# Missouri Drought Update and Growing Season Outlook

March 29, 2024

*2024 AG Lender Webinars: Crop Markets and Weather Outlook*

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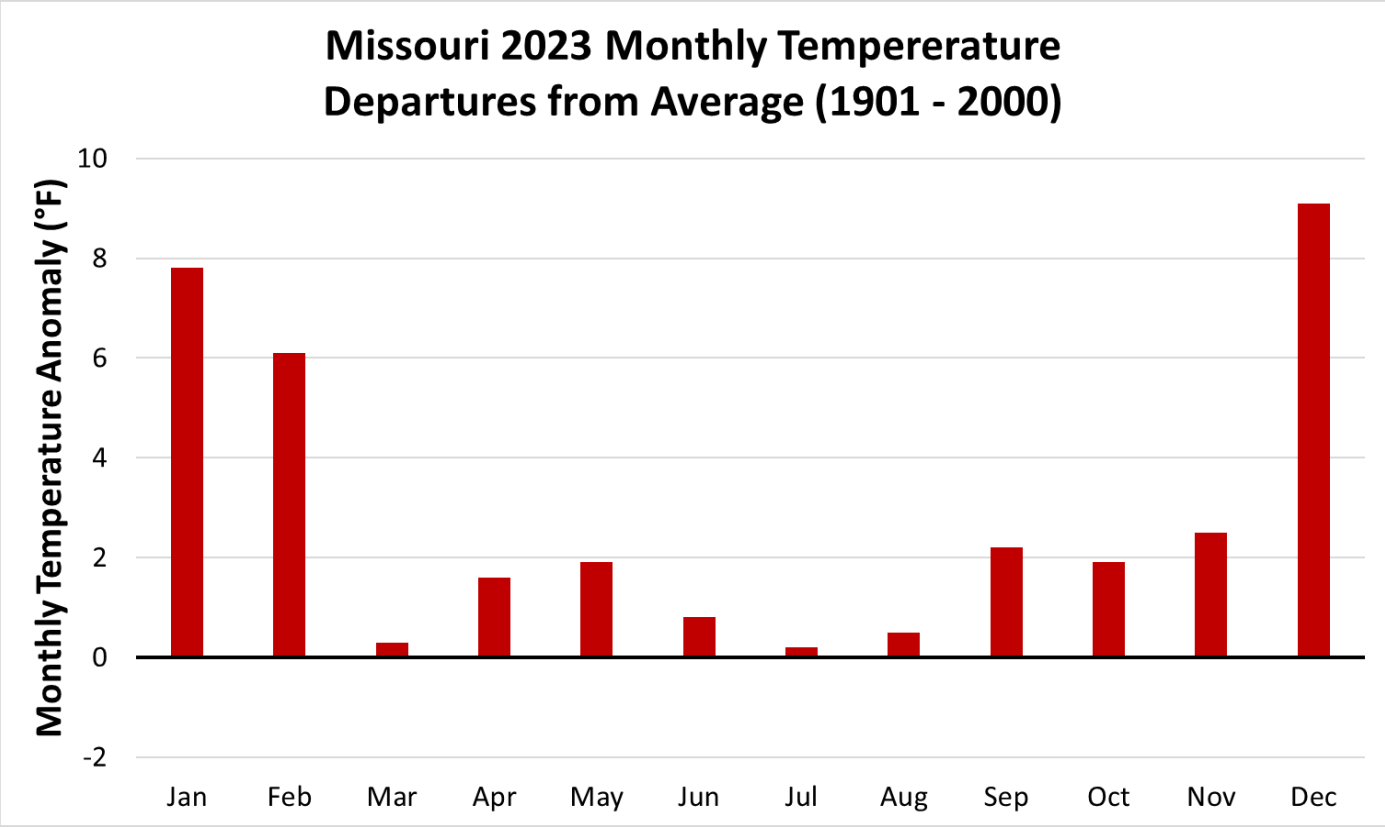
UNIVERSITY OF MISSOURI Extension

Missouri Climate Center

MISSOURI WATER CENTER

# 2023 Climate Summary: Warm and Dry Year for Missouri




- Missouri's statewide average temperature during 2023 was 57.4°F (+ 2.9°F)
- This tied 2016 for Missouri's third warmest year on record
- All twelve months featured above normal monthly temperatures
- Howell and Oregon county recorded their warmest year on record
- More information: https://extension.missouri.edu/news/2023-was-likely-earths-warmest-year-on-record-missouris-third

*Ranks based on data from 1895 to 2023 (129 years)* https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/

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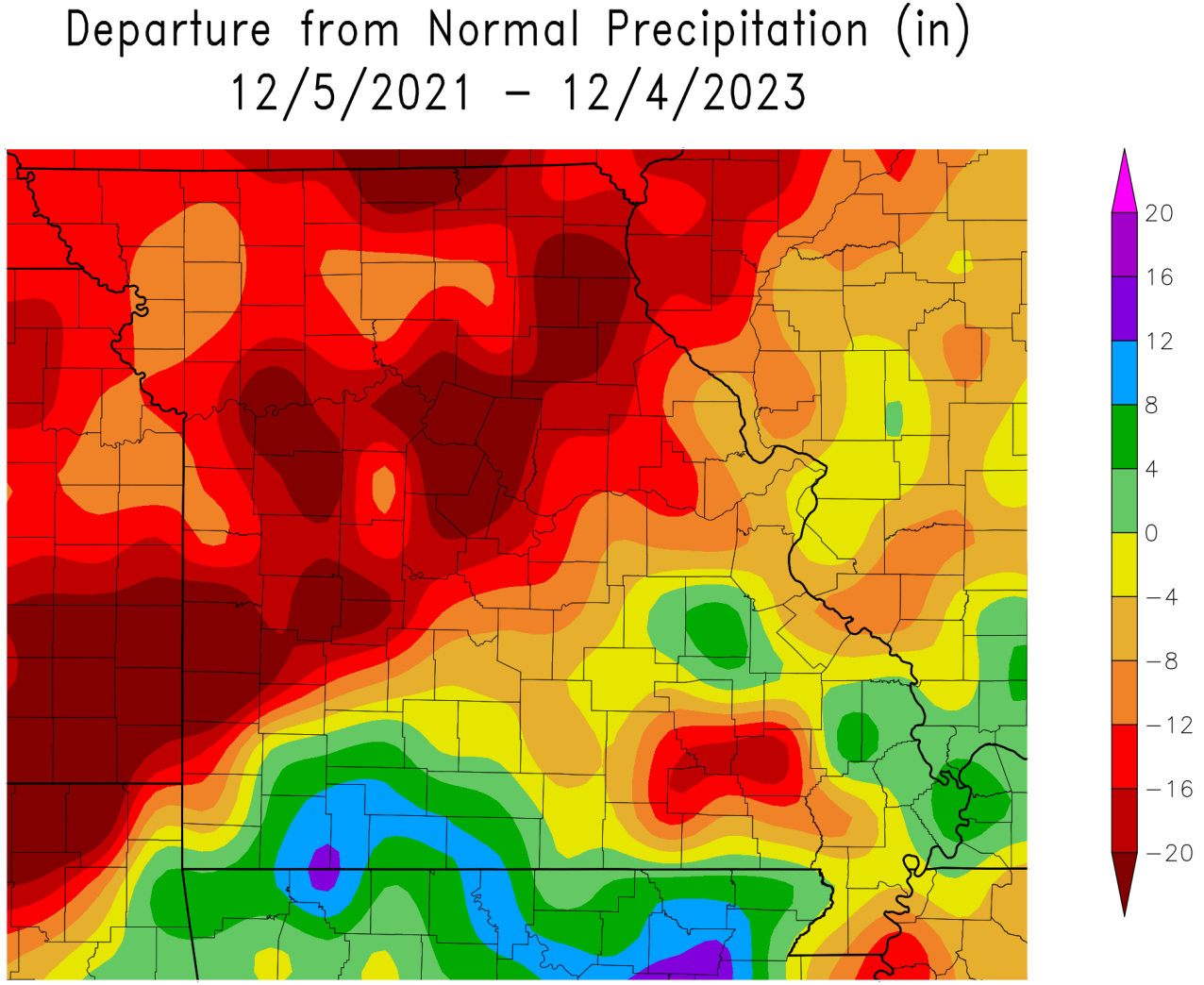


https://hprcc.unl.edu/maps.php?map=ACISClimateMaps

# 2023 Climate Summary: Warm and Dry Year for Missouri

- ***Missouri's 7th driest April – November period (- 8.15") going back to 1895***

- *The 2023 drought is* ***a one-in-20-year drought event*** *(return period = 18.4 years)*

**Missouri Precipitation**

*April-November*

| Period | Precipitation | Rank (out of 129) | Anomaly *1901-2000 Mean: 30.86 in* |
|---|---|---|---|
| April -November 1901 | 15.66" | 1 | -15.20" |
| April -November 1953 | 16.32" | 2 | -14.54" |
| April -November 1980 | 20.72" | 3 | -10.14" |
| April -November 2012 | 21.58" | 4 | -9.28" |
| April -November 1976 | 21.77" | 5 | -9.09" |
| April -November 1930 | 22.63" | 6 | -8.23" |
| April -November 2023 | 22.71" | 7 | -8.15" |
| April -November 1936 | 22.78" | 8 | -8.08" |
| April -November 1897 | 22.81" | 9 | -8.05" |
| April -November 1963 | 23.20" | 10 | -7.66" |

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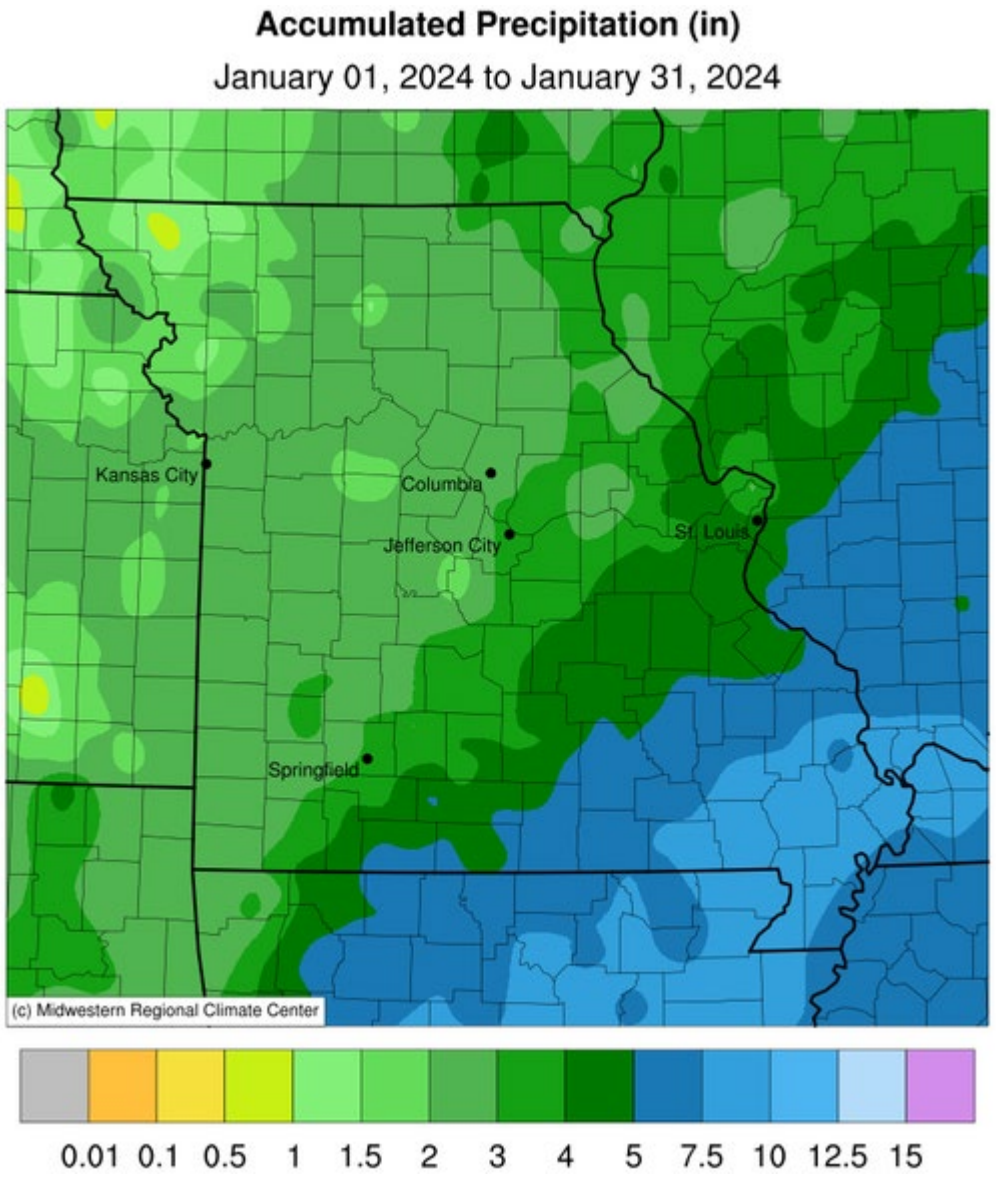
# January 2024 Summary: Cold and Wet for Missouri




