

North Central U.S. Climate & Drought Outlook

September 2025

TRENT FORD

ILLINOIS STATE CLIMATOLOGIST

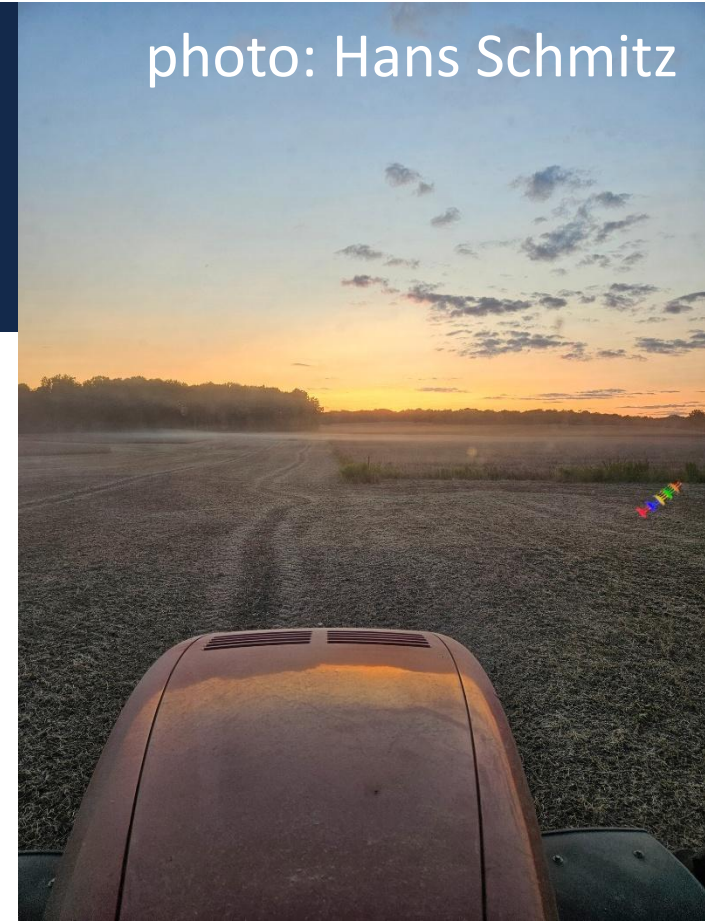
UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN



Illinois State Water Survey

PRAIRIE RESEARCH INSTITUTE

photo: Hans Schmitz



September 18, 2025

General Information

St. Francois County, MO
Photo: CMOR drought reporter

Providing Climate Services to the Central Region

- Collaboration Activity Between:
 - NOAA NCEI/NWS/OAR
 - National Drought Mitigation Center
 - American Association of State Climatologists
 - Midwest and High Plains Regional Climate Centers
 - USDA
 - Universities across the region

****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 16th
Laura Edwards– South Dakota State Climatologist
&
Brad Rippey – USDA



Outline

Recent Climate Conditions

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

Events & Impacts

- Drought: agriculture, water, and fire
- Excessive Wetness
- Extreme Heat & Humidity

Outlooks

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



Photo: Illinois Athletics



Photo: Peoria Journal-Star

Recent Climate Conditions



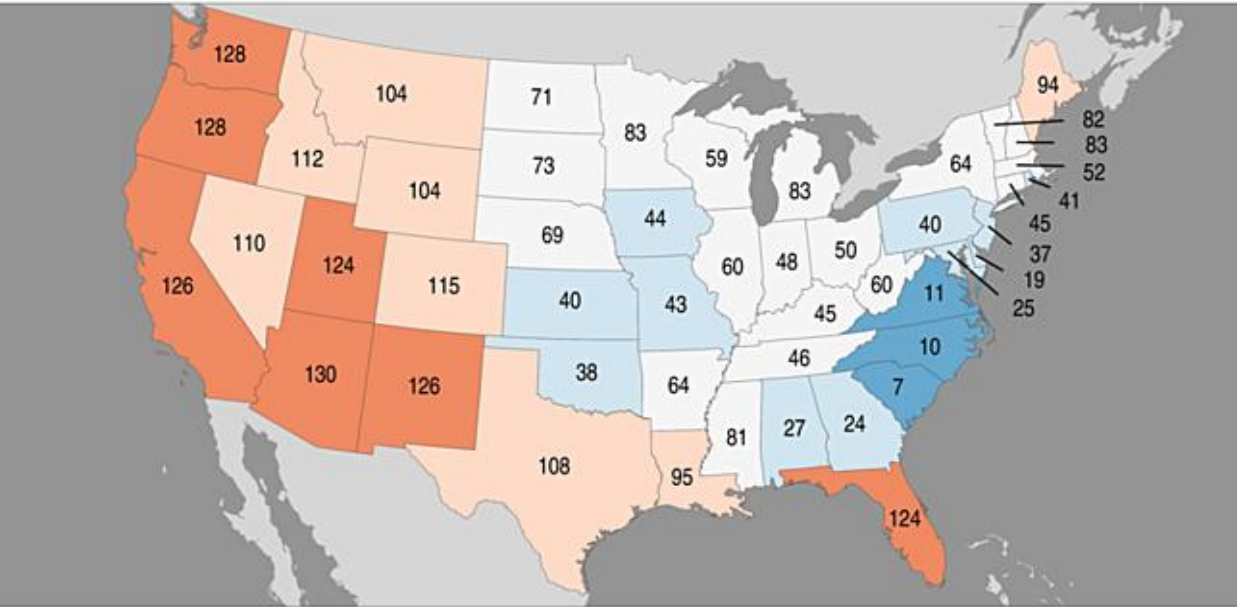
August Climate Review

Statewide Average Temperature Ranks

August 2025

Ranking Period: 1895-2025

NOAA's National Centers for Environmental Information



Record Coldest
(1)

Much Below
Average

Below
Average

Near
Average

Above
Average

Much Above
Average

Record Warmest
(131)



Created: Fri Sep 5 2025
Source: nClimGrid - Monthly

- Cooler than average across region, closer to average around Great Lakes, warmer west
- Nighttime temperatures were higher

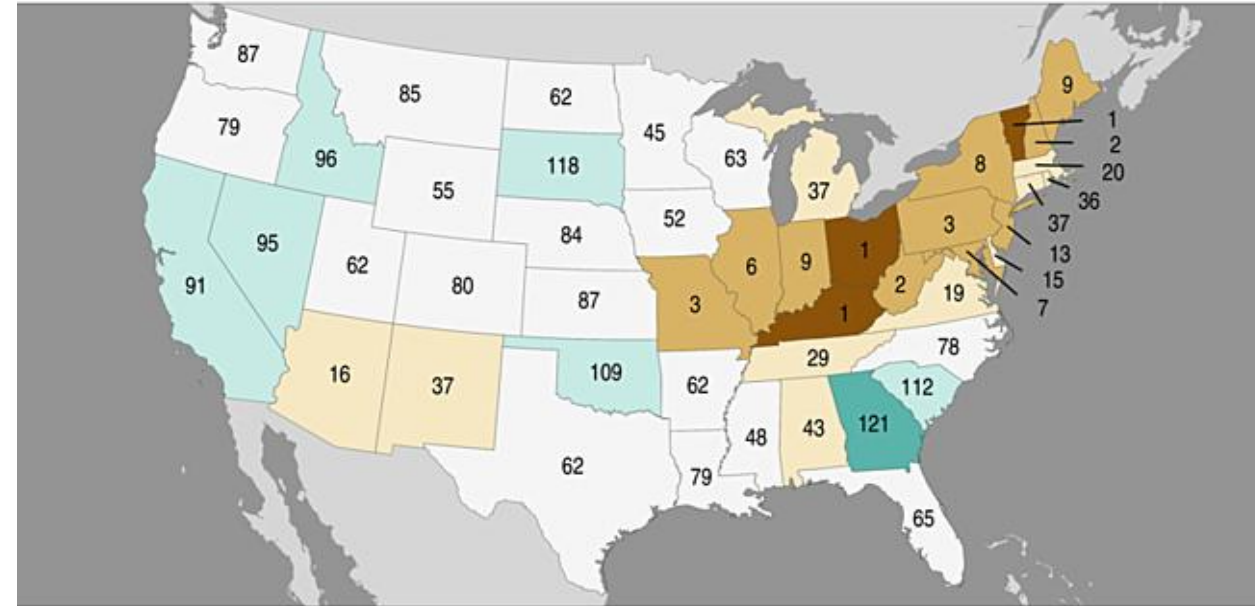
Source: <https://www.ncdc.noaa.gov/temp-and-precip/us-maps/>

Statewide Precipitation Ranks

August 2025

Ranking Period: 1895-2025

NOAA's National Centers for Environmental Information



Record Driest
(1)

Much Below
Average

Below
Average

Near
Average

Above
Average

Much Above
Average

Record Wettest
(131)



Created: Fri Sep 5 2025
Source: nClimGrid - Monthly

- Very dry in eastern corn belt (driest in OH, KY)
- Wetter in SD, NE, and KS

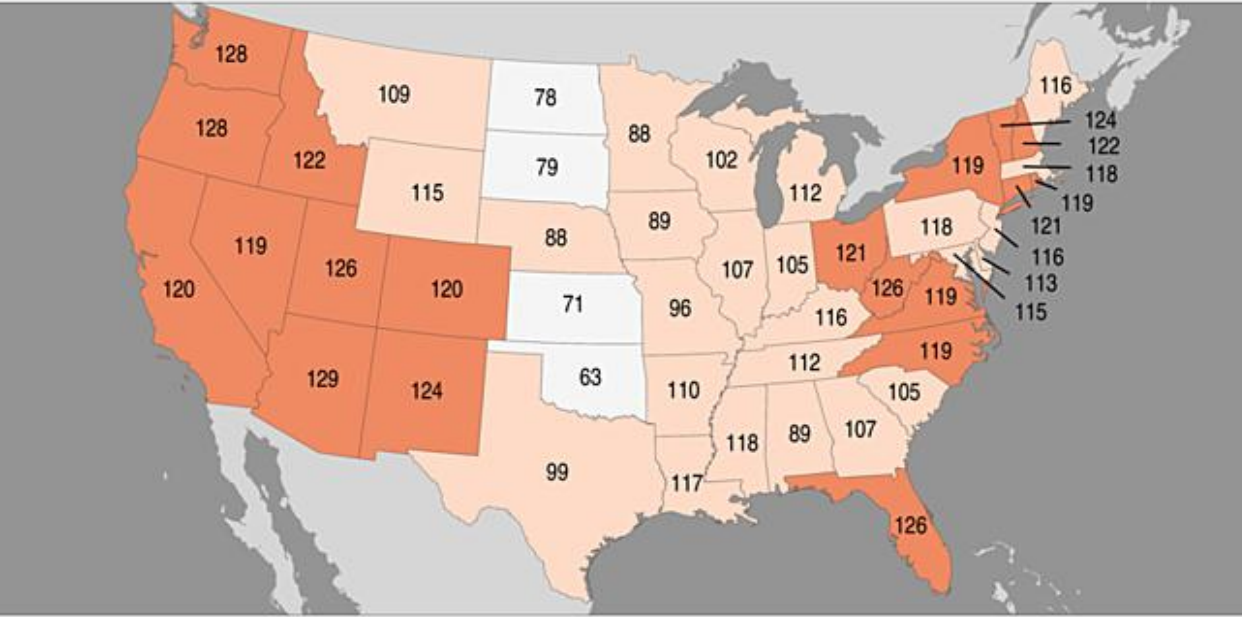
Summer (June-August) Climate Review: Temperatures

Statewide Average Temperature Ranks

June - August 2025

Ranking Period: 1895-2025

NOAA's National Centers for Environmental Information



Record Coldest
(1)

Much Below
Average

Below
Average

Near
Average

Above
Average

Much Above
Average

Record Warmest
(131)



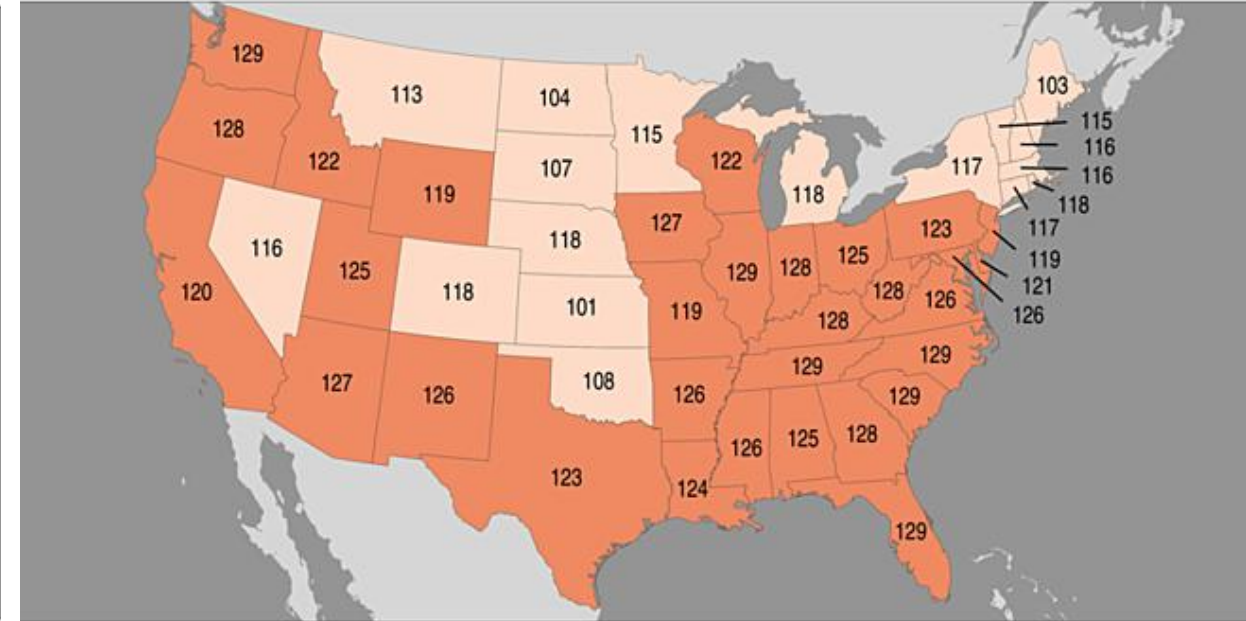
Created: Fri Sep 5 2025
Source: nClimGrid - Monthly

Statewide Minimum Temperature Ranks

June - August 2025

Ranking Period: 1895-2025

NOAA's National Centers for Environmental Information



Record Coldest
(1)

Much Below
Average

Below
Average

Near
Average

Above
Average

Much Above
Average

Record Warmest
(131)



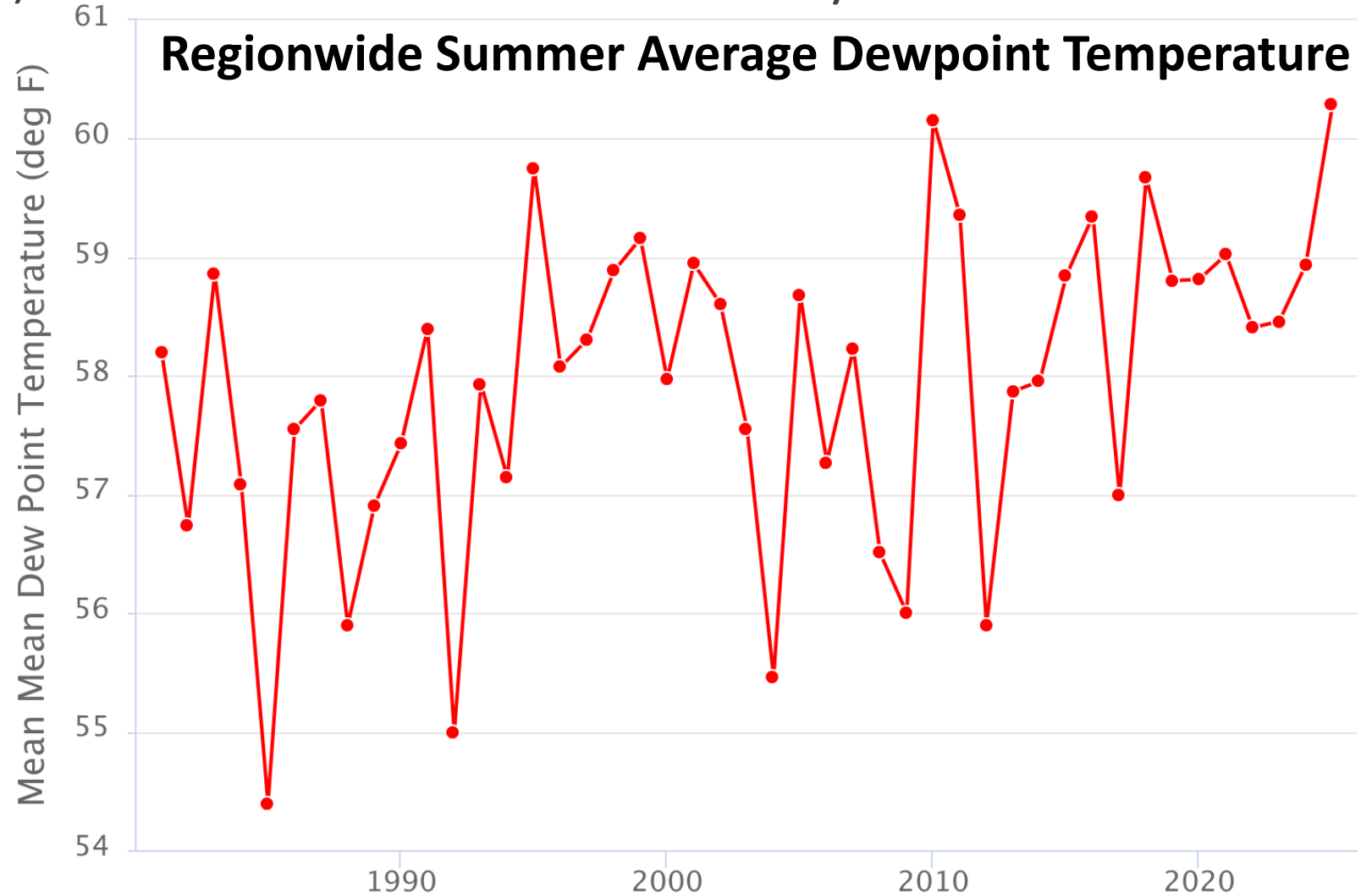
Created: Fri Sep 5 2025
Source: nClimGrid - Monthly

- Warmer than average summer for most of the region, top 10 warmest in Ohio
- Average minimum temperatures were extremely high, especially east
- Top 5 highest summer average nighttime temperatures in IA, IL, IN, and KY

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

Summer (June-August) Climate Review: Humidity

- Highest average dewpoint (humidity) since records began in 1981 for the region
- Parts of the central and southern Midwest spent more than half of the entire summer with a dewpoint at or above 70 degrees!



