North Central U.S. Climate & Drought Outlook
September 2024

TRENT FORD

ILLINOIS STATE CLIMATOLOGIST

UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN

ILLINOIS

Illinois State Water Survey

PRAIRIE RESEARCH INSTITUTE

September 19, 2024

General Information

Providing Climate Services to the Central Region

- Collaboration Activity Between:
  - USDA Climate Hubs
  - American Association of State Climatologists
  - Midwest and High Plains Regional Climate Centers
  - NOAA NCEI/NWS/OAR
  - National Drought Mitigation Center
  - National Integrated Drought Information System

****Open Questions at the End****

Access to Future Climate Webinars & Past Recordings can be found:
https://mrcc.purdue.edu/multimedia/webinars.jsp
http://www.hprcc.unl.edu/webinars.php

Next Climate/Drought Outlook Webinar
October 17th
Austin Pearson – Midwestern Regional Climate Center, Indiana State Climate Office
& Brad Rippey – USDA

Outline

Recent Climate Conditions

- August & Summer Review
- Last 30-, 60-, 90-days

Events & Impacts

- Drought: agriculture, water, and fire
- Extreme Heat

Outlooks

- Next 7-days
- Next 2 – 4 weeks
- La Niña, rest of fall, hints of winter

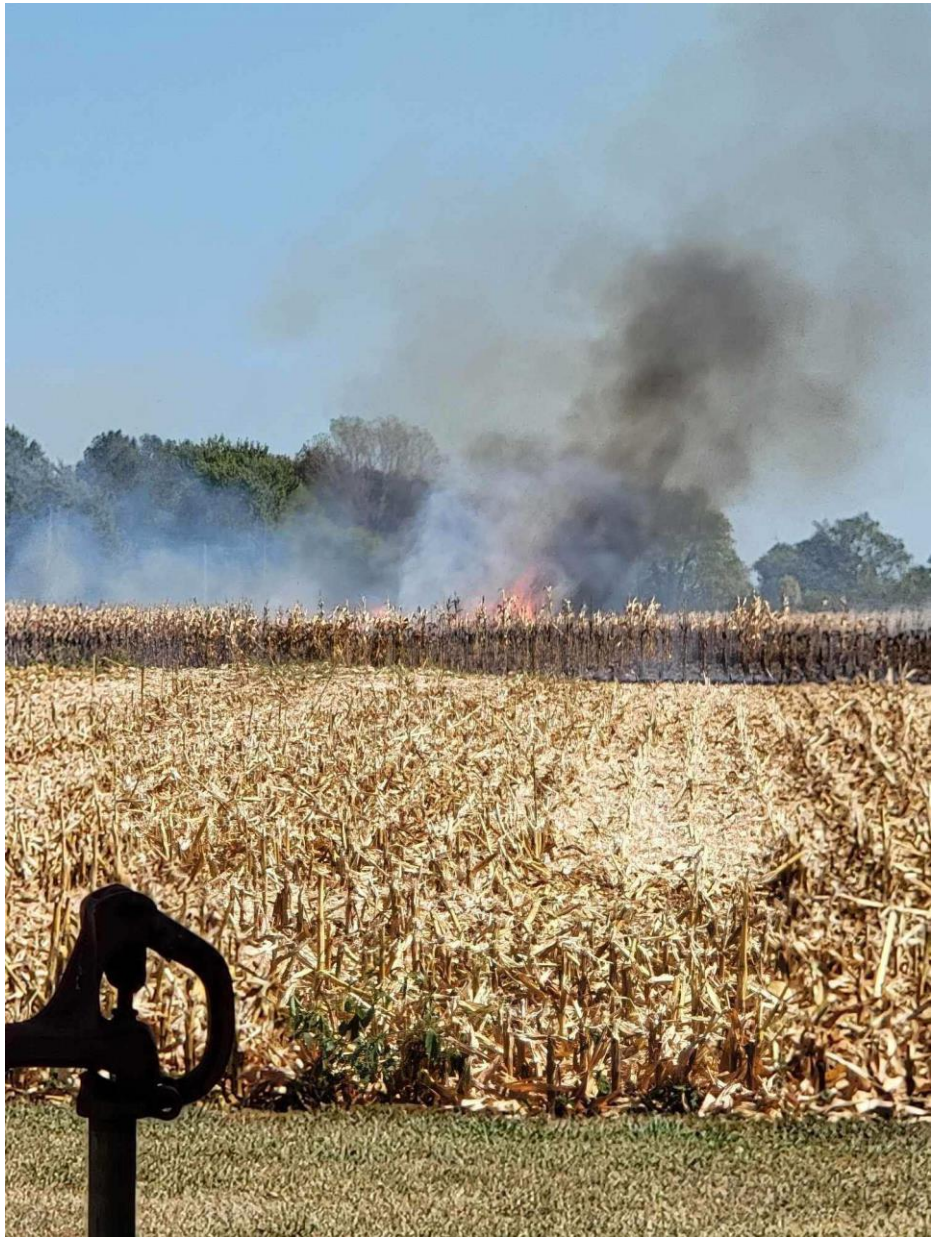
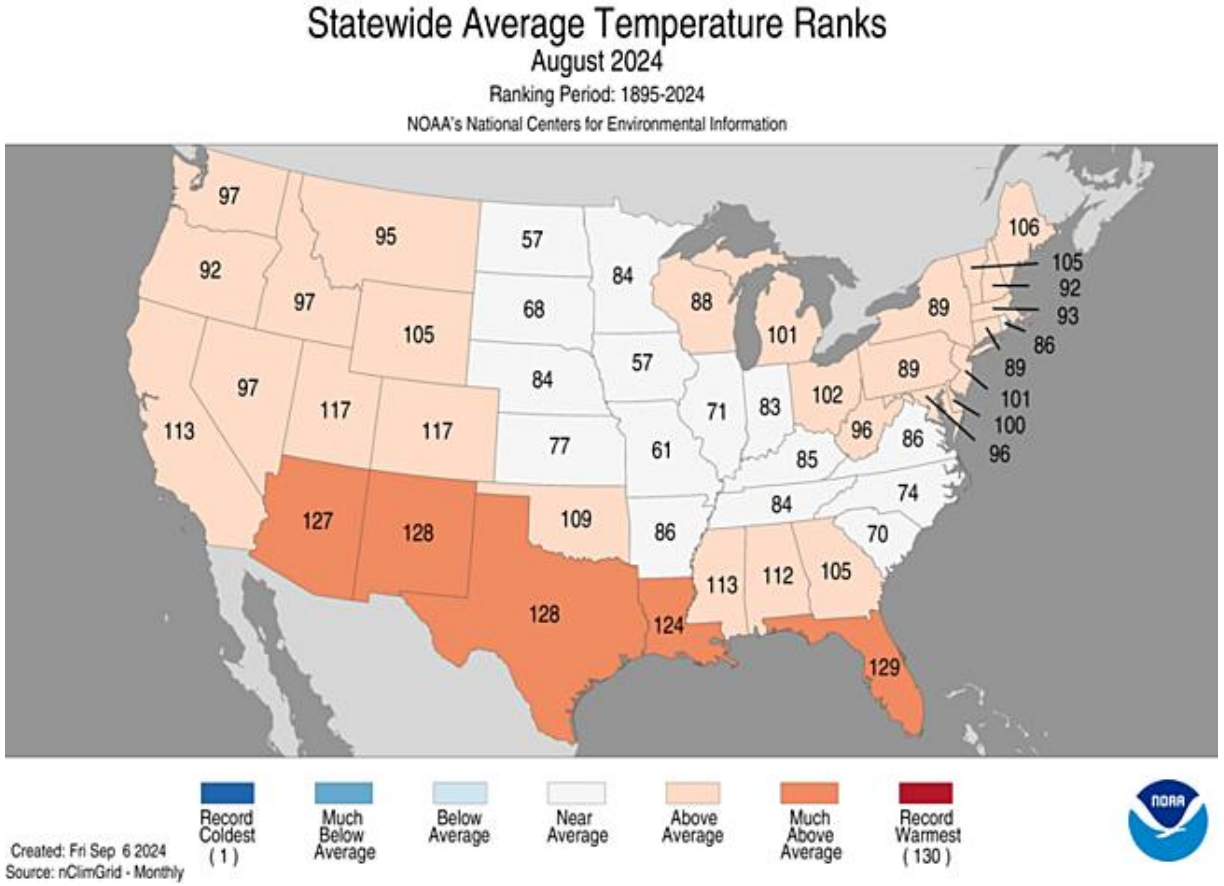


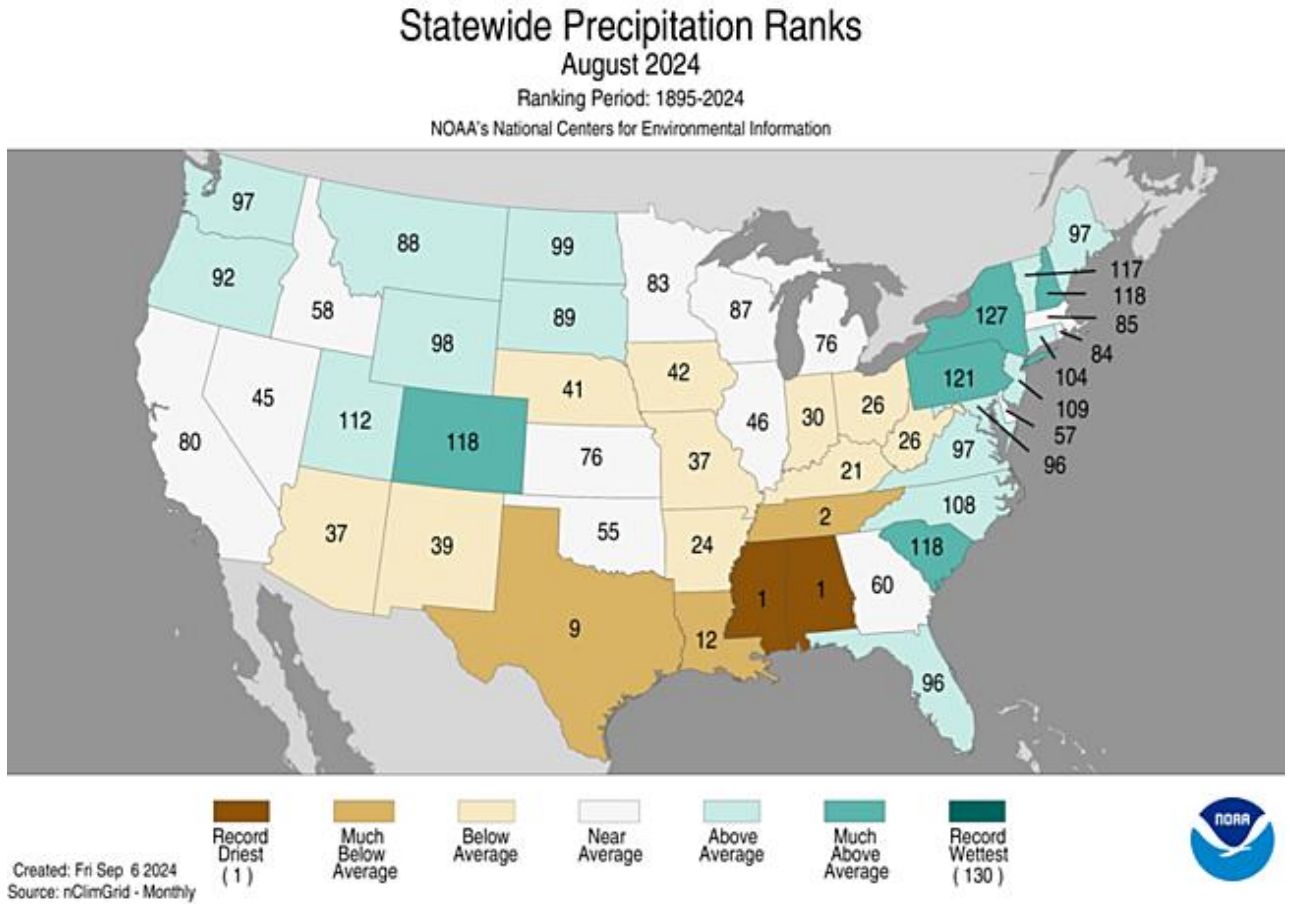
Photo: Mike Estadt - OSU Extension Educator

Source: Aaron Wilson, OSU Extension

Recent Climate Conditions

August Climate Review

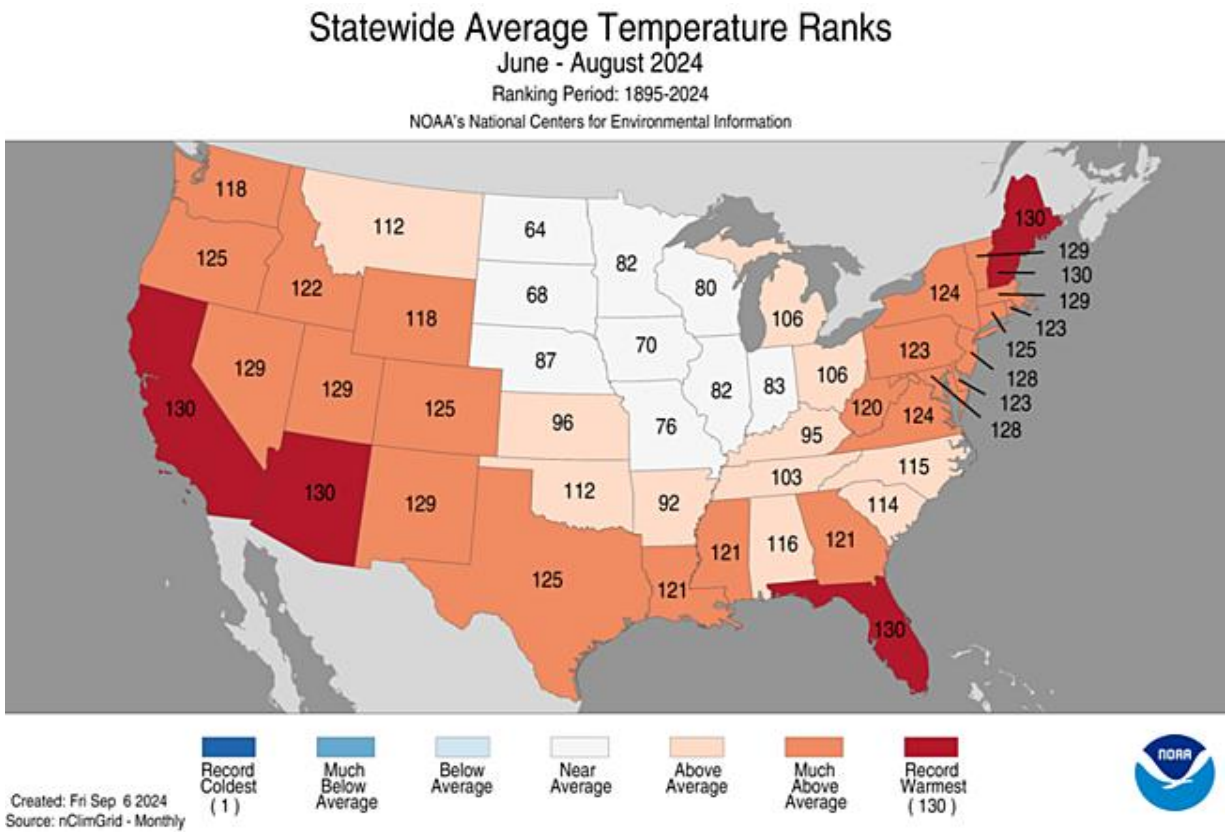


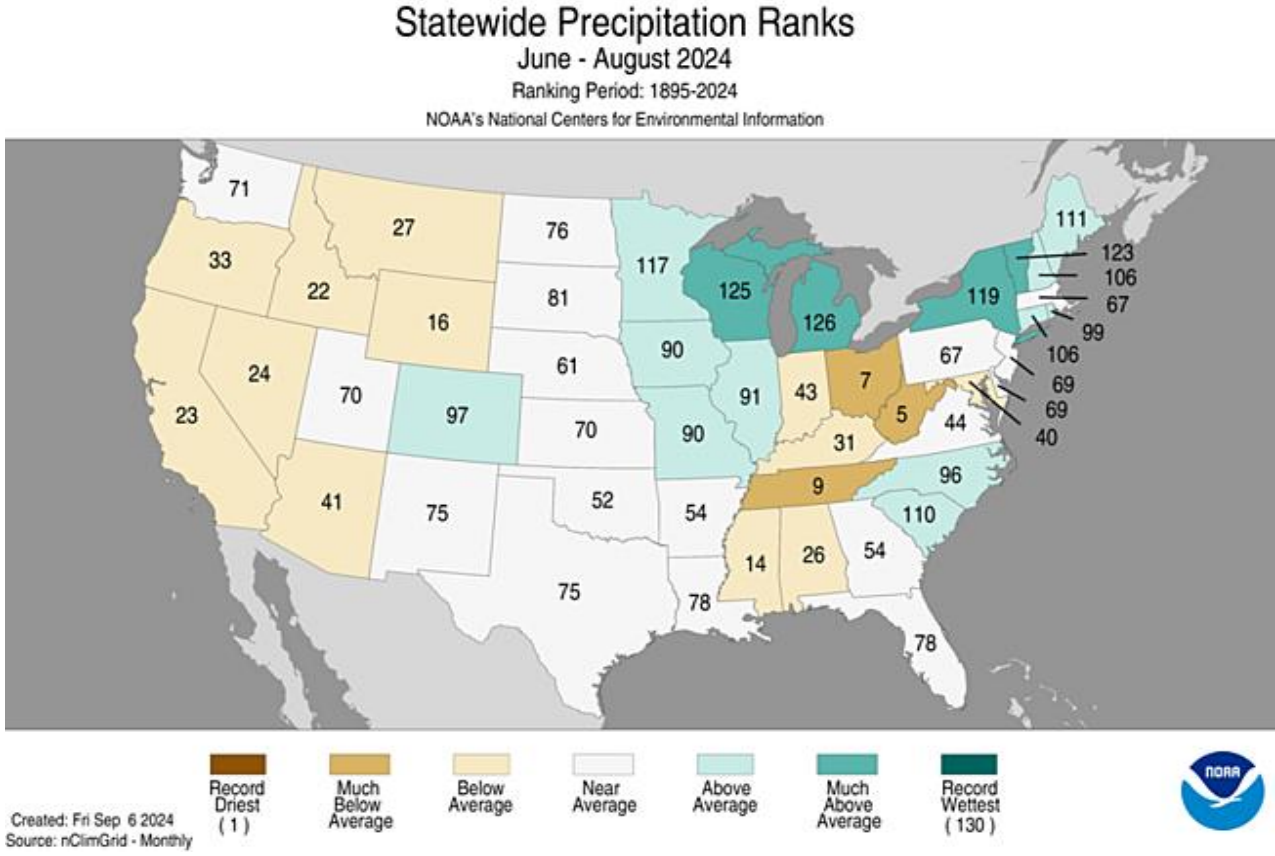


- Warmer near Great Lakes, close to normal west
- August low temperatures (not pictured) were above normal region-wide
- Dry across corn belt – not extremely so
- Wetter in Dakotas, closer to normal in Great Lakes

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

Summer (June-August) Climate Review



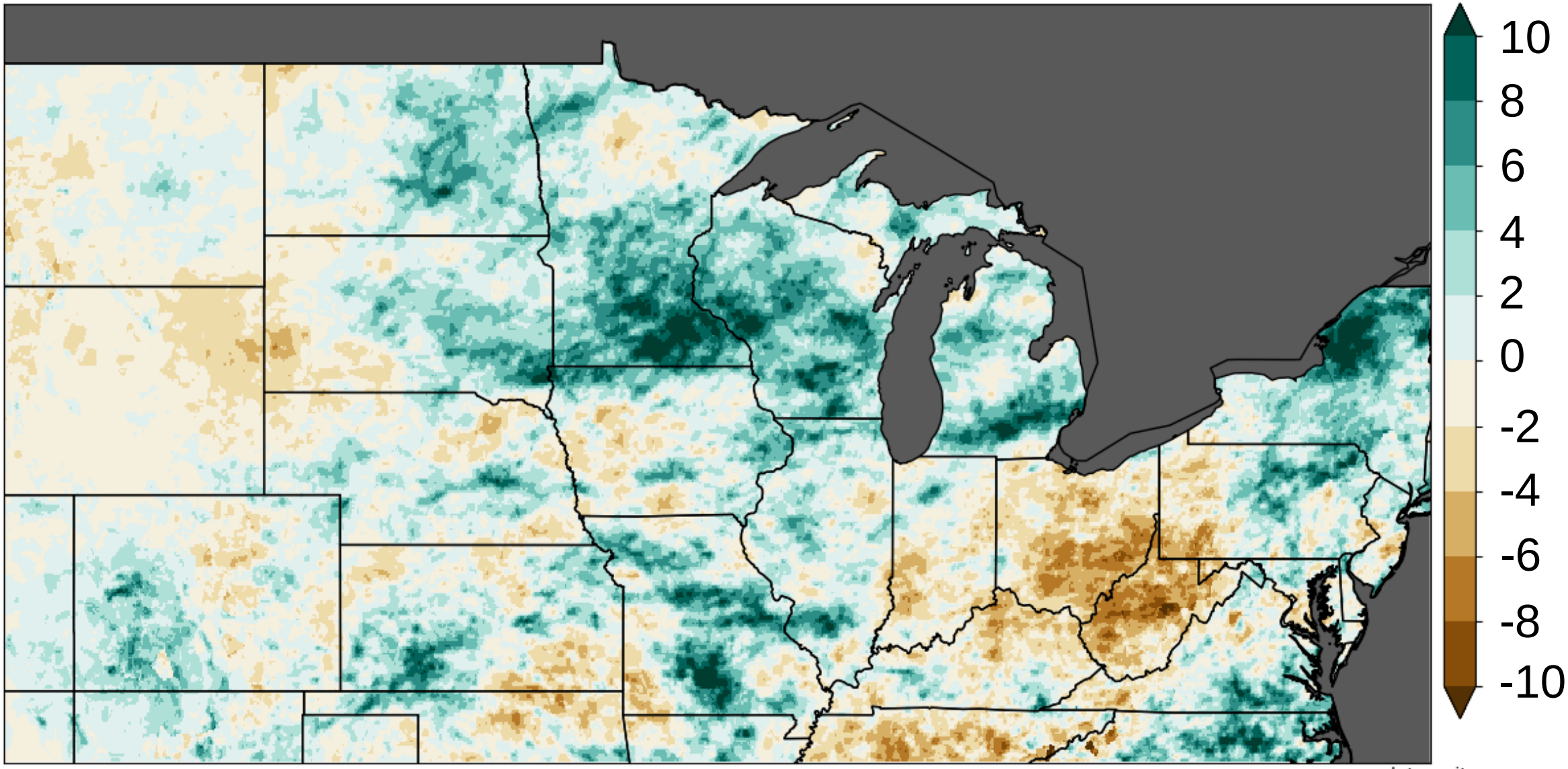


- North-Central region was a near-normal haven in an otherwise very warm summer
- 4th warmest summer on record for the U.S.