- Missouri's statewide average temperature during January 2024 was 27.9°F (- 1.5°F)
- January was the first month with below normal monthly average temperatures in 14 months, going back to October of 2022
- Missouri's statewide average precipitation in January was 3.51" (+ 1.42")
- Missouri's 14th wettest January on record!

*Ranks based on data from 1895 to 2023 (129 years)*

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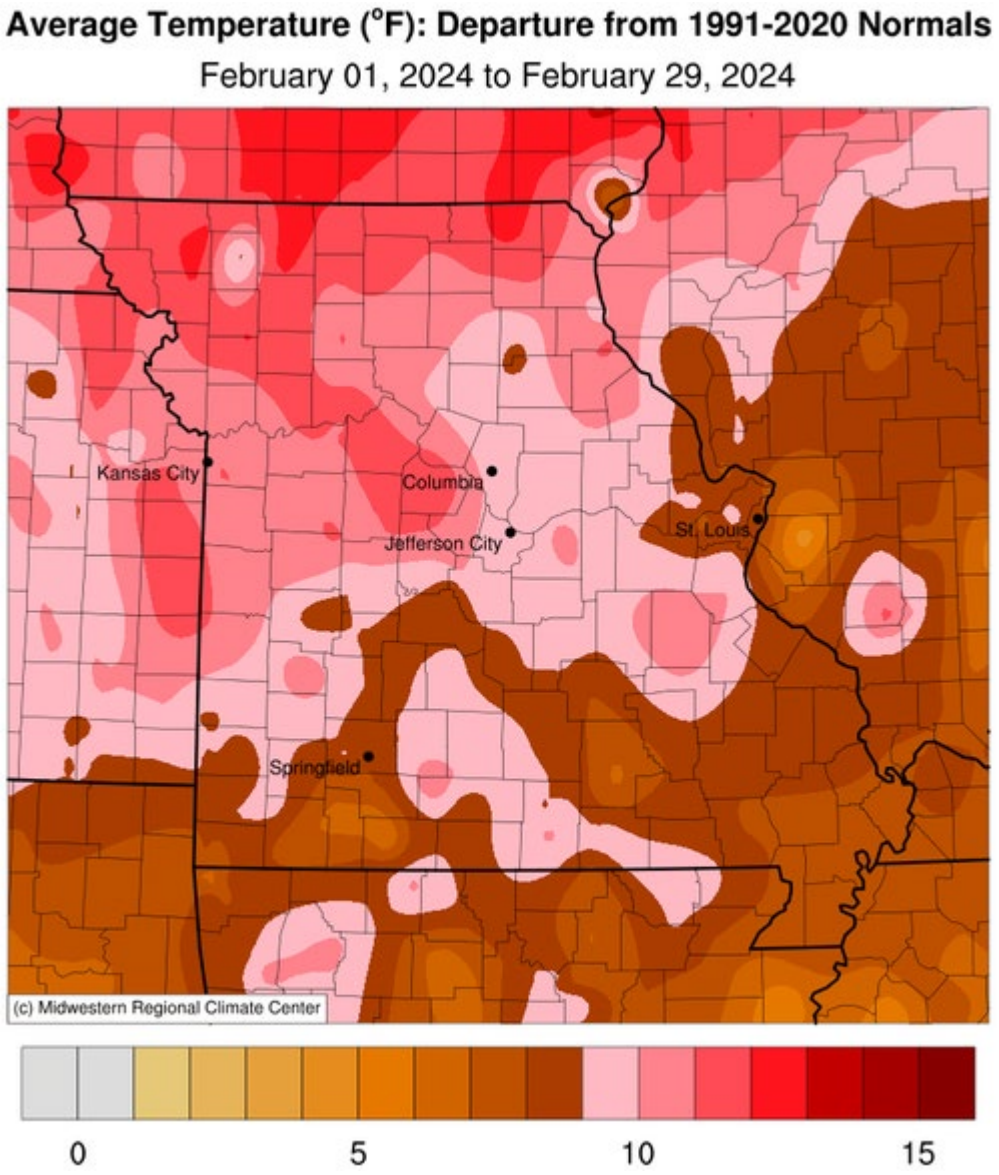
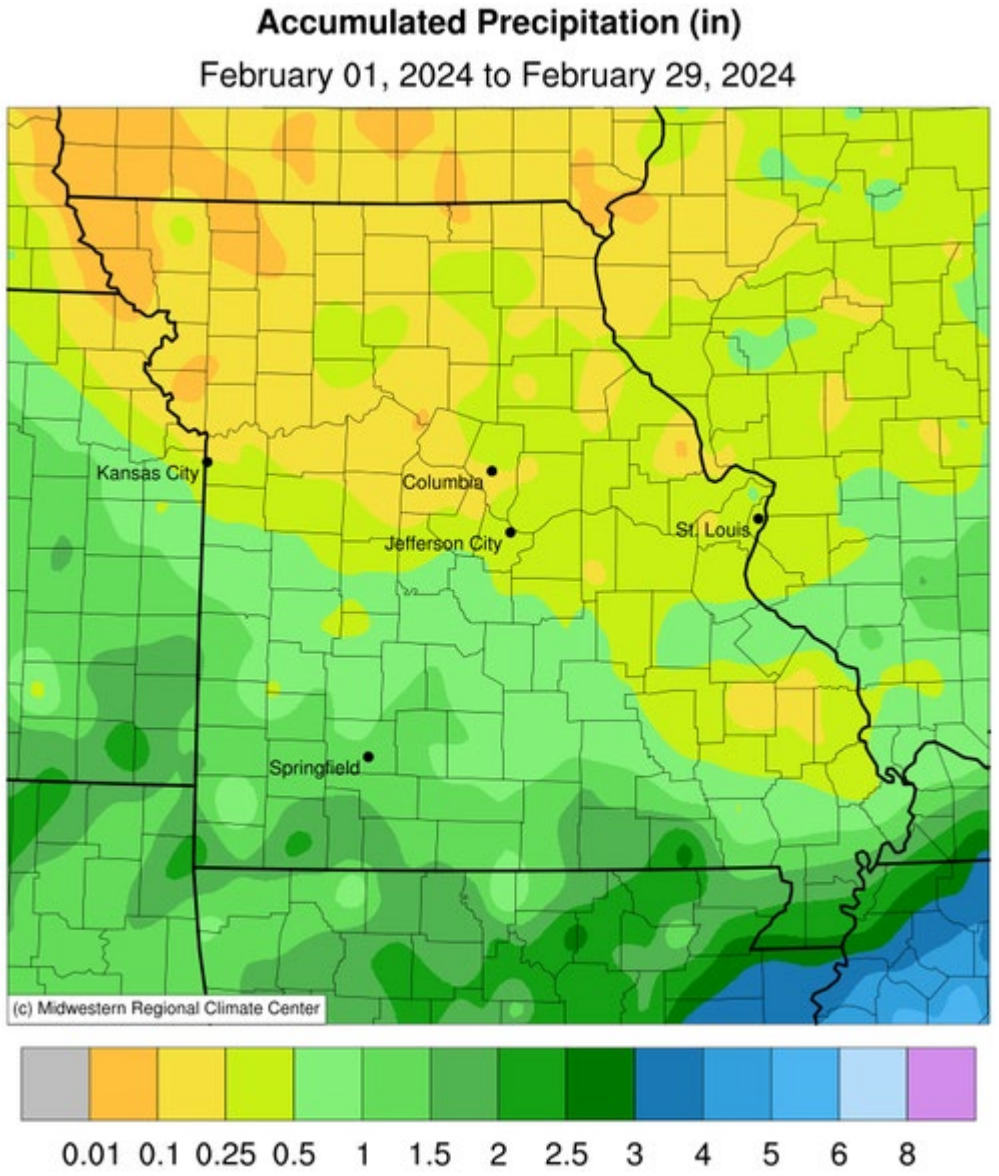
# February 2024 Summary: Warm and Dry for Missouri




- Missouri's statewide average temperature during February 2024 was 45.9°F (+ 12.1°F)
- February's monthly temperature was also 2.3°F higher than the March average
- 2024 was Missouri's warmest February on record (back to 1895)

https://mrcc.purdue.edu/CLIMATE/

# February 2024 Summary: Warm and Dry for Missouri




- Missouri's statewide average precipitation during February 2024 was 0.61" (-1.41")
- 2024 was Missouri's 9th driest February on record (back to 1895)
- Saline, Randolph, and Scotland counties recorded their driest February on record