Generated by ClimateEngine.org

Source: PRISM, via ClimateEngine.org



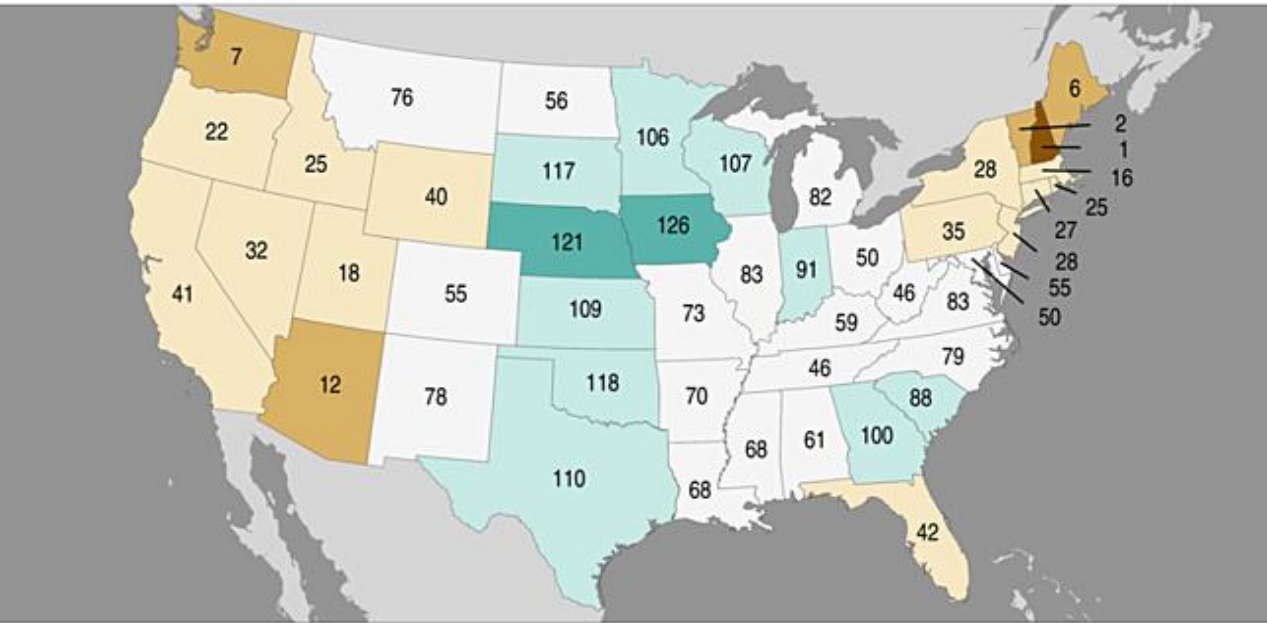
Summer (June-August) Climate Review: Precipitation

Statewide Precipitation Ranks

June - August 2025

Ranking Period: 1895-2025

NOAA's National Centers for Environmental Information



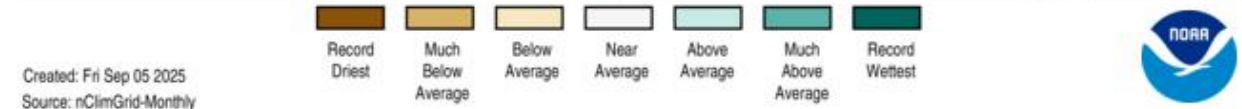
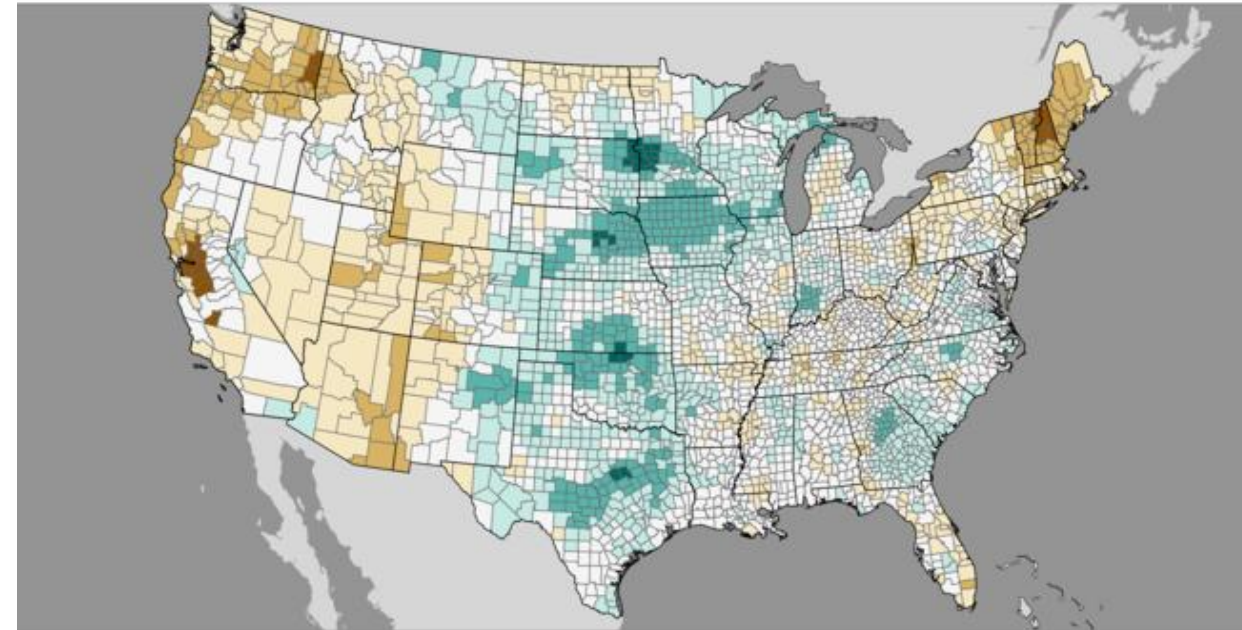
Created: Fri Sep 5 2025
Source: nClimGrid - Monthly

County Precipitation Ranks

June-August 2025

Ranking Period: 1895-2025

NOAA's National Centers for Environmental Information

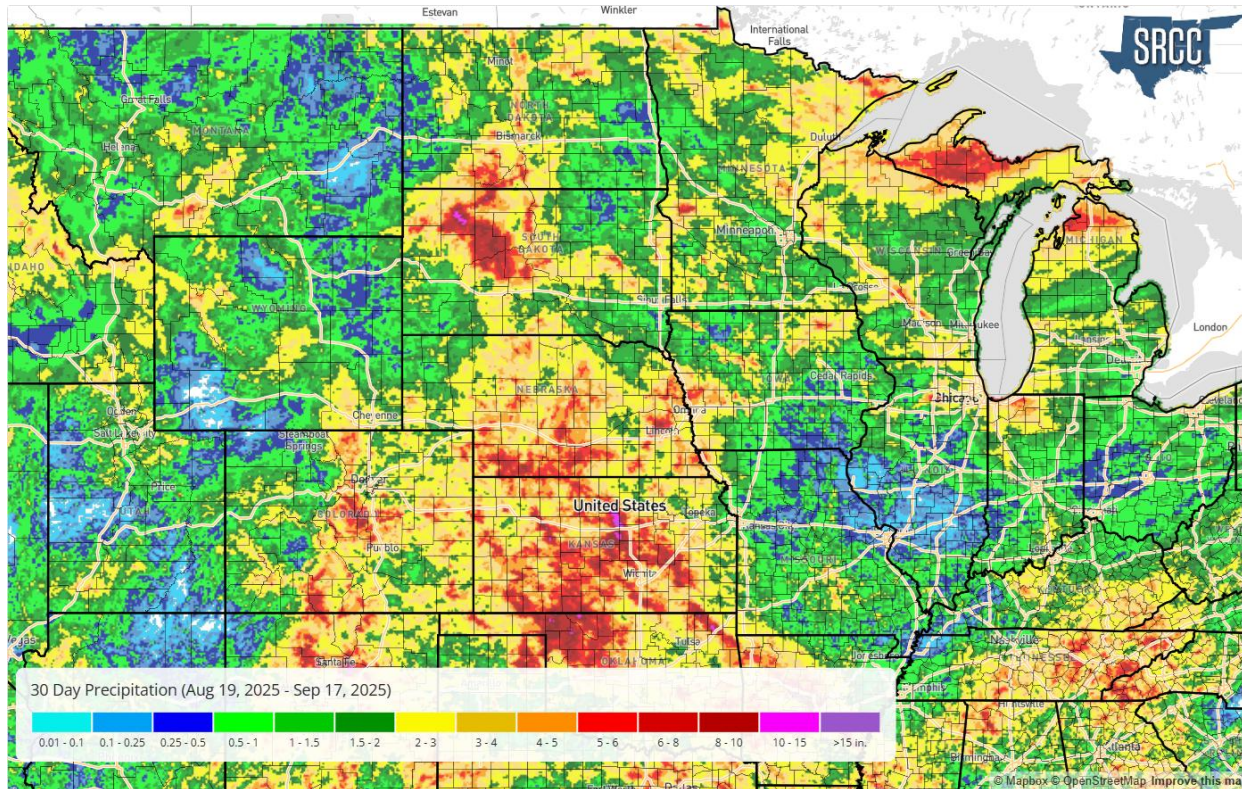


Created: Fri Sep 05 2025
Source: nClimGrid-Monthly

- Wetter than average summer for every state except OH, KY, and ND
- Top 10 wettest summer on record in IA and NE
- Near record wet in some counties in SD, MN, WI, NE, and KS

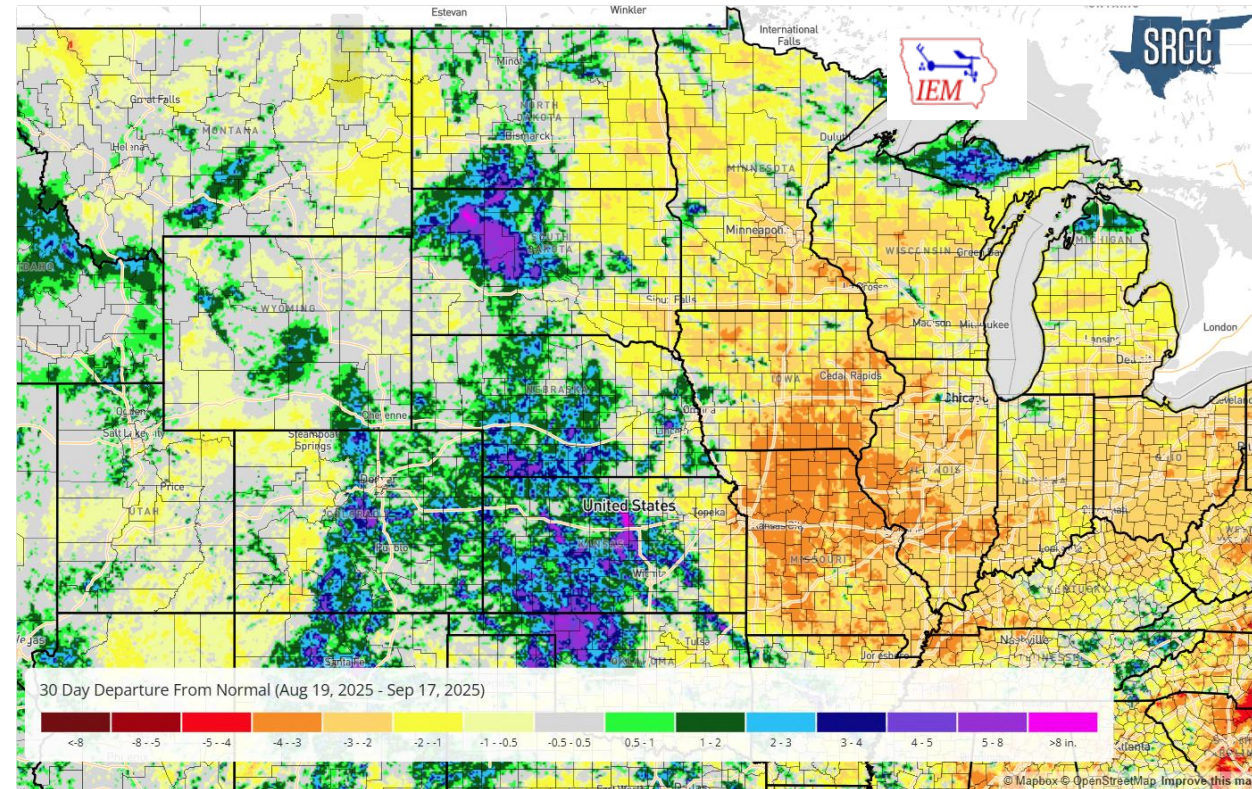
Precipitation – Last 30 Days

Total Precipitation (inches)



Source: https://www.srcc.tamu.edu/water_portal/

Departure from Normal (inches)

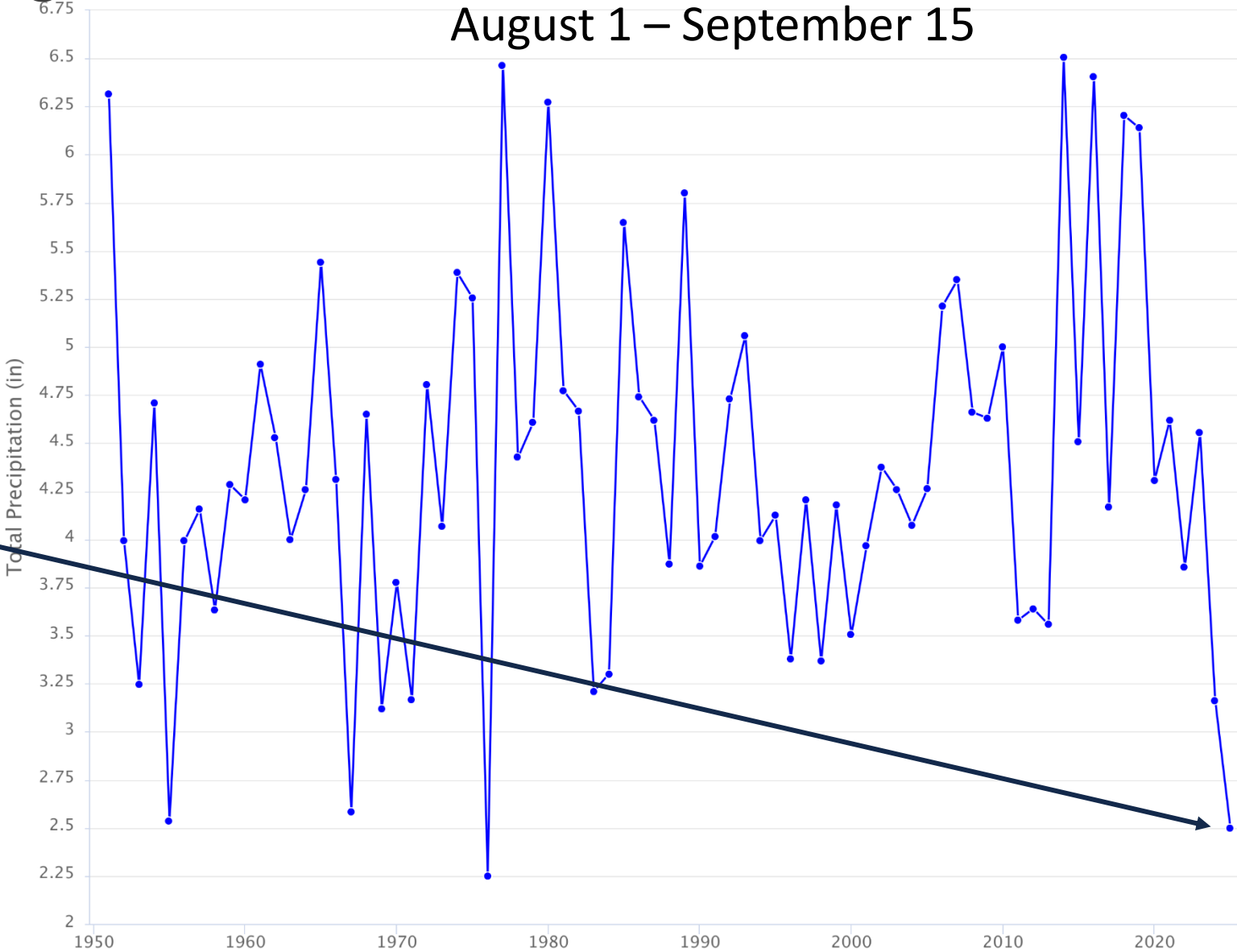


- Extremely dry across the eastern corn belt and southern Midwest since mid-August
- < 0.10" since mid-July in parts of southeast MO and southern IL
- Heavy rain in parts of SD, KS, MN, and MI have created the only positive rainfall anomalies

Dry Across the Region since August

Total Precipitation in North Central Region:
August 1 – September 15

Driest August 1 – September 15th in
the region since 1976
2nd driest since 1951

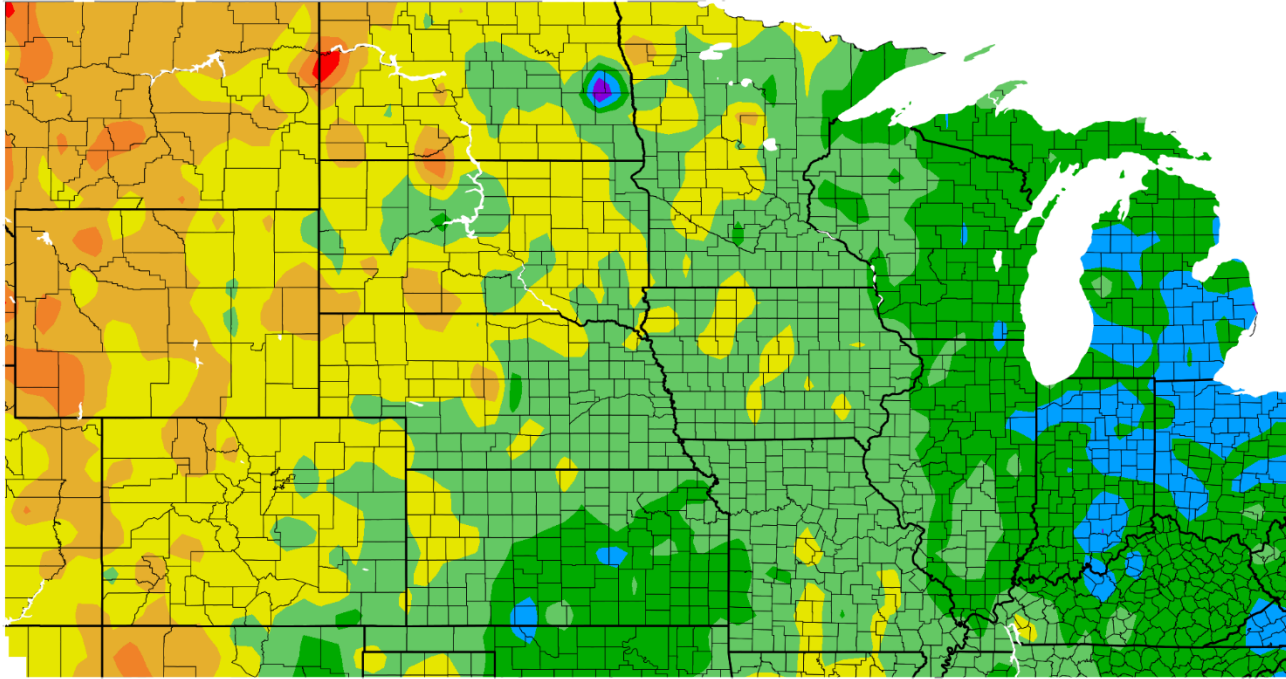


Generated by ClimateEngine.org

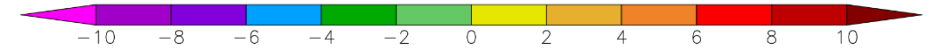
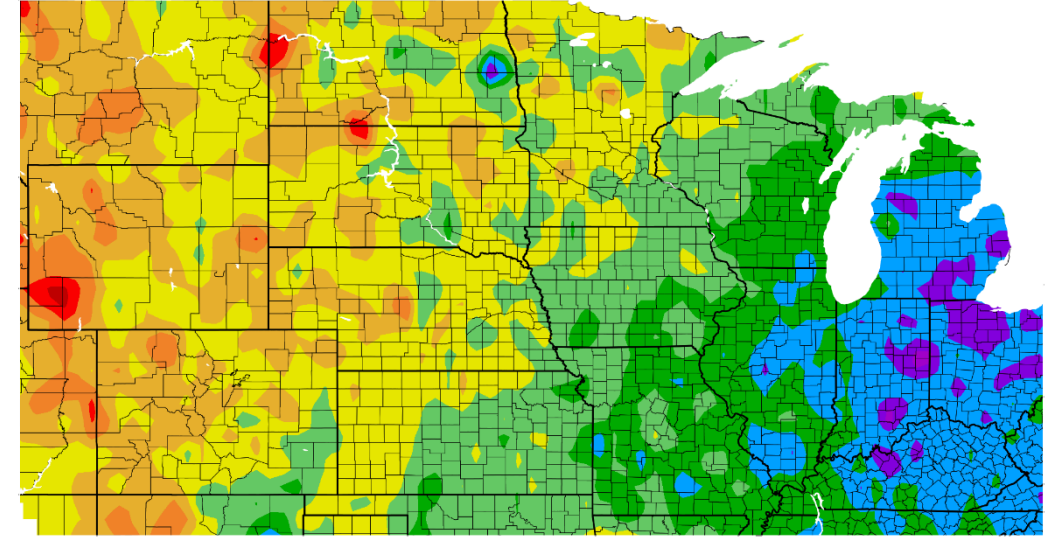