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

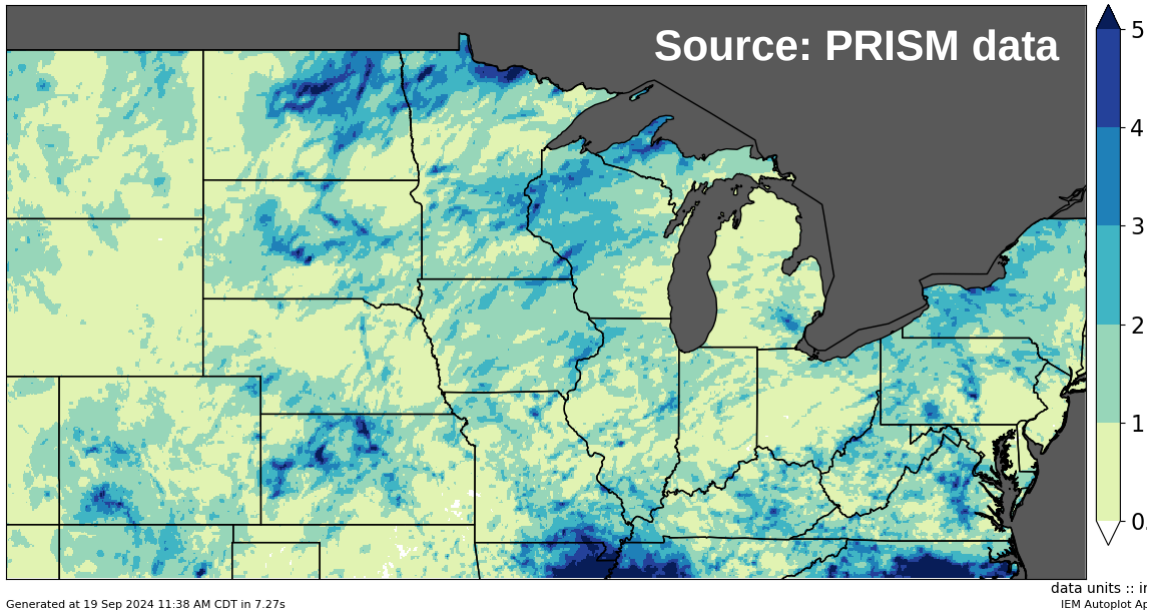
- Wetter than normal in Upper MS Valley
- Very wet in MN, WI, & MI
- Extremely dry in Ohio

Summer Precipitation Dichotomy

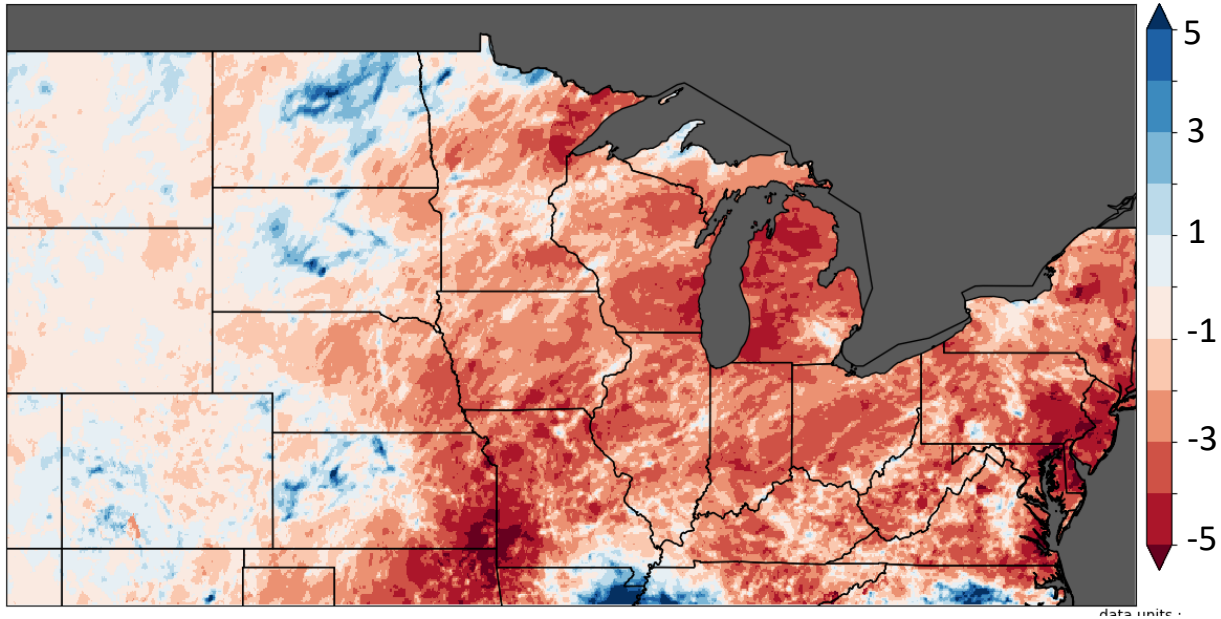


Precipitation – Last 30 Days

Total Precipitation (inches)



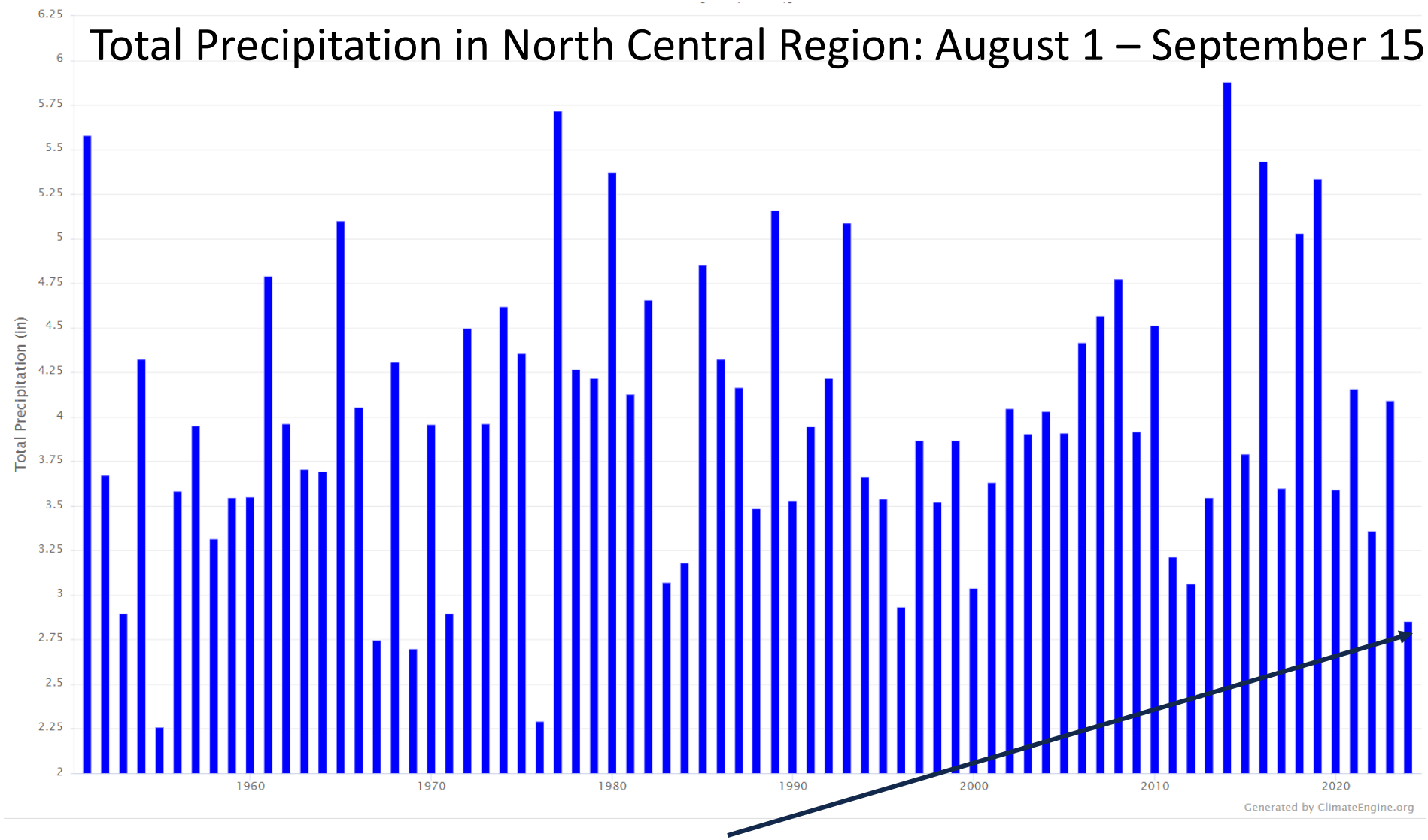
Departure from Normal (inches)



Source: IEM, https://mesonet.agron.iastate.edu/plotting/auto/?q=84

- Extremely dry across most of the Midwest and eastern Plains
- 3-5” deficits from southwest Missouri to the Great Lakes
- Only parts of KS, CO, ND, SD, and MT are wetter than normal since mid-August

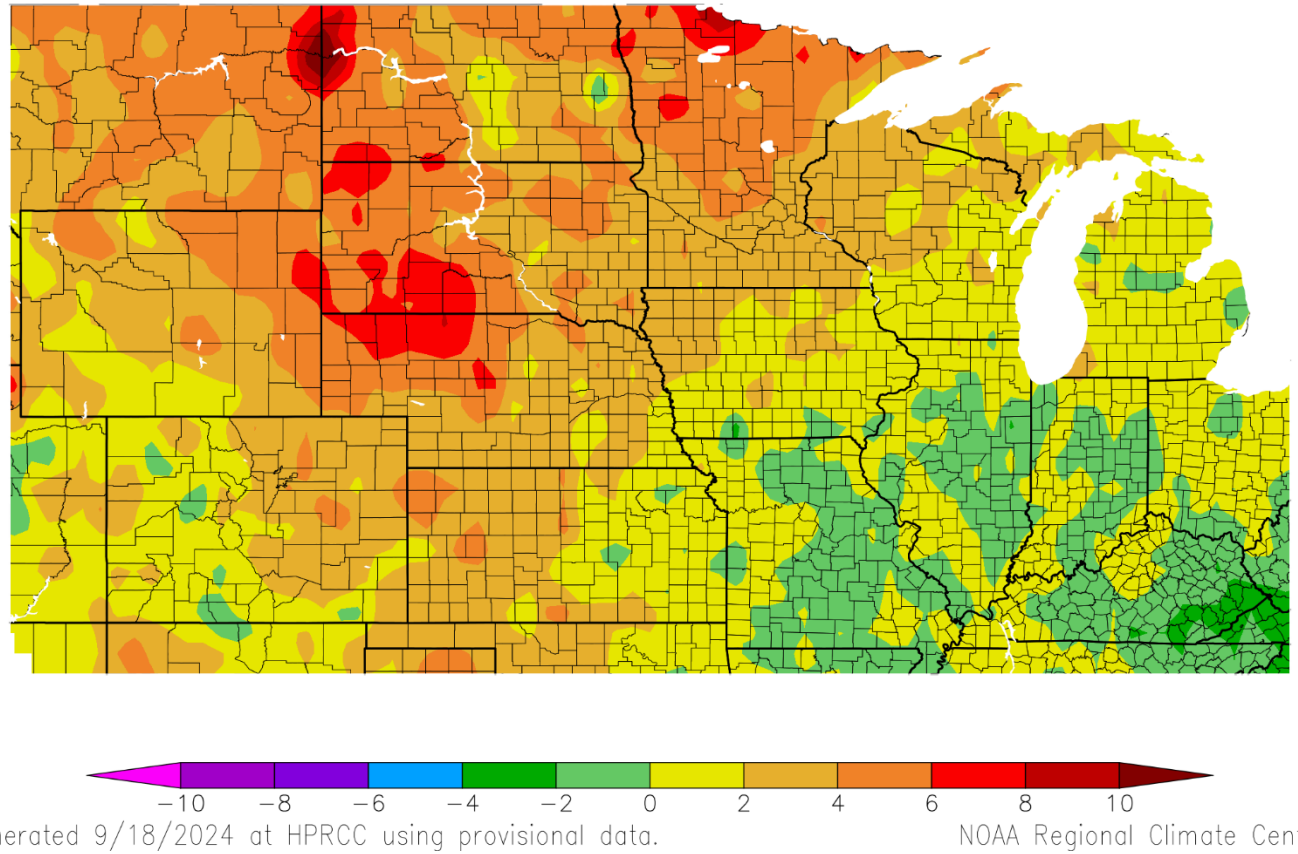
Dry Across the Region since August



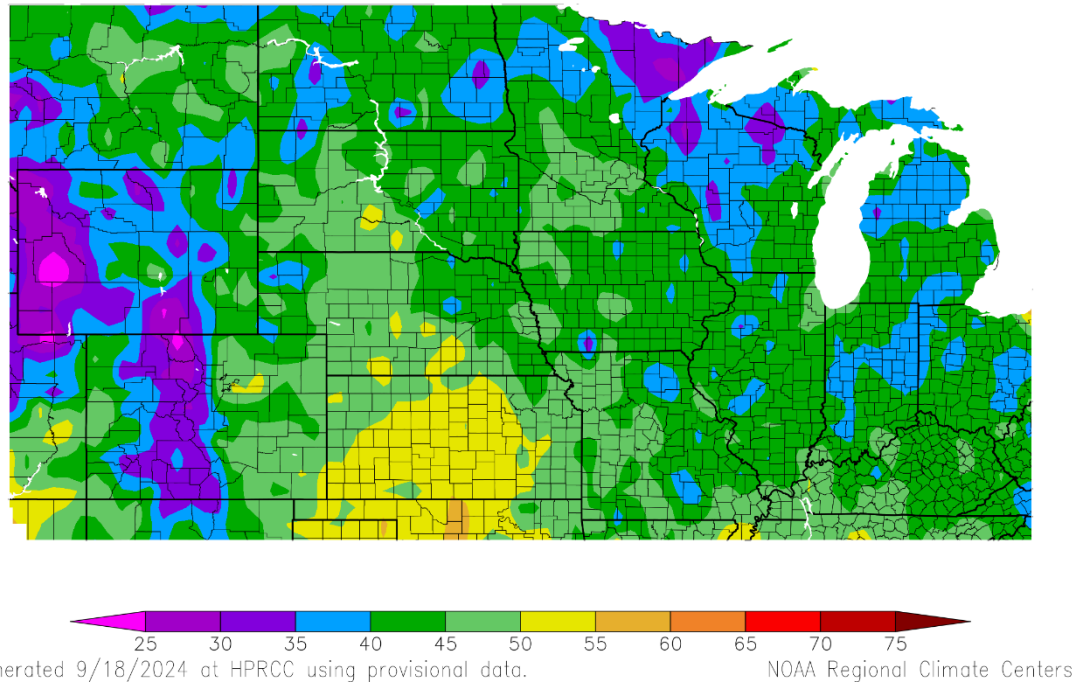
Driest August 1 – September 15th in the region since 1976, 5th driest since 1951

Temperatures – Last 30 Days

Average Temperature Departure from Normal (°F)



Lowest Temperature Observed (°F)

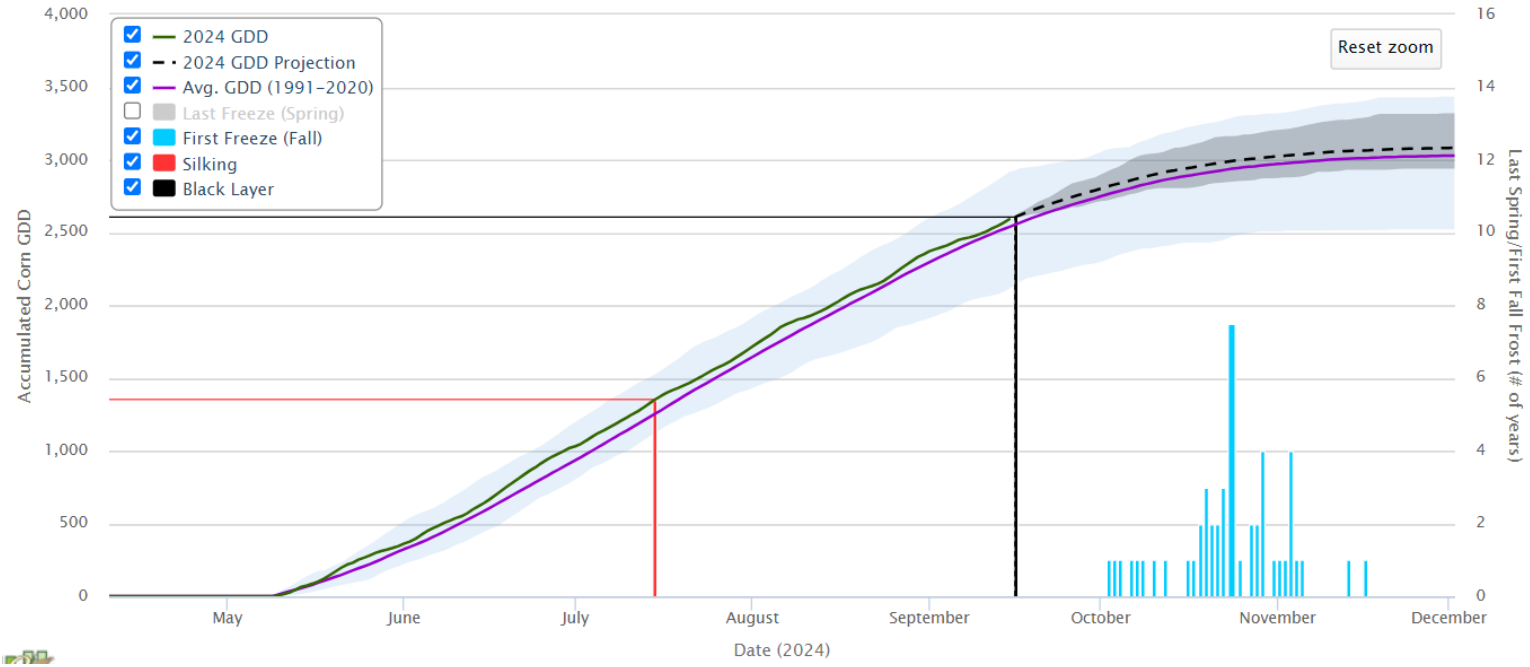


- Average temperatures 2°F to 8°F warmer than normal in Plains and Upper Midwest
- Near to slightly cooler than normal in eastern Corn Belt since mid-August
- Lows in the 30s in early September across much of the region, 26°F in Ely, Minnesota