https://mrcc.purdue.edu/CLIMATE/

# March Month-to-Date Summary

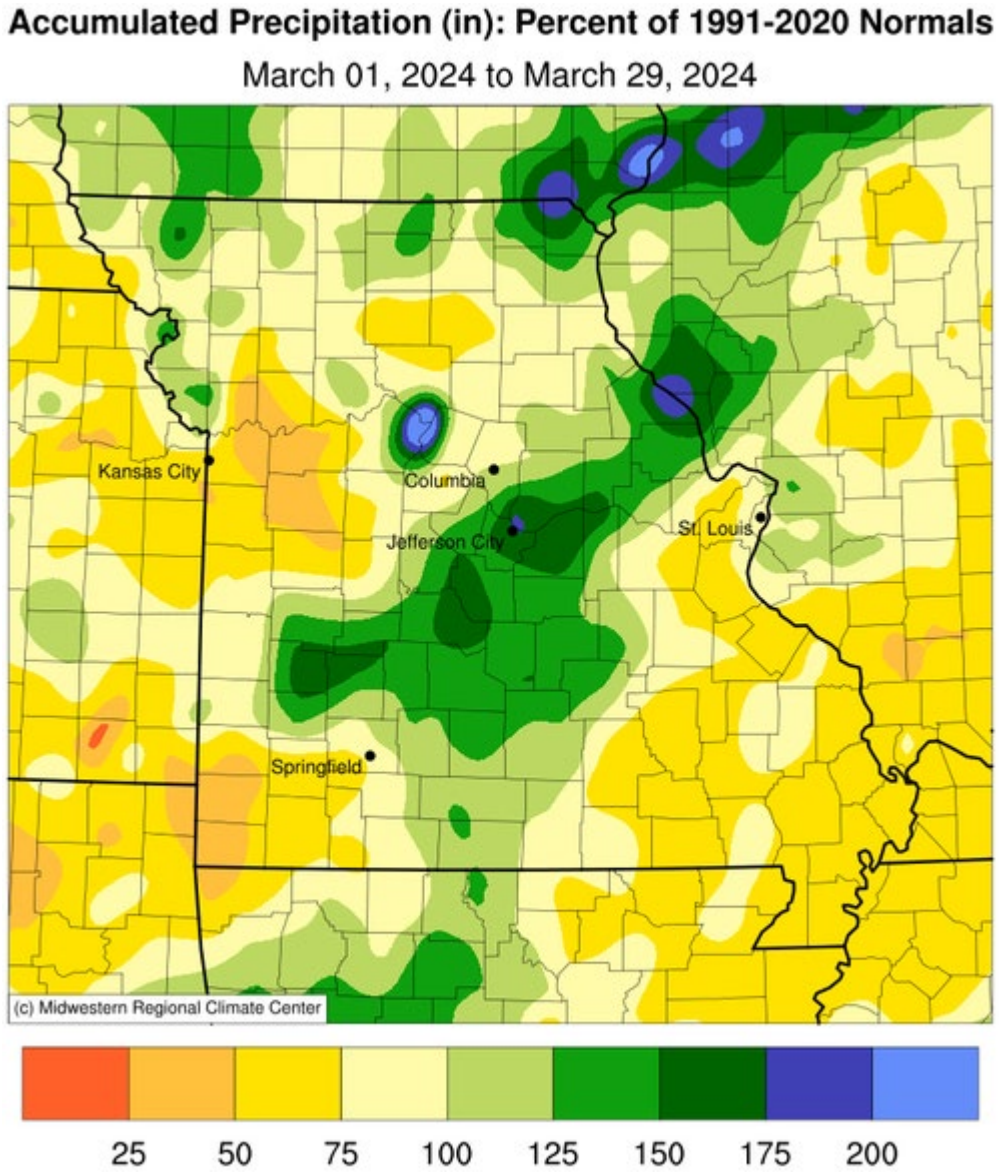
Kansas City
- Temperature + 3.7°F above normal
- Precipitation - 0.32” below normal

St. Louis
- Temperature + 6.4°F above normal
- Precipitation - 0.81” below normal

Springfield
- Temperature + 3.9°F above normal
- Precipitation - 0.81” below normal

Columbia
- Temperature + 4.5°F above normal
- Precipitation + 0.67” above normal

Cape Girardeau
- Temperature + 4.0°F above normal
- Precipitation - 1.86” below normal

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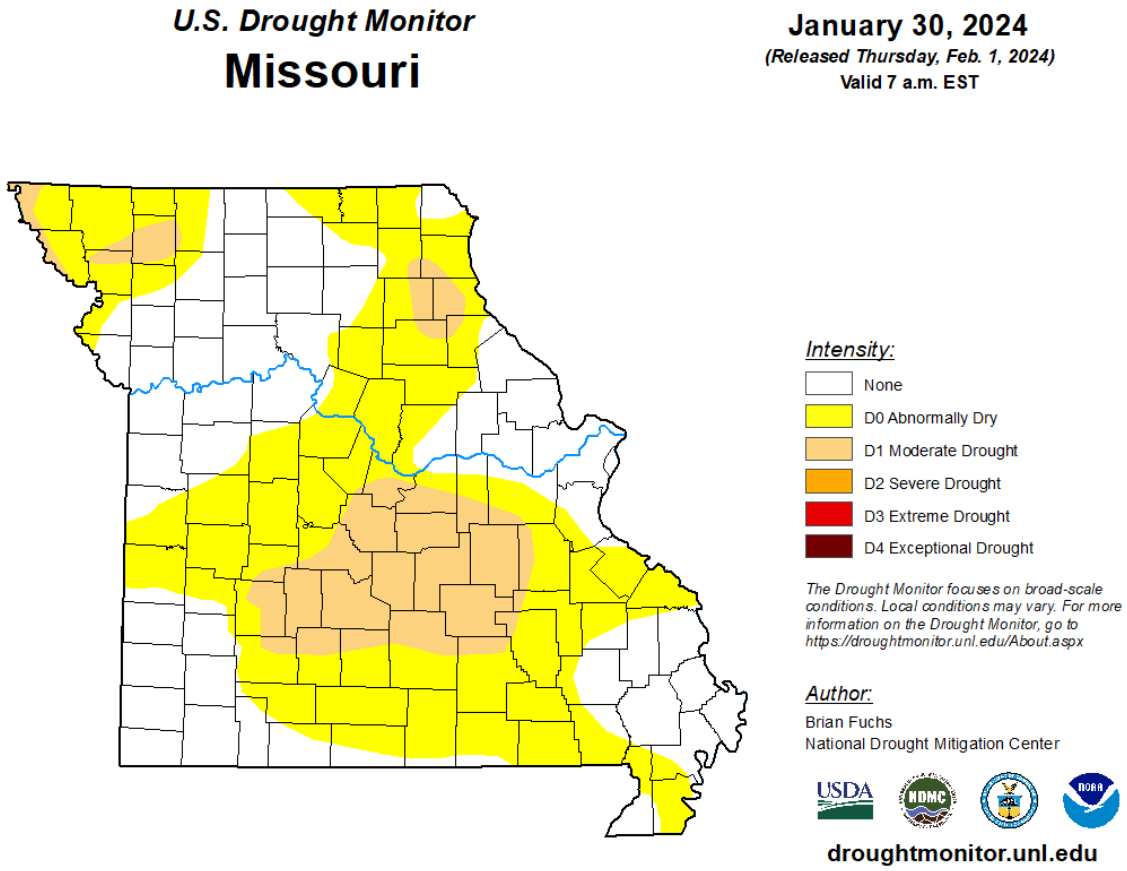
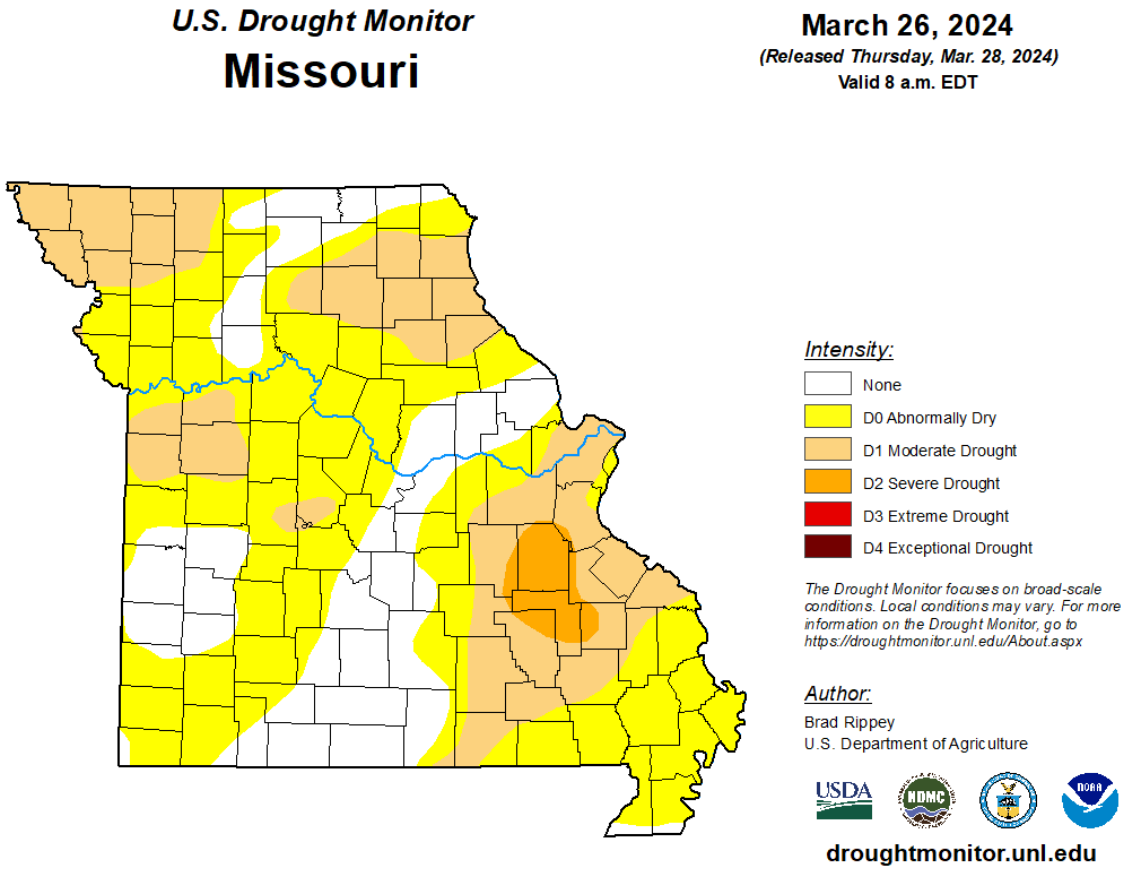
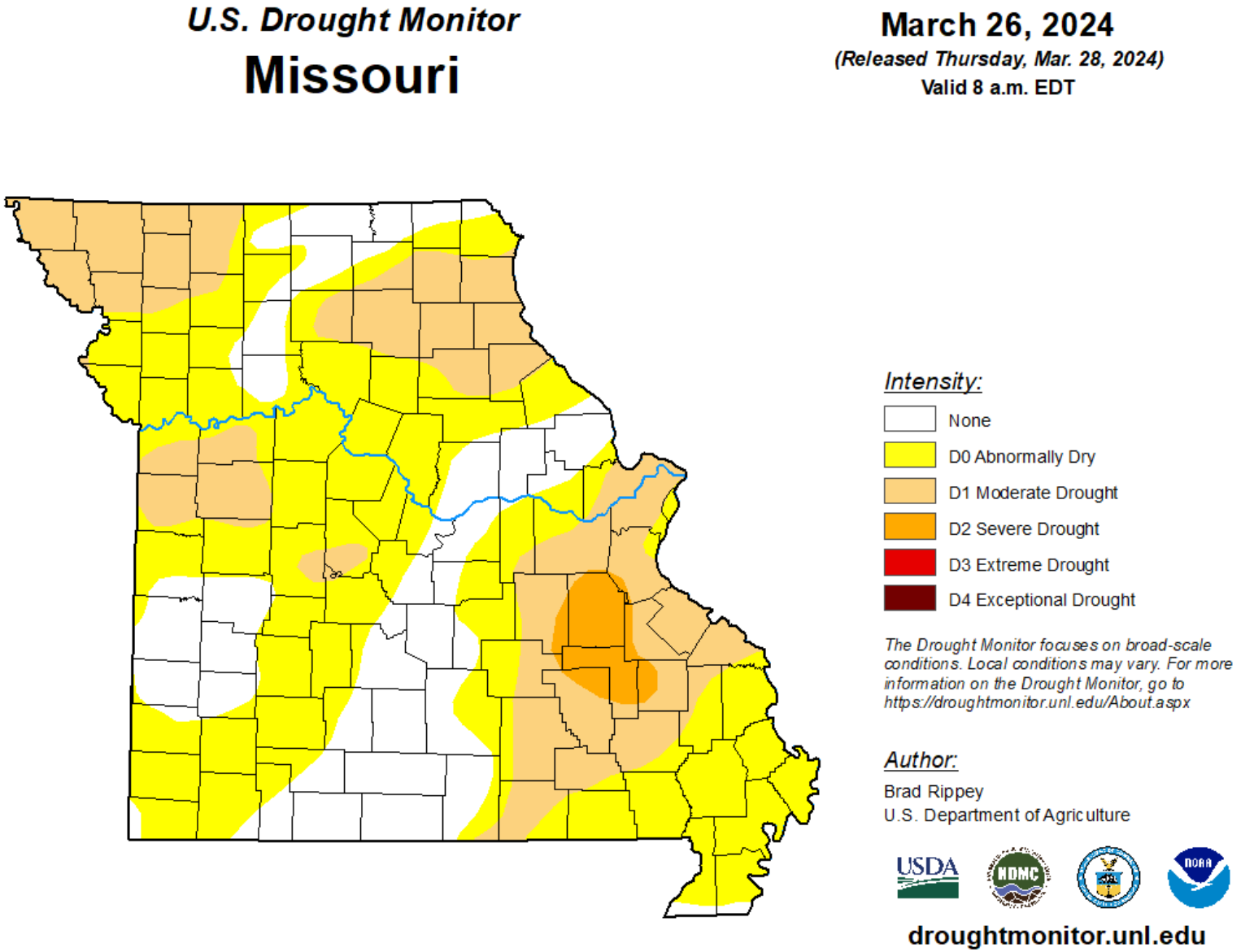
# January 2024 Summary: Cold and Wet for Missouri