Temperatures – Last 30 Days

Average Temperature Departure from Normal (°F)



Minimum Temperature Departure from Normal (°F)

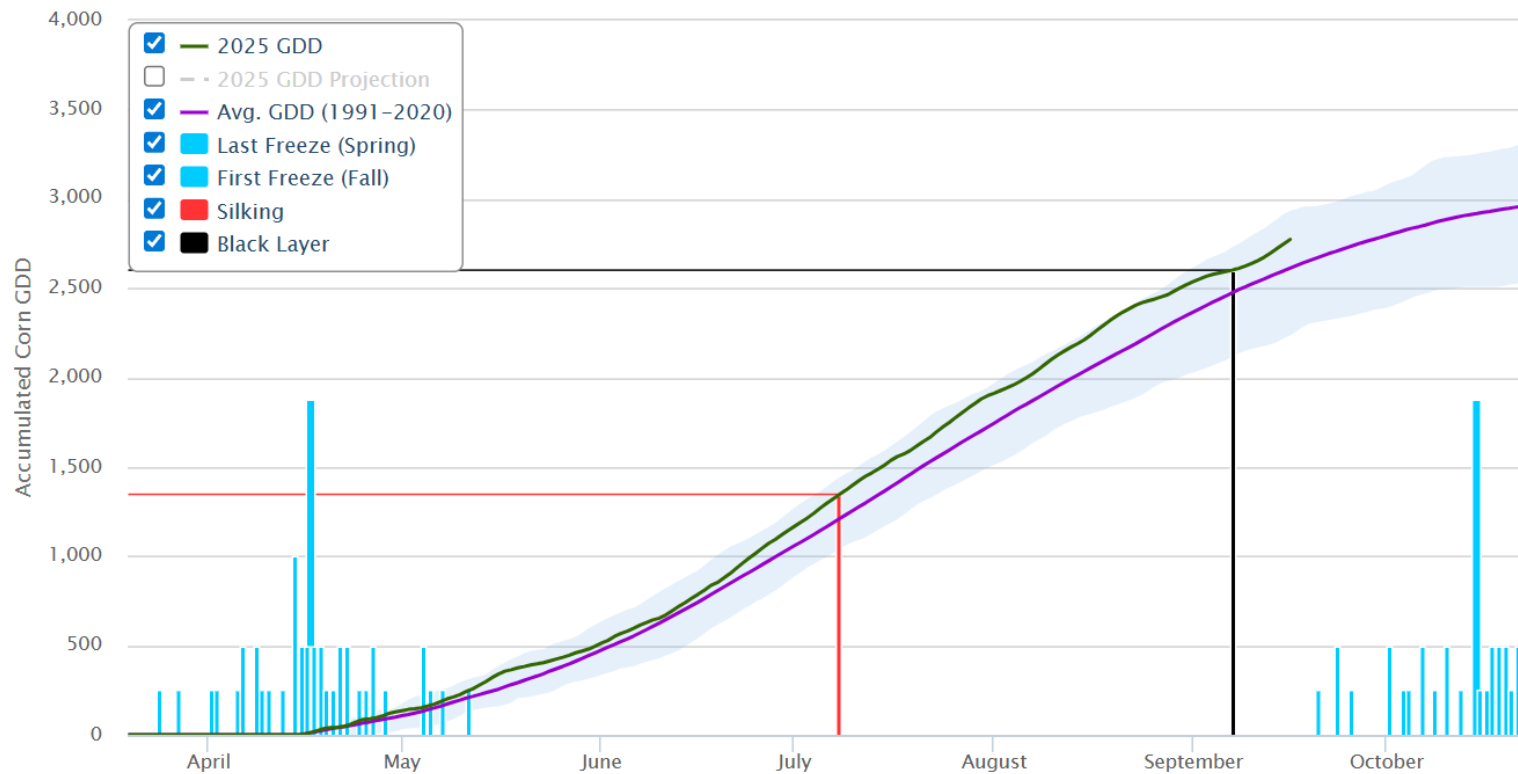


- Average temperatures 2°F to 6°F warmer than normal in northwest region, 2°F to 6°F cooler than normal in eastern region
- Nighttime lows were much cooler than normal in IL, IN, MI, OH, and KY

Growing Degree Days (Since April 1st)

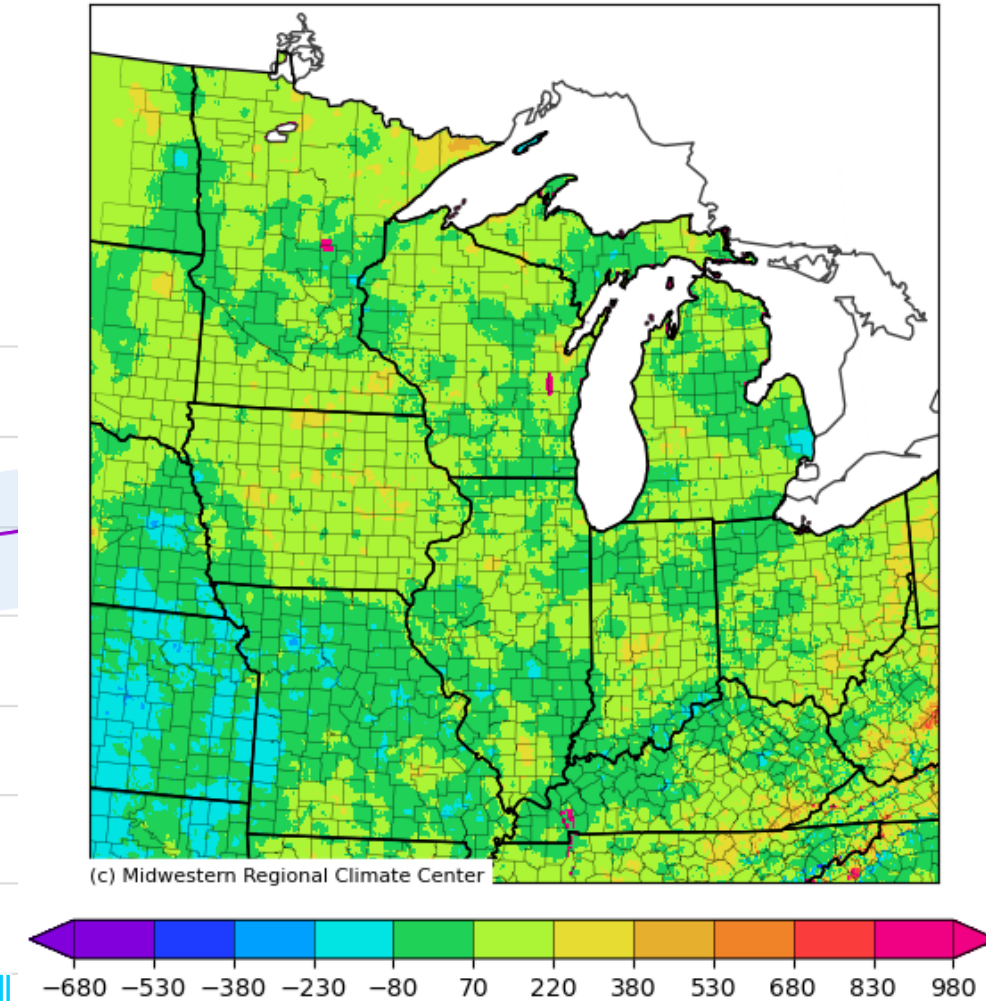
- GDDs are running well ahead of average in much of the region, a bit behind average in western region

Corn Growing Degree Day Tool – Linn County, Iowa



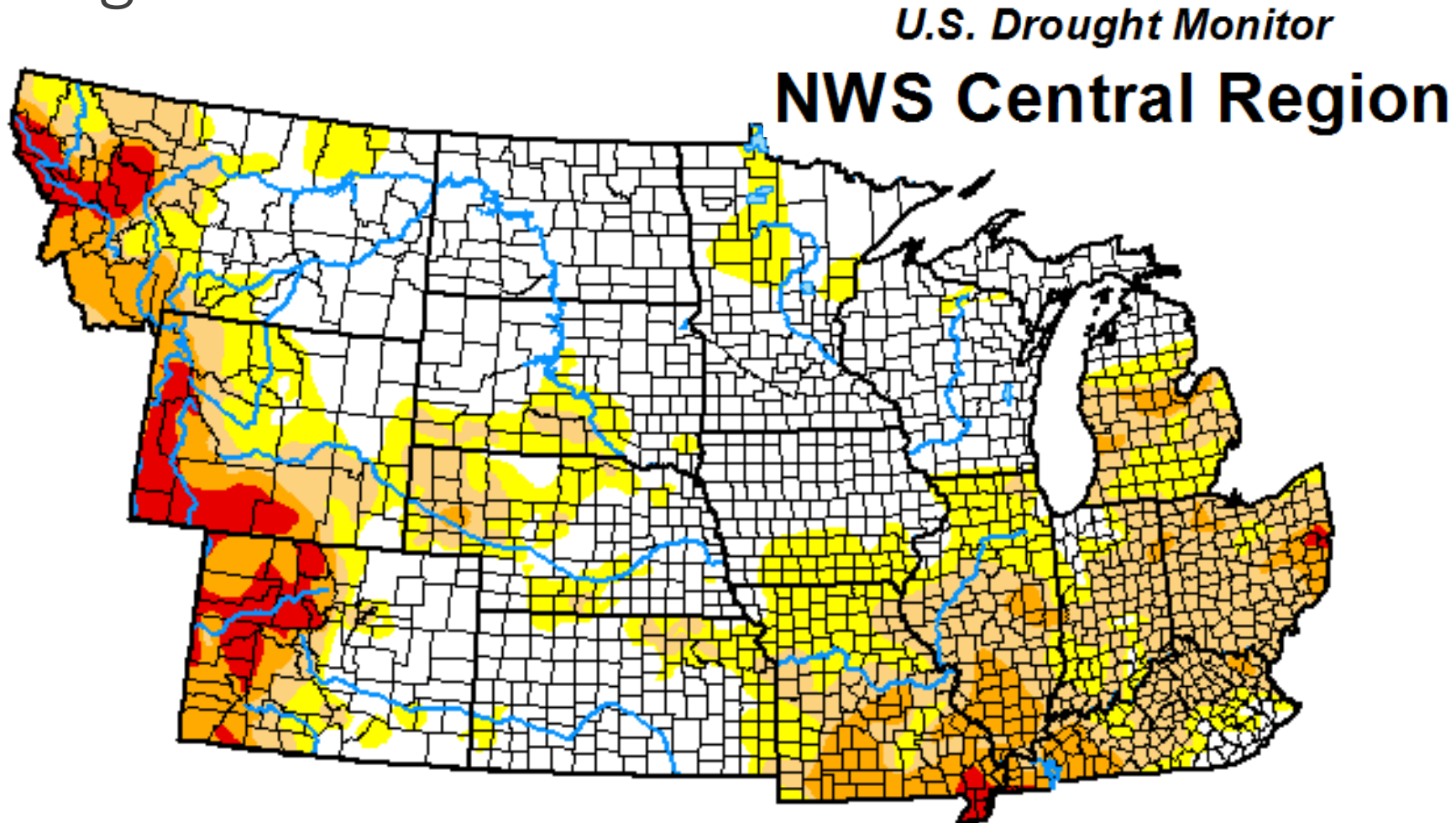
<https://hprcc.unl.edu/agroclimate/gdd.php>

April 01, 2025 to September 15, 2025



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

Drought



September 16, 2025
(Released Thursday, Sep. 18, 2025)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	48.91	51.09	31.23	13.69	4.43	0.00
Last Week 09-09-2025	53.49	46.51	23.84	11.10	5.15	0.00
3 Months Ago 06-17-2025	49.44	50.56	27.14	7.72	0.58	0.00
Start of Calendar Year 01-07-2025	31.02	68.98	45.49	19.38	5.80	0.00
Start of Water Year 10-01-2024	20.79	79.21	36.88	12.04	3.20	0.40
One Year Ago 09-17-2024	23.85	76.15	39.29	12.69	3.05	0.46

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:

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NOAA/NWS/NCEP/CPC

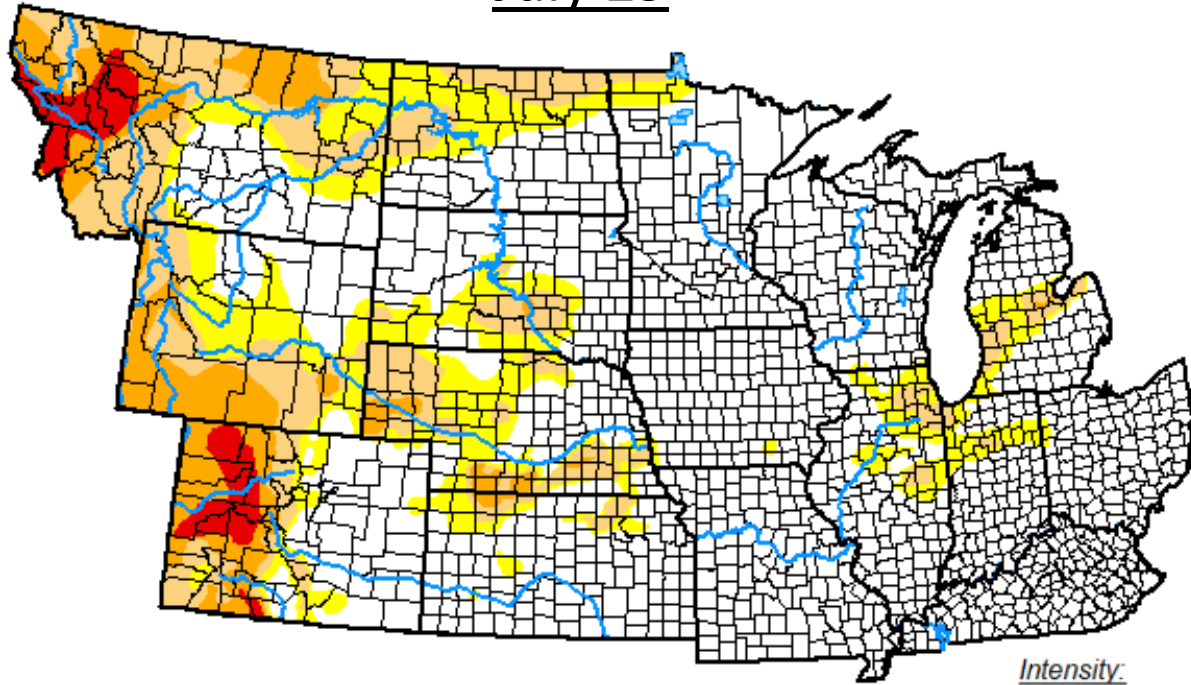


droughtmonitor.unl.edu

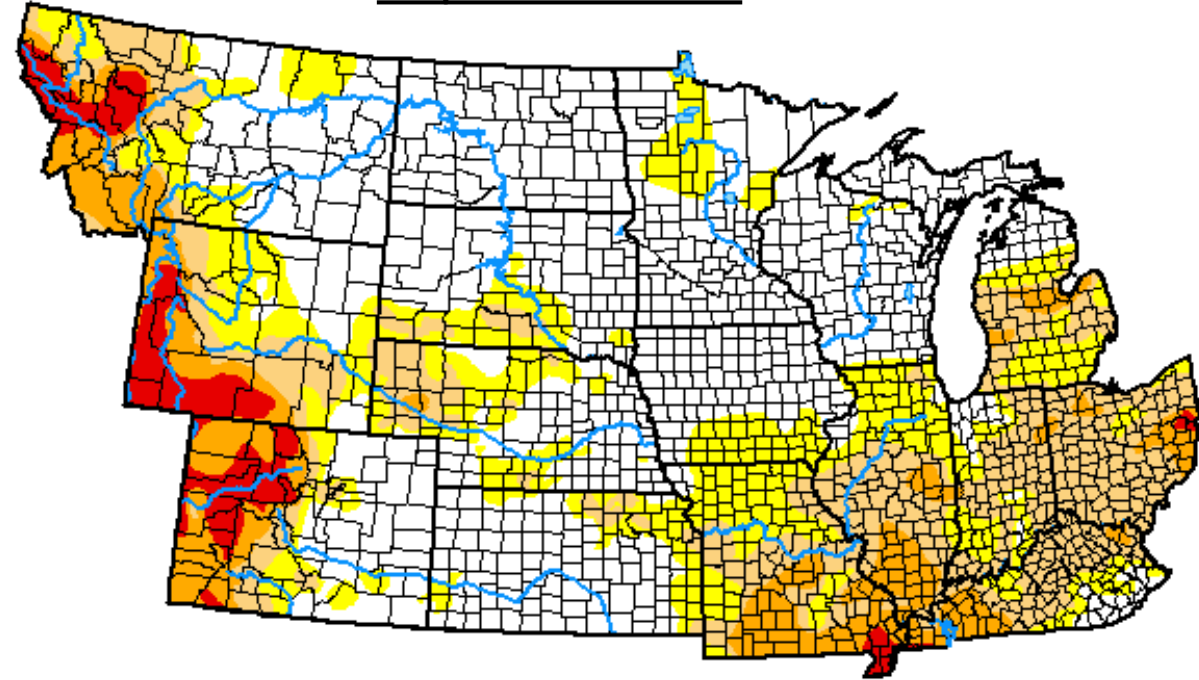
- Over 30% of the region is in at least moderate drought
- Longer-term drought in western region, serious flash drought in east

Flash Drought Indeed

July 29



September 16



Intensity:

None

D0 Abnormally Dry

D1 Moderate Drought

D2 Severe Drought

D3 Extreme Drought

D4 Exceptional Drought

- Missouri went from 0% drought to 62% in D1, 31% in D2 in 7 weeks
- Ohio went from 0% drought to 95% in D1 in 4 weeks

