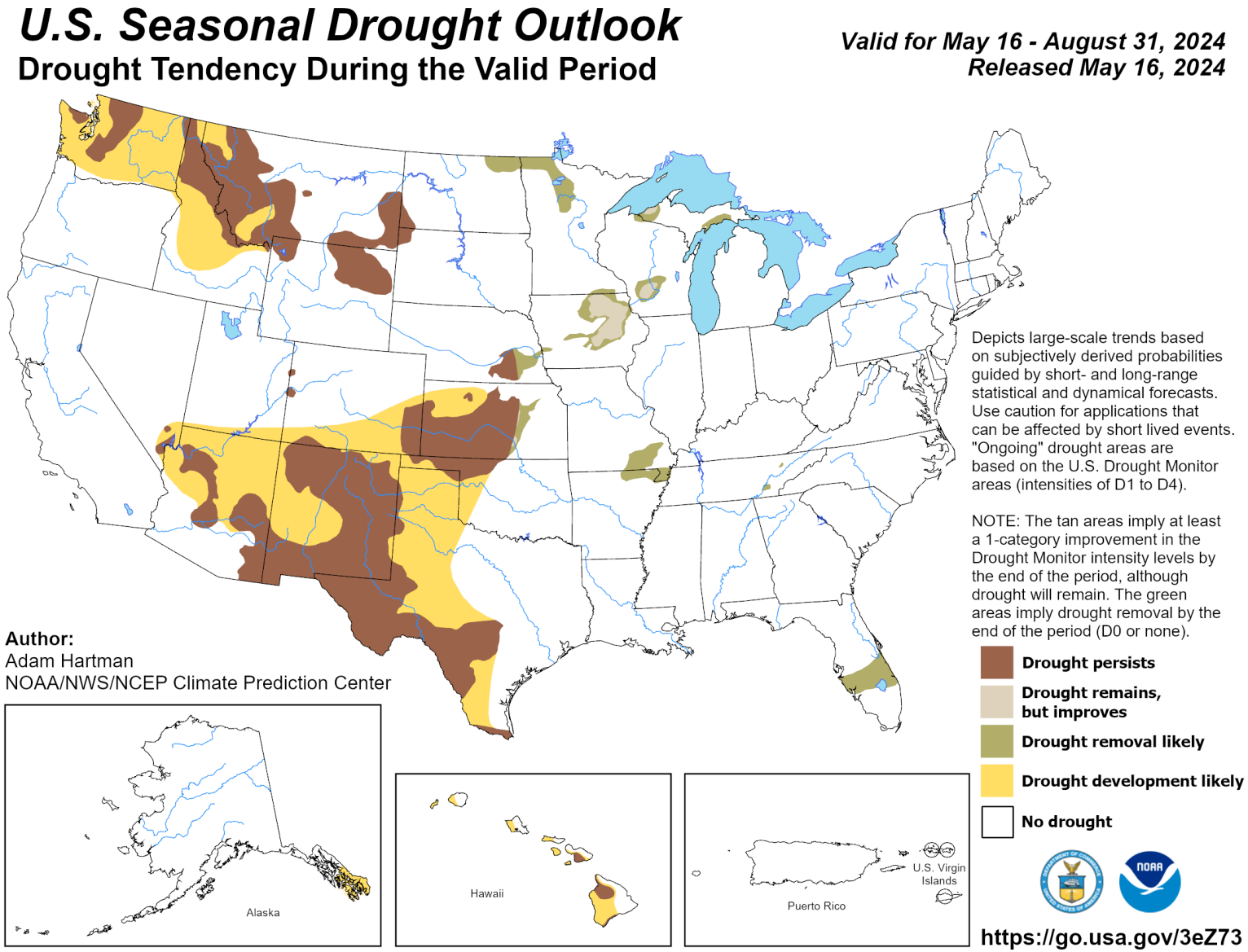
https://www.cpc.ncep.noaa.gov/products/predictions/90day/

Seasonal Scenario "If precipitation between now and August 31st is below-normal, we estimate that grassland production in your area (at lbs / acre of peak biomass) will be ____ % more or less than its 36-year average."



https://grasscast.unl.edu/

Seasonal Drought Outlook



http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png

Outlook Summary

- Short-term outlooks showing high probabilities of warmer temperatures south/eastern Corn Belt, cooler central/western Corn Belt and wetter overall.
- Seasonal temperature outlooks not a clear-cut across western portions of the region with the potential for warmer/wetter pattern east.
- Drought conditions region wide look to improve in the short-term; summer more of a wildcard
- ENSO-neutral conditions imminent with a high probability of a La Niña transition in summer
  - Analog years show summer conditions warmer and no clear signal on precipitation.
  - Mesoscale or thunderstorm-driven weather patterns hard to pin down compared to El Niño impacts on CONUS weather during winter.

Further Information - Partners

- **Today's and Past Recorded Presentations and :**
  - https://mrcc.purdue.edu/multimedia/webinars.jsp
  - https://hprcc.unl.edu/webinars.php
- NOAA's National Climatic Data Center: www.ncdc.noaa.gov
  - ➢ Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov
- Climate Portal: www.climate.gov
- U.S. Drought Portal: www.drought.gov
- National Drought Mitigation Center**: http://drought.unl.edu/**
- USDA Climate Hubs https://www.climatehubs.usda.gov/
- State climatologists
  - http://www.stateclimate.org
- Regional climate centers
  - http://mrcc.purdue.edu
  - http://www.hprcc.unl.edu

Thank You and Questions?

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