https://droughtmonitor.unl.edu/

# Drought Update: March 2024



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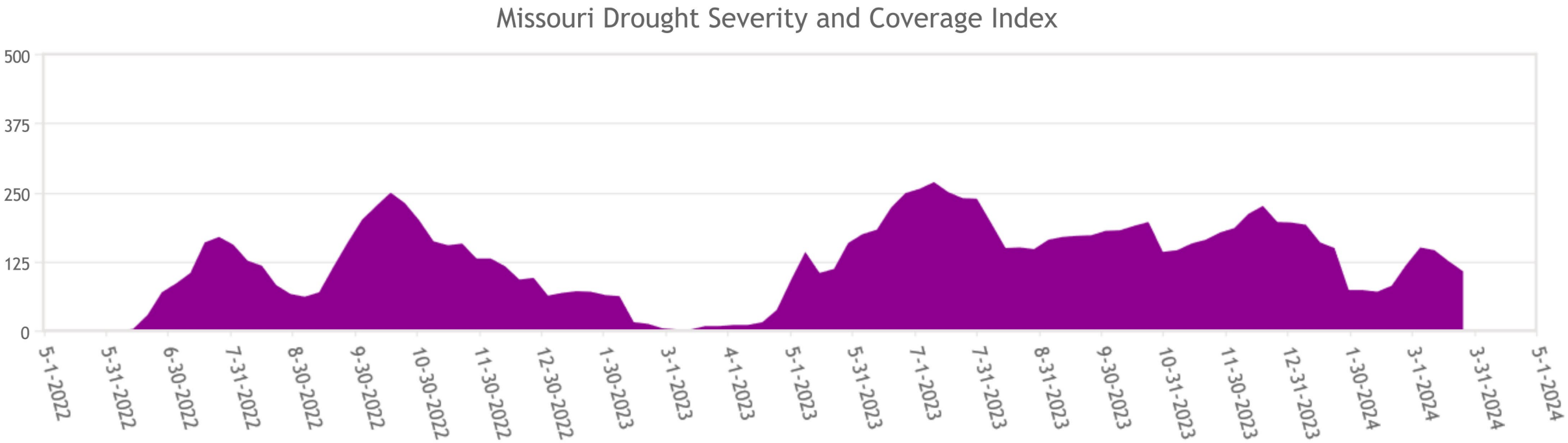
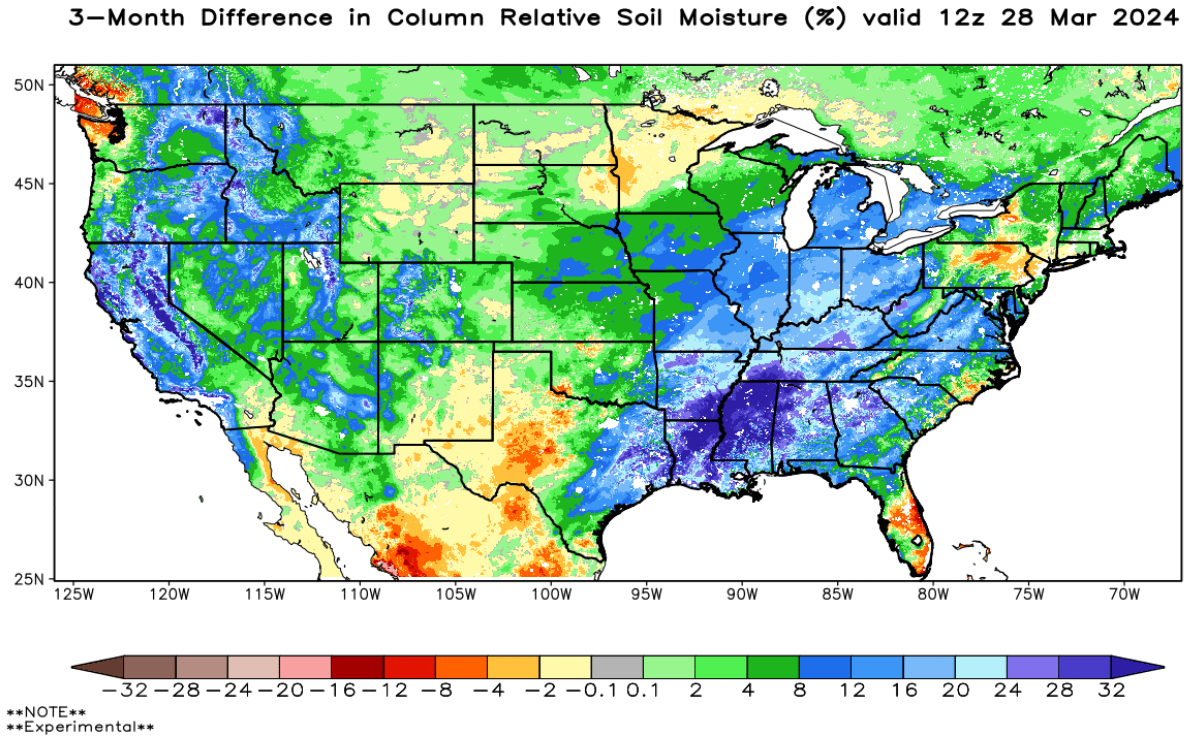


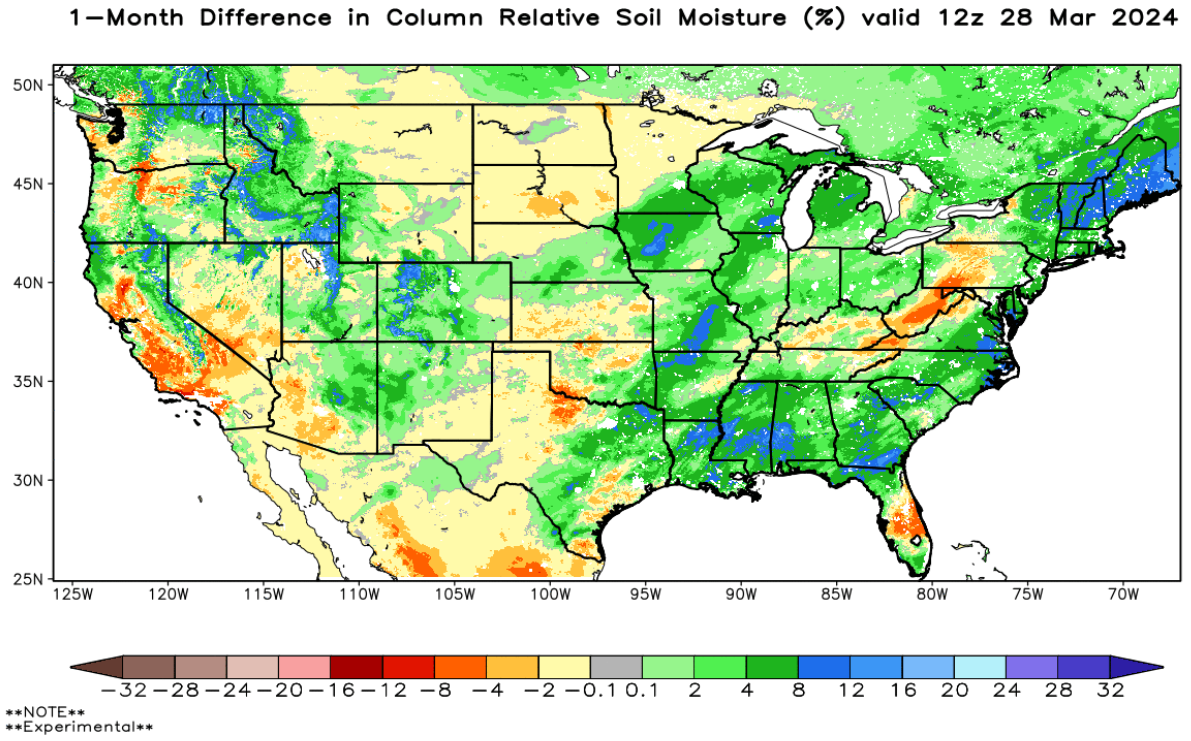

From the U.S. Drought Monitor website, https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx, 3-29-2024

*Current DSCI:* ***108***

*DSCI one year ago:* ***9 (3/28/23)***

# Drought Update: March 2024




https://weather.ndc.nasa.gov/sport/

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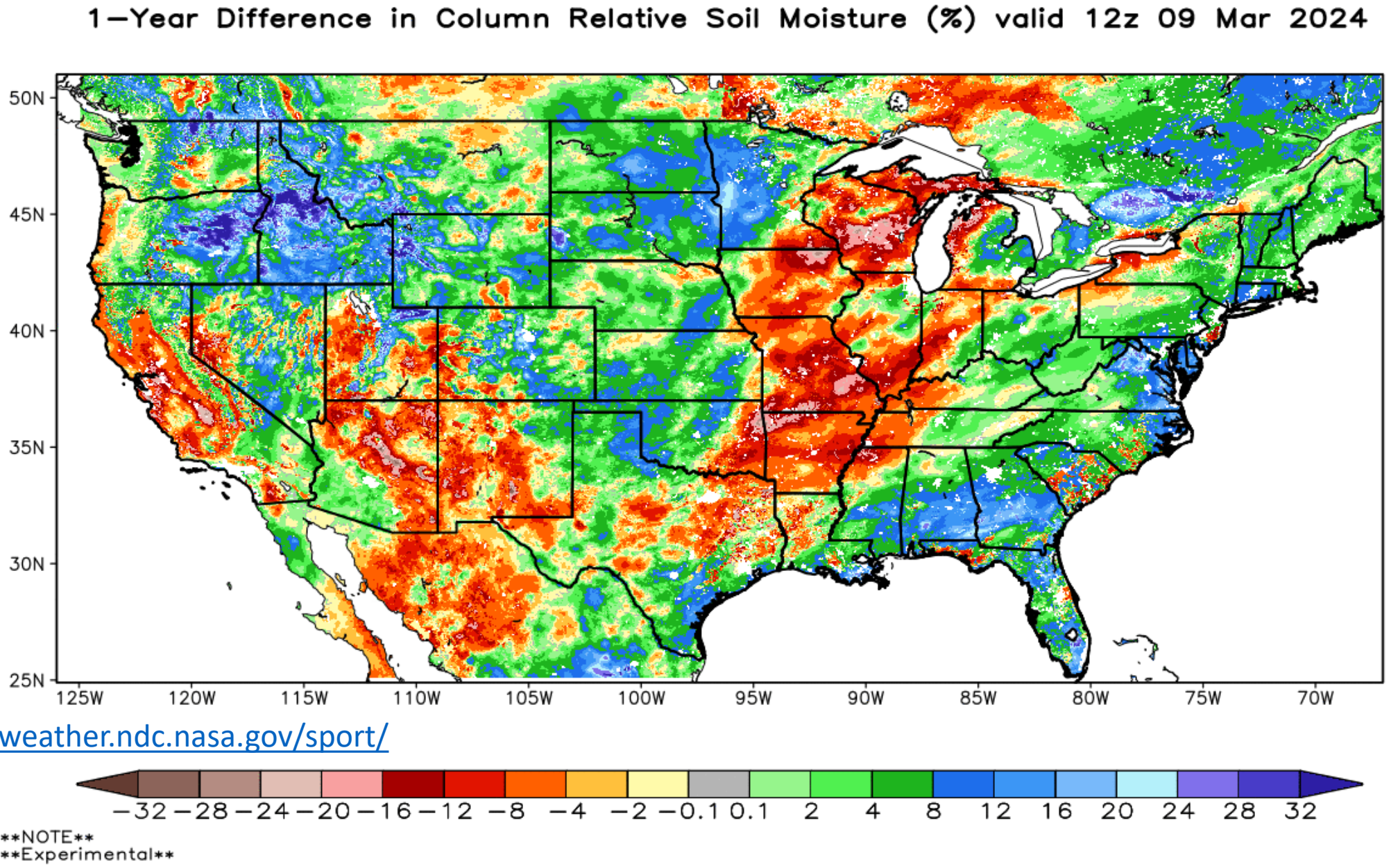