Soil Moisture



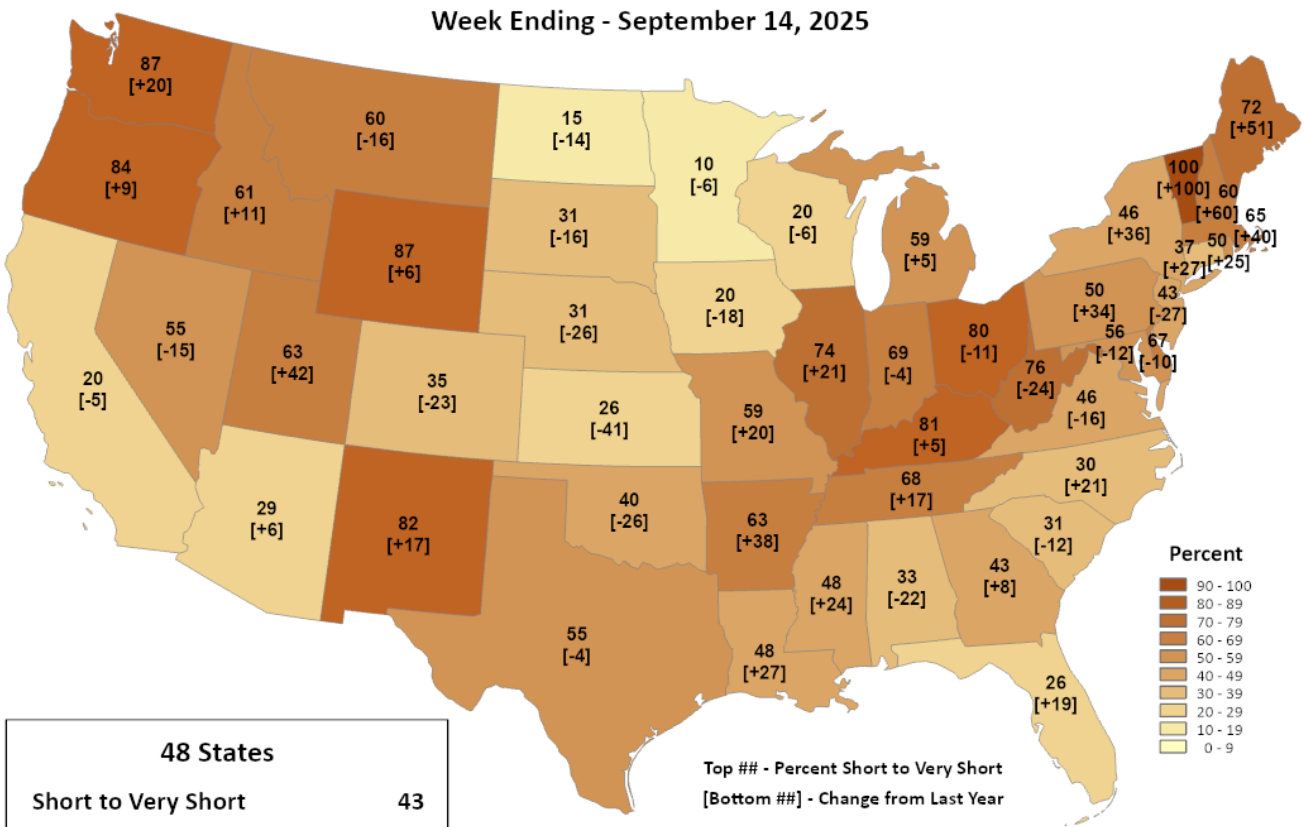
United States
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World Agricultural Outlook Board (WAOB)

Subsoil Moisture

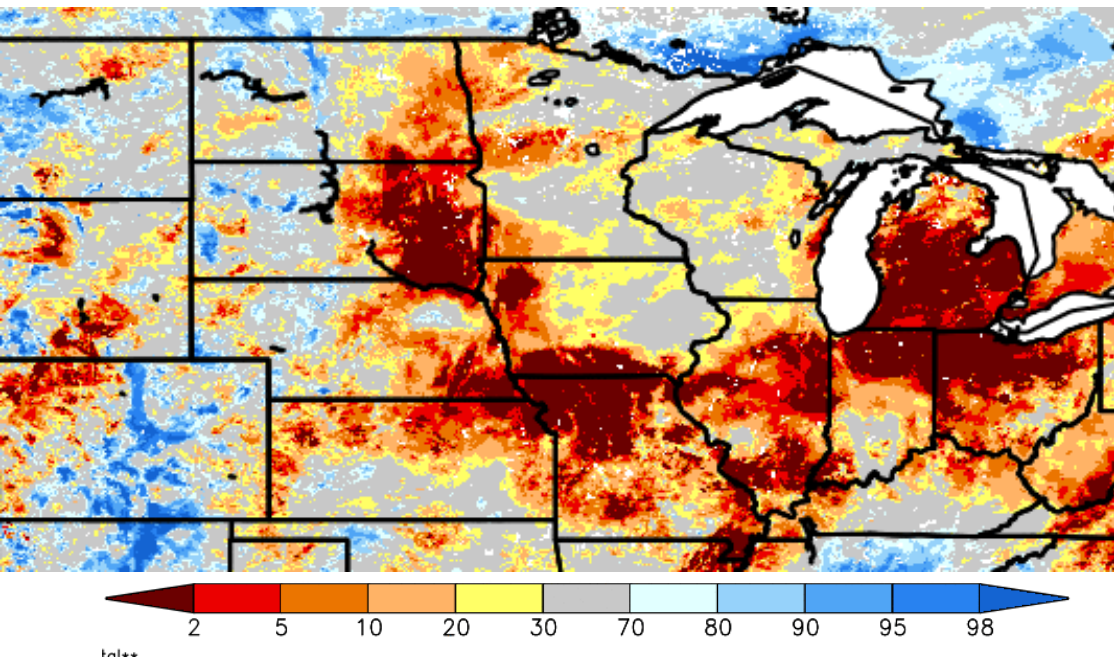
Percent Short to Very Short

Week Ending - September 14, 2025



Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

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



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

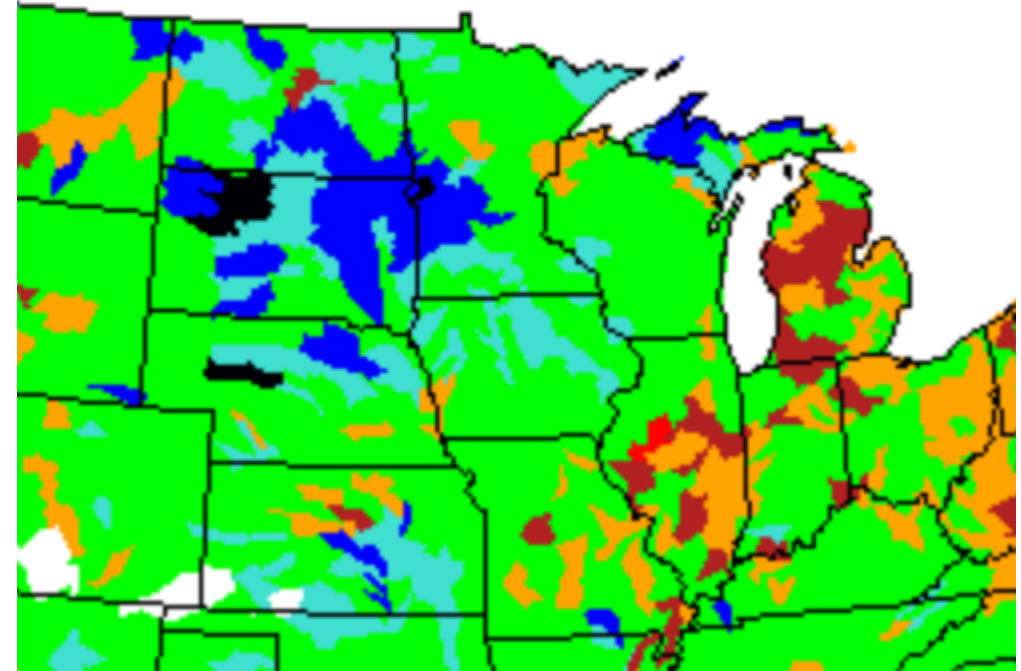
<https://agindrought.unl.edu/Other.aspx>



Stream Conditions

- Many streams in eastern part of the region have below to much below normal flow
- Above normal flow in Dakotas, Minnesota, Iowa
- Sangamon River at Monticello, IL reached no-flow for the 3rd time in the last 115 years (last was 2012)
- Minnesota River at Montevideo, MN crested at 16' on August 21, highest on record for August

Wednesday, September 17, 2025

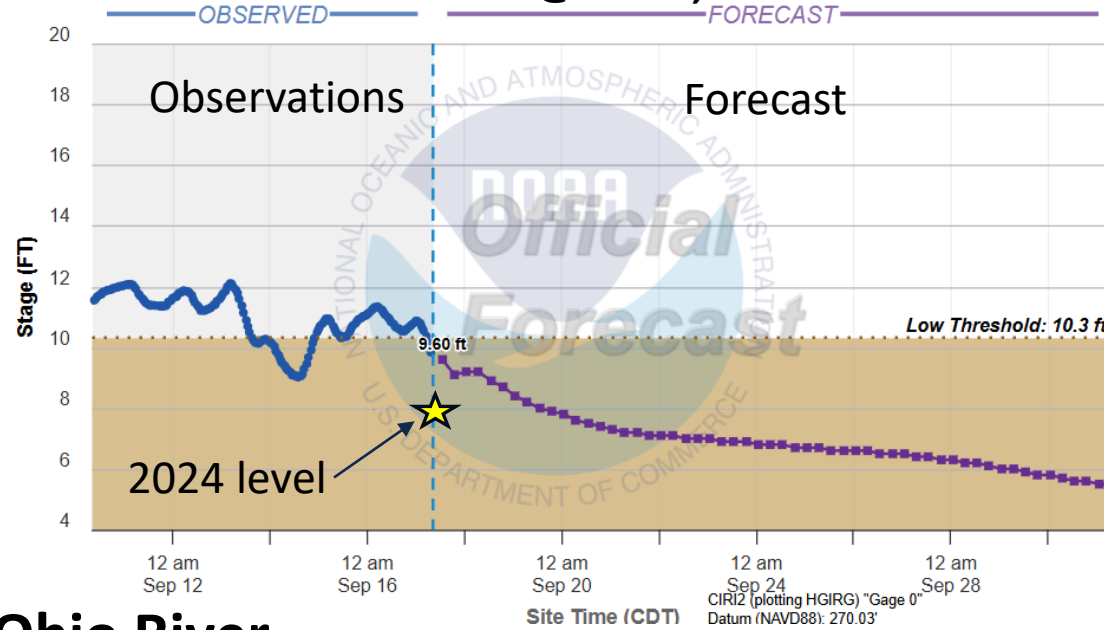


Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

<https://waterwatch.usgs.gov/>

Major Rivers

Ohio River @ Cairo, IL



Ohio River

- Once again approaching low stage due to drought – expected to decline through rest of September

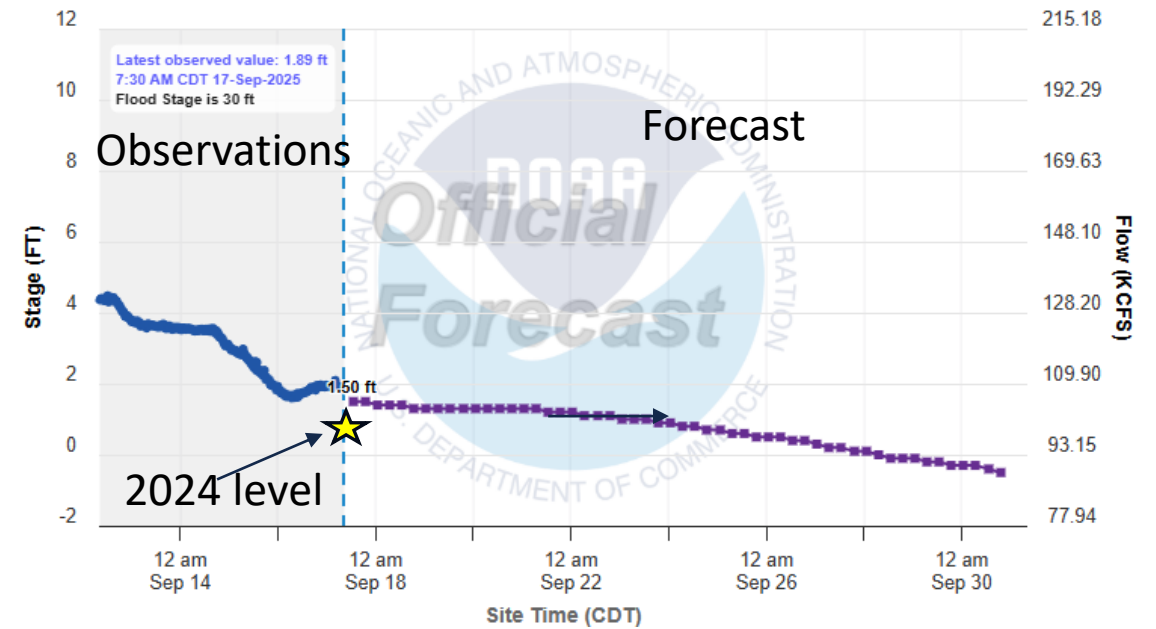
Mississippi River

- Upper Midwest storms have kept river @ St. Louis above low stage, for now
- Draft restrictions in place along MS River south of Cairo, lack of OH River input

Missouri River

- Below average runoff will keep Gavin's Point (SD) winter releases to minimum level

Mississippi River @ Memphis, TN



Great Lakes: Temperatures & Levels

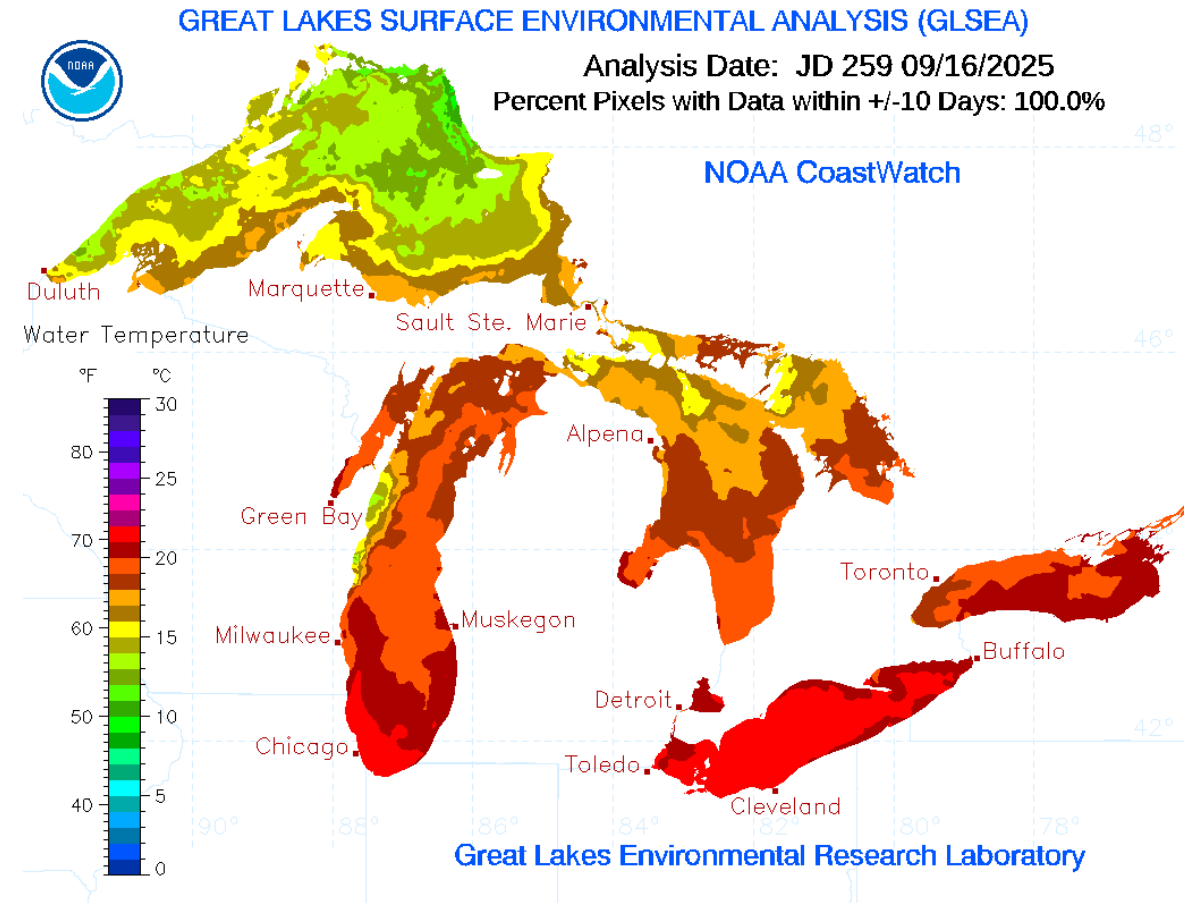
Lake Temperatures

- After reaching near record water temperatures in July, all lakes are currently near to slightly cooler than average

Lake Levels

- Lakes Michigan-Huron, Erie, and St. Clair are 1-2 feet below average for mid-September
- Lakes Superior and Ontario close to average

<https://lre-wm.usace.army.mil/ForecastData/GLBasinConditions/daily-GLWL-Graph.jpg>



<https://coastwatch.glerl.noaa.gov/satellite-data-products/glsea-annual-comparison/>