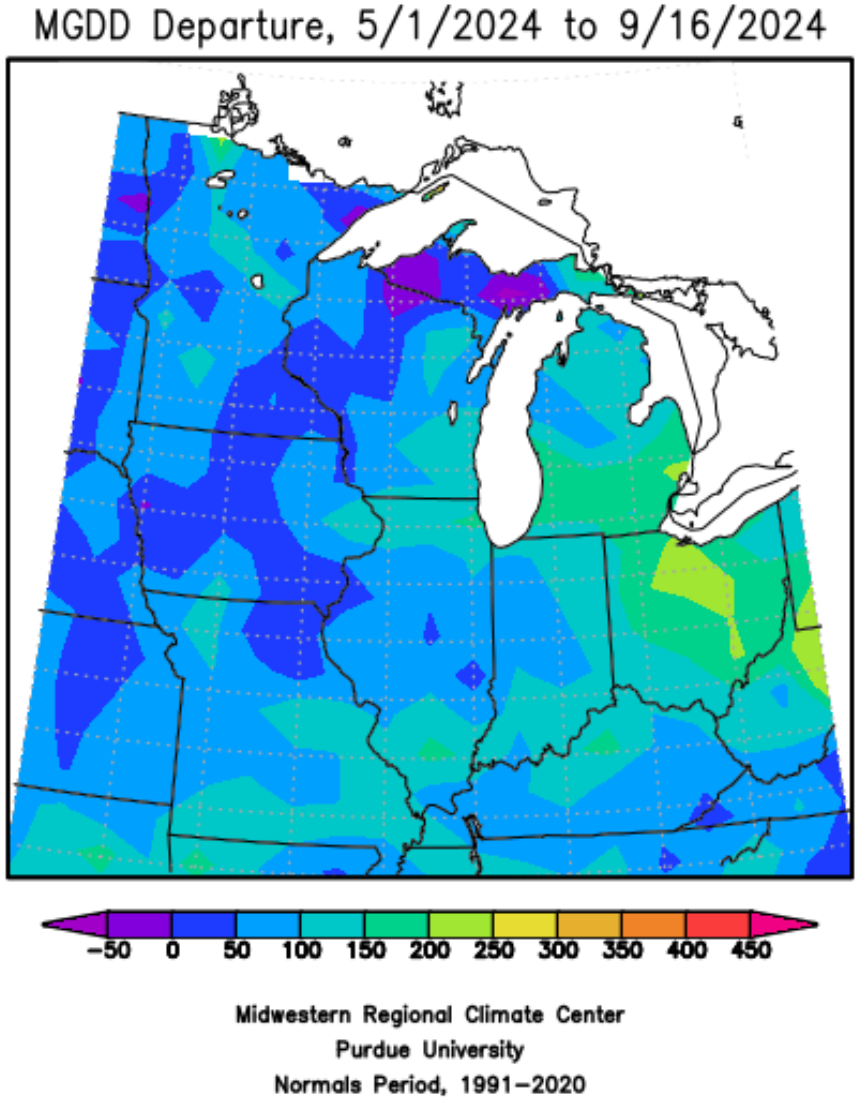
Growing Degree Days (Since April 1st)

- GDDs are running near average in western corn belt, 50-250 above average in the east

Corn Growing Degree Day Tool – Stark County, Illinois



https://hprcc.unl.edu/agroclimate/gdd.php

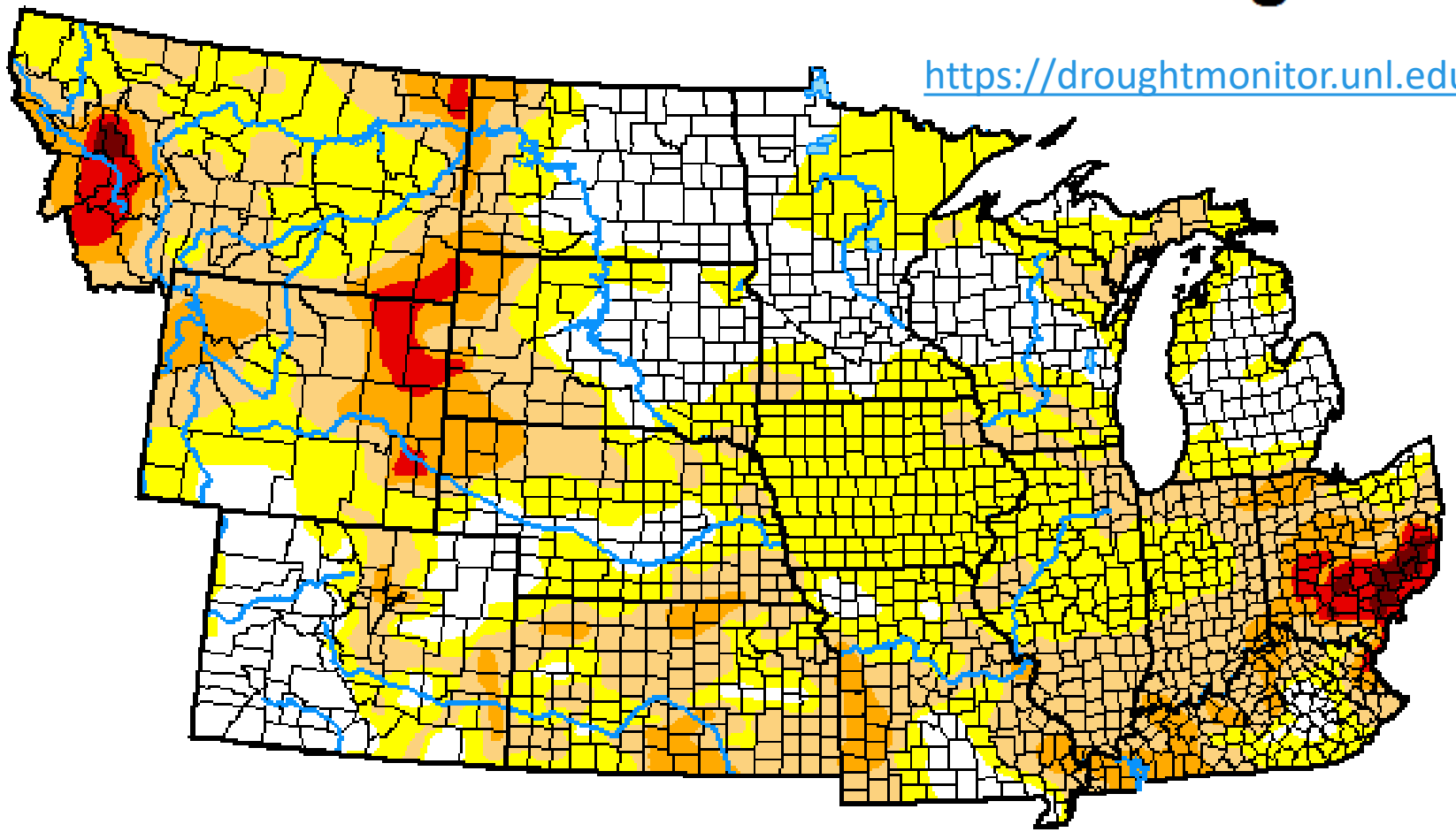


https://mrcc.purdue.edu/climate_watch/special_topics/agriculture

Drought

U.S. Drought Monitor
NWS Central Region

September 17, 2024
(Released Thursday, Sep. 19, 2024)
Valid 8 a.m. EDT



https://droughtmonitor.unl.edu/

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	23.85	76.15	39.29	12.69	3.05	0.46
Last Week *09-10-2024*	29.37	70.63	32.94	10.41	2.57	0.42
3 Months Ago *06-18-2024*	63.33	36.67	10.20	1.28	0.00	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 *09-19-2023*	41.23	58.77	39.47	23.31	8.94	1.04

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 Rippey
U.S. Department of Agriculture

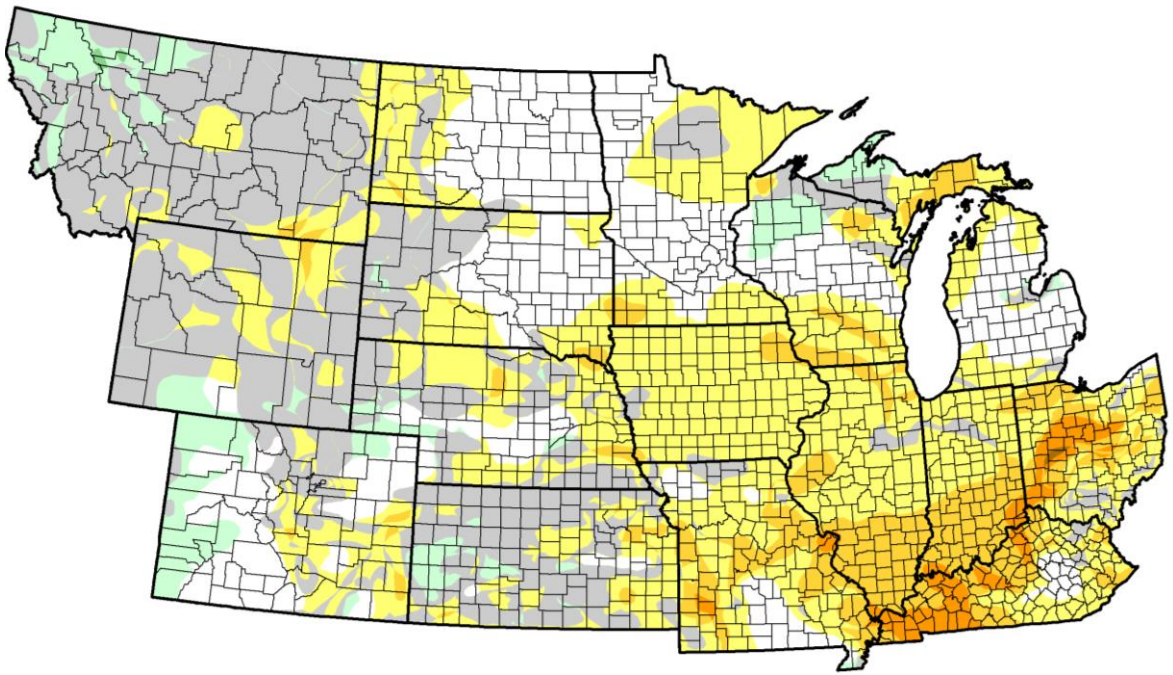
droughtmonitor.unl.edu

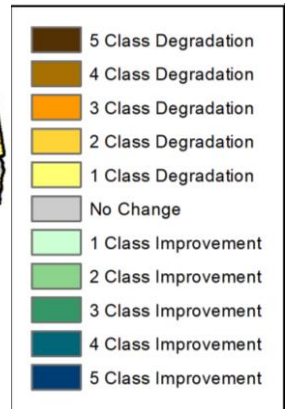
- Nearly 40% of the region is in at least moderate drought
- First D4 (exceptional drought) in Ohio since USDM started (Jan. 2000)

Drought Change

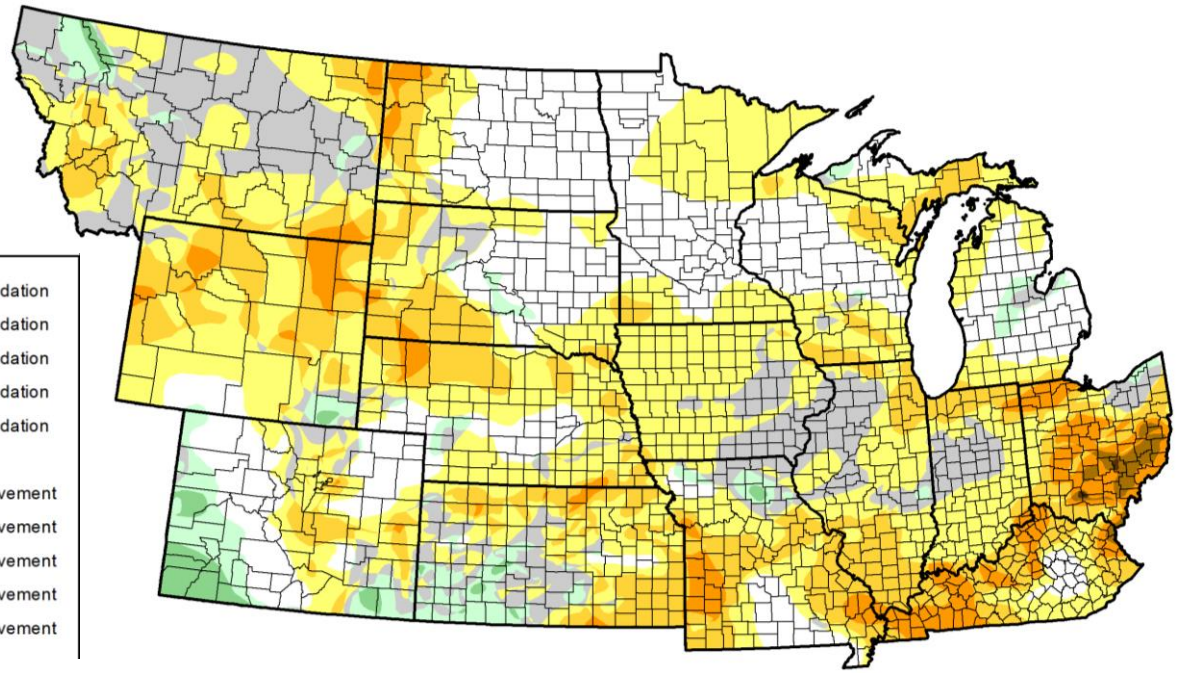
https://droughtmonitor.unl.edu/Maps/ChangeMaps.aspx

Change Since August 20



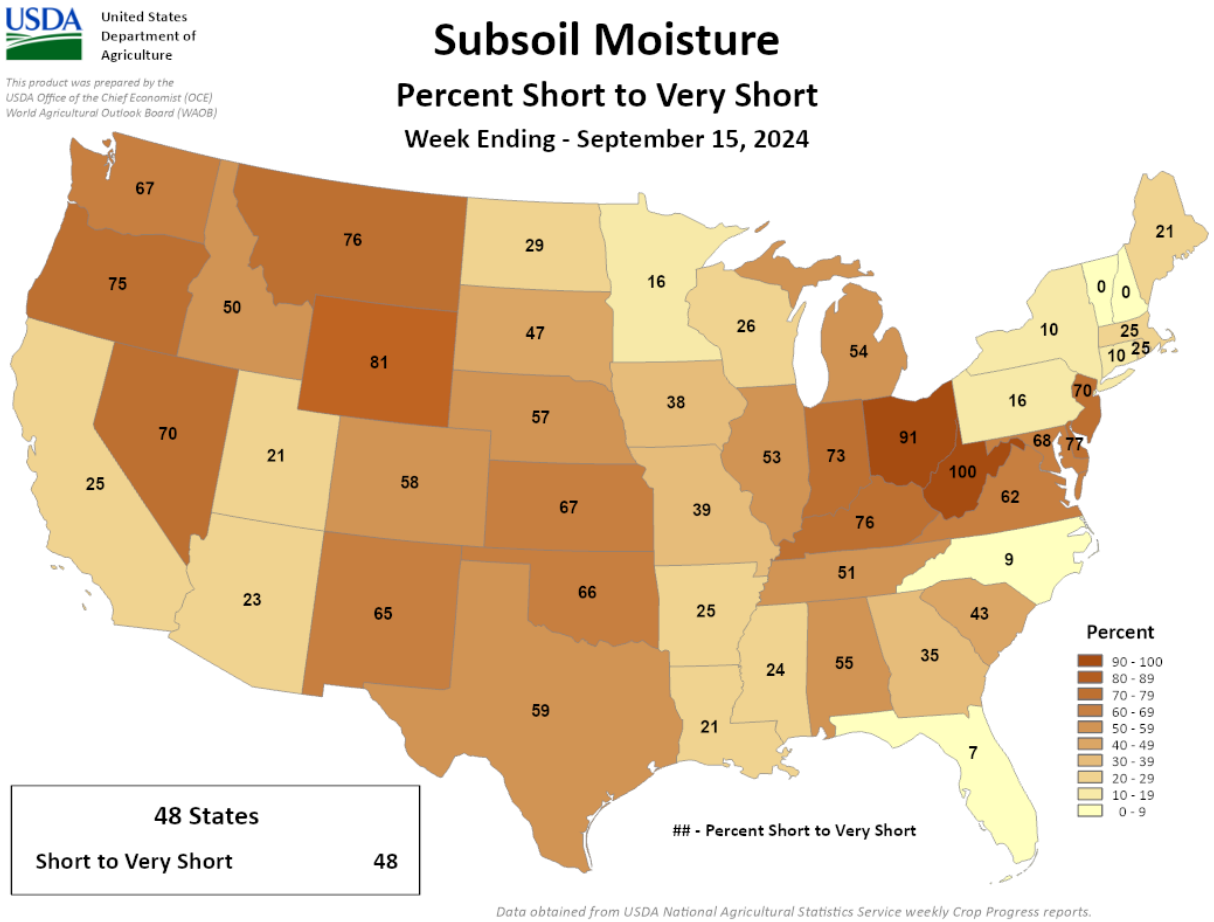


Change Since June 18



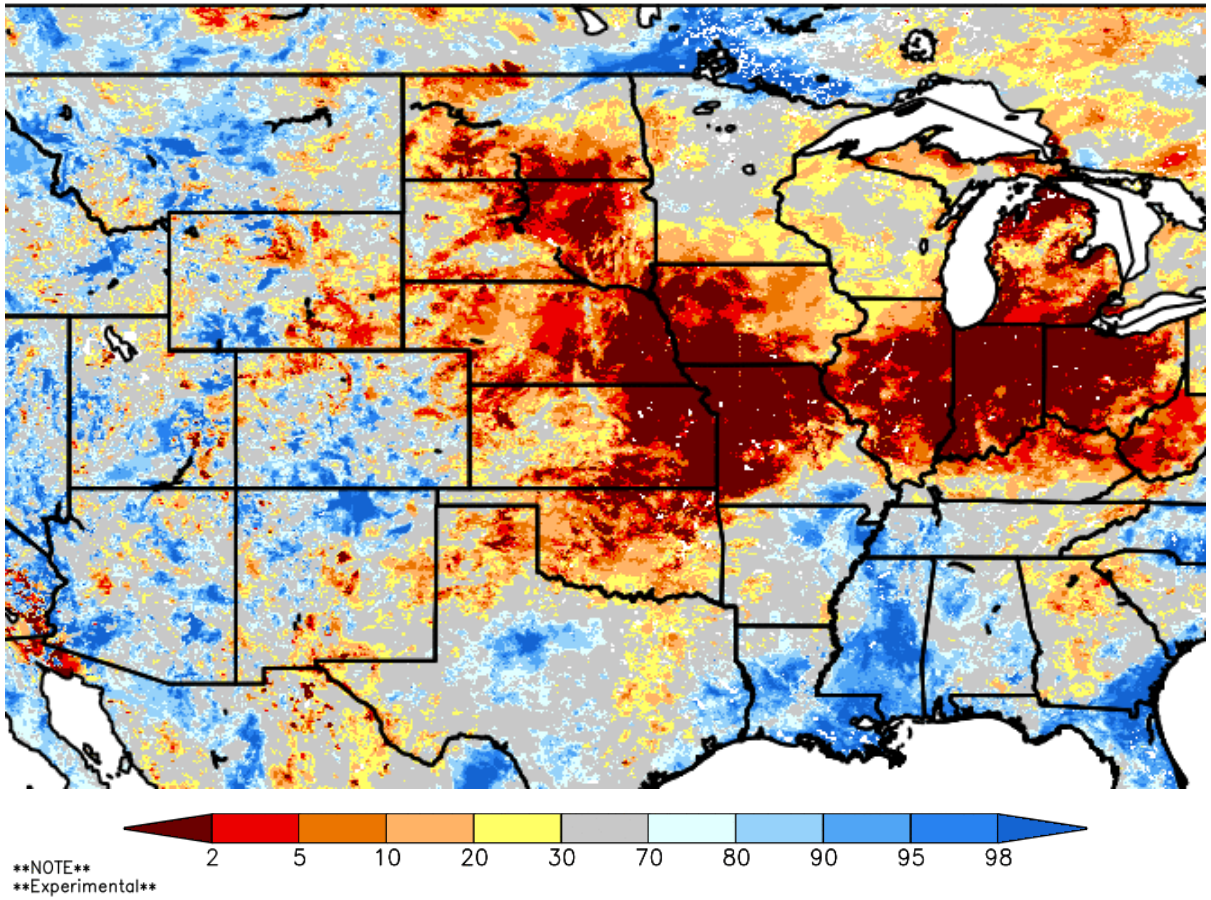
- Rapid drought intensification in eastern corn belt: 2-4 class degradation in 4 weeks
- Some improvement in western MT and CO since mid-summer

Soil Moisture



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

SPoRT-LIS Model Soil Moisture Percentile (top 40")