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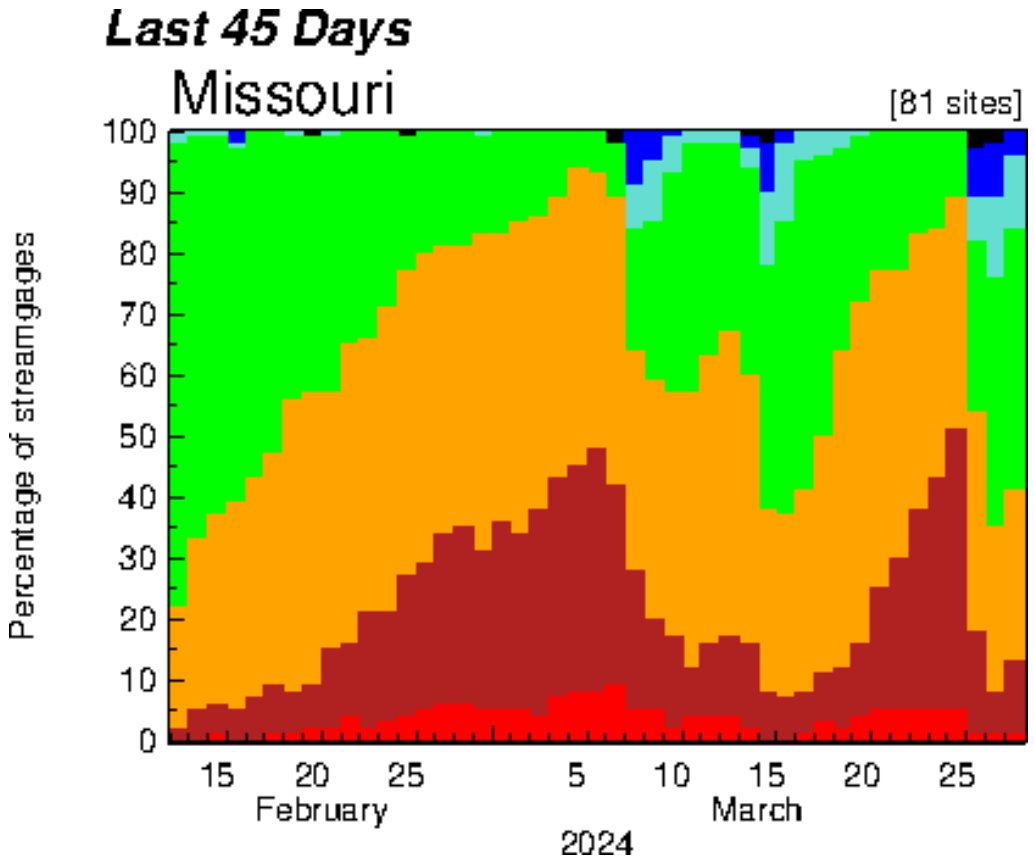