Impacts & Notable Events



Very dry pasture in Phelps County, MO
Source: CMOR Drought Reporter



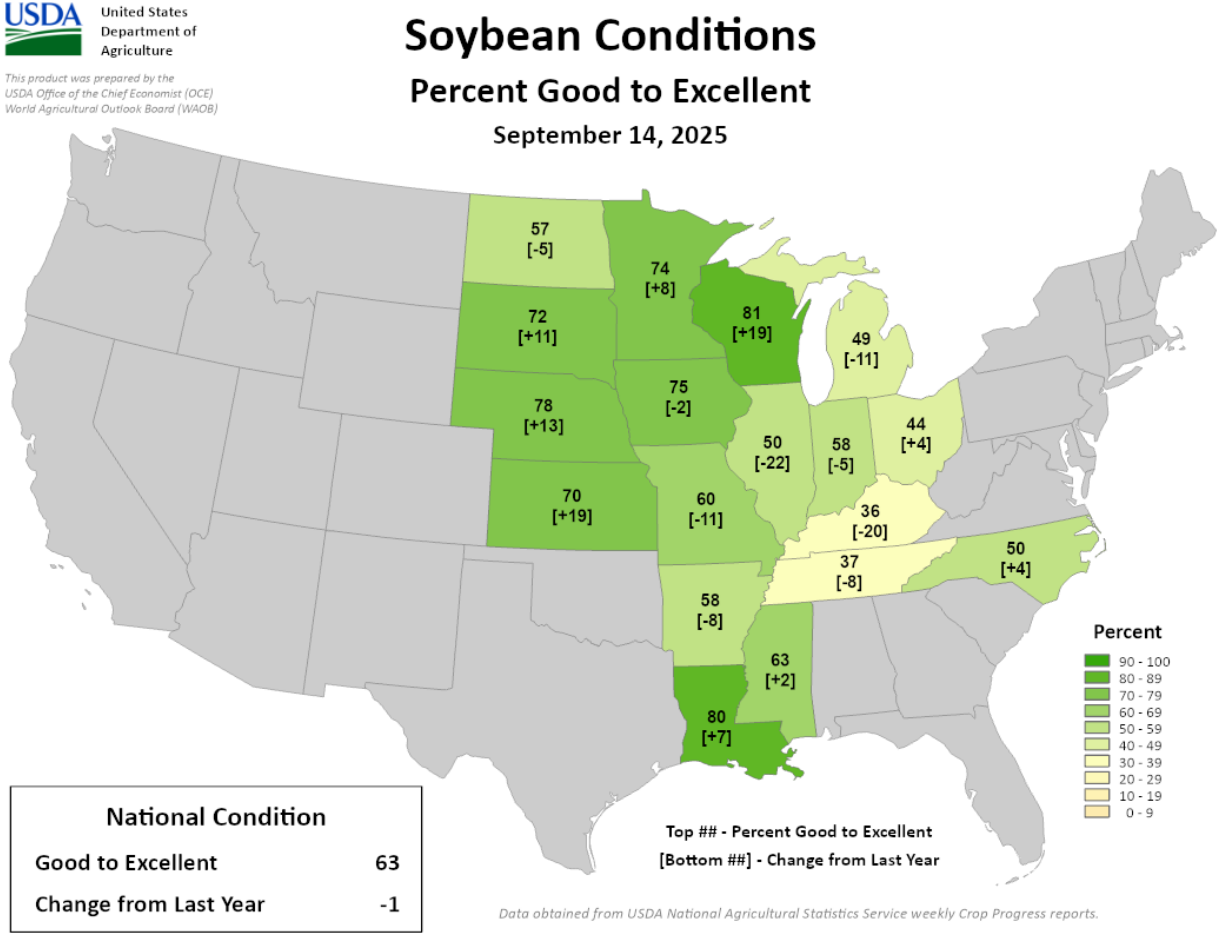
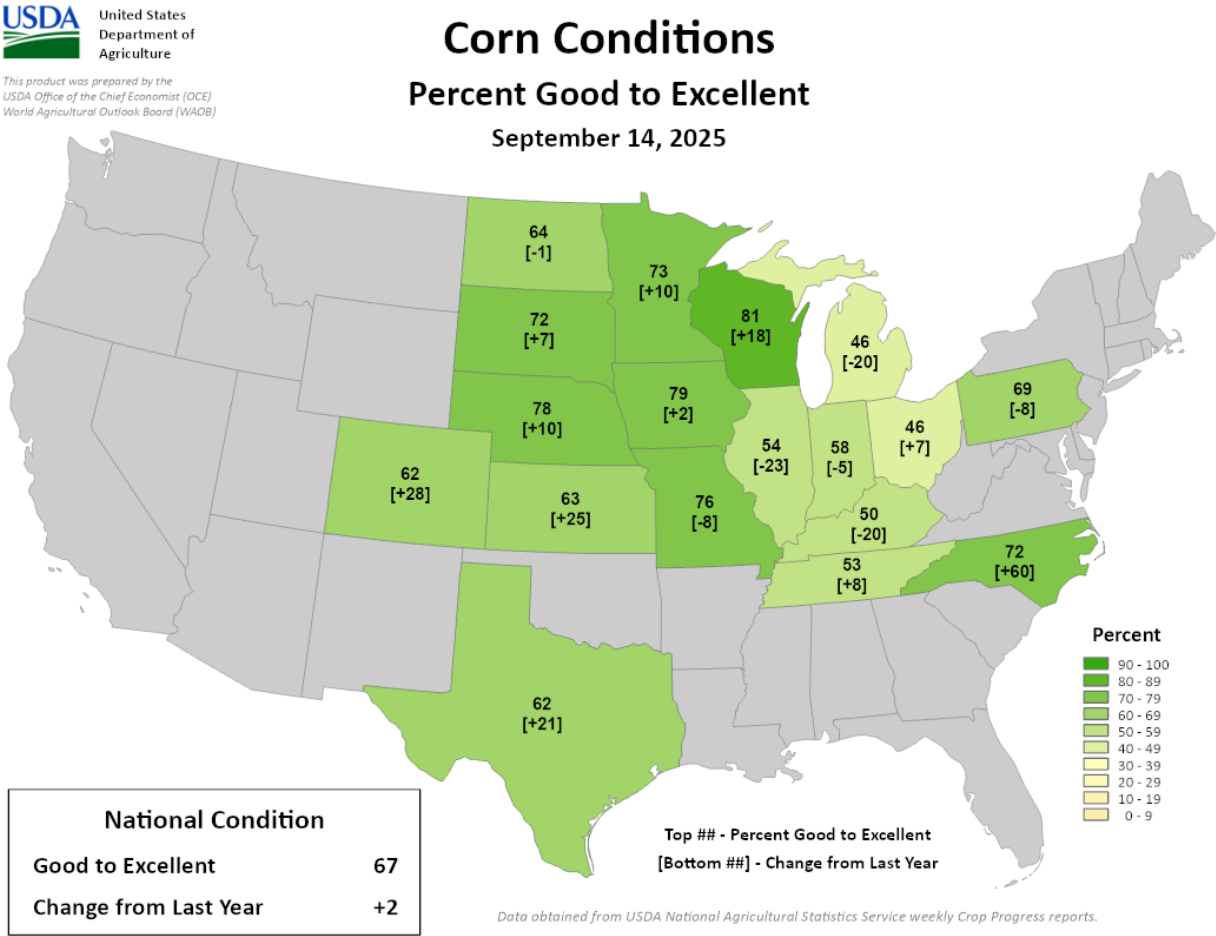
Agriculture Impacts

- Row Crops
 - Late season drought stress and production impacts to soybeans southern and eastern Midwest
 - Very rapid drying in eastern corn belt
 - Slower drying in Dakotas
 - Southern Rust prevalence in Iowa
- Pasture & Livestock
 - Pasture conditions are deteriorating in MO, IL, IN, and OH
 - Little to no regrowth, producers feeding hay
 - Producers in IL are hauling water; Stock ponds are running short in MO; Concerns over water quality
- Specialty Crops
 - Isolated frost damage in South Dakota, Minnesota, Wisconsin
 - Apple producers in MO, IL, IN irrigating more than usual to make up for lack of rainfall

Bean harvest in southern Indiana
Source: Hans Schmitz



USDA NASS Crop Conditions: Corn & Beans



- More G-E corn and beans than last year in western region (+10% corn & +13% beans in NE)
 - Less G-E corn and beans than last year in eastern corn belt (-23% corn & -22% beans in IL)
- <https://agindrought.unl.edu/Other.aspx>

USDA NASS Crop Progress: Corn & Beans <https://agindrought.unl.edu/Other.aspx>



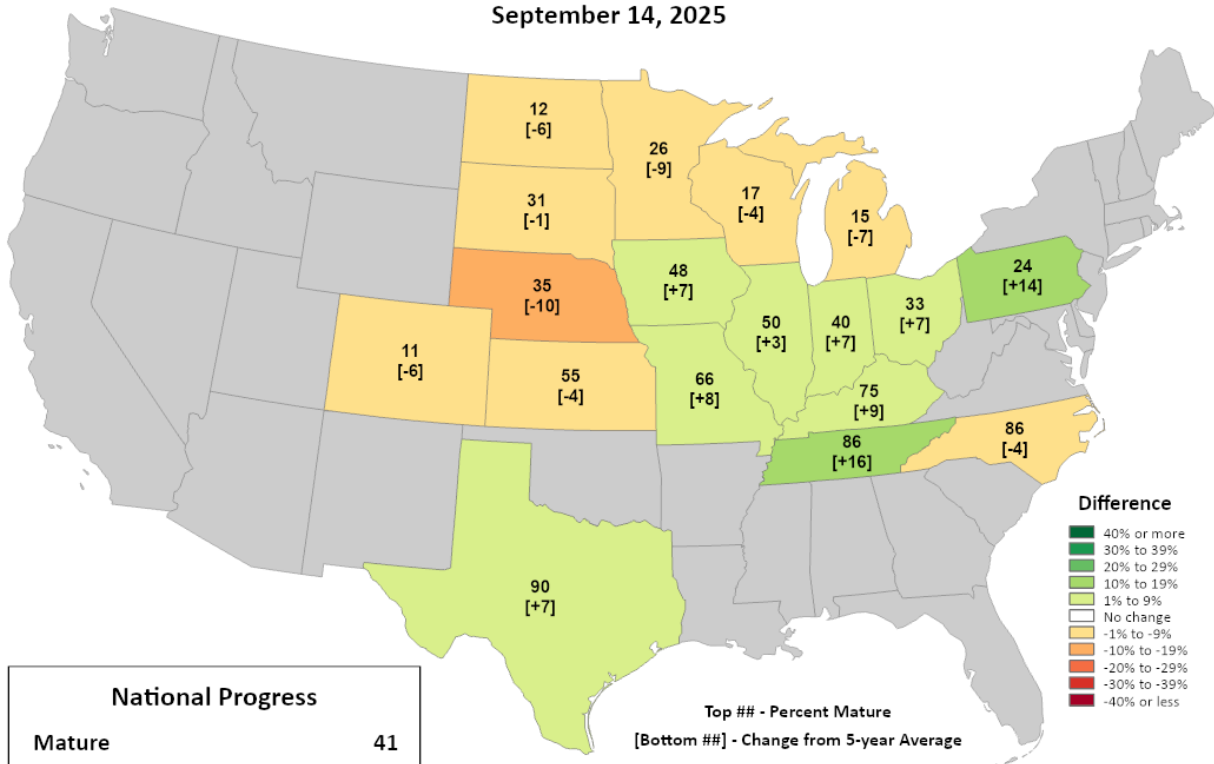
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Corn Progress

Percent Mature

September 14, 2025



Difference

- 40% or more
- 30% to 39%
- 20% to 29%
- 10% to 19%
- 1% to 9%
- No change
- 1% to -9%
- 10% to -19%
- 20% to -29%
- 30% to -39%
- 40% or less

National Progress

Mature	41
Change from 5-year Average	0

Top ## - Percent Mature
[Bottom ##] - Change from 5-year Average

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.



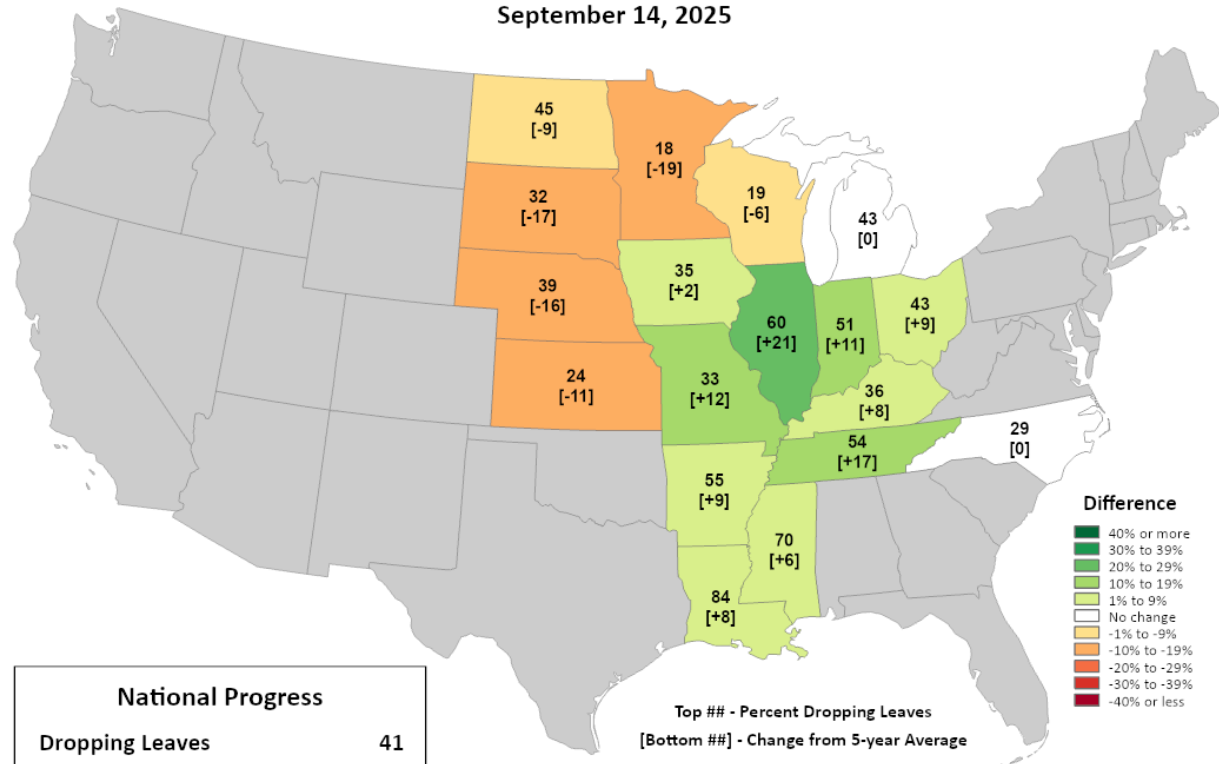
United States
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Soybeans Progress

Percent Dropping Leaves

September 14, 2025



Difference

- 40% or more
- 30% to 39%
- 20% to 29%
- 10% to 19%
- 1% to 9%
- No change
- 1% to -9%
- 10% to -19%
- 20% to -29%
- 30% to -39%
- 40% or less

National Progress

Dropping Leaves	41
Change from 5-year Average	+1

Top ## - Percent Dropping Leaves
[Bottom ##] - Change from 5-year Average

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

- Corn and beans maturing ahead of 5-year average in south and southeast (heat + drought)
- Beans lagging 5-year average in northwest region
- 7% corn harvested (right at 5-year average) and 5% beans harvested (+2% above 5-year average)



USDA NASS Crop Progress: Pasture

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



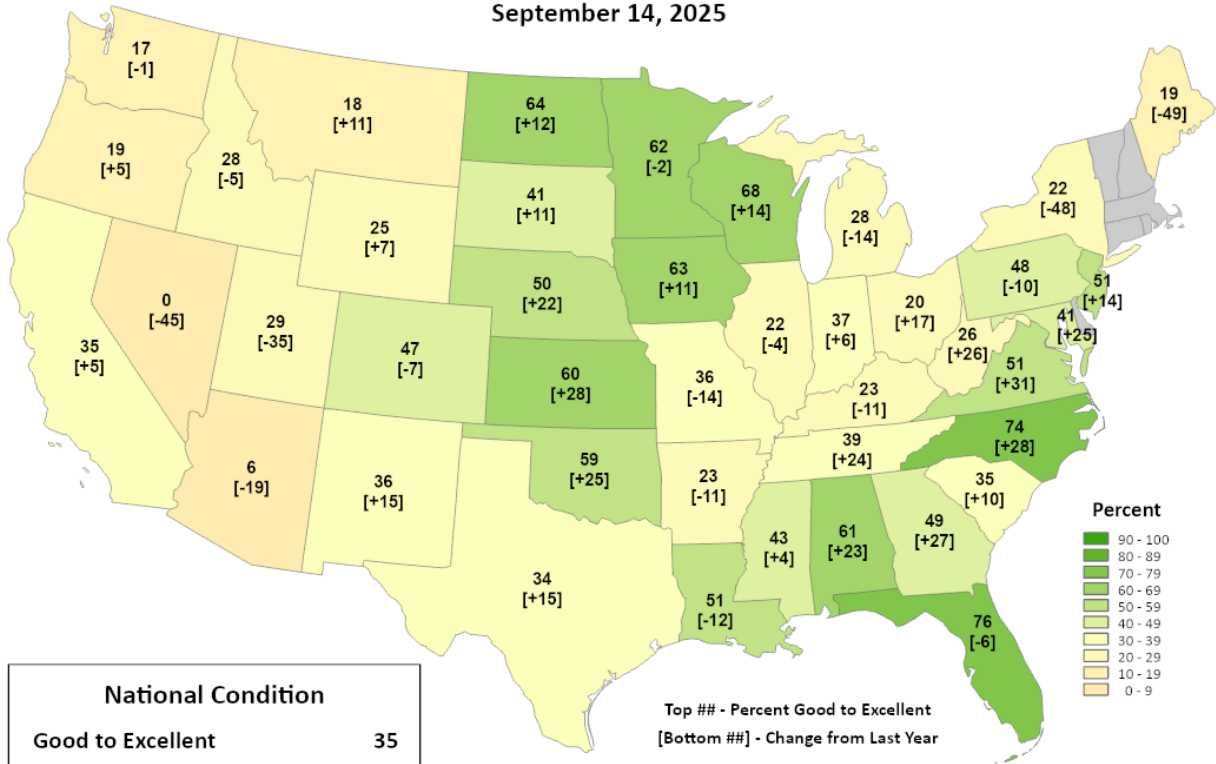
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Pasture and Range Conditions

Percent Good to Excellent

September 14, 2025



National Condition	
Good to Excellent	35
Change from Last Year	+8

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.



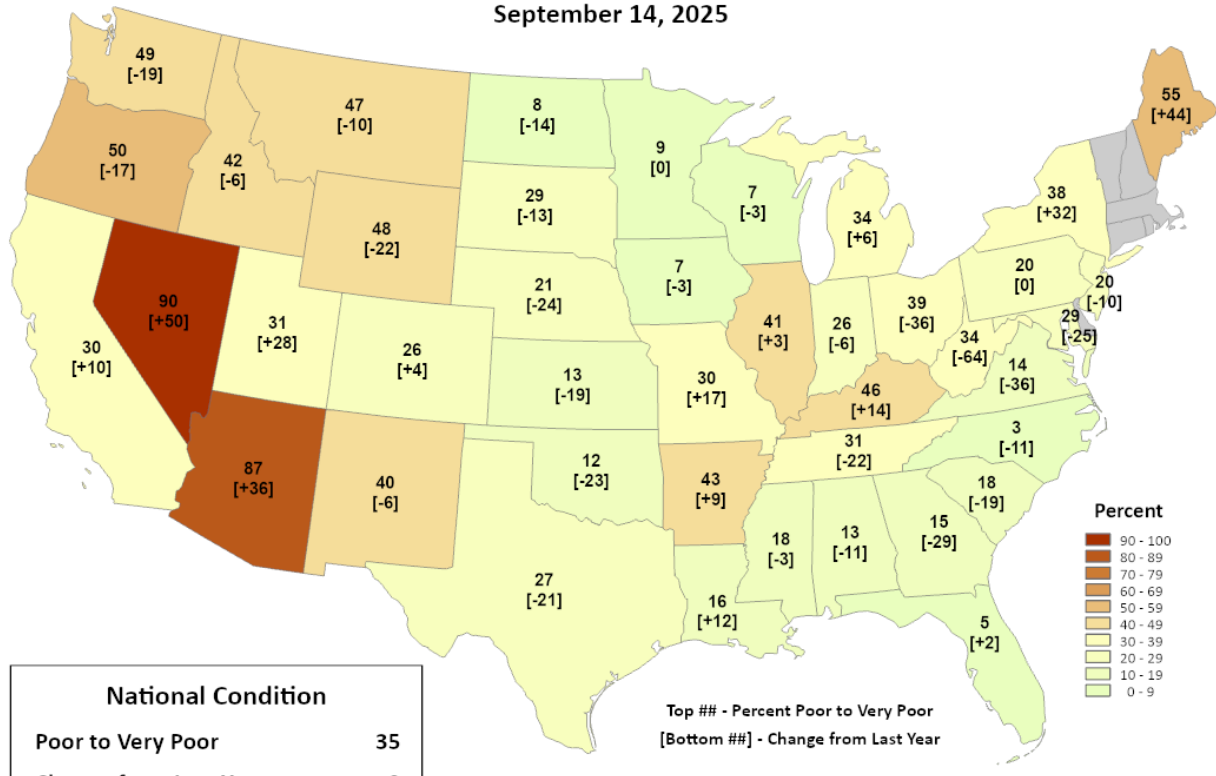
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Pasture and Range Conditions

Percent Poor to Very Poor

September 14, 2025



National Condition	
Poor to Very Poor	35
Change from Last Year	-9

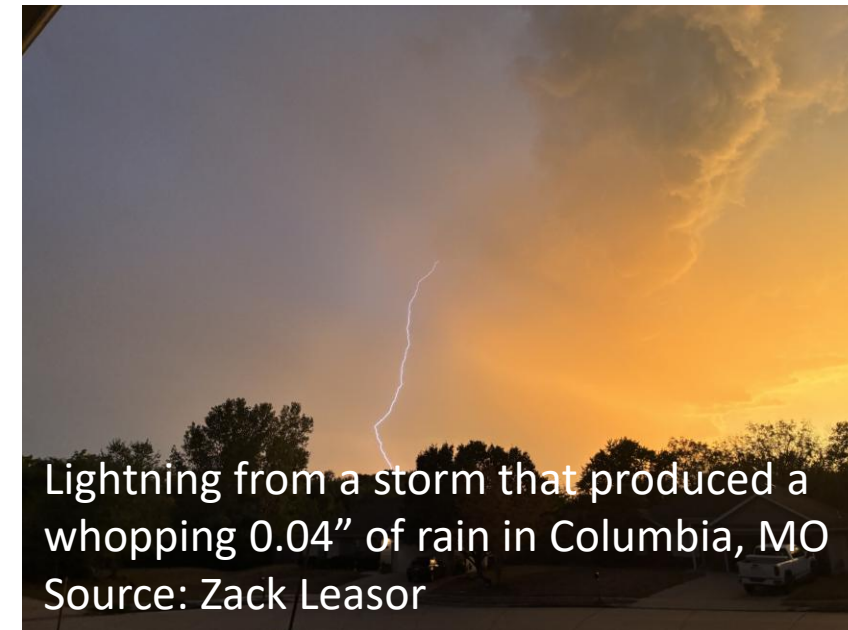
Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.