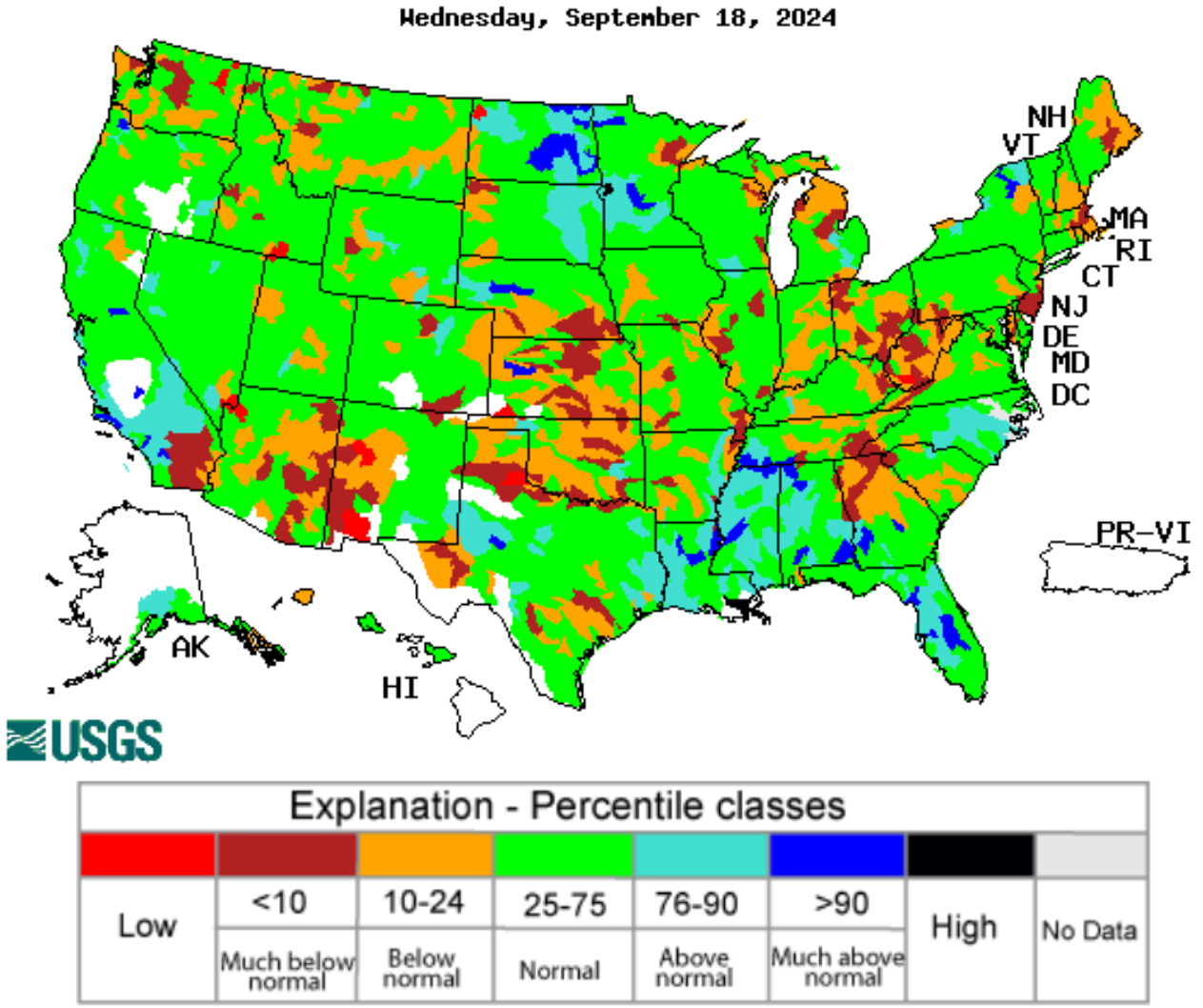


https://weather.ndc.nasa.gov/sport/viewer/?dataset=lis_conus&product=vsm0-100percent

Stream Conditions

- Many streams at or approaching below normal flow
- Streamflow drought most prevalent in NE, KS, and OH

14-day Streamflow by Watershed



https://waterwatch.usgs.gov/

Major Rivers

Mississippi River

- Reached low flow once again on lower MS River
- River levels at Memphis are expected to decline into October

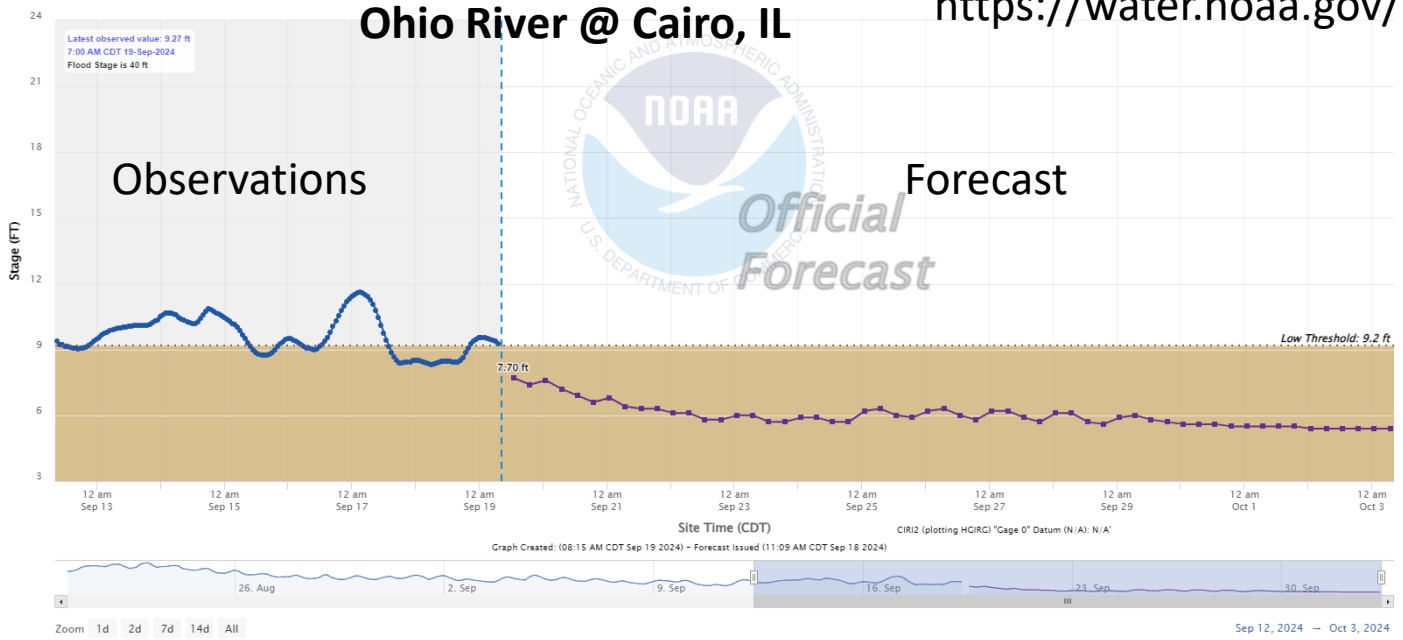
Ohio River

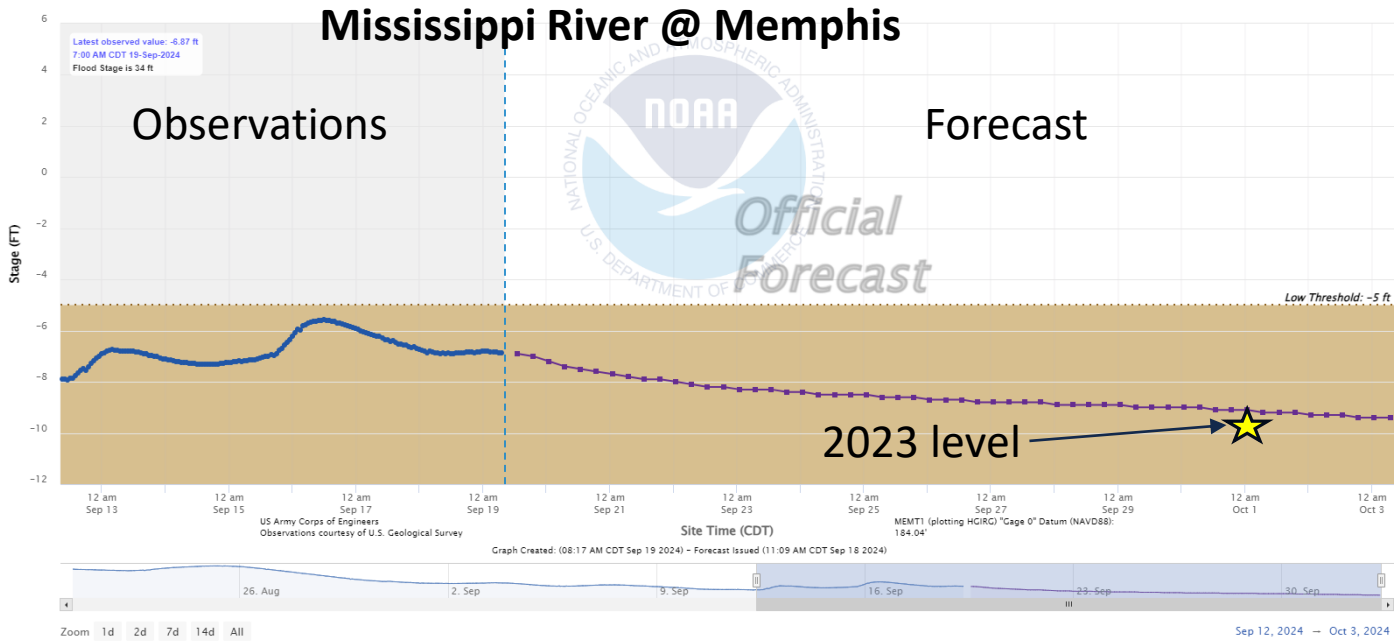
- 74% of the basin is in at least moderate drought
- Reached low flow at Cairo, expected to decline into October
- Ohio River typically contributes 50% of flow to lower MS River, currently at 10%

Missouri River

- No major issues

https://water.noaa.gov/





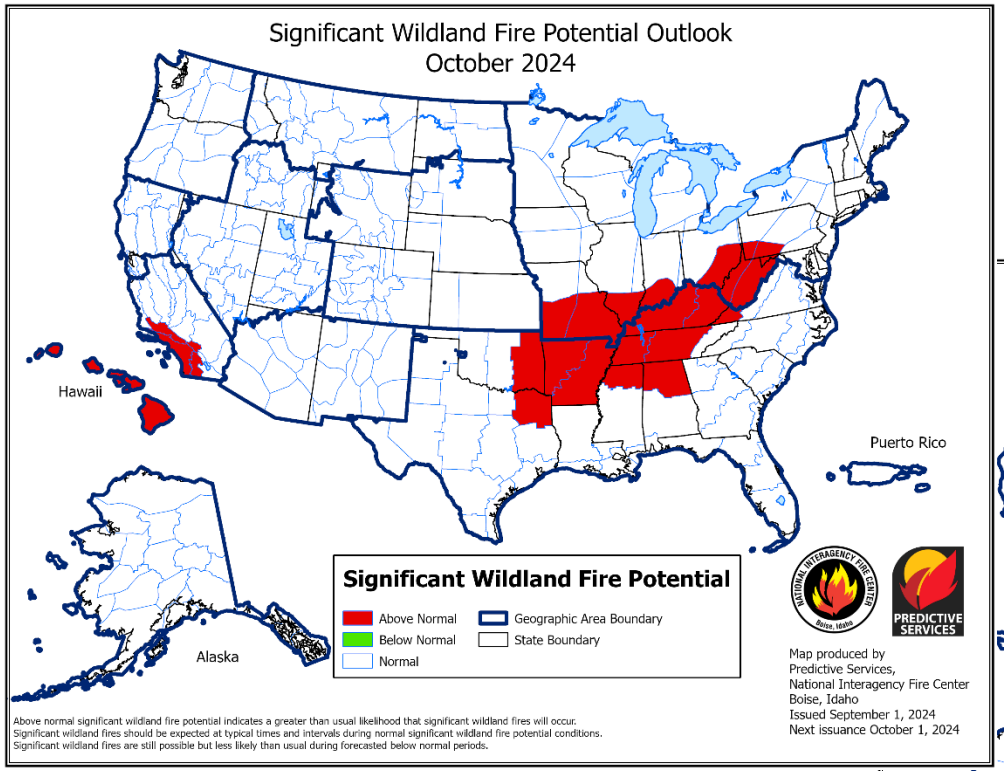
Fire Issues in the Region

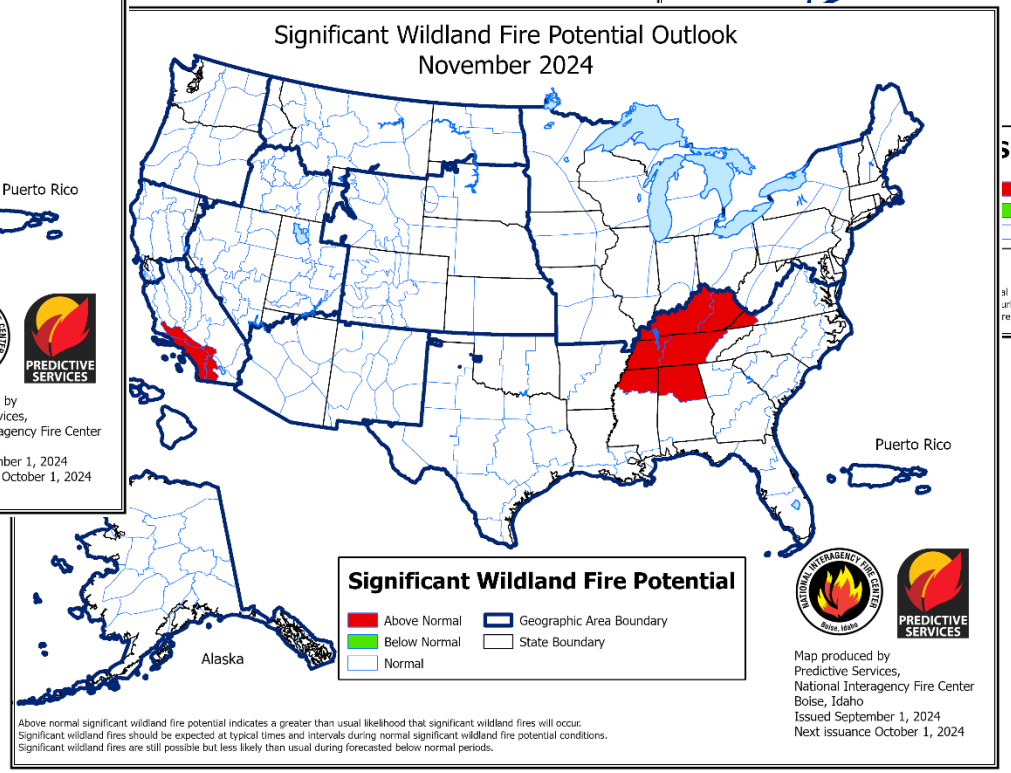
- Several wildfires burning in Wyoming, Montana, Colorado, South Dakota, and Minnesota
- Field fires in Ohio and Indiana, increased fire risk as harvest begins in earnest

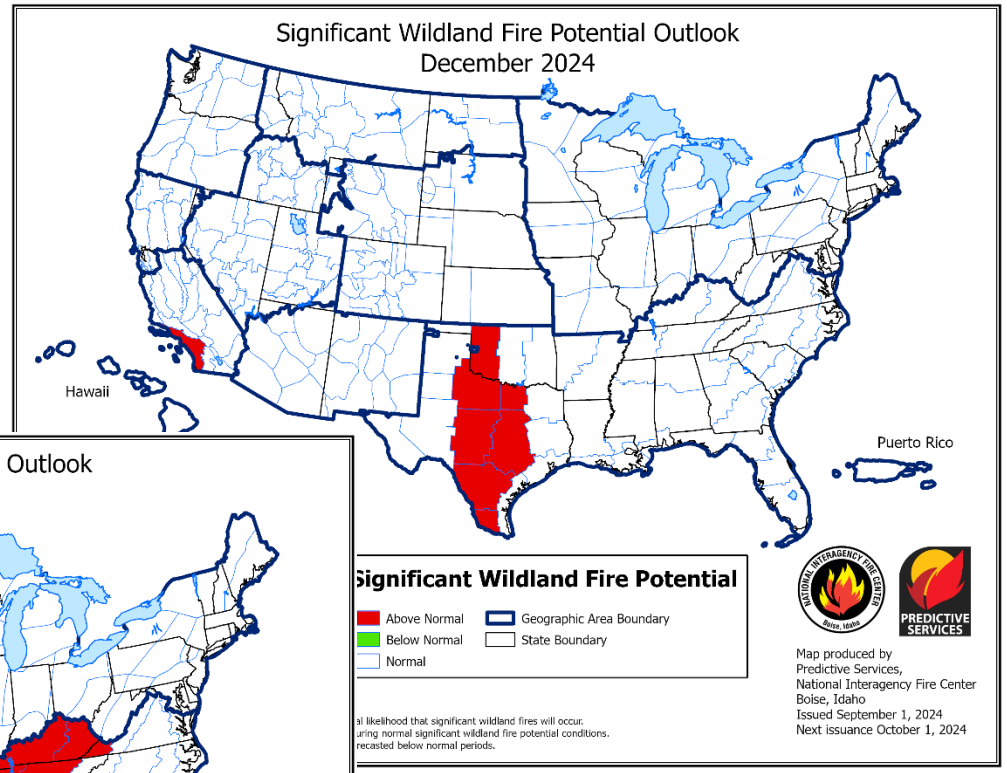
Short Draw fire in Wyoming.
Source: Yoder Volunteer Fire Department

Remington Fire along Wyoming-Montana border.
Source: Rosebud County Sheriff's Office

Wildland Fire Outlooks: Oct – Dec







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

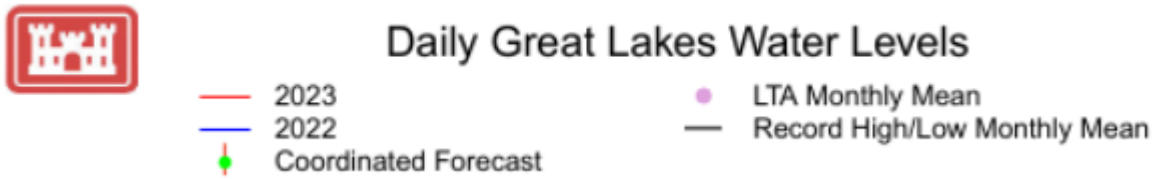
Great Lakes: Temperatures & Levels

Lake Temperatures

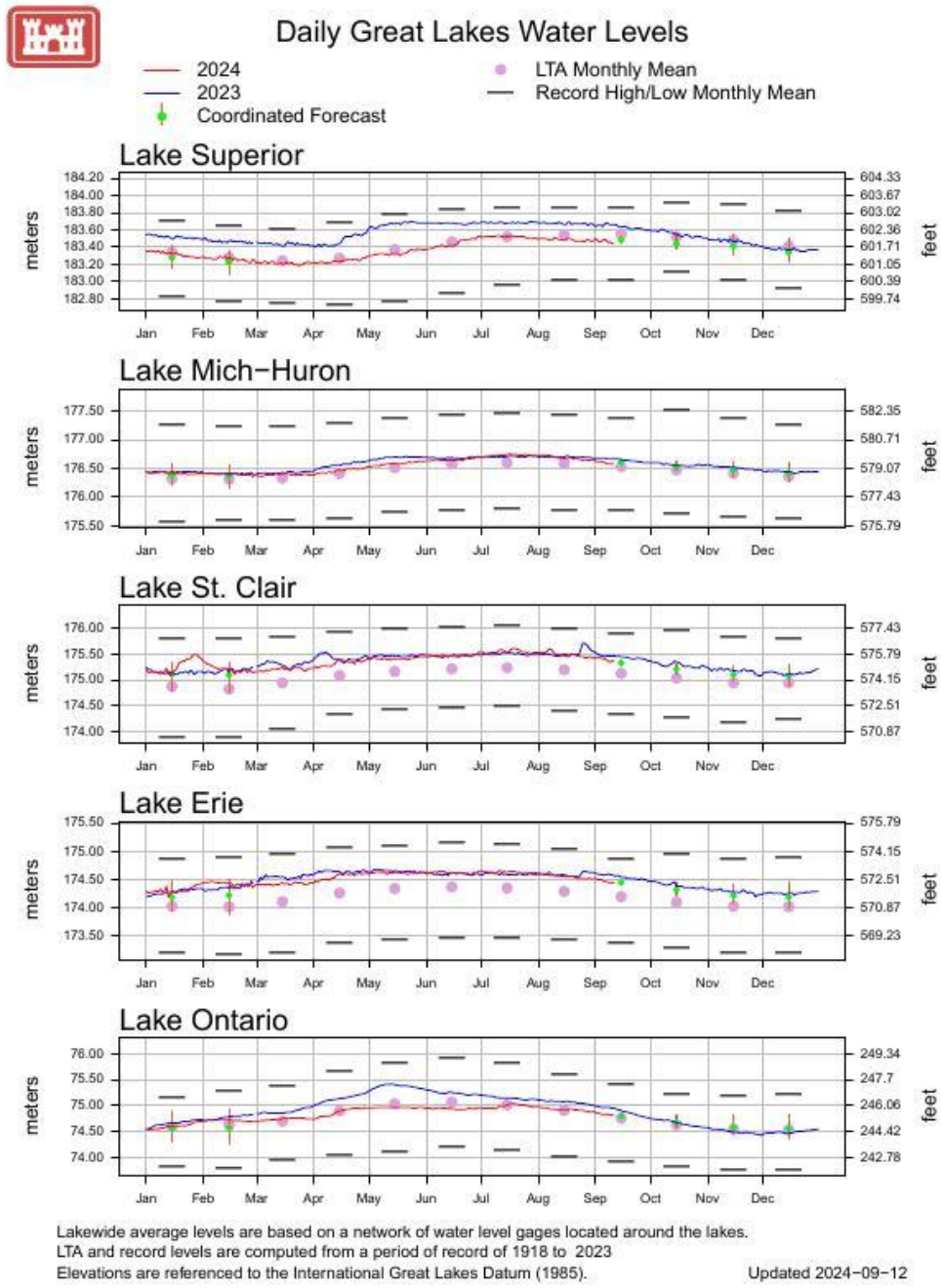
- Superior & Michigan running 2-4°F above average
- All other lakes are within 1°F of average