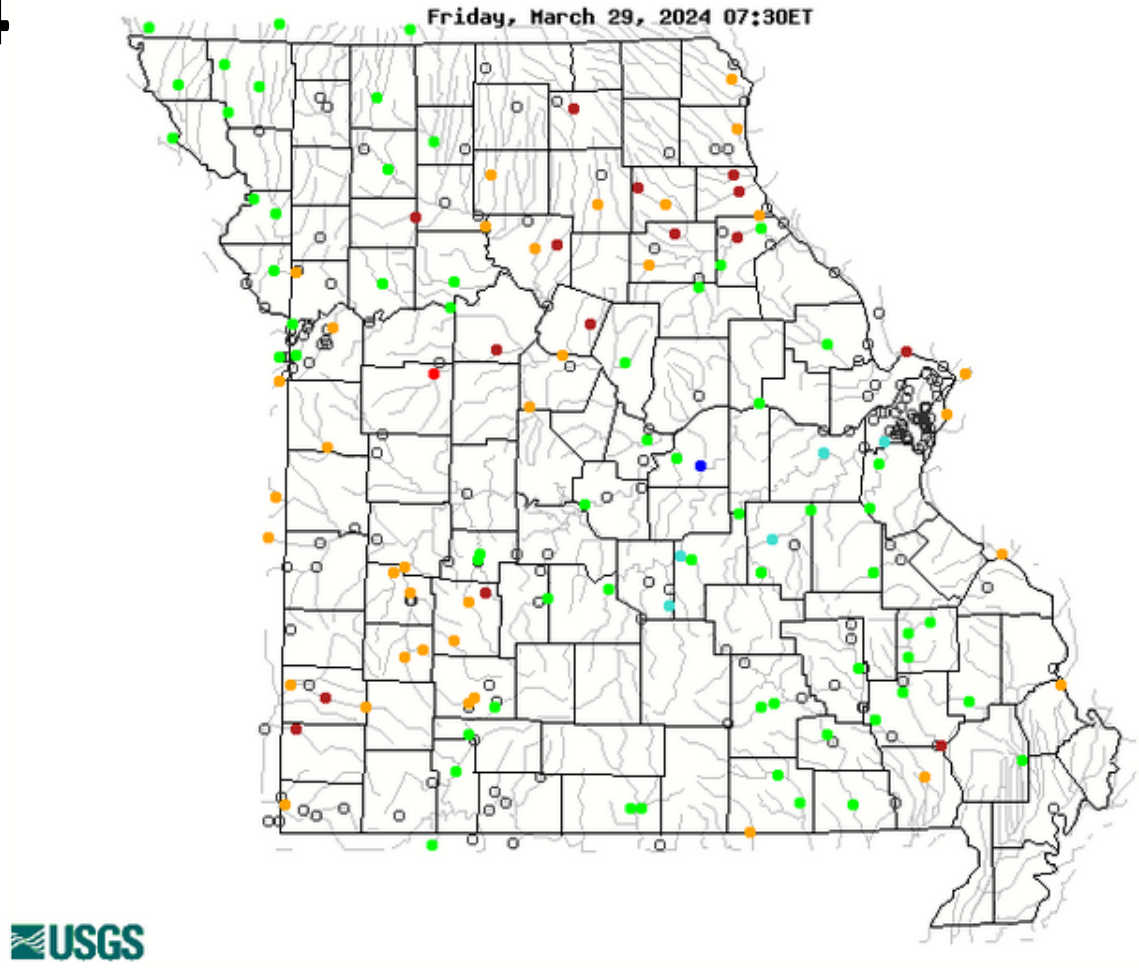


https://waterwatch.usgs.gov/index.php?m=real&r=mo&w=map

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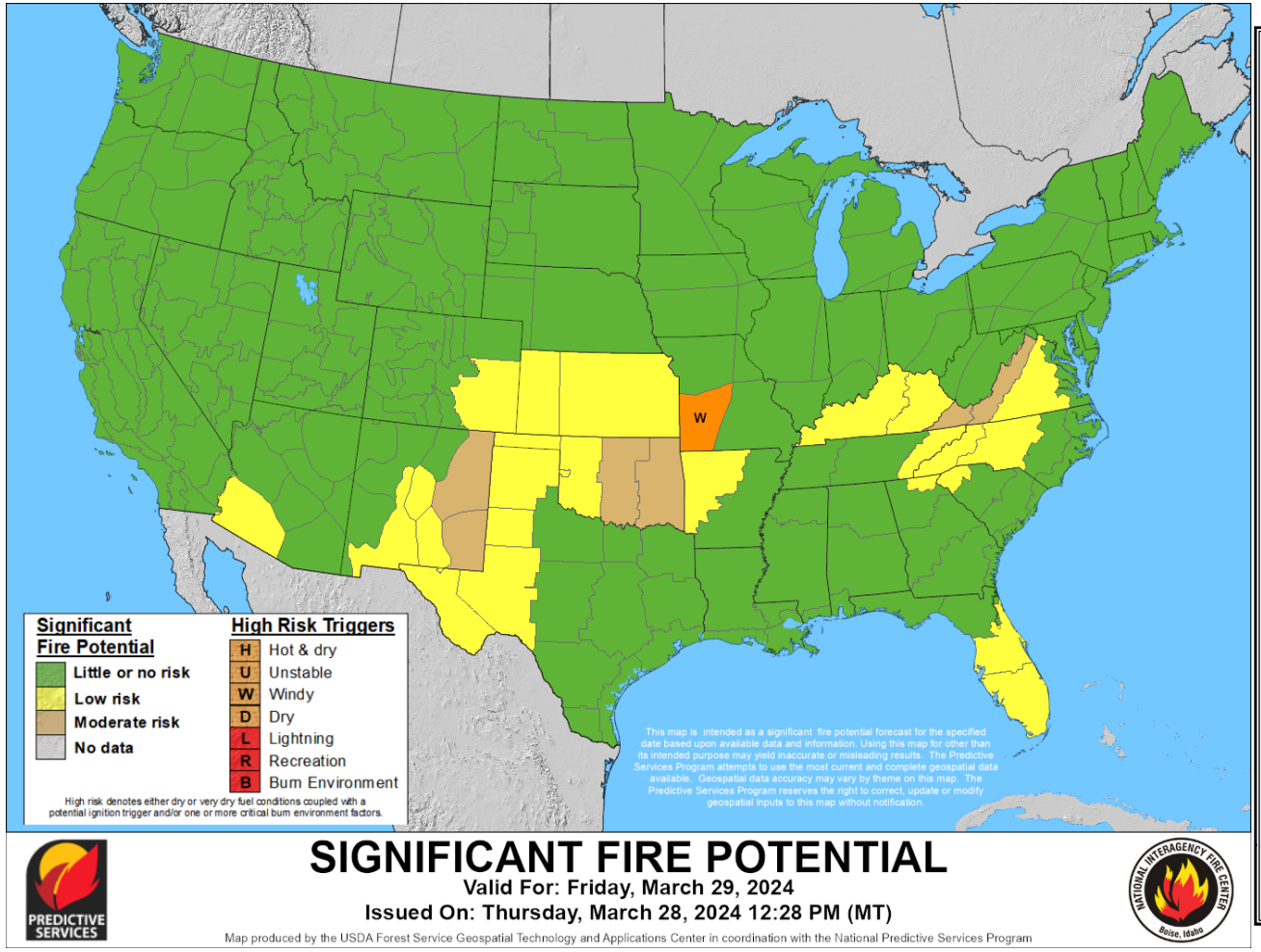
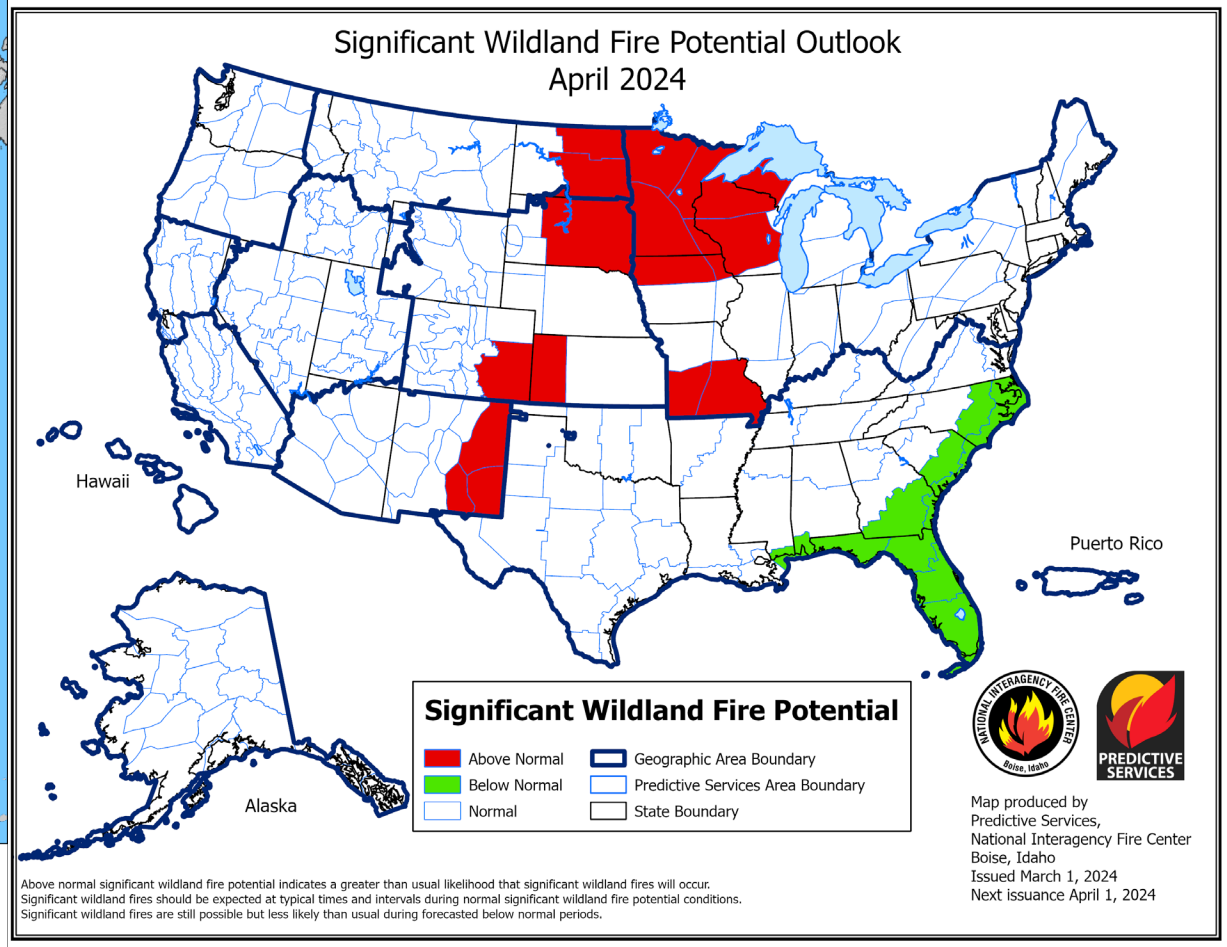



https://www.nifc.gov/nicc/predictive-services/outlooks

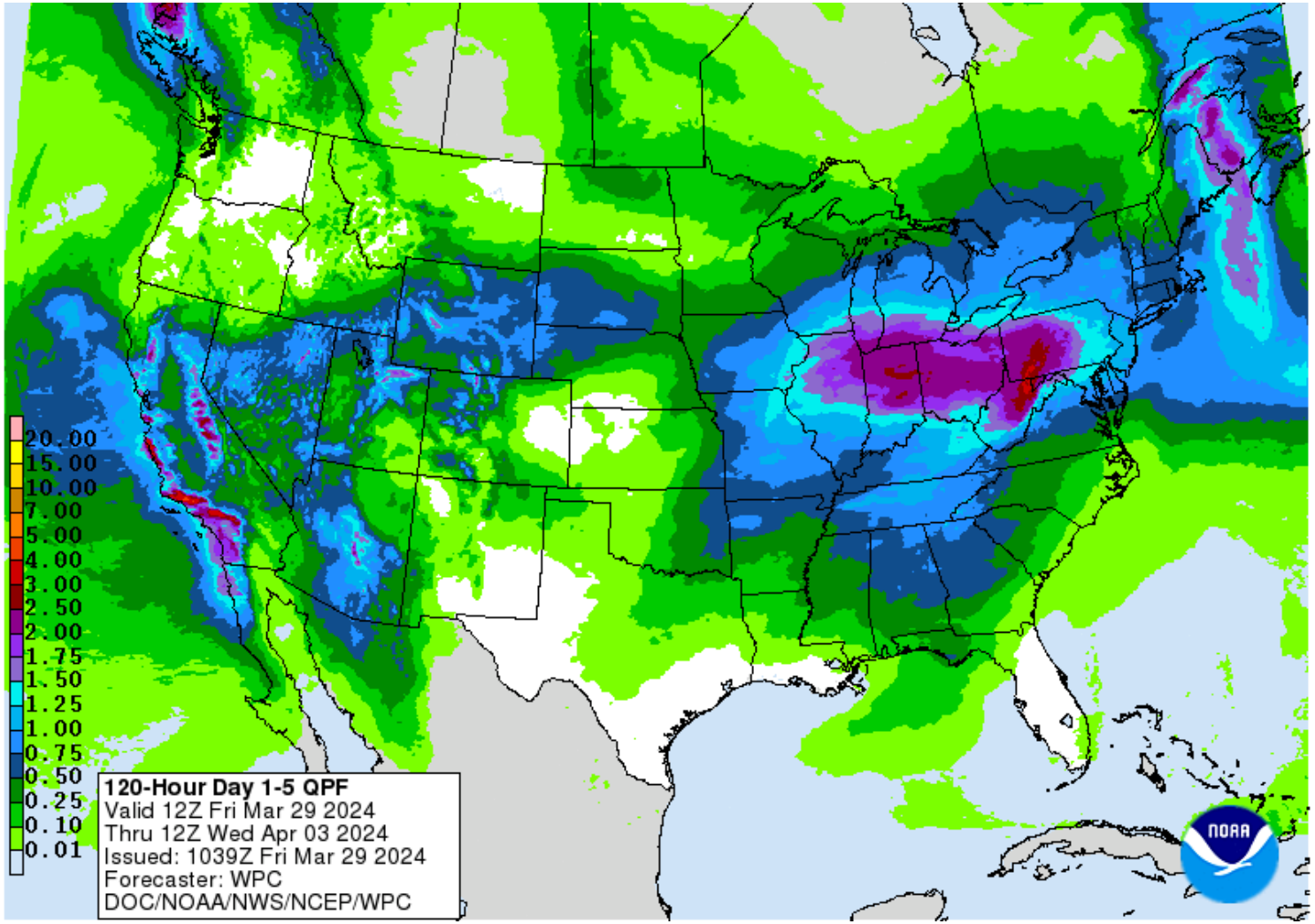
# Drought Update: March 2024

- Wetter conditions in December and January helped significantly with drought recovery
- Unfortunately, drought concerns are on the rise again after one of the warmest and driest February months on record
- There are still residual impacts from the 2023 drought with dry soils and low streamflow
- Precipitation totals have been highly localized in March, but some locations have received beneficial rainfall

# Looking Ahead…

- Rain and storm chances will increase on Sunday ahead of a system that will bring several rounds of moderate precipitation through Tuesday

- Rainfall totals > 1” are possible




https://www.wpc.ncep.noaa.gov/#page=qpf

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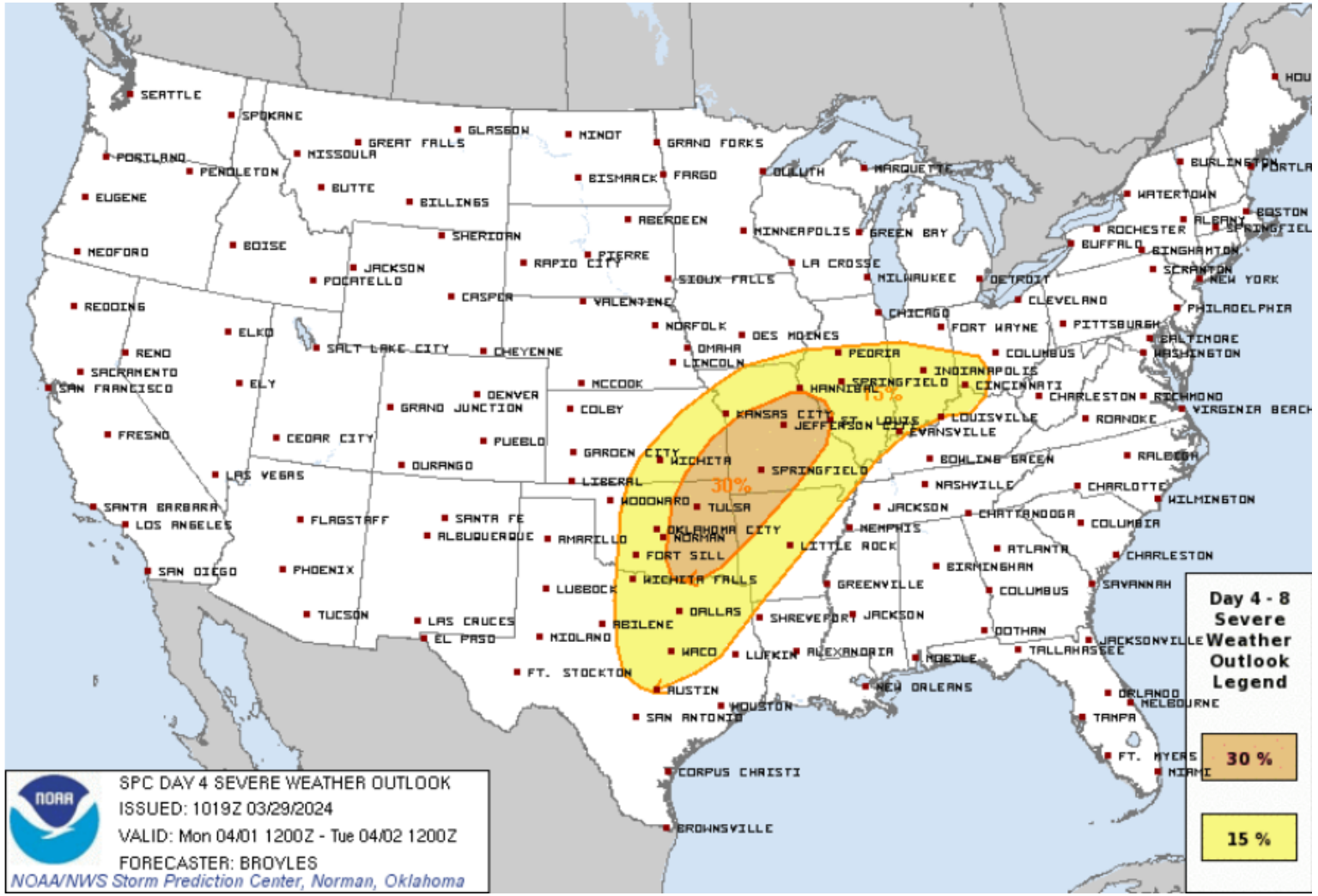