- Much better pasture conditions than last year in west and northern Plains
- More poor to very poor pasture conditions in MT & WY, and in IL, MO, and KY



Other Drought Impacts

- Ecology
 - Trees dropping leaves, early senescence, limited fall color
- Recreation & Tourism
 - Boats removed from docks on some Illinois Lakes
 - Fireworks and other events cancelled at fairs and festivals
 - Burn bans in dozens of counties in OH, IN, IL, and KY
- Water Resources
 - Municipal water resources from reservoirs in Illinois are dropping quickly, worsened by low stream levels
 - Livestock producers hauling water from municipal wells
- Public Health
 - High West Nile Virus prevalence across the region
 - Very high risk of field fires as harvest ramps up



Other Significant Weather Impacts

Heavy Rain & Flooding

- Flooding from nearly 10" of rain in less than 12 hours in Lincoln Co. Kansas
- Episodic flooding on James, Republican, Big Sioux Rivers in Dakotas

Frost

- Patchy frost in August and early September
- Some sub-freezing temperatures in North Dakota

Severe Weather

- Big tornado outbreak in North Dakota on September 14th, well over a dozen tornadoes
- Lack of severe weather in eastern corn belt... quiet late summer-early fall



Tornado damage near Butte, ND.
Source: Brandon Copic



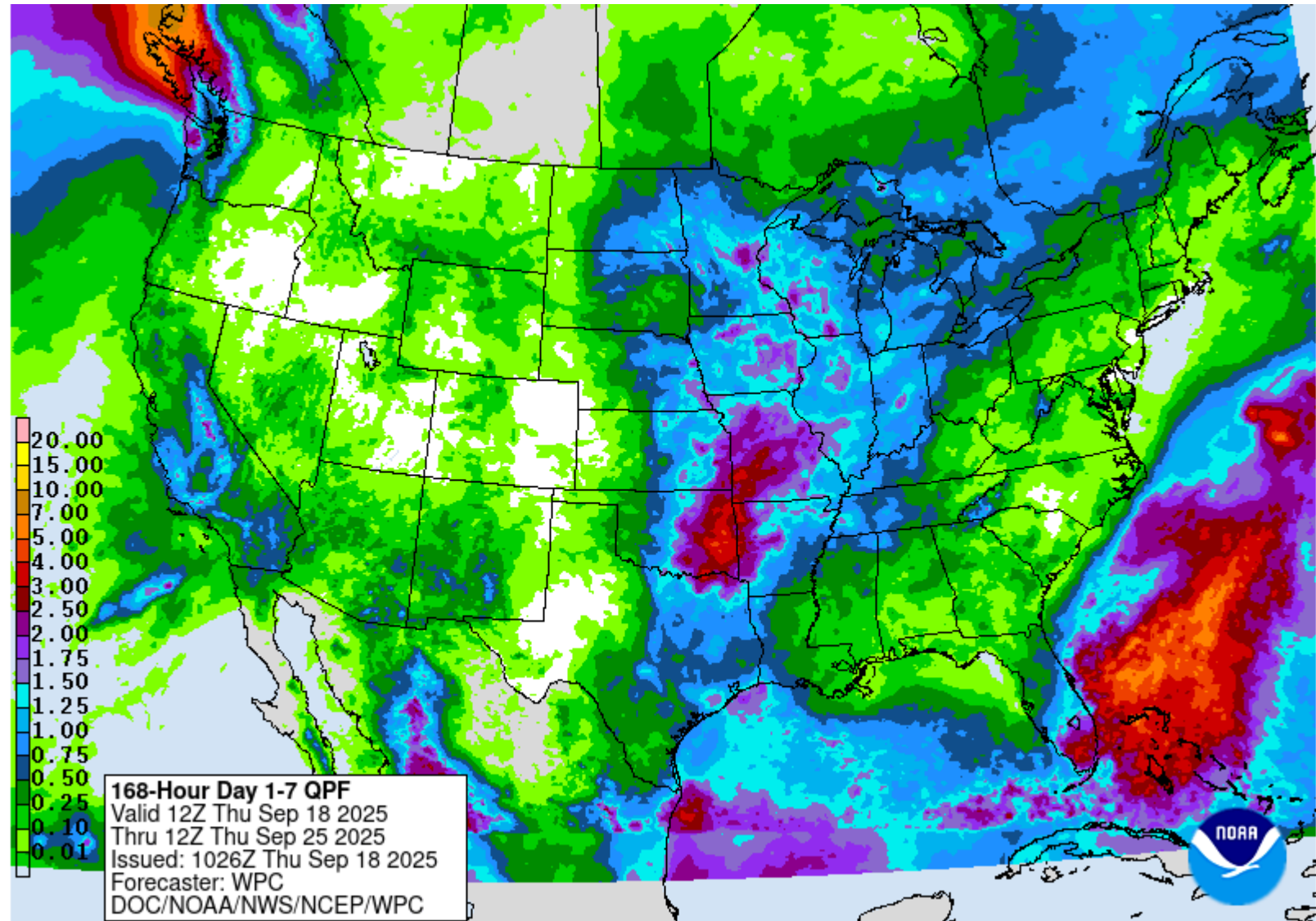
Flooding in Kansas.
Photo: Jeff Gross

Outlooks



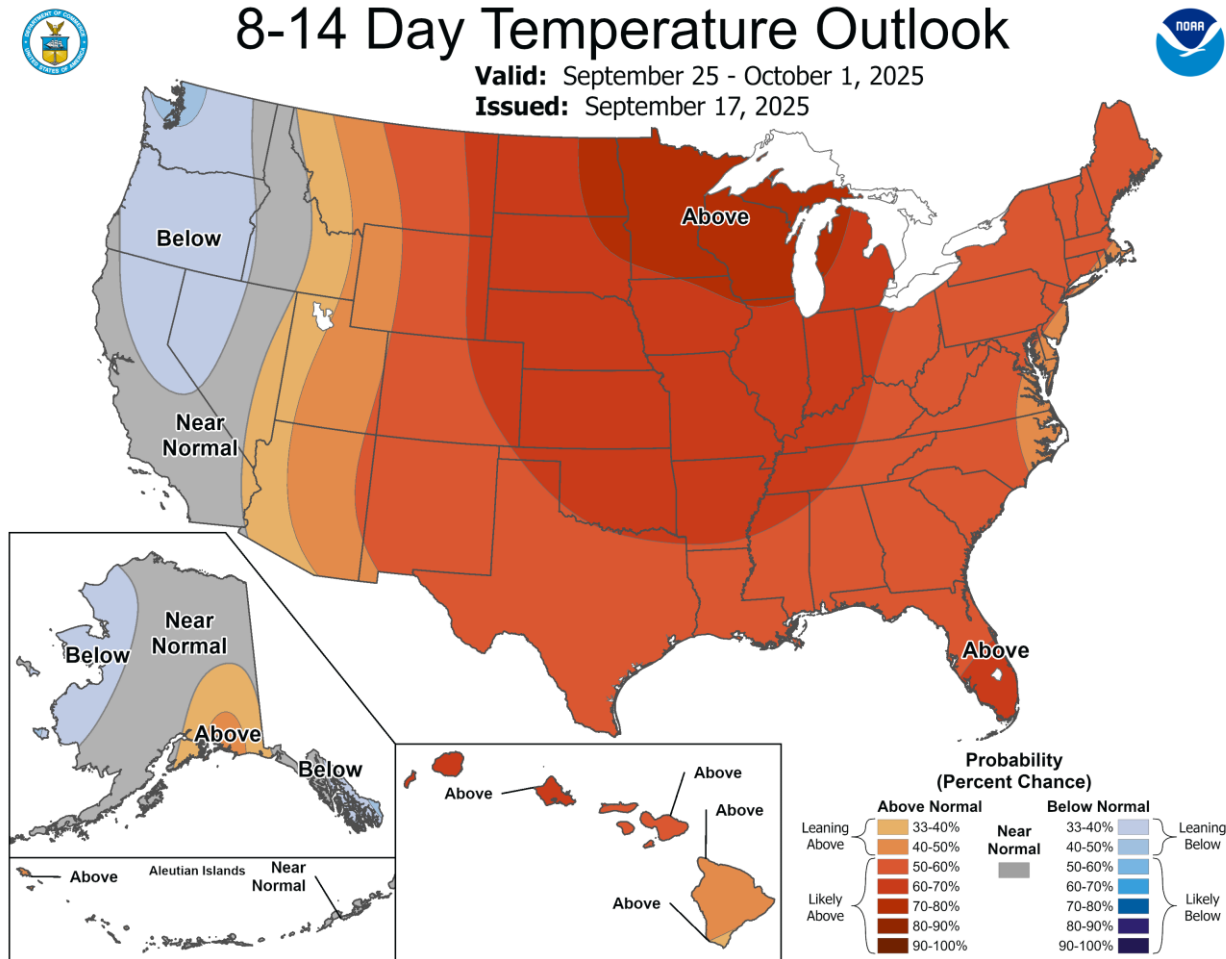
7-day Precipitation Forecast

- More Gulf moisture = wetter forecast for central Midwest
- Any precipitation will be welcome from Missouri to Ohio
- Drier forecast west, Dakotas could use some dryness to help prepare for harvest

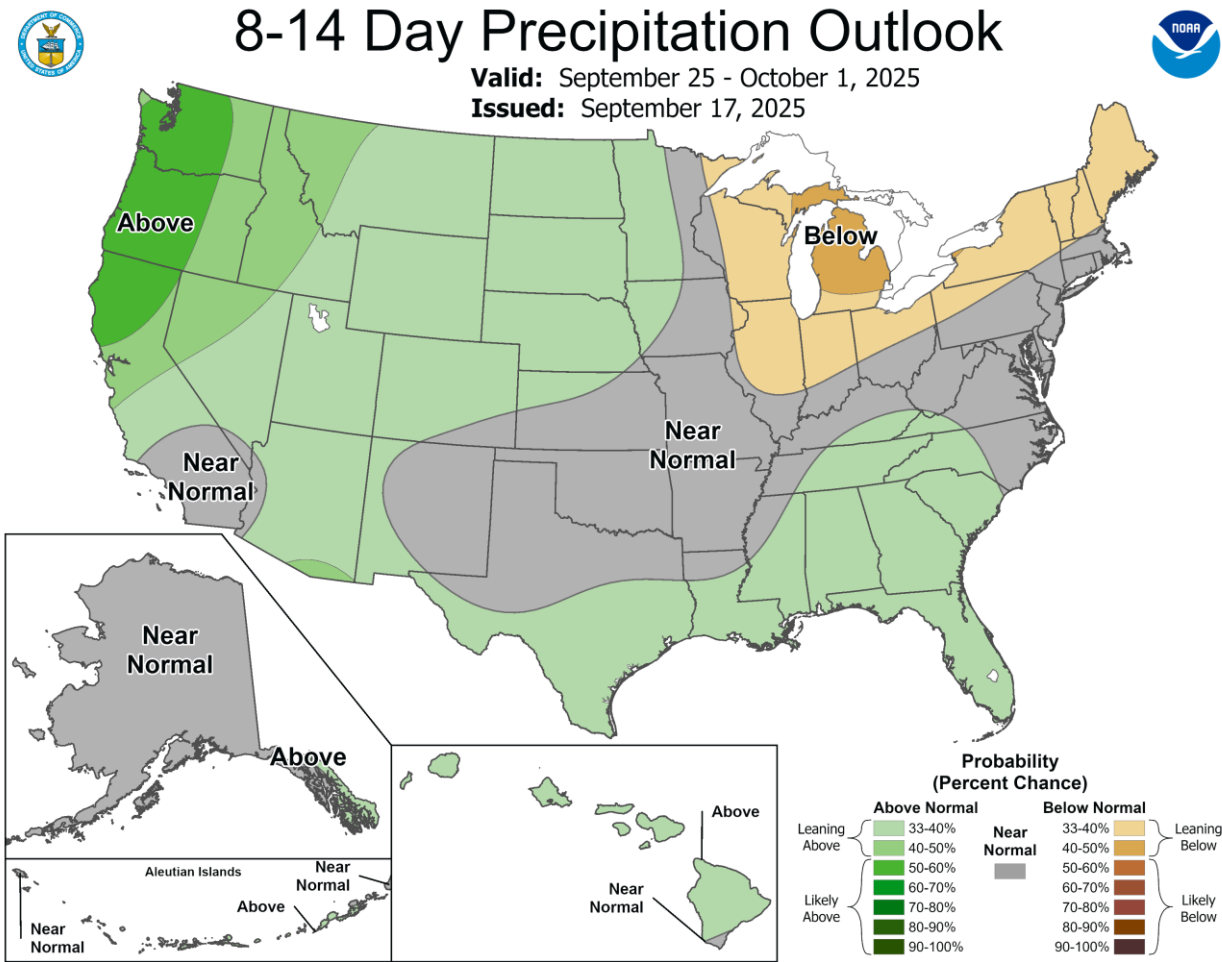


Source: wpc.ncep.noaa.gov/qpf/

8-14 Day Outlooks



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



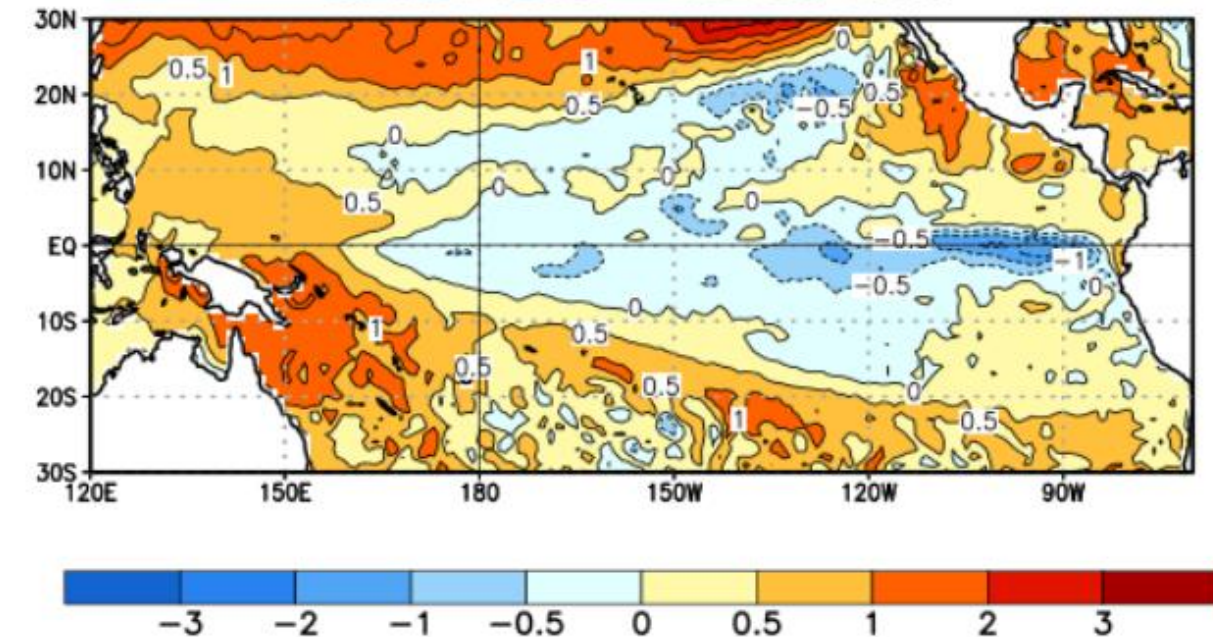
Better chances of going back to **Drier** weather around Great Lakes, slightly better chances for **Wetter** in northern Plains

El Niño-Southern Oscillation (ENSO) Outlooks

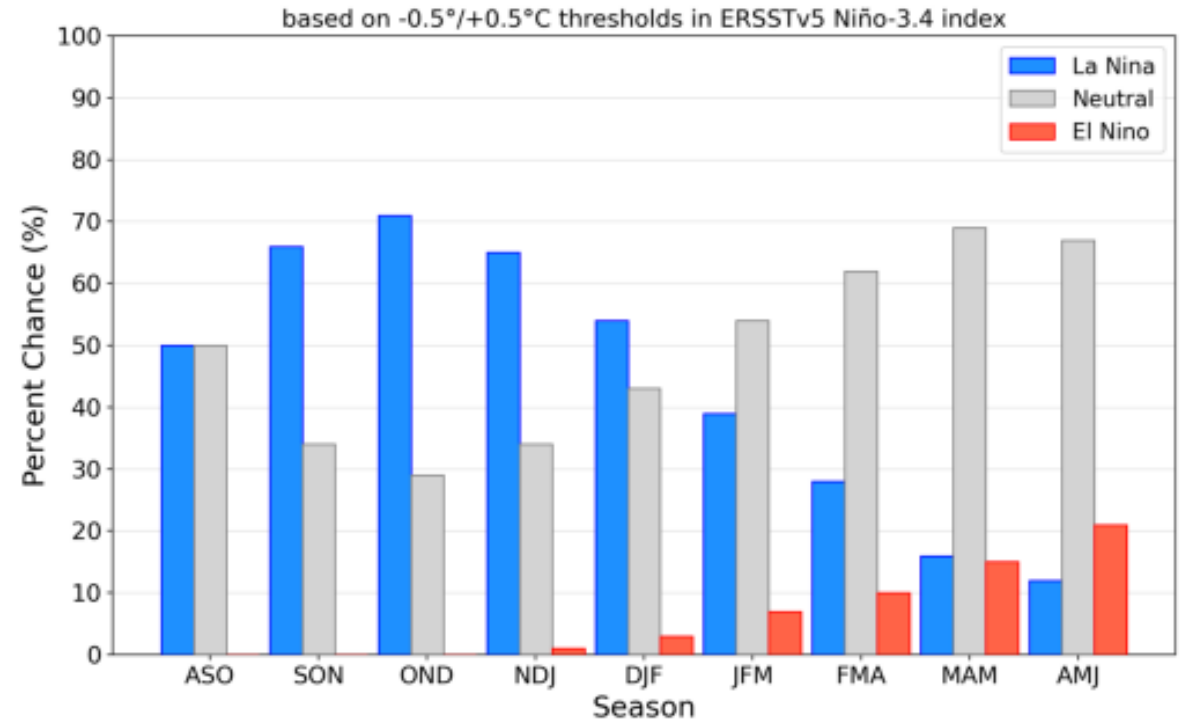
- We are in a La Niña watch
- > 70% likelihood of La Niña before end of the year

- Most models show weak to moderate La Niña
- Only slightly higher than 50/50 chance of persisting through winter

Average SST Anomalies
17 AUG 2025 – 13 SEP 2025



Official NOAA CPC ENSO Probabilities (issued September 2025)