Lake Levels

- Lake Erie levels are slightly above average
- All other lakes are very close to average for this time of the year



https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Information-2/Water-Level-Data/

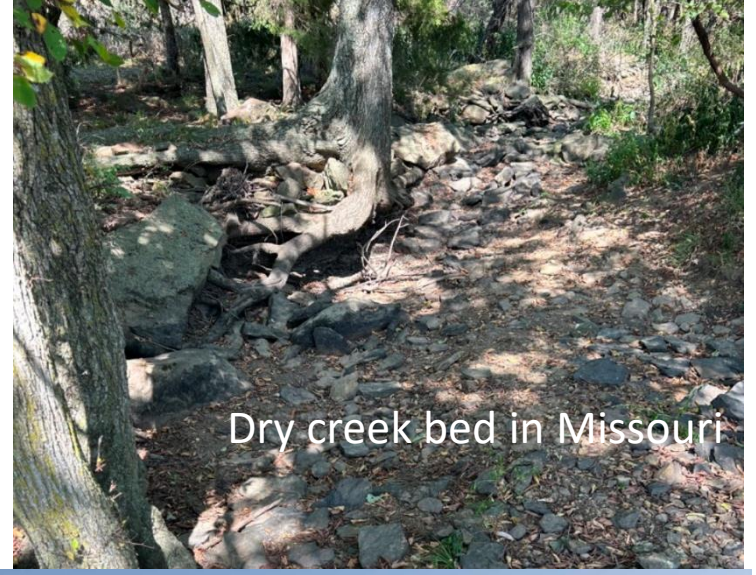


Impacts & Notable Events

Source: WCCO Minnesota

Agriculture Impacts

- Row Crops
  - Poor to very poor conditions for corn and soybeans in Ohio and parts of Kentucky
  - Rapid drying across the corn belt
- Pasture & Livestock
  - Pasture conditions deteriorated in past 3-4 weeks
  - Little/no regrowth, producers feeding hay
  - Concerns over water quality
- Specialty Crops (Ohio & Kentucky)
  - Fruit and nut abandonment on trees
  - Smaller fruit size, early maturity
  - Insect pressure on vegetables
- Wheat planting and germination concerns in Indiana and Illinois

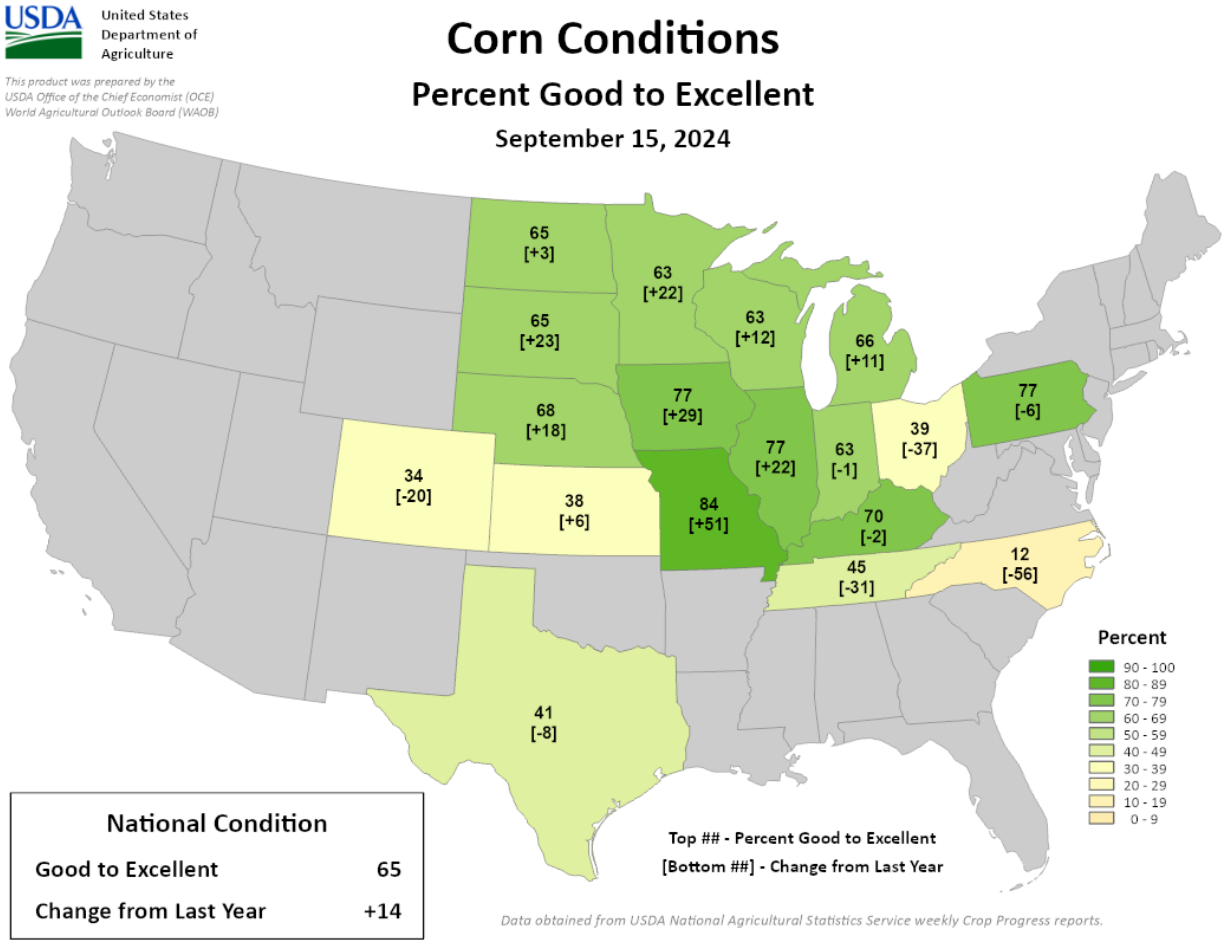


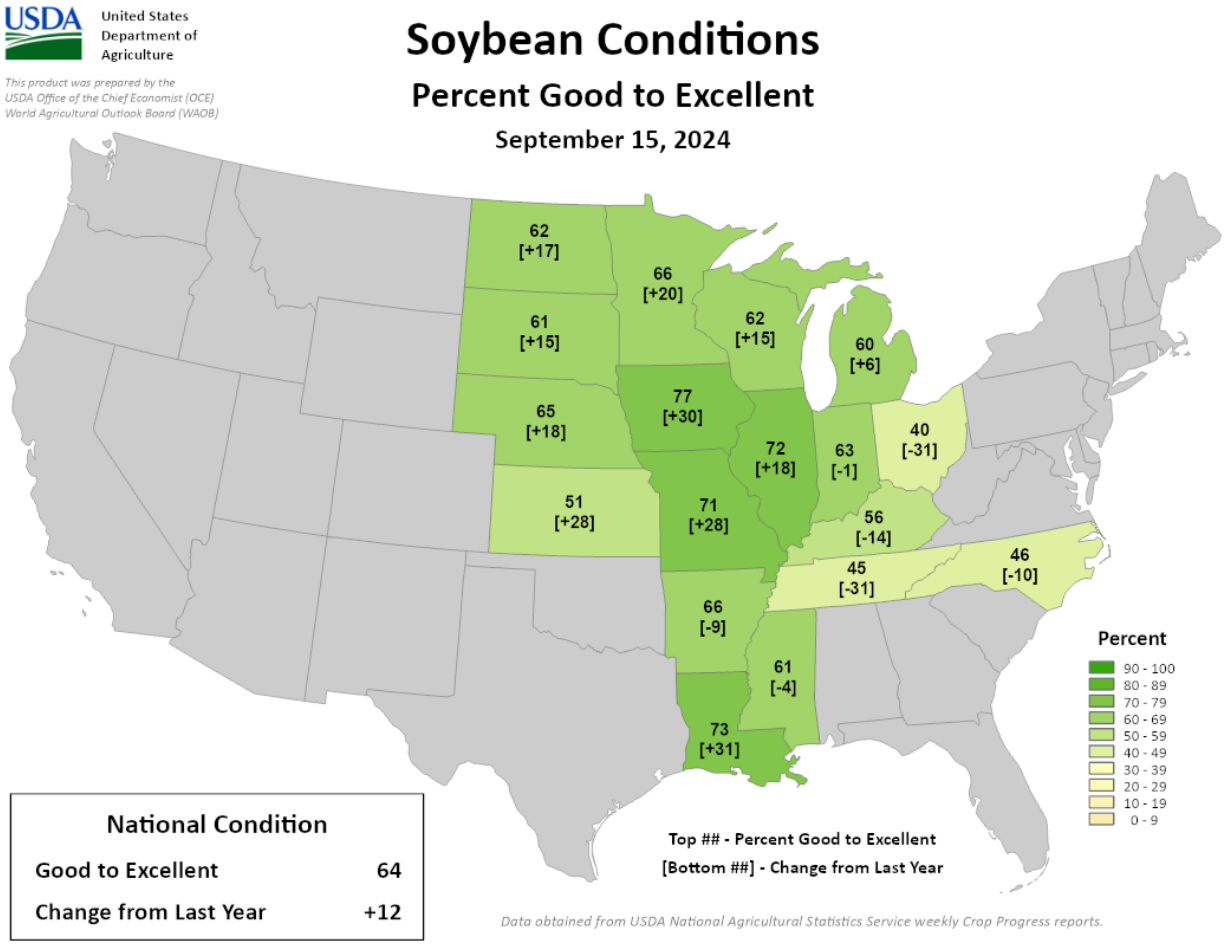
Dry creek bed in Missouri

Photo Source: Christine Gelly, OSU Extension

Poor pasture conditions in Ohio

USDA NASS Crop Conditions: Corn & Beans



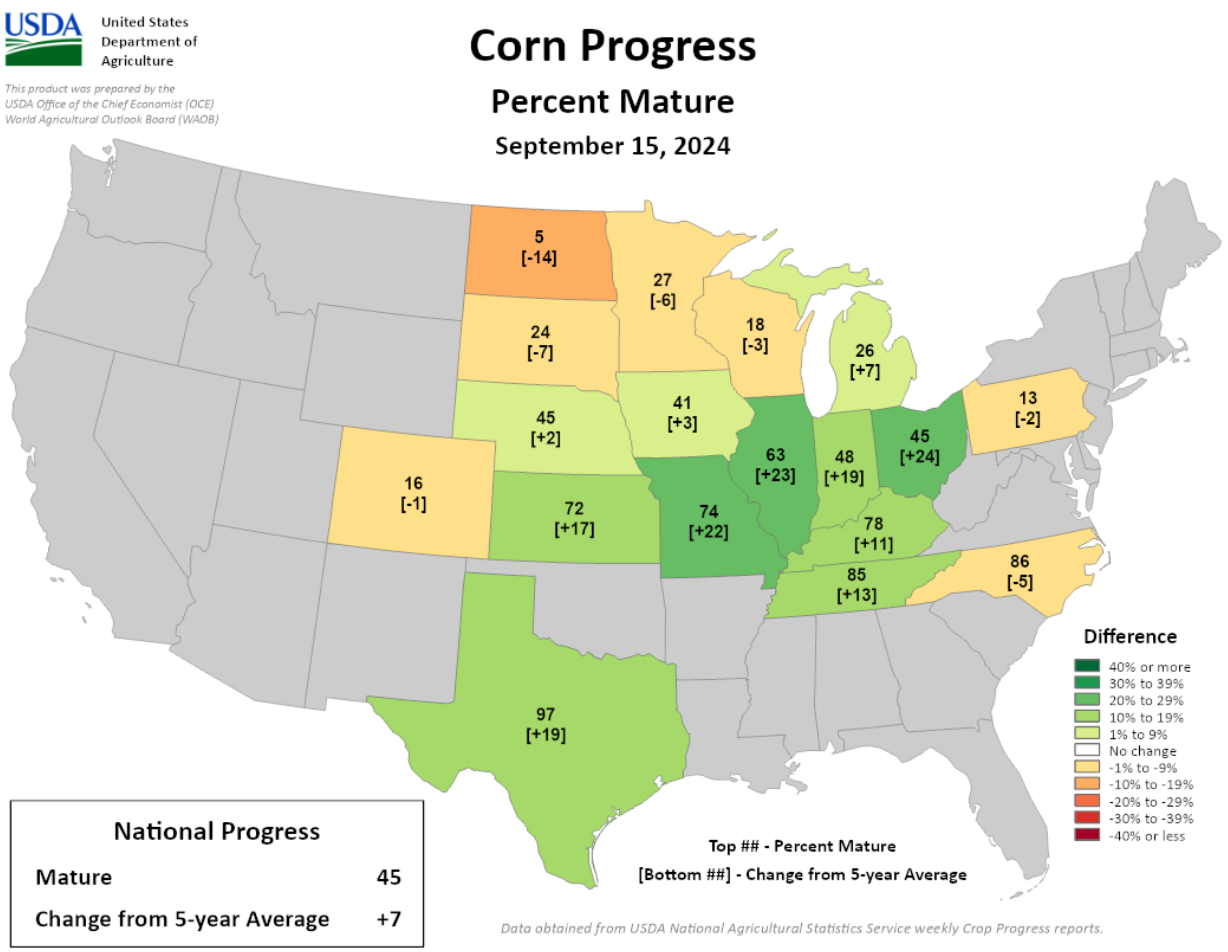


- Still good corn and beans conditions in much of the region, much better than this time last year
- Significant % poor to very poor corn conditions in Ohio, Kentucky, and Kansas

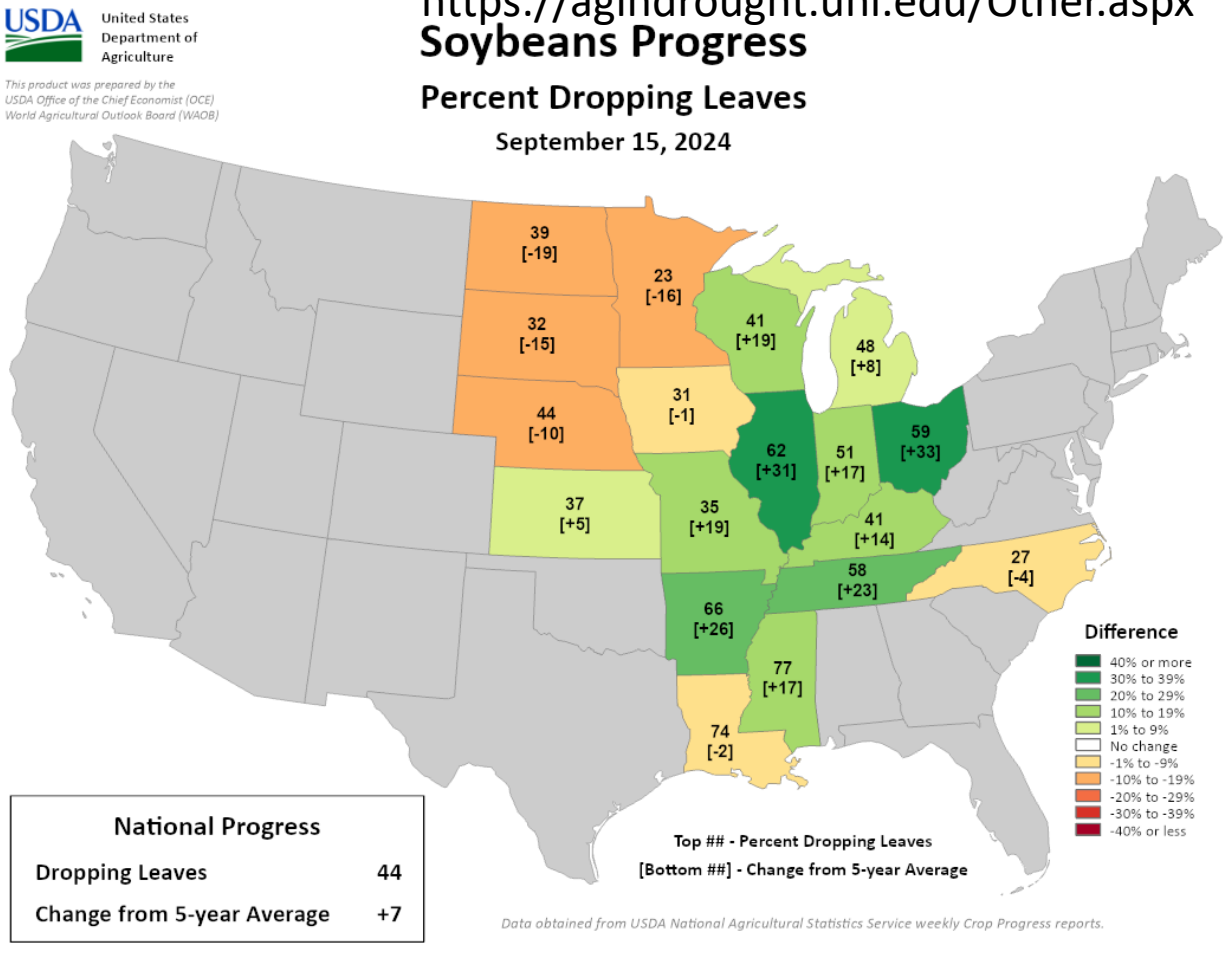
https://agindrought.unl.edu/Other.aspx

USDA NASS Crop Progress: Corn & Beans

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



National Progress	
Mature	45
Change from 5-year Average	+7



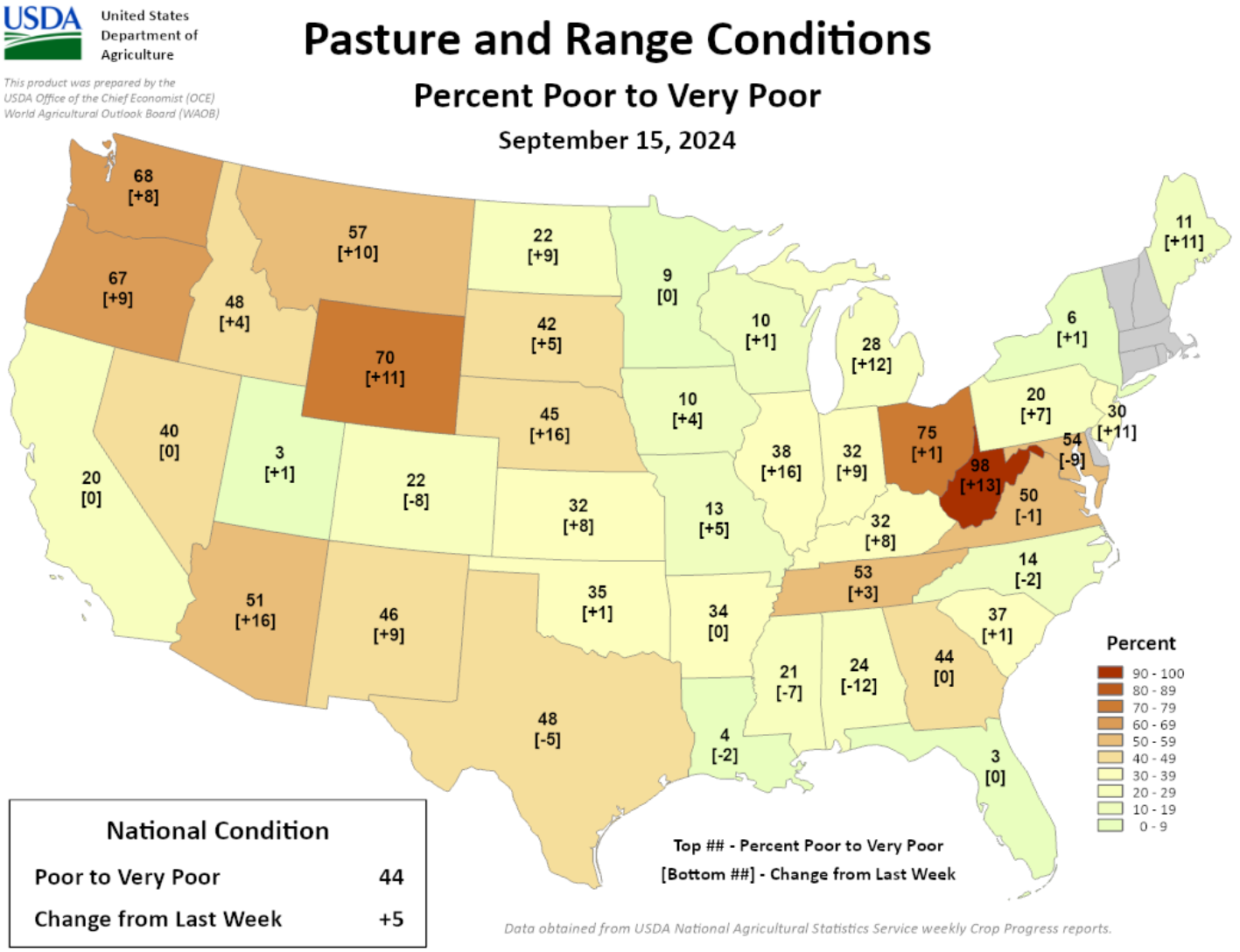
National Progress	
Dropping Leaves	44
Change from 5-year Average	+7