https://www.spc.noaa.gov/products/exper/day4-8/

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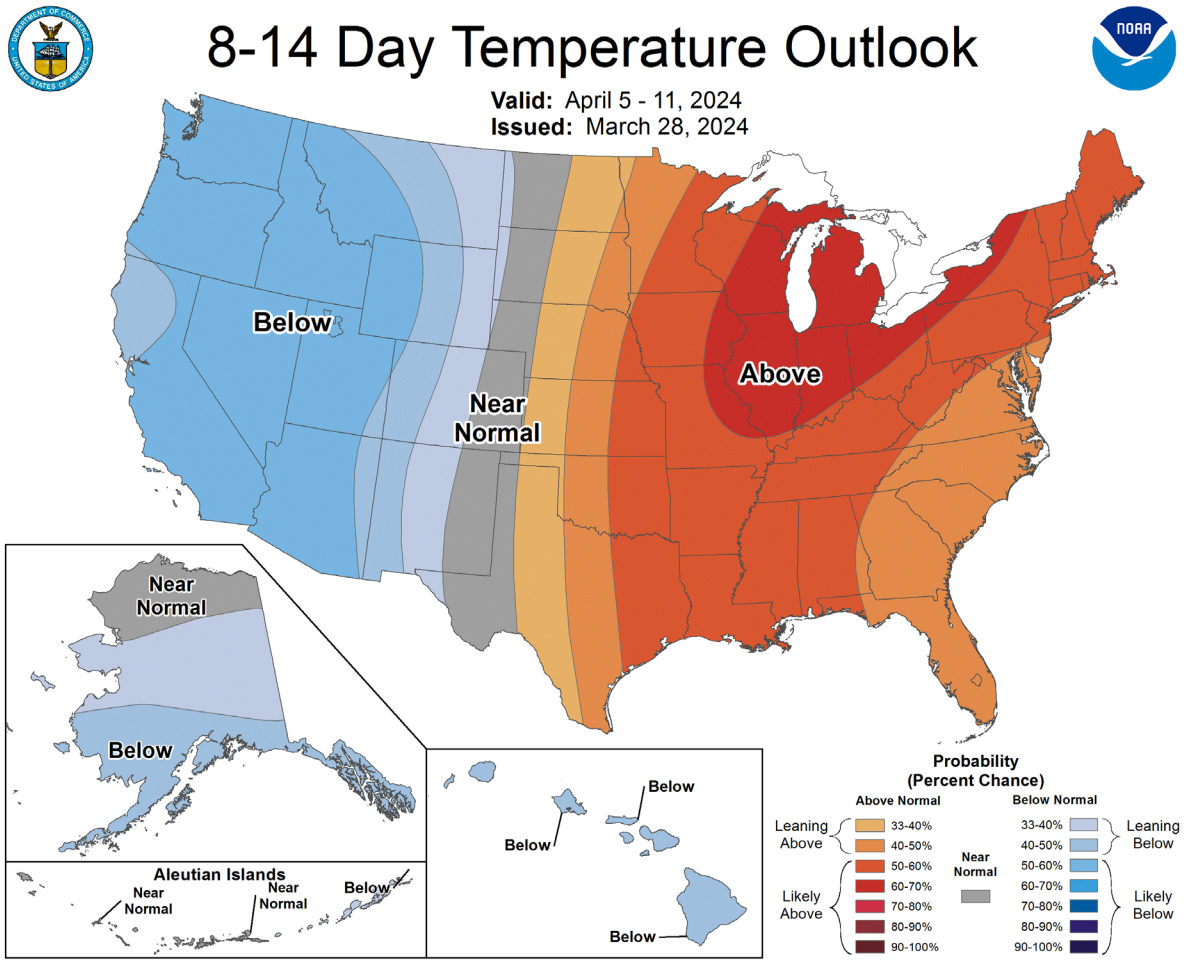
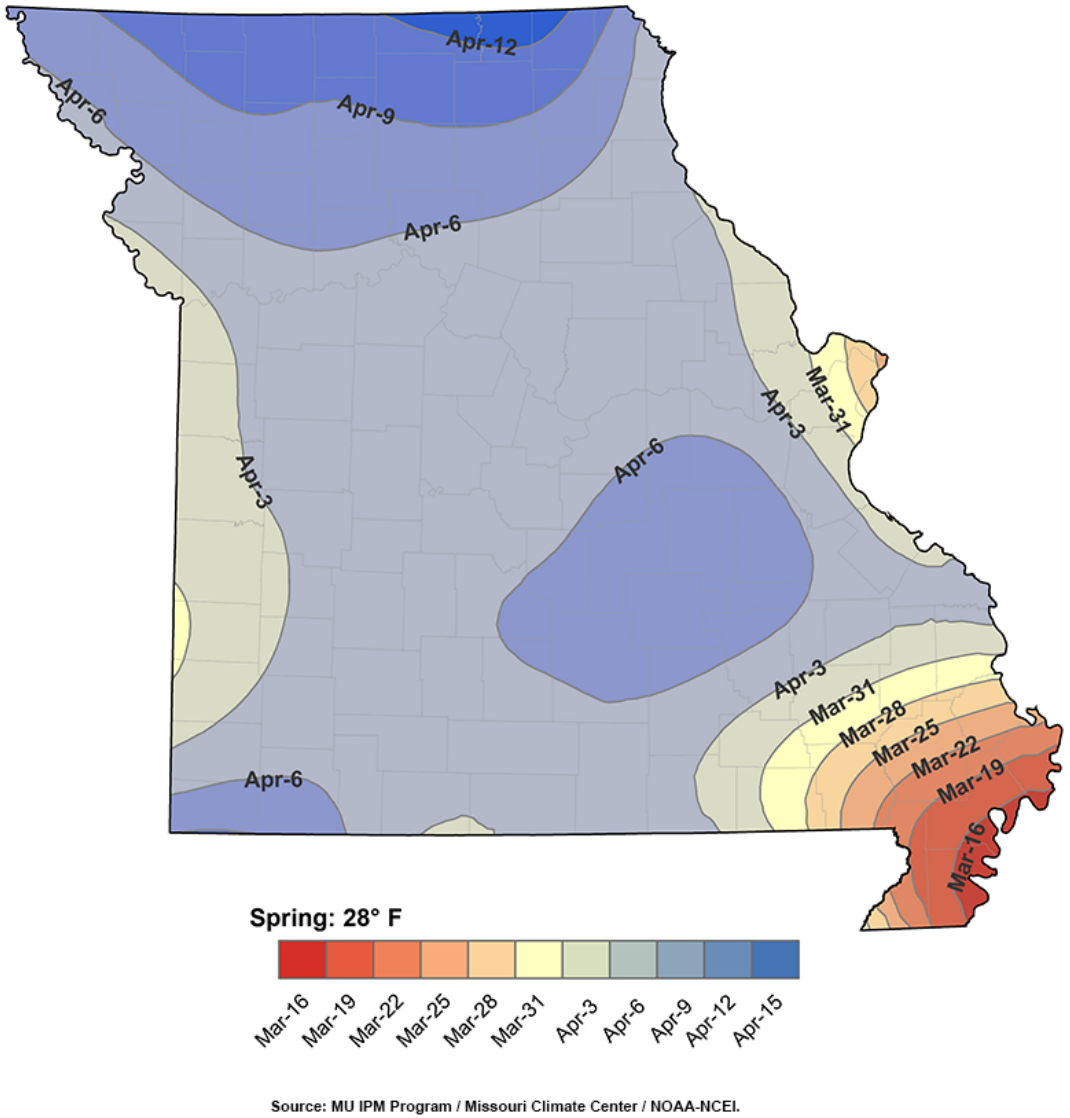



https://ipm.missouri.edu/frostfreezeguide/

# Median Date of Last Spring Hard Freeze




Source: MU IPM Program / Missouri Climate Center / NOAA-NCEI.

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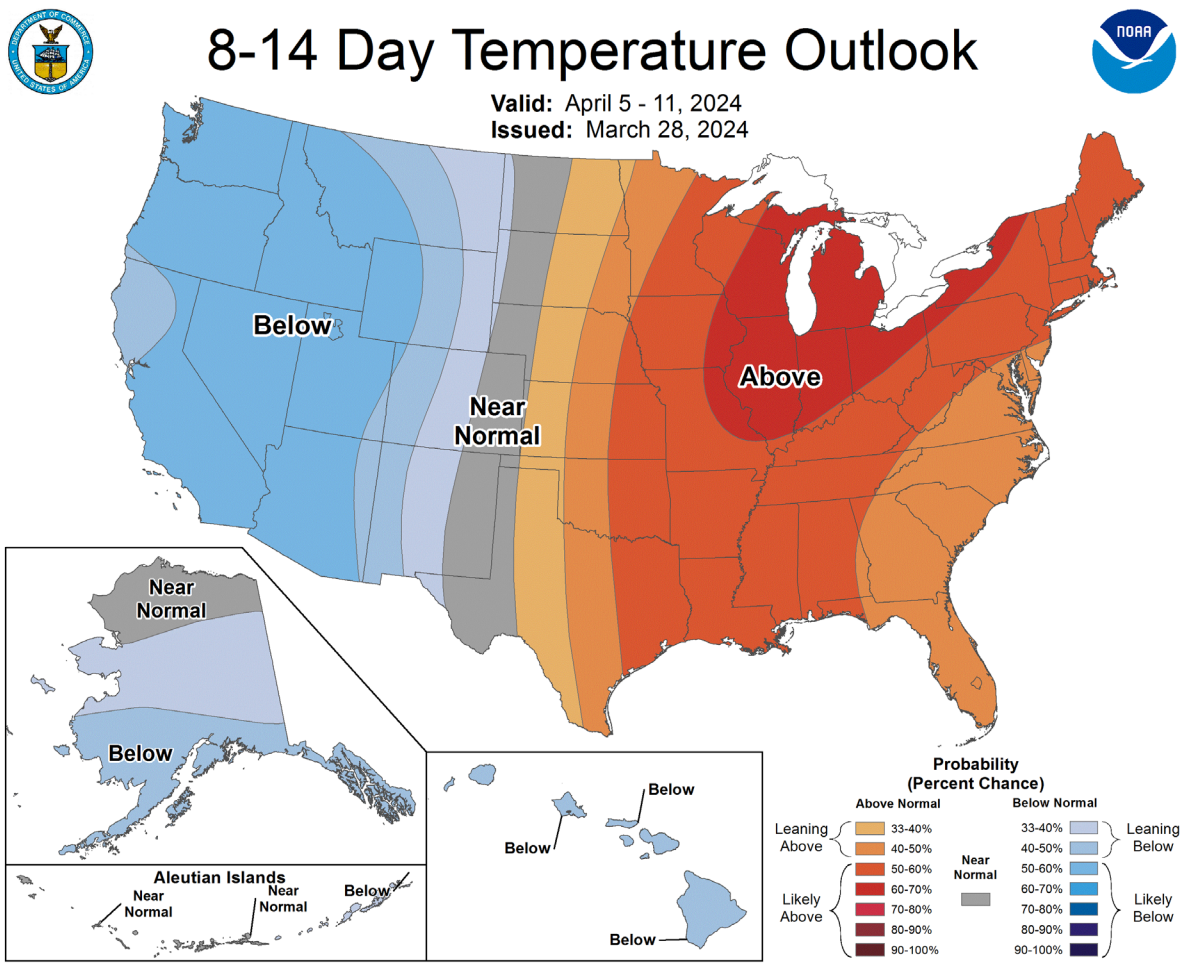