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

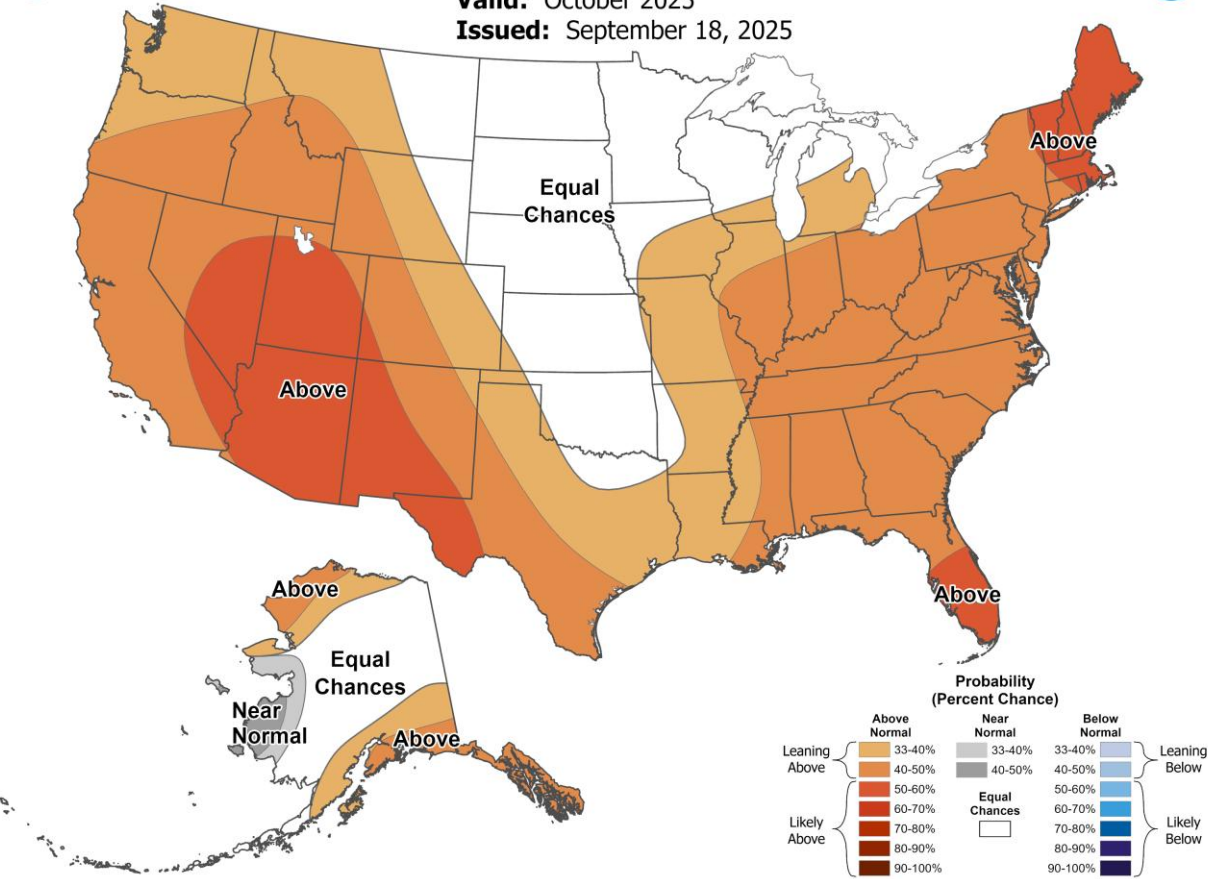
https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

October Outlooks

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

Monthly Temperature Outlook

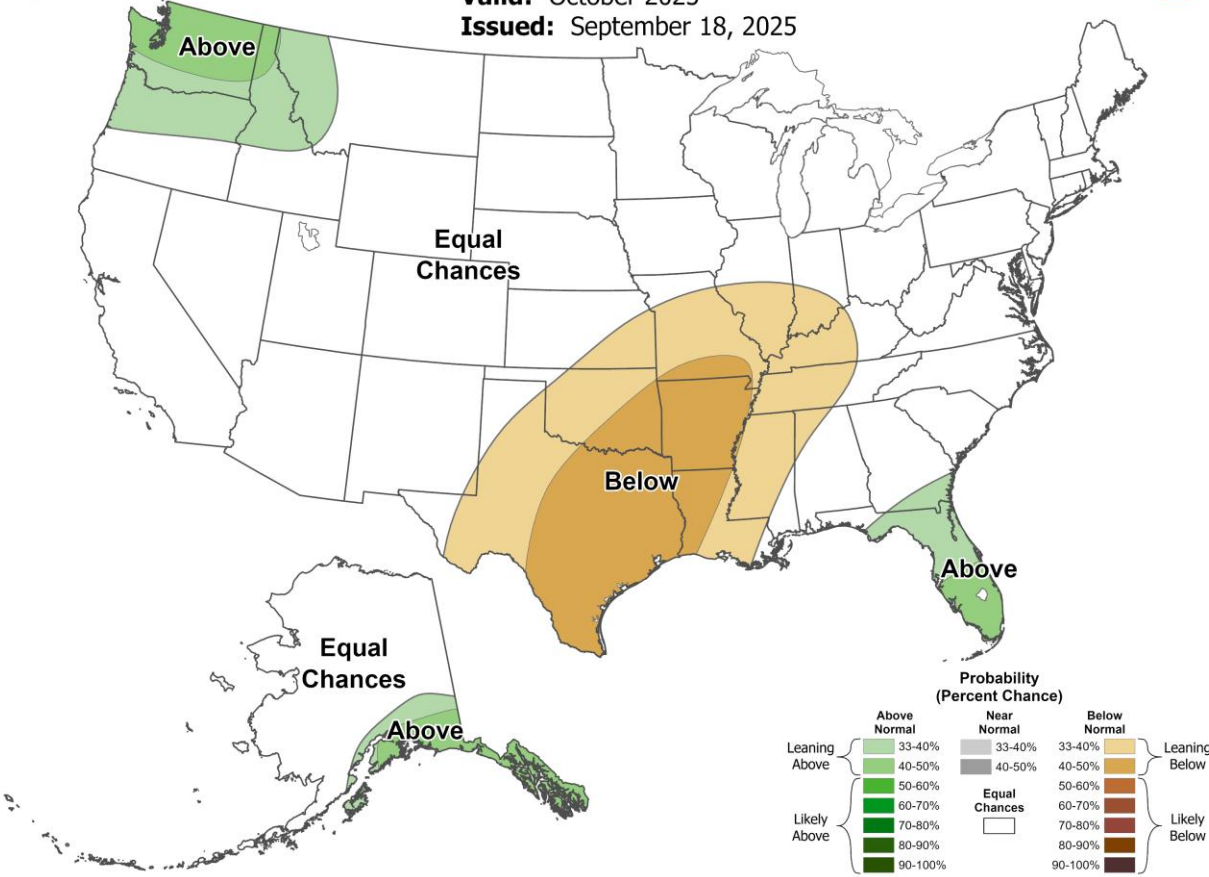
Valid: October 2025
Issued: September 18, 2025



Leaning **Warmer** than normal in eastern region,
no strong temperature signal west and north

Monthly Precipitation Outlook

Valid: October 2025
Issued: September 18, 2025



Weak **Drier** signal in MO and Ohio Valley,
equal chances north and west

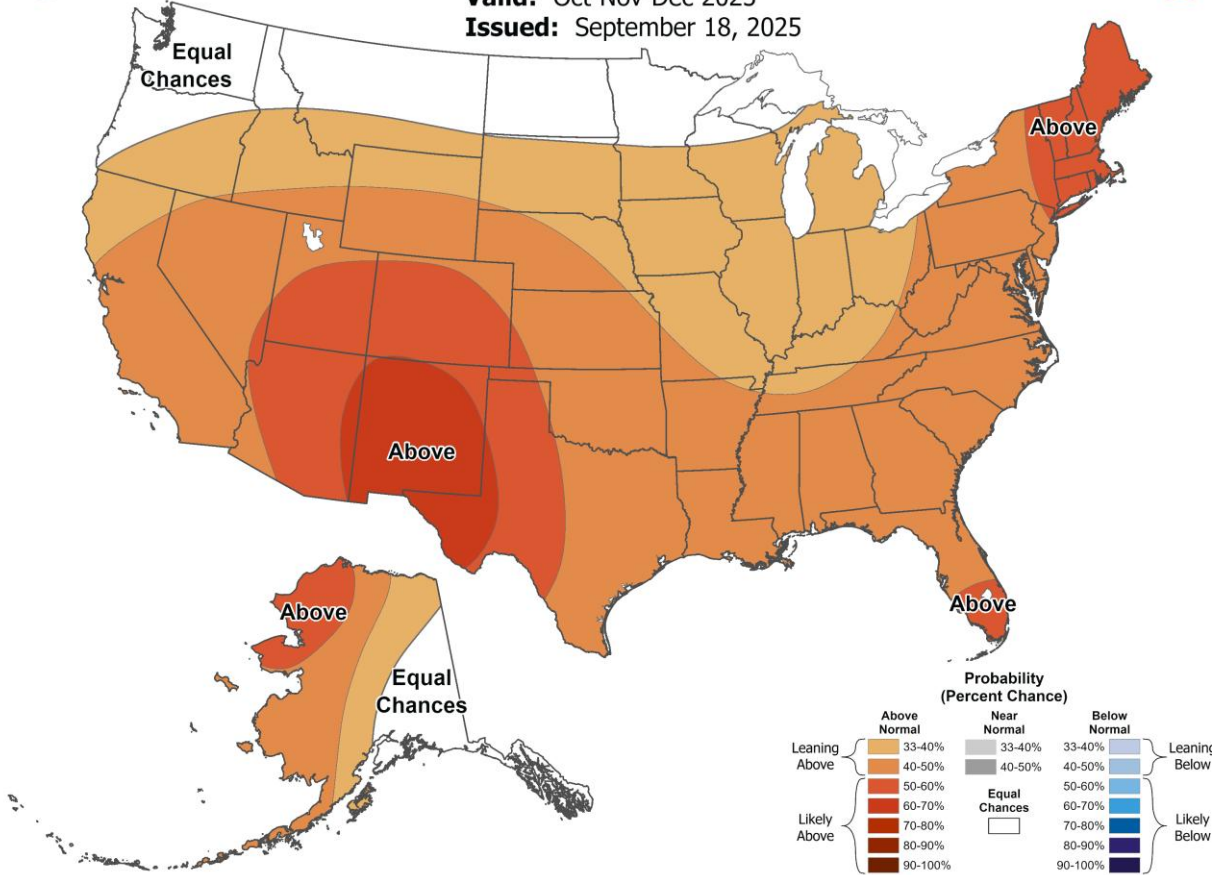


Season Outlooks: October – December <https://www.cpc.ncep.noaa.gov/>



Seasonal Temperature Outlook

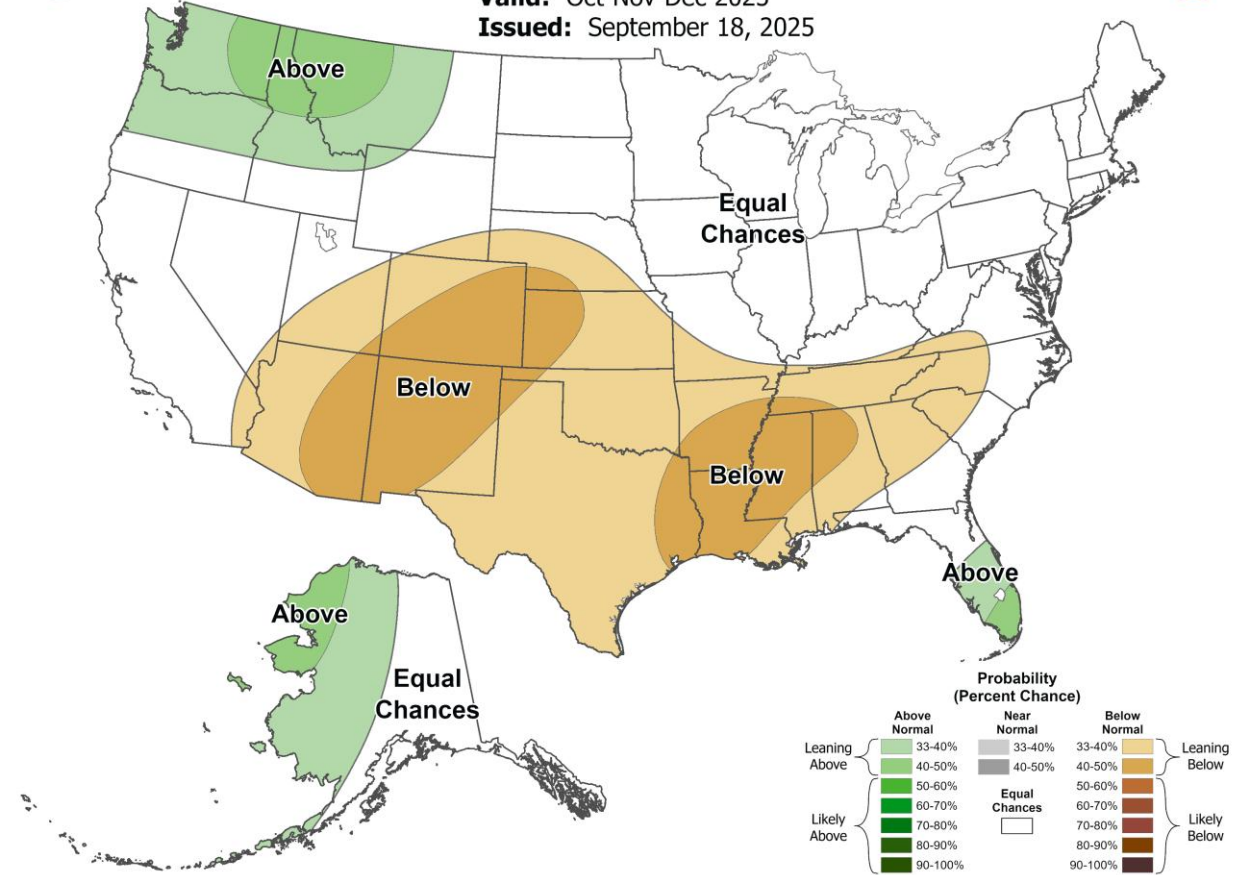
Valid: Oct-Nov-Dec 2025
Issued: September 18, 2025



Keeping **Warmer** in most of the region,
equal chances in far north

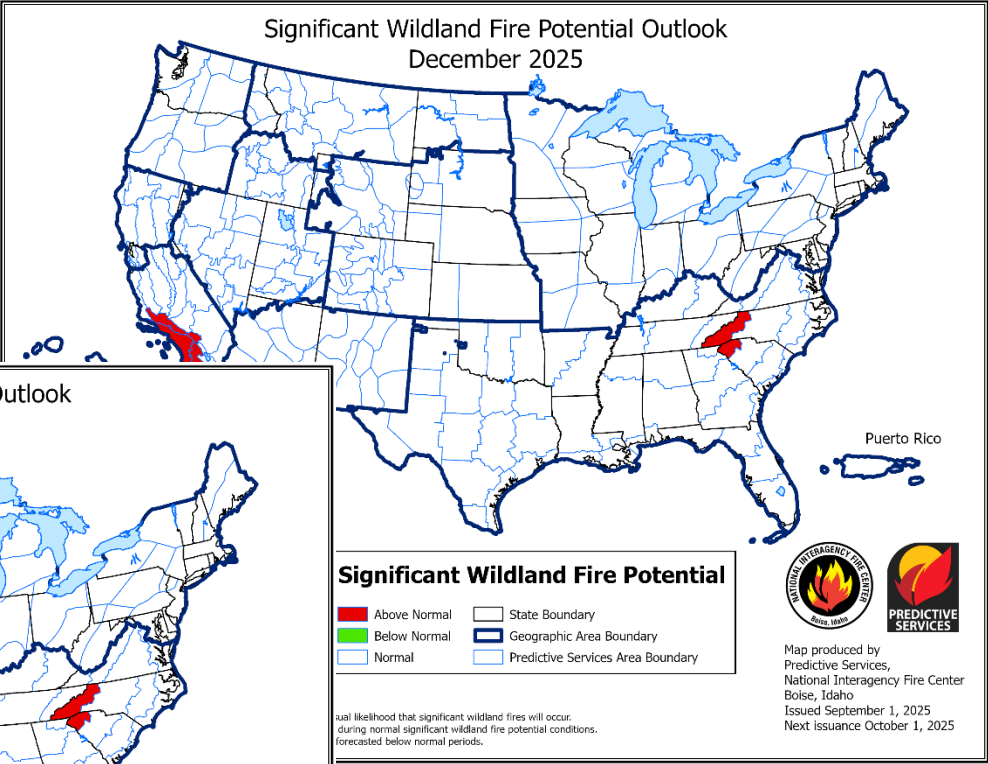
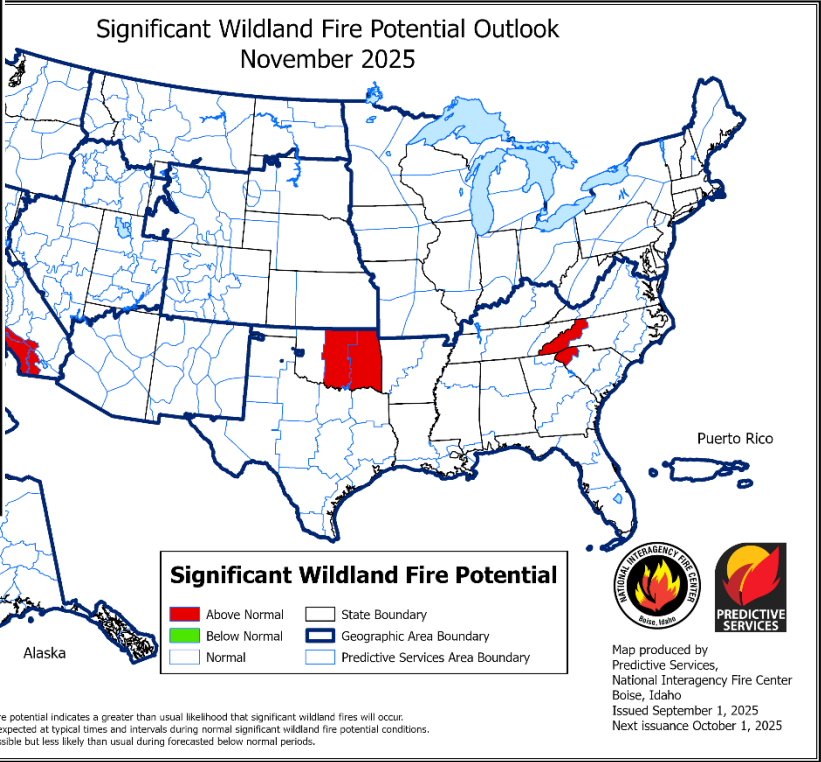
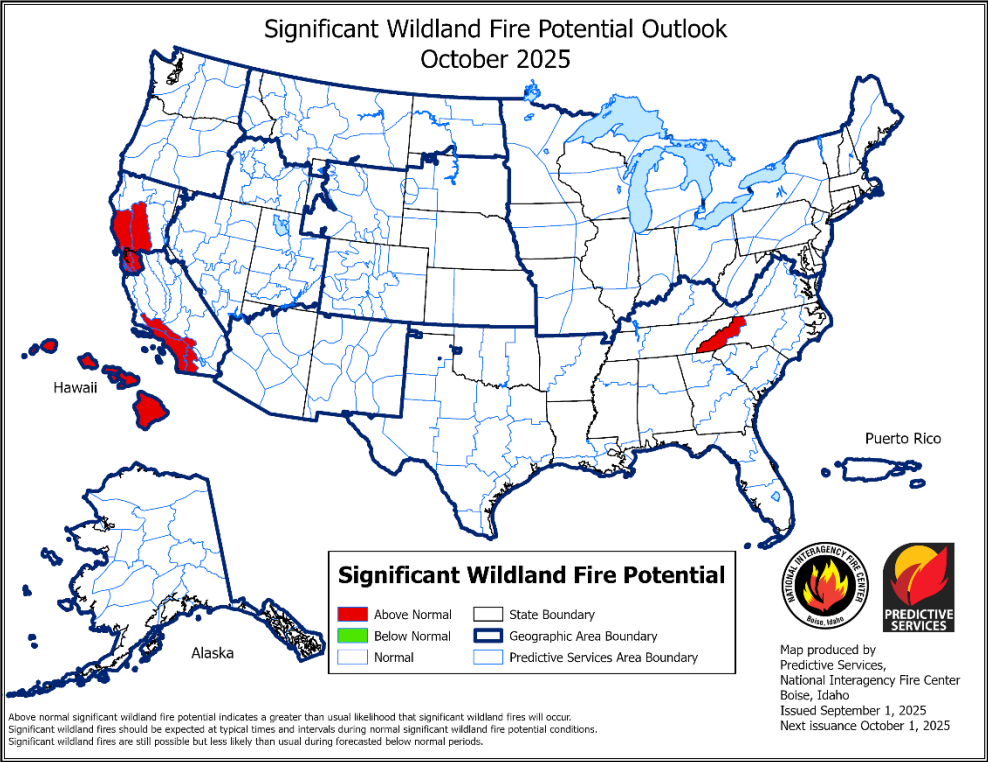
Seasonal Precipitation Outlook