- Corn and beans maturing well ahead of 5-year averages in eastern and southern areas
- Crop progress still behind average in northwest, particularly for beans

USDA NASS Pasture Conditions

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

- Drought has had a big impact on pasture conditions
- Limited regrowth, poor quality
- Third consecutive poor pasture fall season in the region
- Dispersal and herd reductions in Ohio, Indiana, and Illinois in recent weeks



Other Drought Impacts

- Ecology
  - Trees dropping leaves, early senescence, limited fall color
  - Fish kills on Ohio River and tributaries
  - Nurseries challenged with watering demand
- Recreation & Tourism
  - Boats removed from docks on some Ohio Lakes
  - Fireworks and other events cancelled at county fairs
  - Burn bans in dozens of counties in OH, IN, IL, and KY
- Water Resources
  - Water conservation (voluntary & mandatory) enacted in multiple Ohio communities
  - Some rural wells going dry in Ohio and eastern Kentucky
- Public Health
  - Unpleasant smells in Chicago and other urban areas in drought
  - West Nile Virus concerns in eastern and upper Midwest

Dead fish along Ohio River at Paducah
Source: WPSD News 6

Bubbly Creek in Bridgeport (Chicago)
Source: Block Club Chicago

Other Significant Weather Impacts

Extreme Heat

- Dozens of daily high and low temperature records broken in the last week of August
- Worsened drought conditions & plant/animal stress

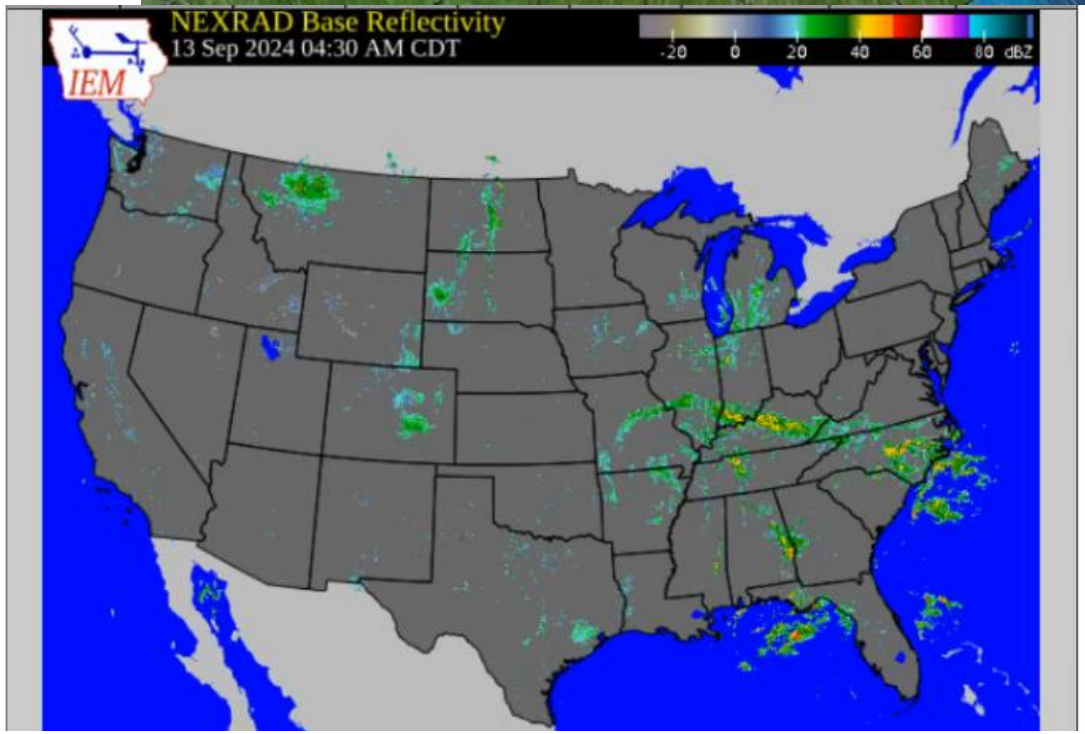
Frost

- Patchy frost in late August
- Some record-breaking early occurrence of 30s°F in central Midwest (e.g., Springfield, IL, etc.)

Severe Weather

- Lack thereof… quiet late summer-early fall
- Some tropical moisture from Francine

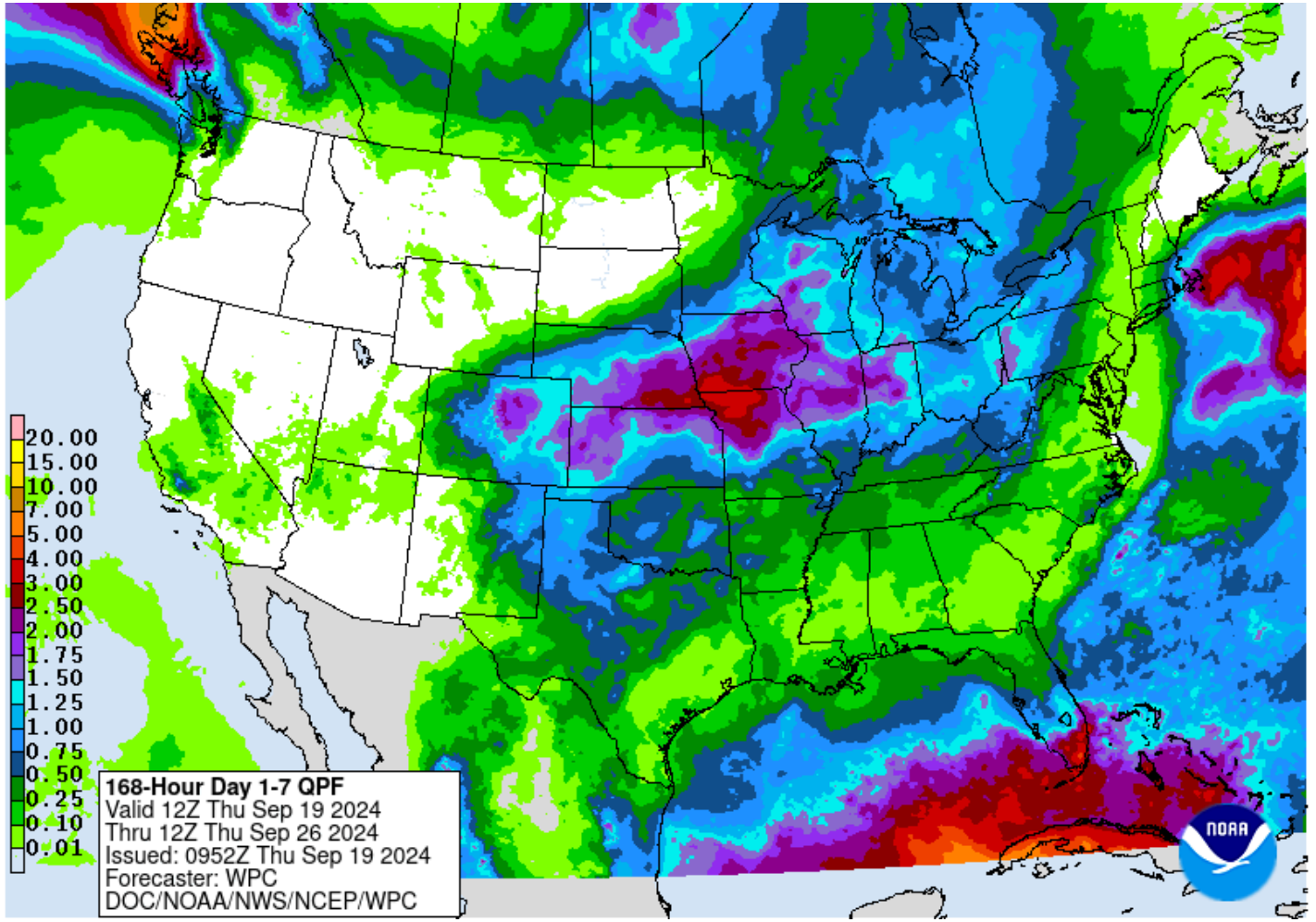
Heat Index Values on August 27th



Outlooks

7-day Precipitation Forecast

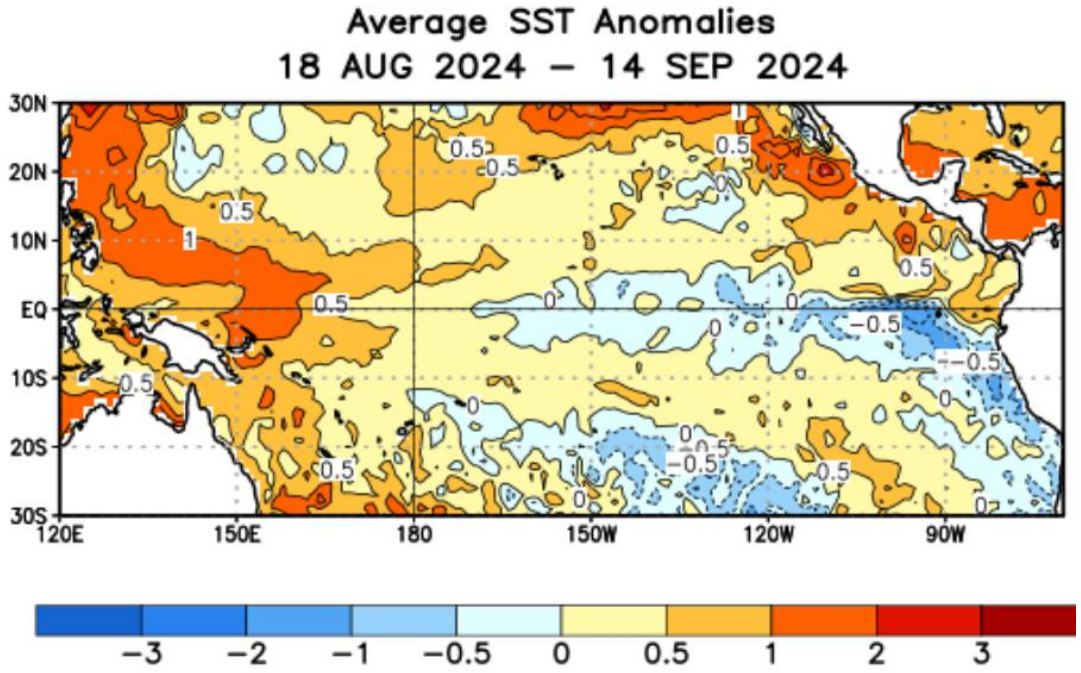
- Maybe a break in the dryness for much of the region
- Drier in northwest next 7 days
- Less relief in lower Ohio and lower Mississippi basins
- Dry soils can affect rainfall (see: Francine)



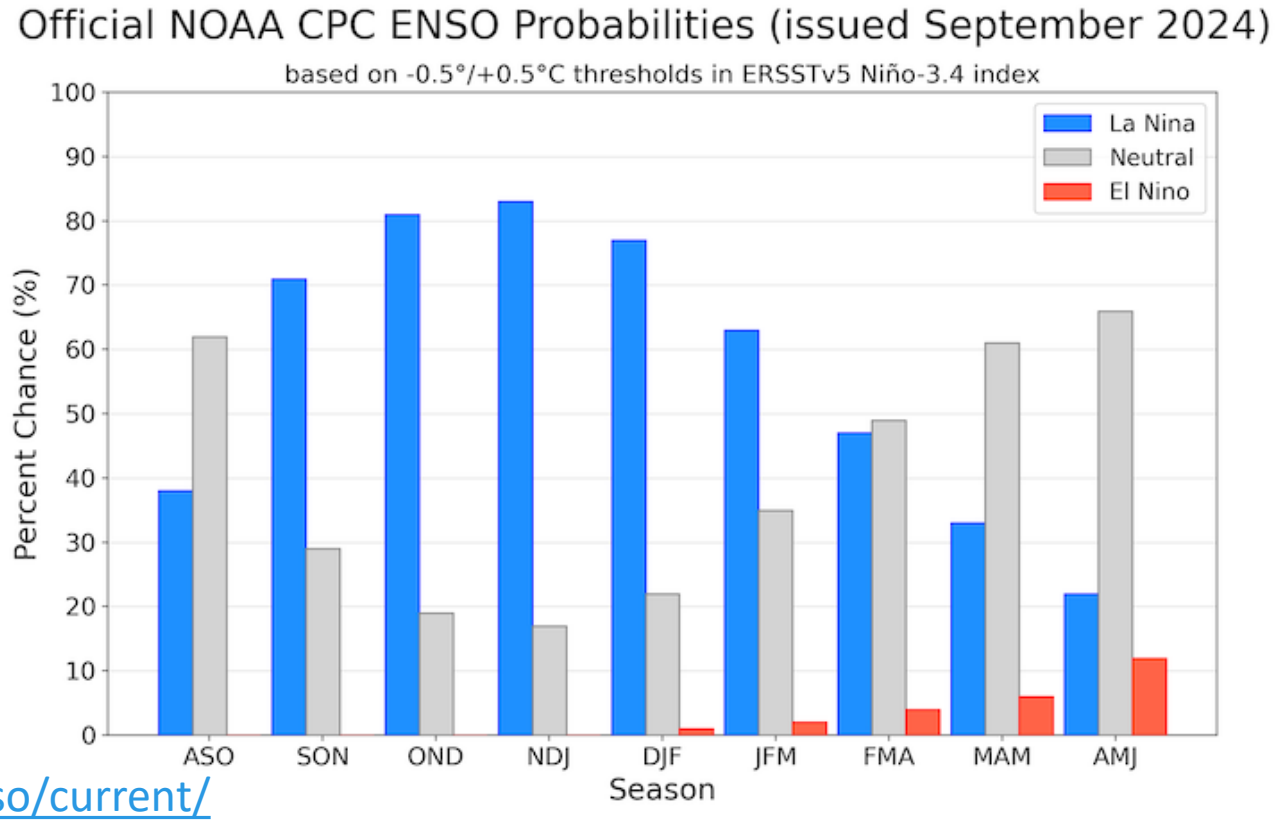
Source: wpc.ncep.noaa.gov/qpf/

El Niño-Southern Oscillation (ENSO) Outlooks

- Currently ENSO-neutral
- La Niña-esque conditions developing



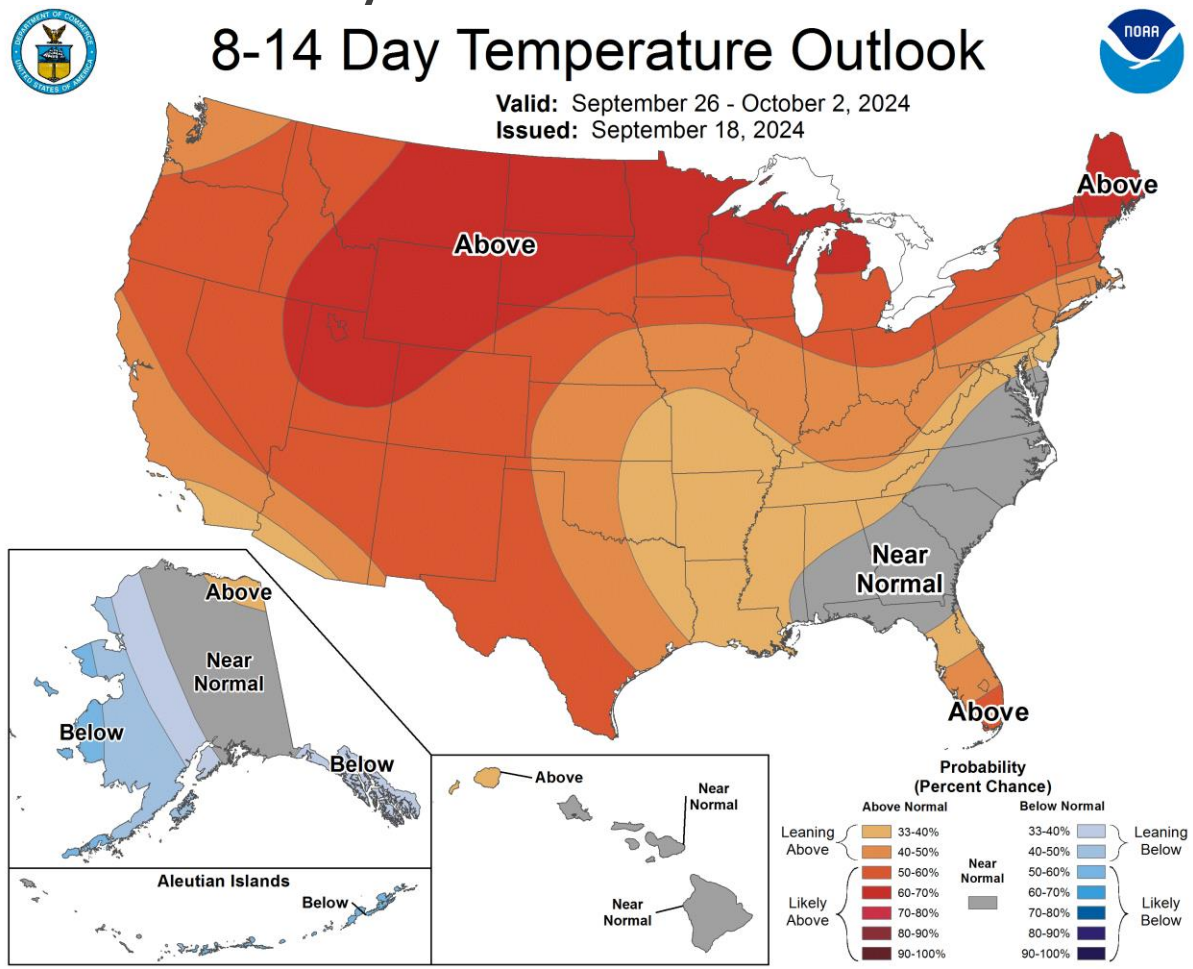
- > 70% likelihood of La Niña onset this season, 45% of moderate La Niña
- Models show La Niña persisting through winter



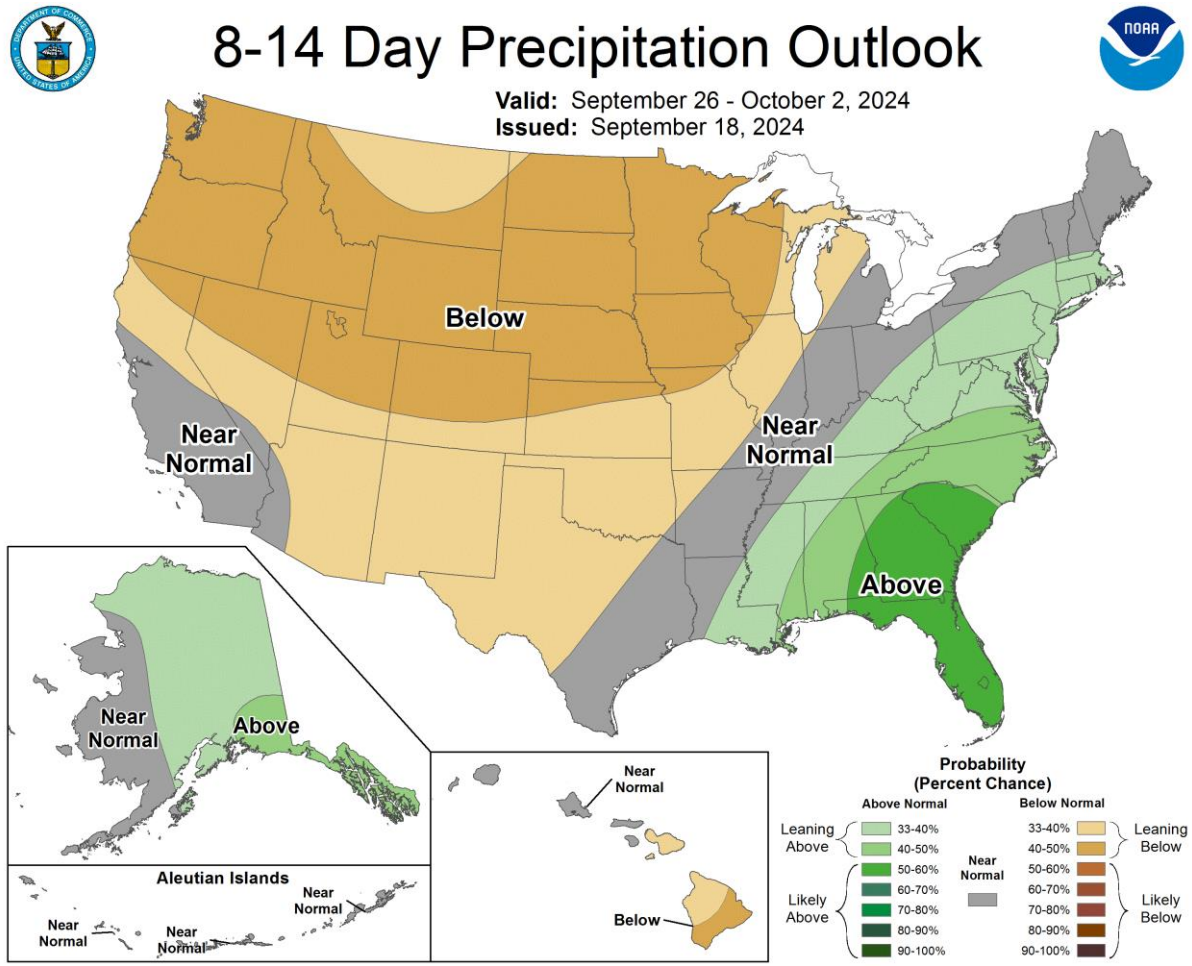
https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