Valid: Oct-Nov-Dec 2025
Issued: September 18, 2025



Slightly **Drier** far southwest, equal chances
for most, slightly **Wetter** in Montana

Wildland Fire Outlooks: Oct – Dec



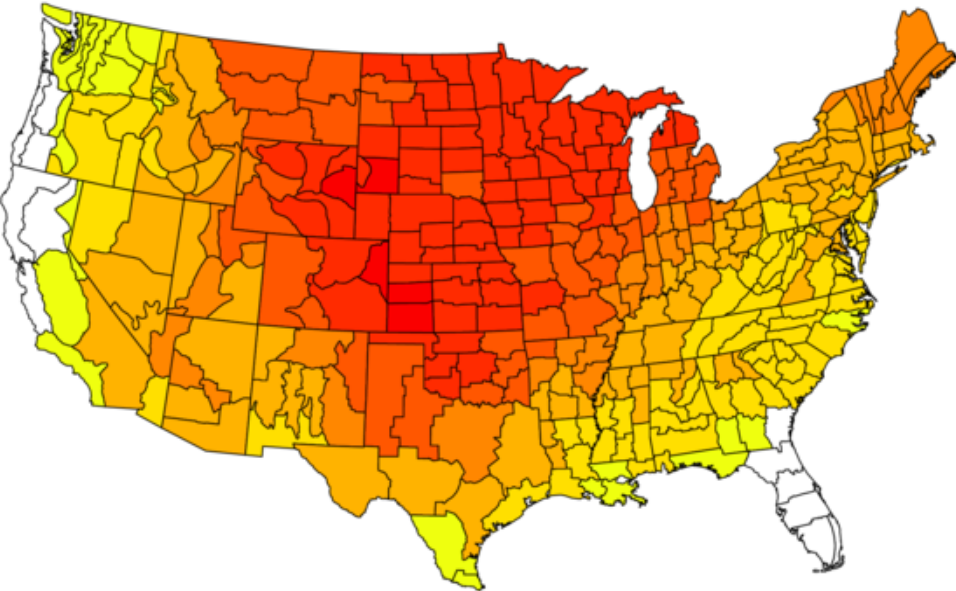
<https://www.nifc.gov/nicc/predictive-services/outlooks>



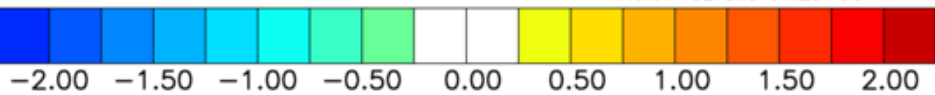
October – November Conditions in Past La Niña Events (Since 1990)

Temperature Anomalies

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Versus 1991–2020 Longterm Average
Oct to Nov 1995,1998,1999,2000,2005,2007,2008,2010,2016,2017
2020,2021,2022



NOAA PSL and CIRES-CU



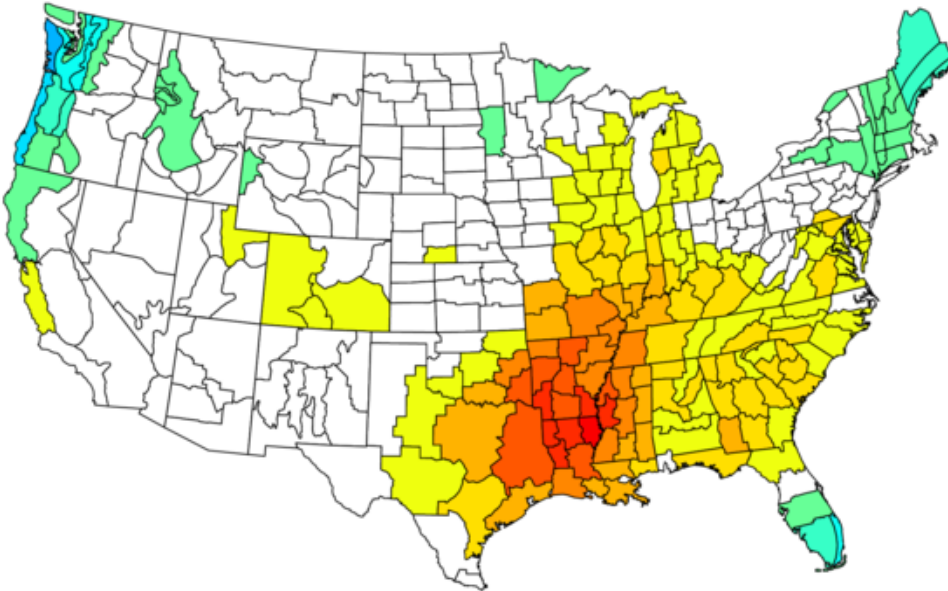
<https://psl.noaa.gov/data/usclimdivs/>

Not Forecast

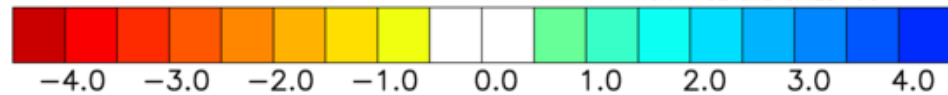
Average anomalies in
past events lean
Warmer in the central
US; a bit **Drier** in MS
Basin and lower OH
Basin

Precipitation Anomalies

NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
Versus 1991–2020 Longterm Average
Oct to Nov 1995,1998,1999,2000,2005,2007,2008,2010,2016,2017
2020,2021,2022



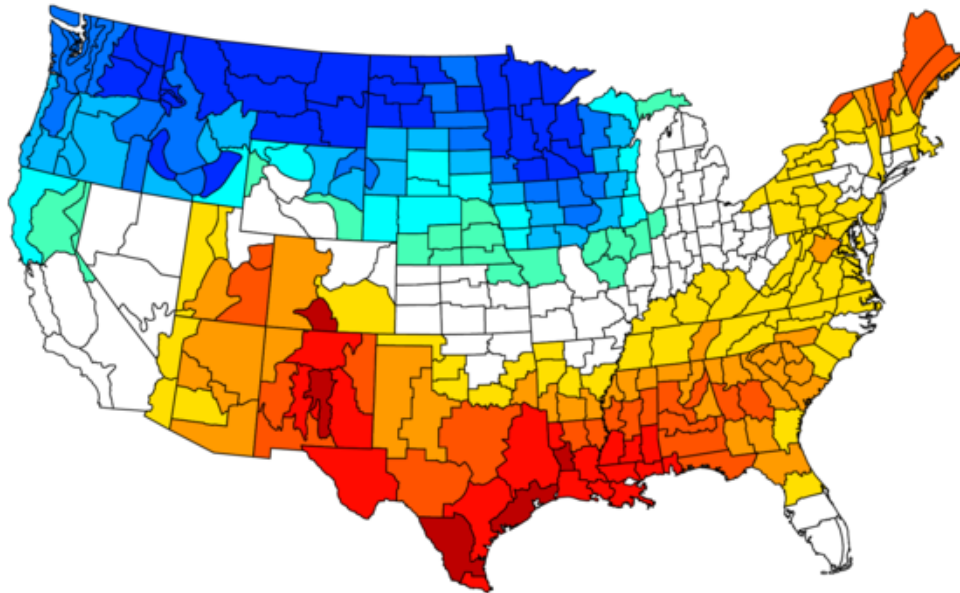
NOAA PSL and CIRES-CU



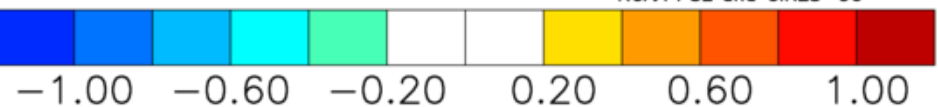
December – February Conditions in Past La Niña Events (Since 1990)

Temperature Anomalies

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Versus 1991–2020 Longterm Average
Dec to Feb 1995–96,1998–99,1999–00,2000–01,2005–06,2007–08,2008–09,2010–11
2016–17,2017–18,2020–21,2021–22,2022–23,



NOAA PSL and CIRES-CU

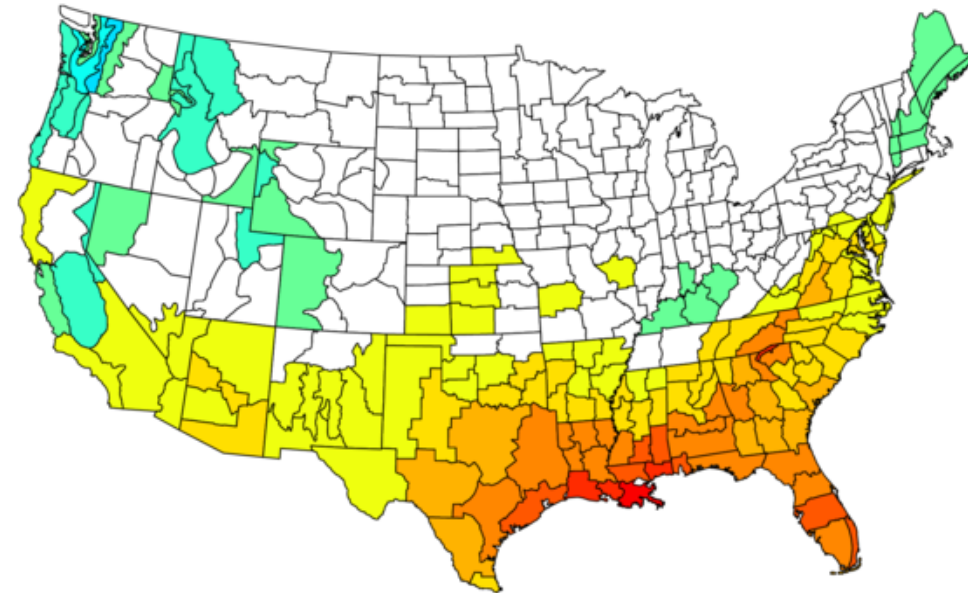


Not Forecast

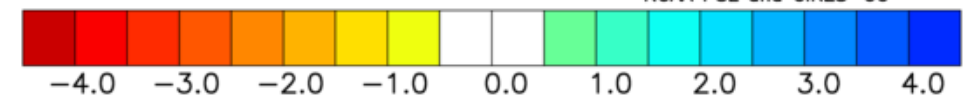
Average anomalies in
past events lean **Cooler**
in the northwest
region; a bit **Wetter** in
lower OH Basin

Precipitation Anomalies

NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
Versus 1991–2020 Longterm Average
Dec to Feb 1995–96,1998–99,1999–00,2000–01,2005–06,2007–08,2008–09,2010–11
2016–17,2017–18,2020–21,2021–22,2022–23,



NOAA PSL and CIRES-CU



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

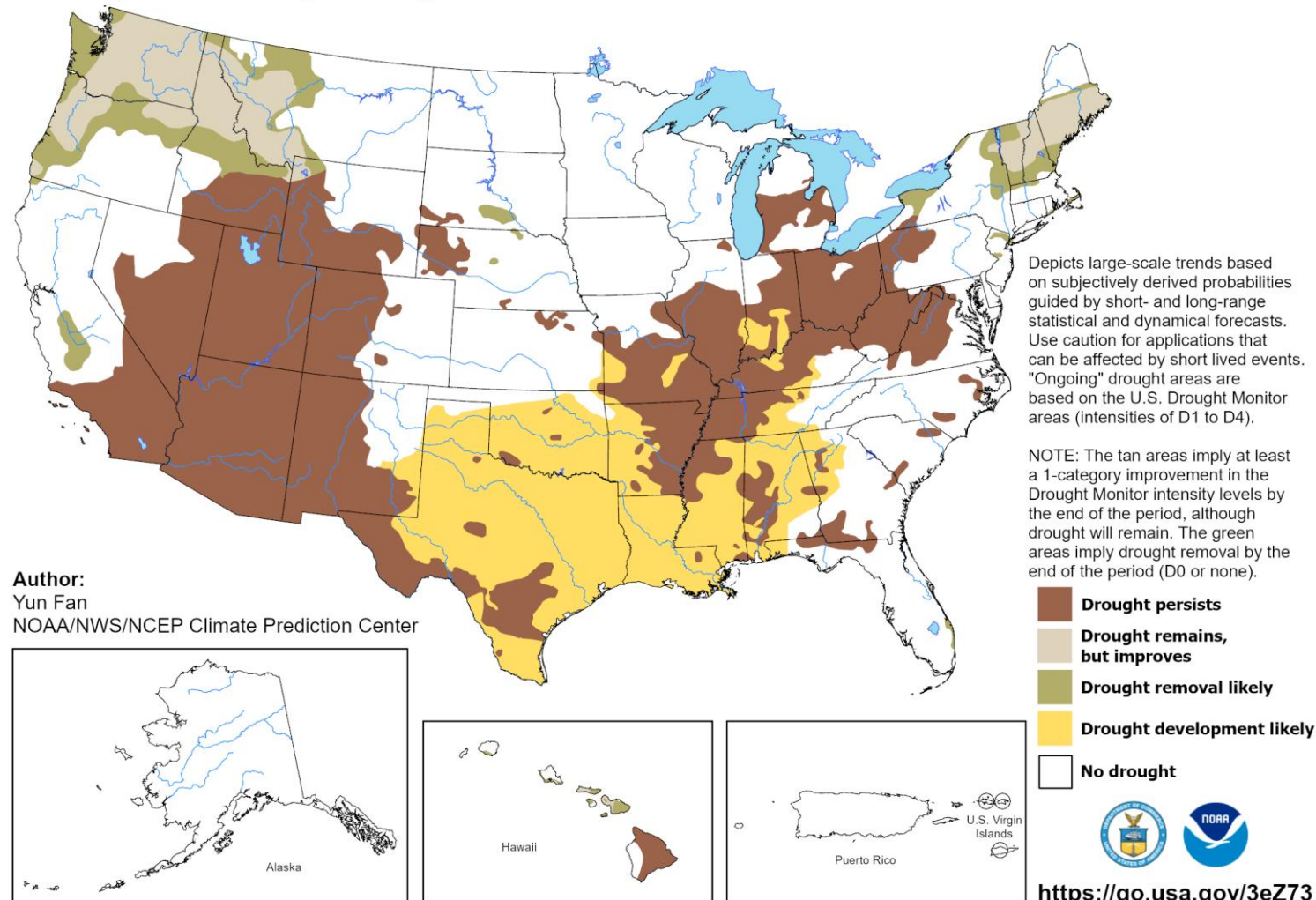
Drought Outlook – October through December

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for September 18 - December 31, 2025
Released September 18, 2025

Following 1- and 3-month Outlooks:

- Drought persistence from MO to OH
- Drought not expected in Upper Midwest or northern Plains



Summary

Current Conditions

- Extremely dry August in eastern and southern Midwest has left much of the eastern corn belt in moderate to severe drought
- Very wet conditions in Dakotas and parts of Minnesota have caused episodic flooding
- Harvest will likely progress quickly in much of the region, but very high field fire risk in eastern corn belt
- Pasture problems (again) – continued stress for livestock producers in MO, IL, IN, and OH
- Low levels on Ohio River for a 4th consecutive fall... not going to get better soon, could affect MS flow south of Cairo
- Early (and diminished) fall color and senescence in drought areas... want to watch lagged stress in young trees

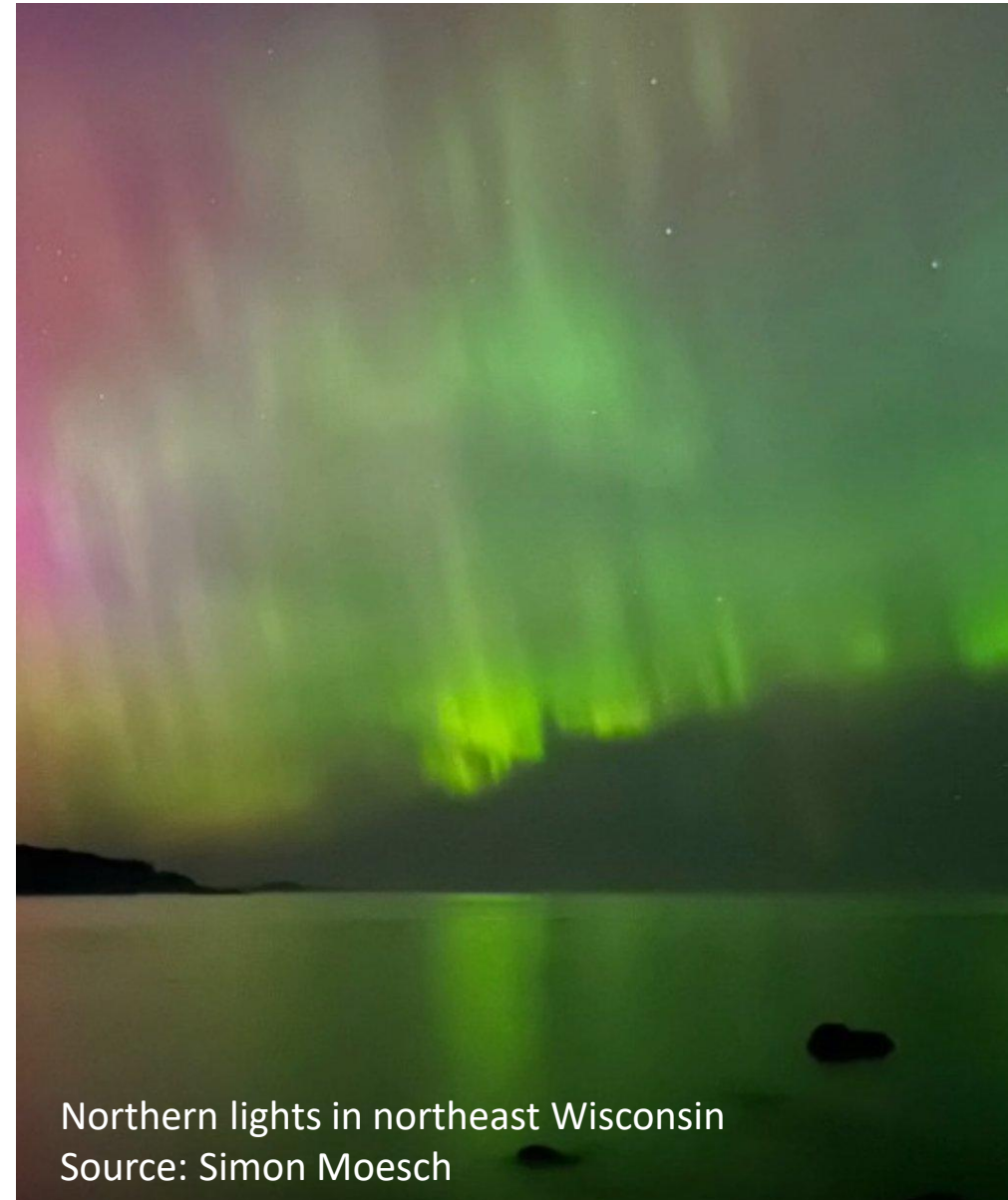
Outlooks

- Best rain chances in weeks over the next 7-days from Missouri to Ohio
- Outlooks lean dry for last week of the month, not really a strong October precipitation signal
- Outlooks continue to show above normal temperature for most of the region (especially east) in October and thru December
- La Niña is expected to form before end of the year, likely going to be weak-to-moderate, may persist thru winter



Further Information – Partners

- Today's & Past Recorded Presentations at:
 - <https://mrcc.purdue.edu/webinars>
 - <https://hprcc.unl.edu/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>



Northern lights in northeast Wisconsin
Source: Simon Moesch

Thank You, Questions?

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Average Date of First Fall Freeze (32°F)