8-14 Day Outlooks

https://www.cpc.ncep.noaa.gov/



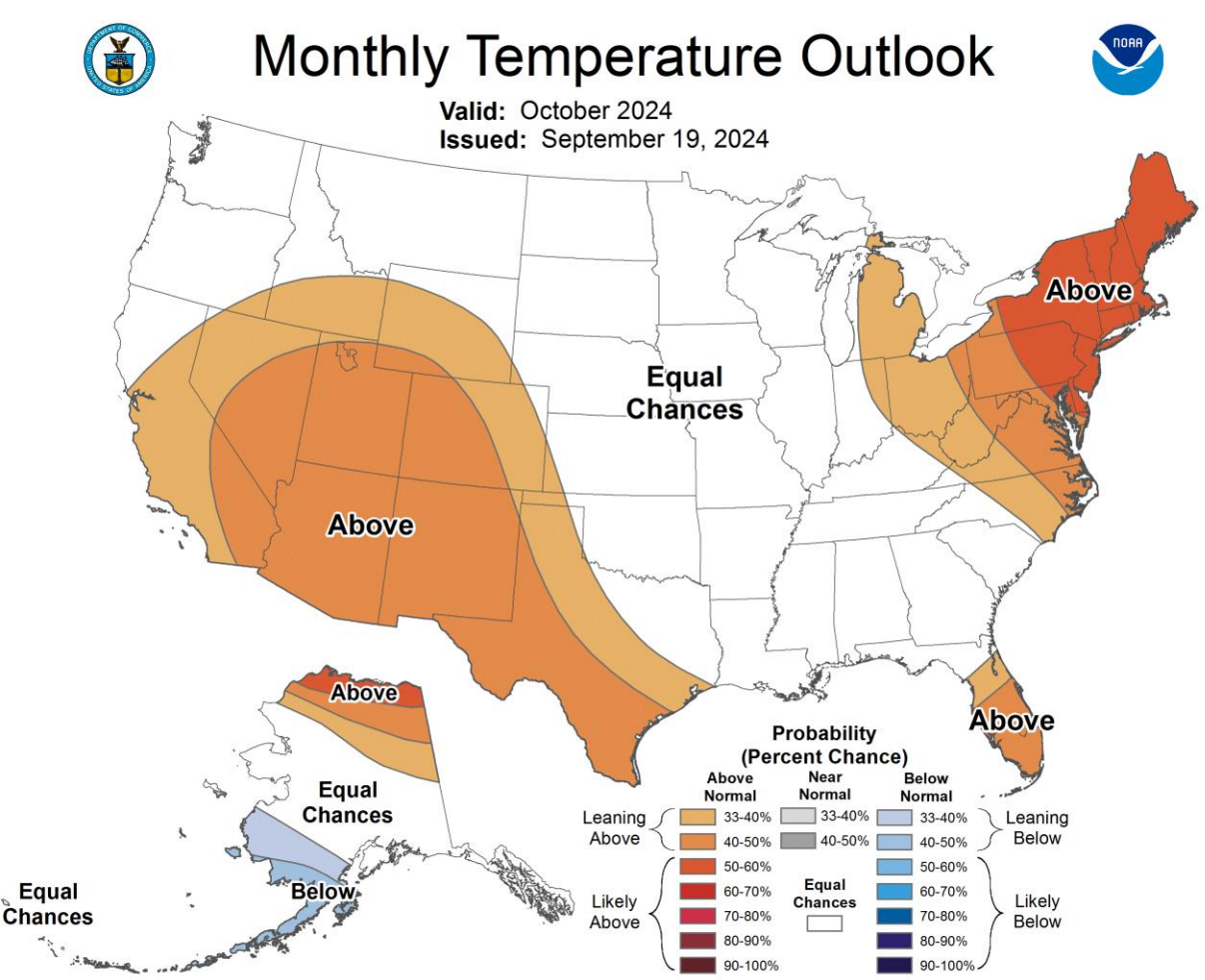
Higher chances of **Warmer** than normal everywhere through the end of the month

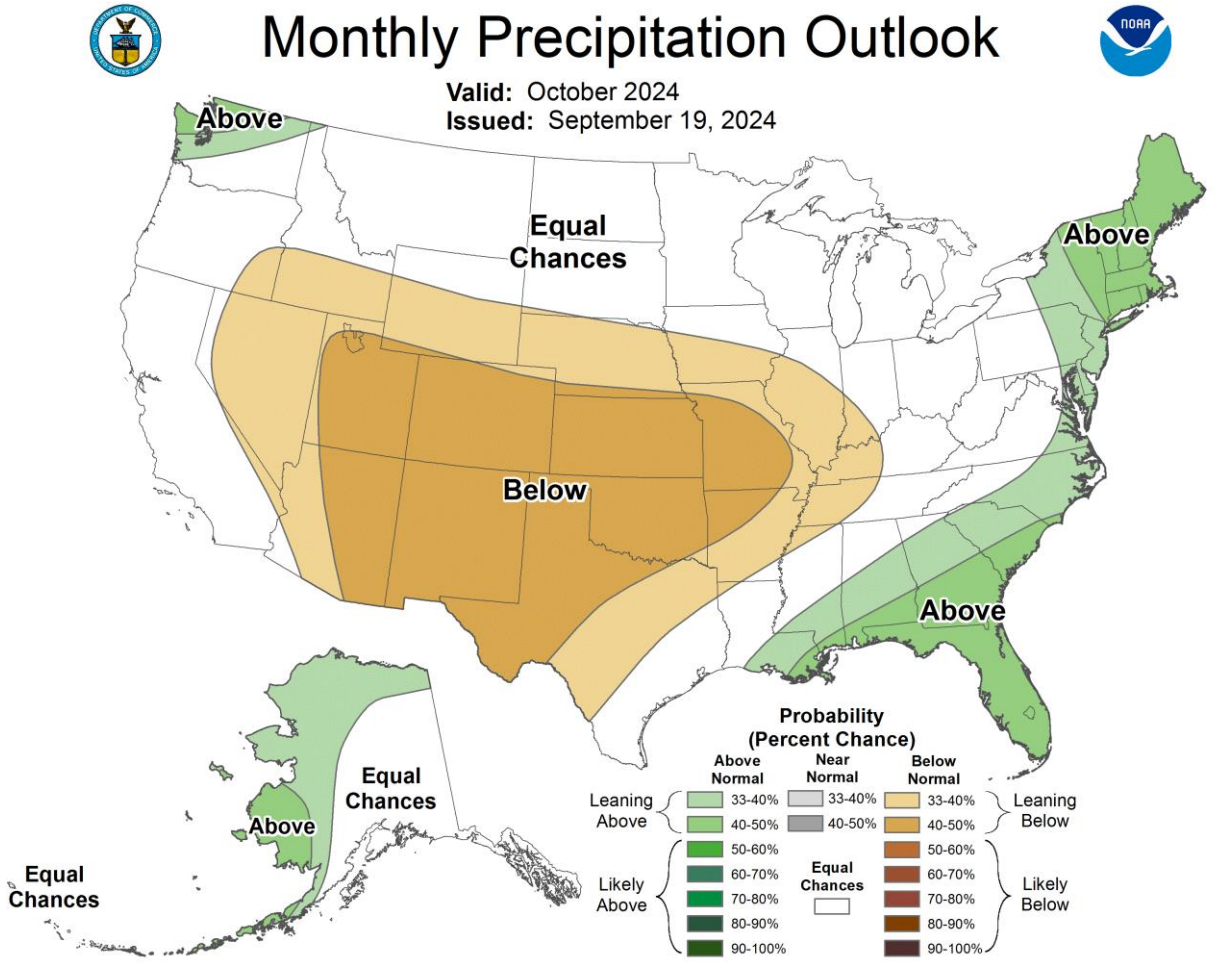


Better chances of going back to **Drier** weather in most of the region after rain in next 7 days

October Outlooks

https://www.cpc.ncep.noaa.gov/



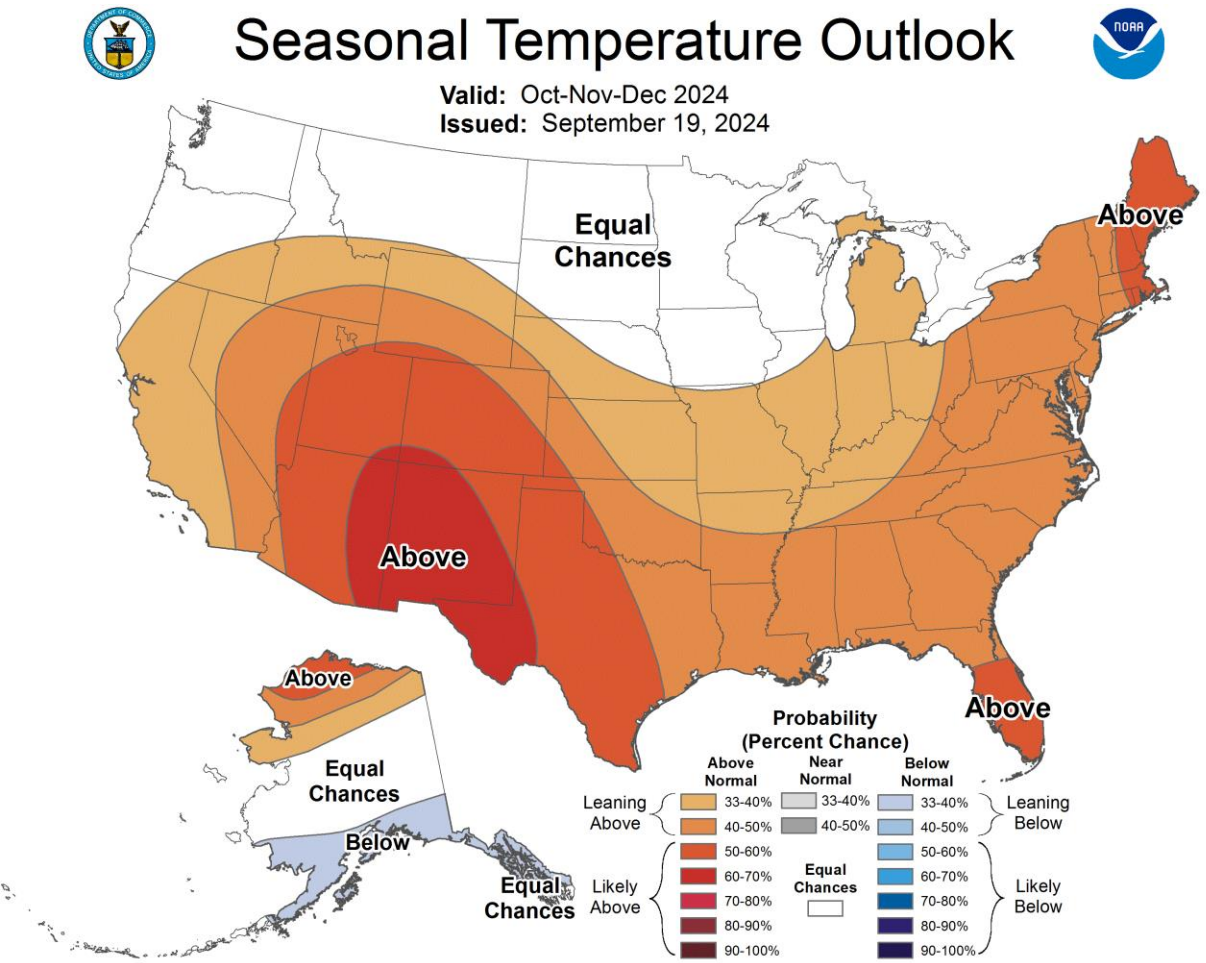


Leaning **Warmer** than normal in far western and eastern regions, weaker signal everywhere else

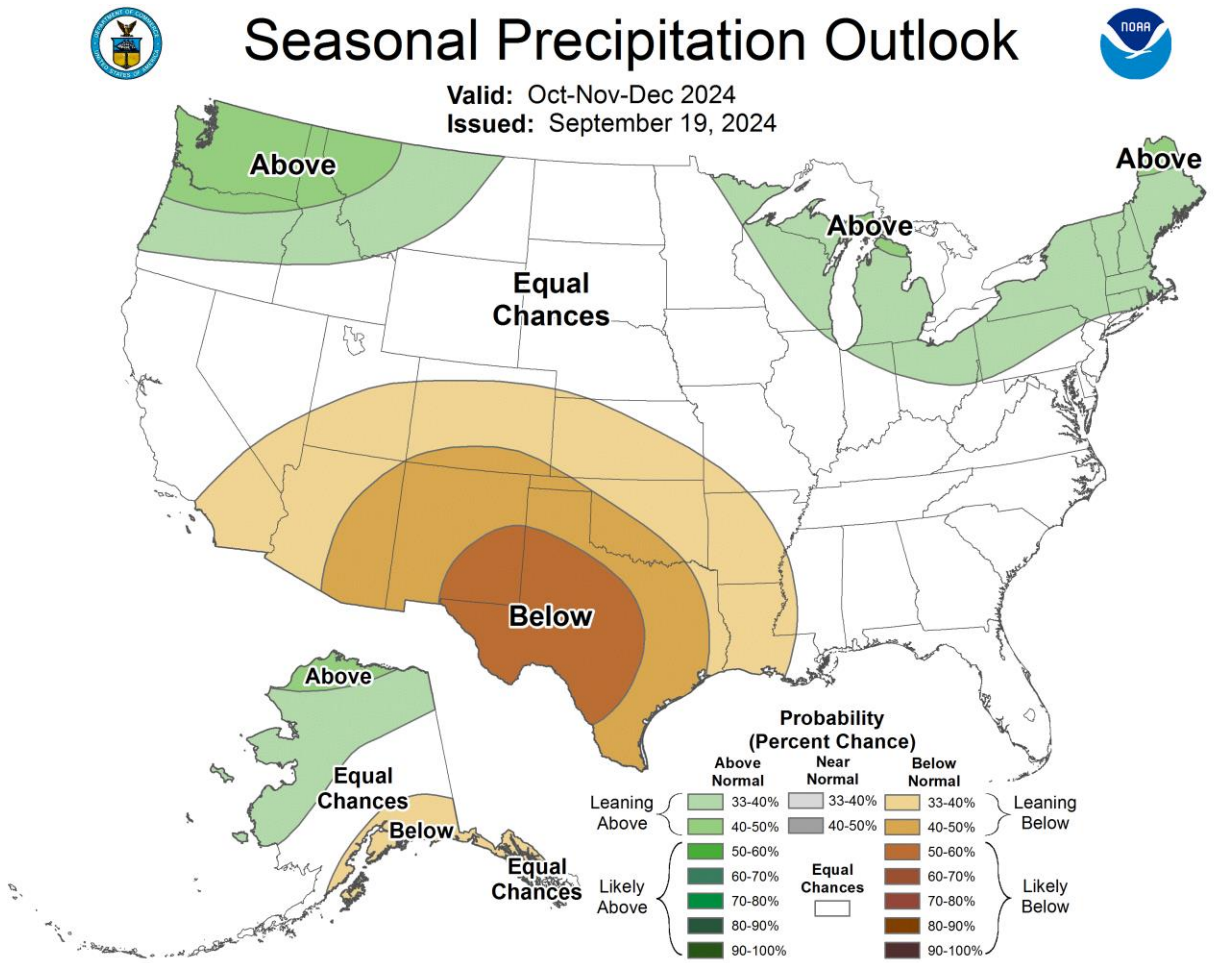
Drier in Plains and southern Midwest, equal chances north and east

Season Outlooks October – December

https://www.cpc.ncep.noaa.gov/

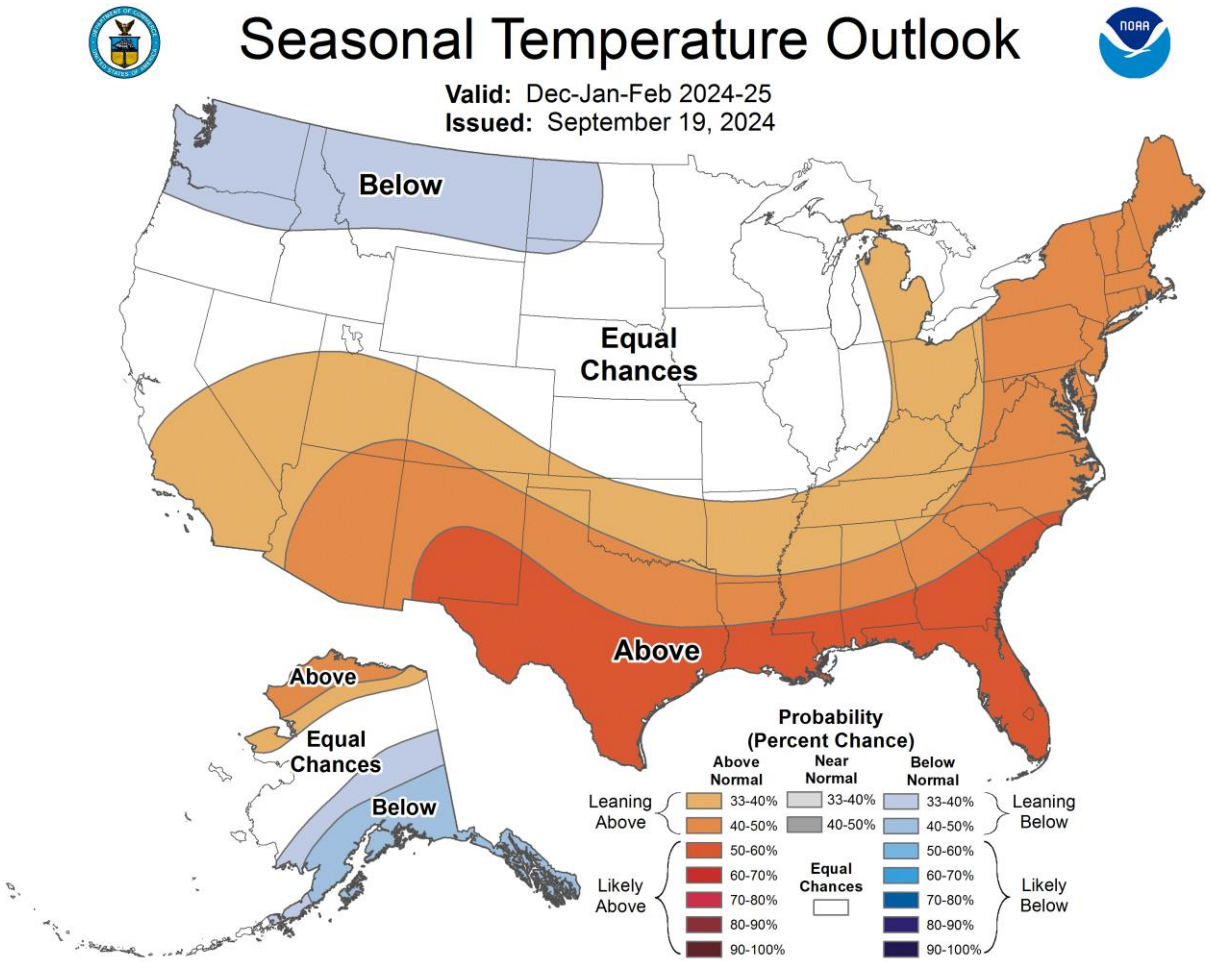


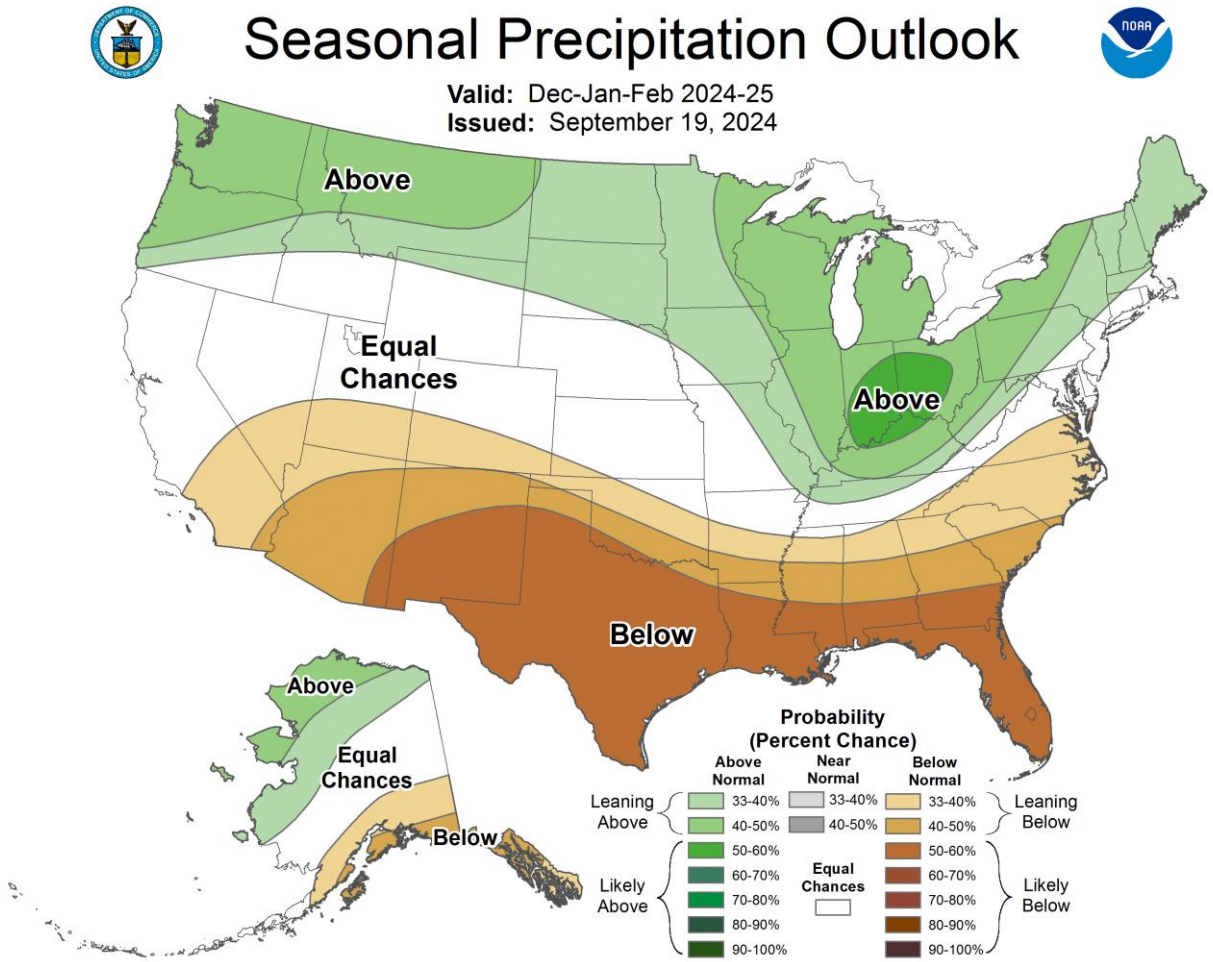
Keeping **Warmer** south and east, equal chances in north and west



Wetter around Great Lakes, **Drier** far southwest

Season Outlooks December – February https://www.cpc.ncep.noaa.gov/





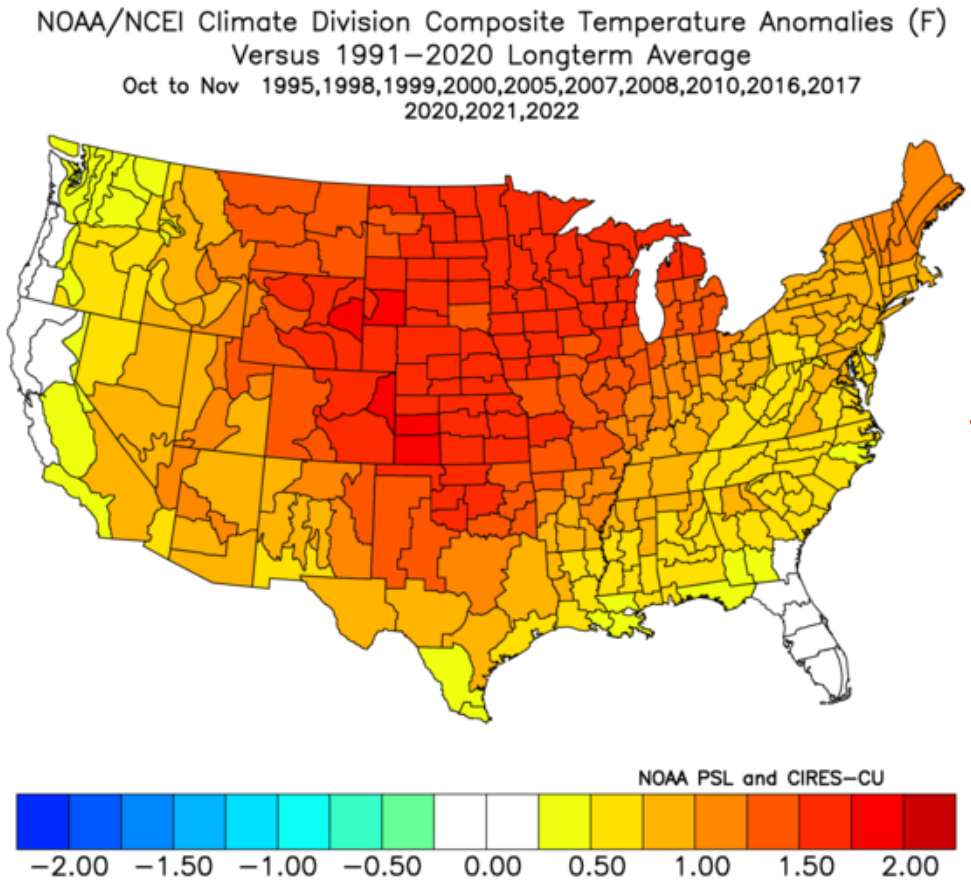
Cooler in northwest, slightly higher chances of **Warmer** in far east

Wetter across north and especially in Ohio Valley

October – November Conditions in **Past** La Niña Events (Since 1990)

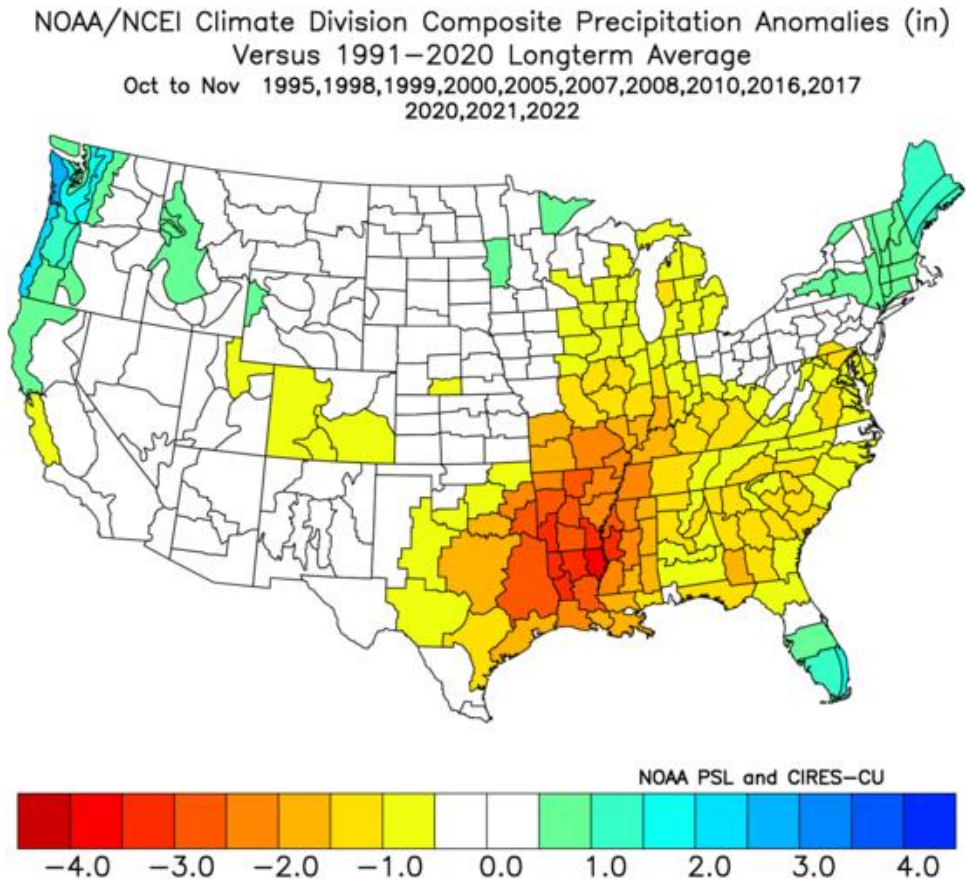
Not Forecast

Temperature Anomalies



Average anomalies in past events lean **Warmer** in the central US; a bit **Drier** in MS Basin and lower OH Basin

Precipitation Anomalies

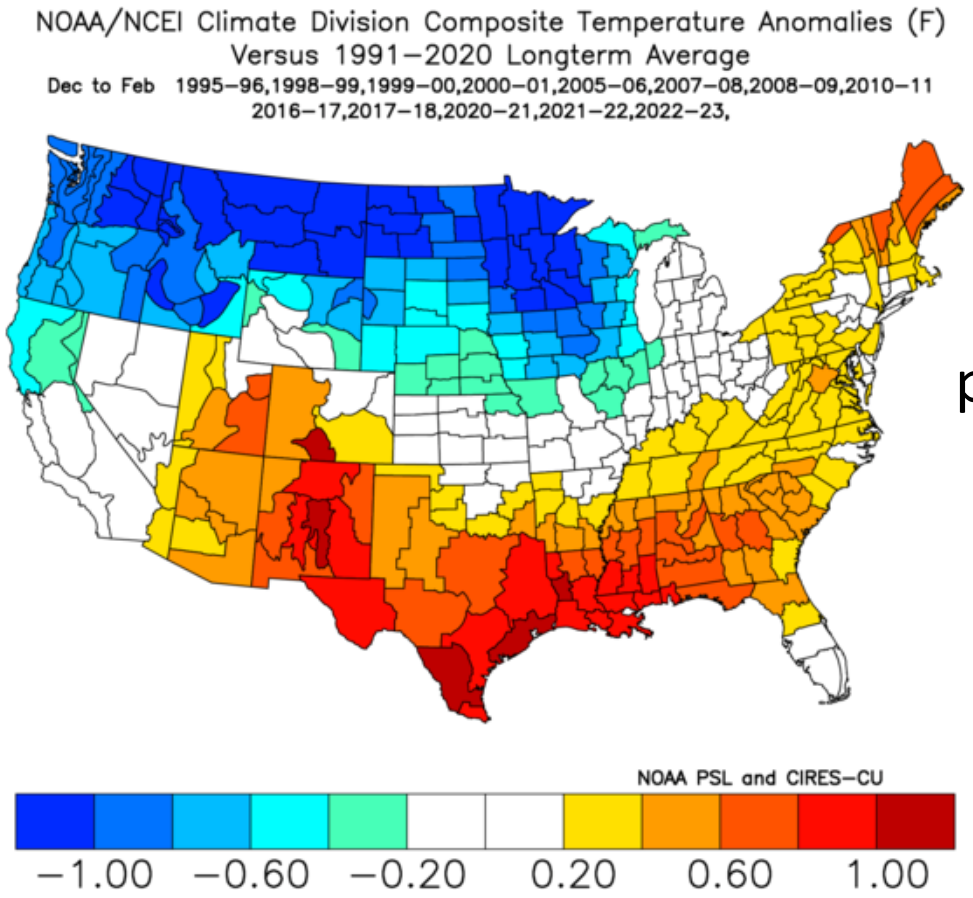


https://psl.noaa.gov/data/usclimdivs/

December – February Conditions in **Past** La Niña Events (Since 1990)

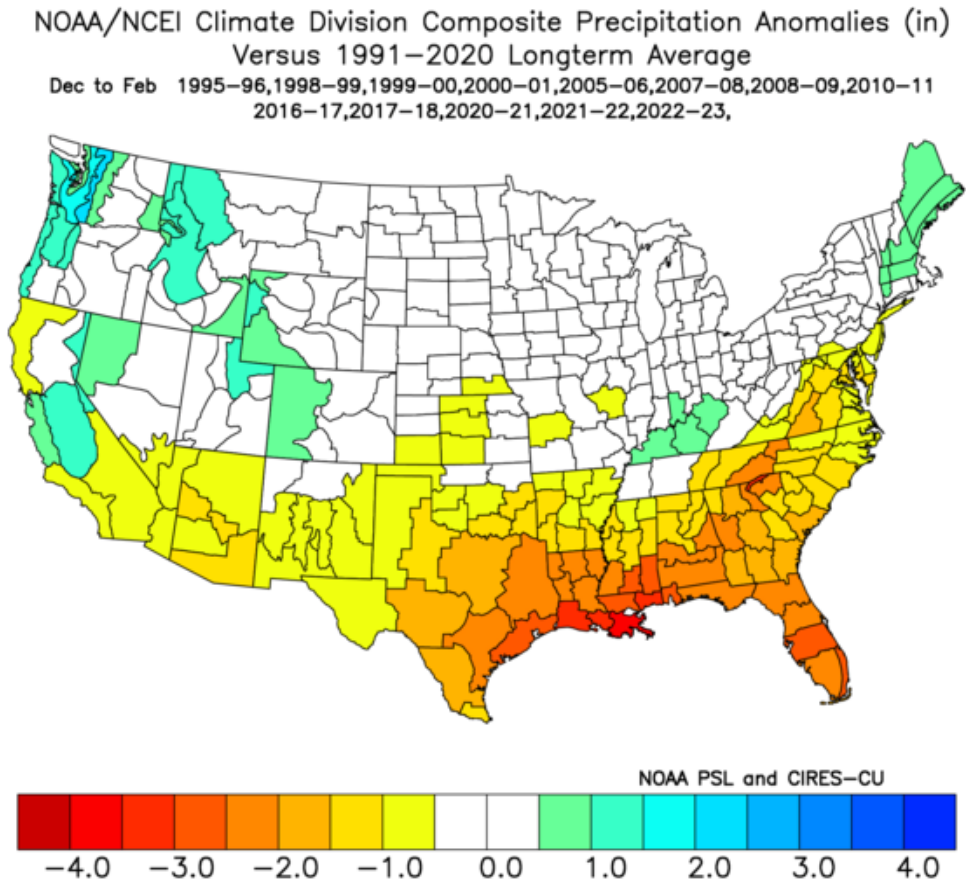
Not Forecast

Temperature Anomalies



Average anomalies in past events lean **Cooler** in the northwest region; a bit **Wetter** in lower OH Basin

Precipitation Anomalies



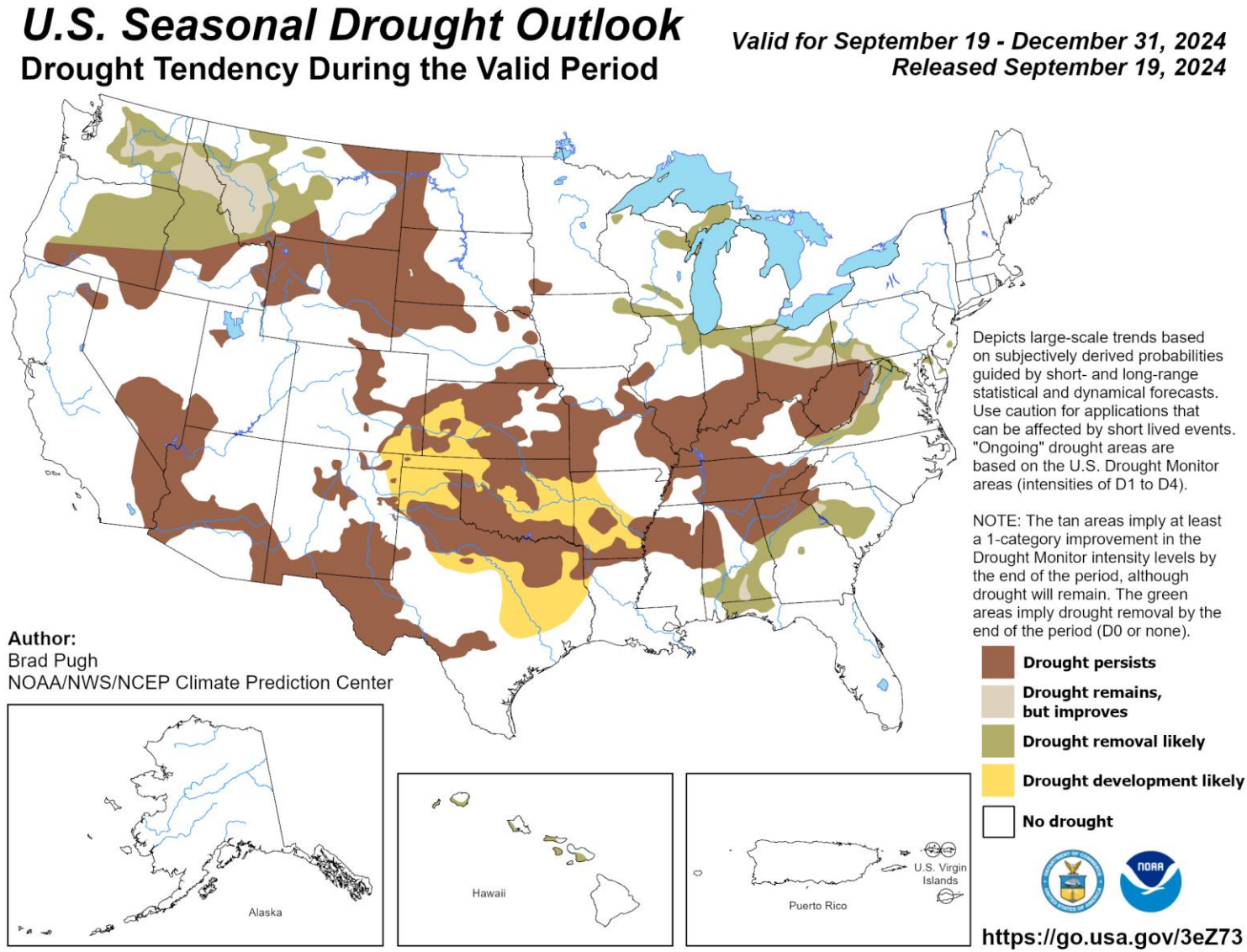
https://psl.noaa.gov/data/usclimdivs/

Drought Outlook – October through December

Following 1- and 3-month Outlooks:

- Drought improvement/removal closer to Great Lakes
- Drought persistence in most existing drought areas in Plains & Ohio Valley
- Possible drought development in western KS & eastern CO

https://www.cpc.ncep.noaa.gov/



Summary

Current Conditions

- Much of the region has fallen back into drought
- Harvest will likely progress well, but with increased field fire and blowing dust risk
- Pasture problems (again) – continued stress for livestock producers
- Low levels on Ohio and Mississippi Rivers for a 3rd consecutive fall… not going to get better soon
- Crop progress delayed in Minnesota and Dakotas – legacy of extremely wet spring
- Early fall color and senescence in drought areas… want to watch 2nd year stress in young trees

Outlooks

- Best rain chances in weeks over the next 7-days from Kansas to Ohio
- Outlooks lean dry for last week of the month, stay dry in October for western part of the region
- Outlooks start to show more wetness around Great Lakes and Ohio Valley as we move into winter (DJF)
- Above normal temperatures throughout fall, switching to cooler pattern in winter in northwest region

Further Information – Partners

- Today's & Past Recorded Presentations at:
  - https://mrcc.purdue.edu/webinars
  - https://hprcc.unl.du/webinars.php
- NOAA National Centers for Environmental Information: www.ncei.noaa.gov
- Monthly climate reports (US & Global): https://www.ncdc.noaa.gov/sotc/
- NOAA Climate Prediction Center: www.cpc.ncep.noaa.gov
- Climate Portal: www.climate.gov
- U.S. Drought Portal: www.drought.gov
- National Drought Mitigation center: https://drought.unl.edu
- State Climatologists: http://www.stateclimate.org
- Regional Climate Centers:
  - Midwestern – https://mrcc.purdue.edu
  - High Plains – https://hprcc.unl.edu
- USDA Midwest Climate Hub: https://www.climatehubs.usda.gov/hubs/midwest

Partial lunar eclipse September 17th
Source: Kris Habermehl, Chicago

Thank You, Questions?

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