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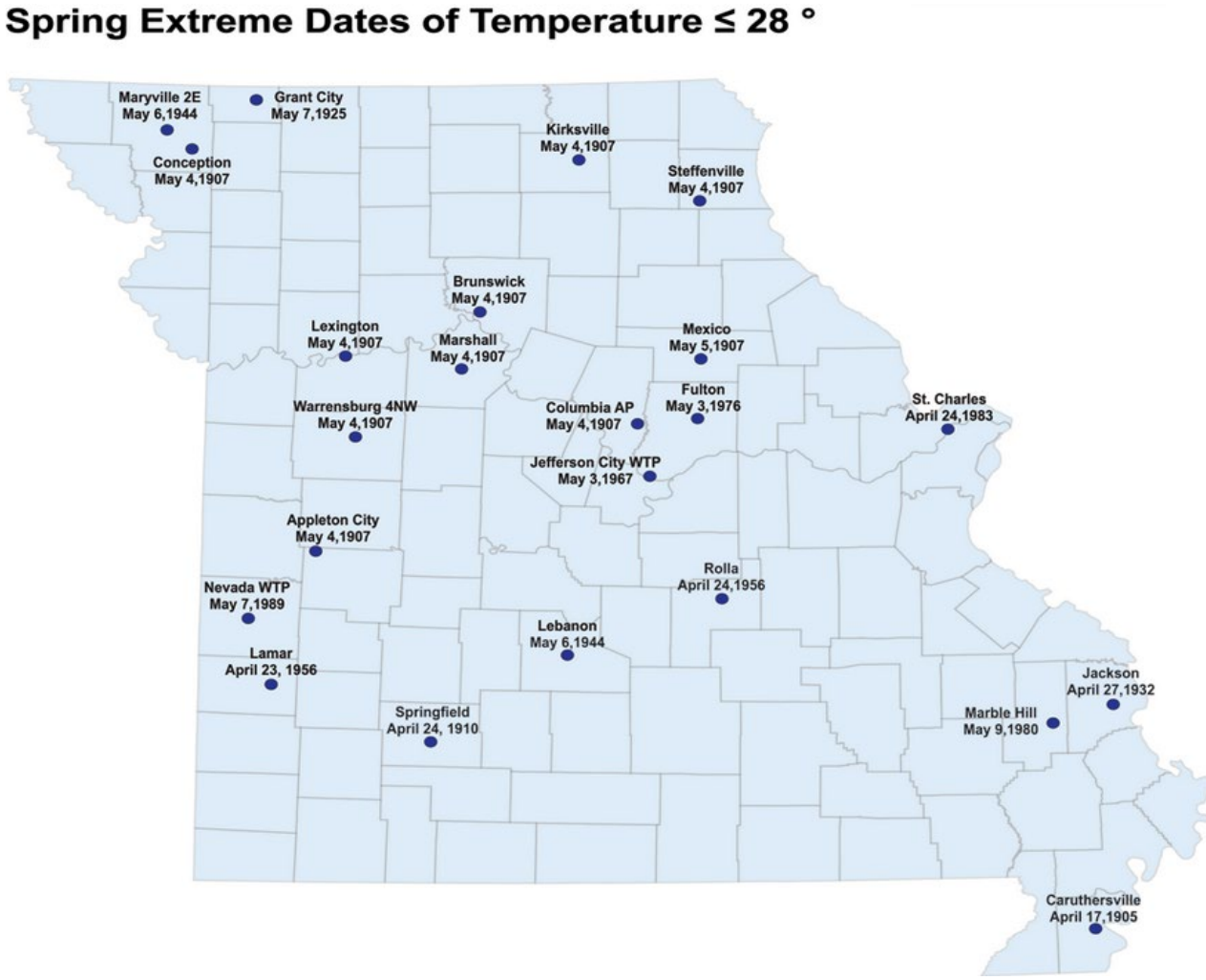


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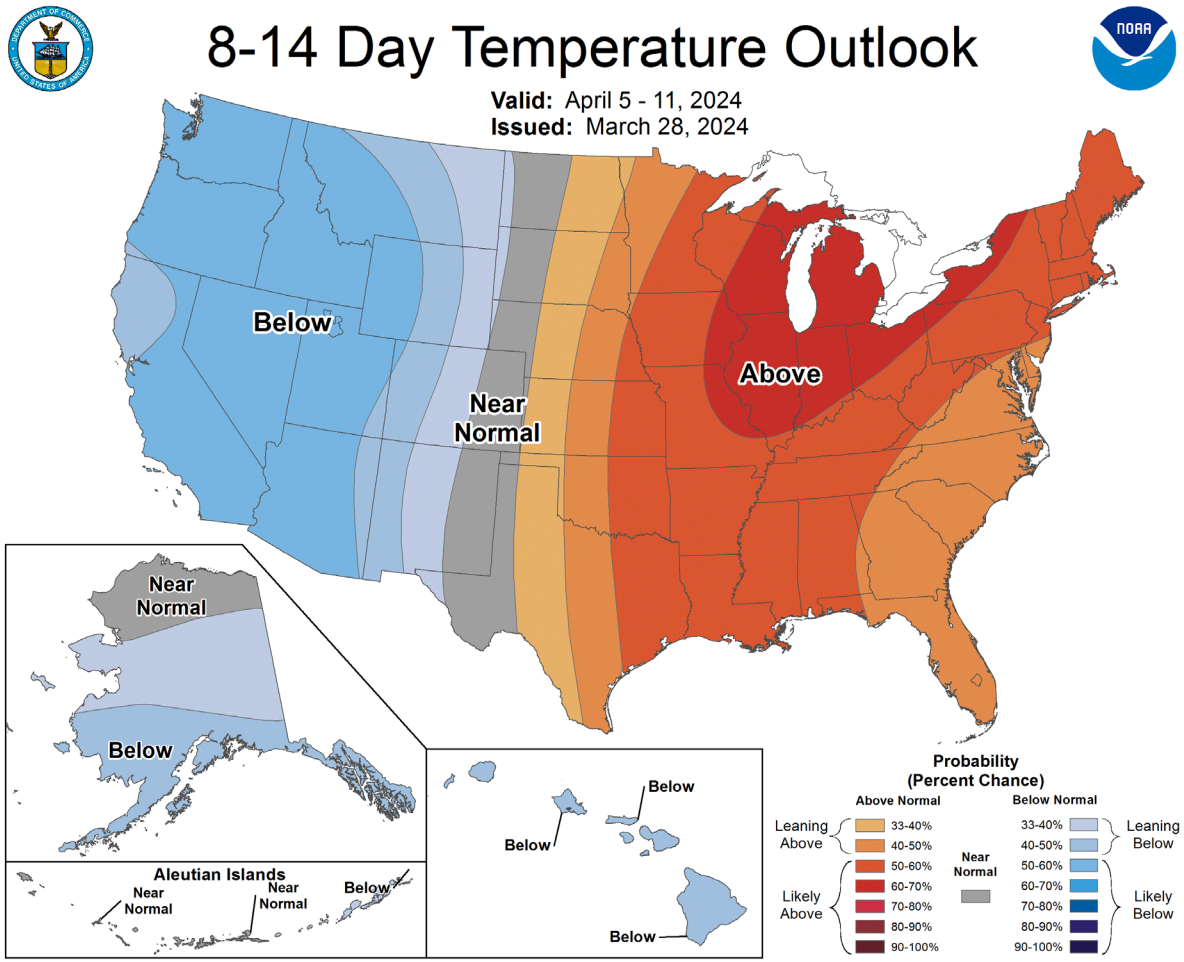


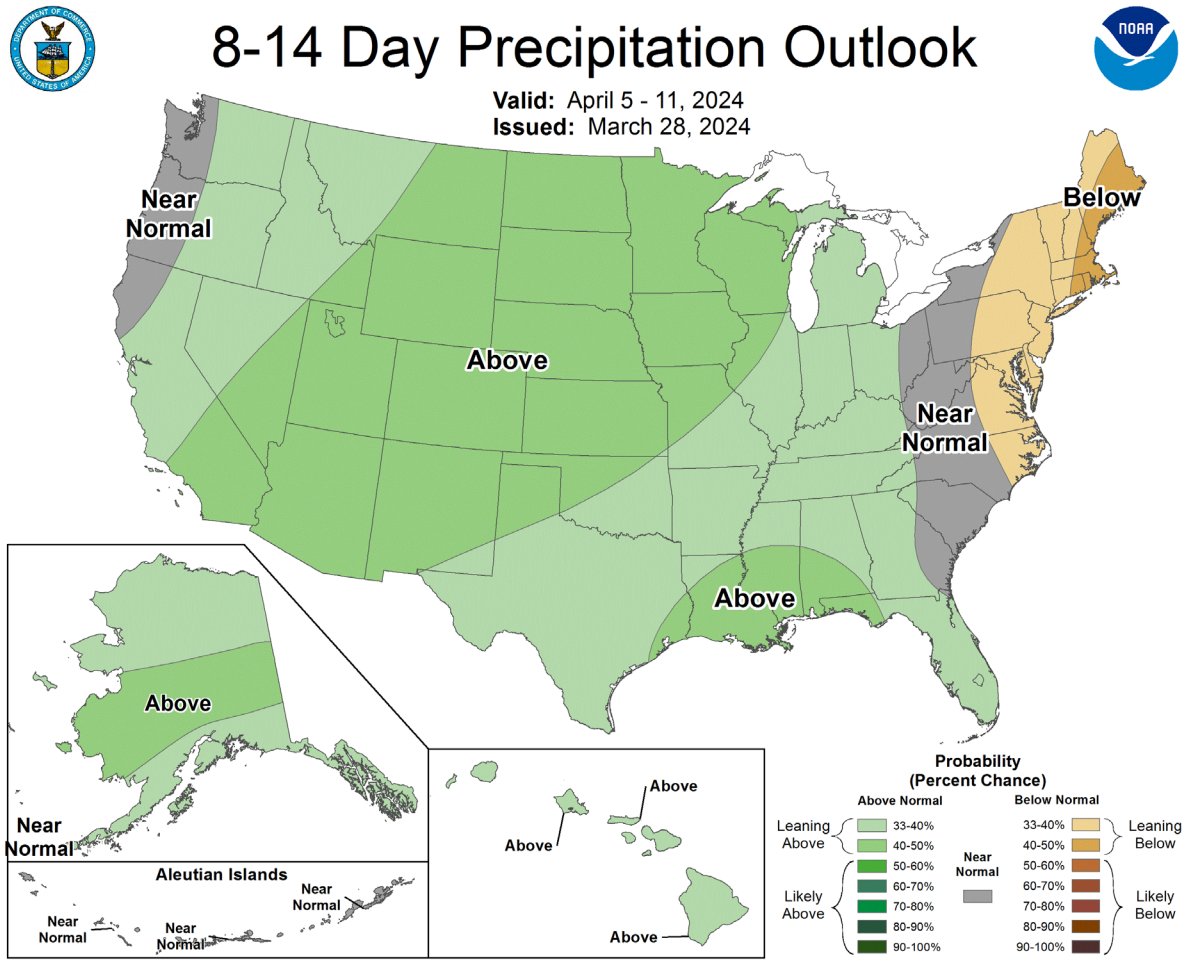


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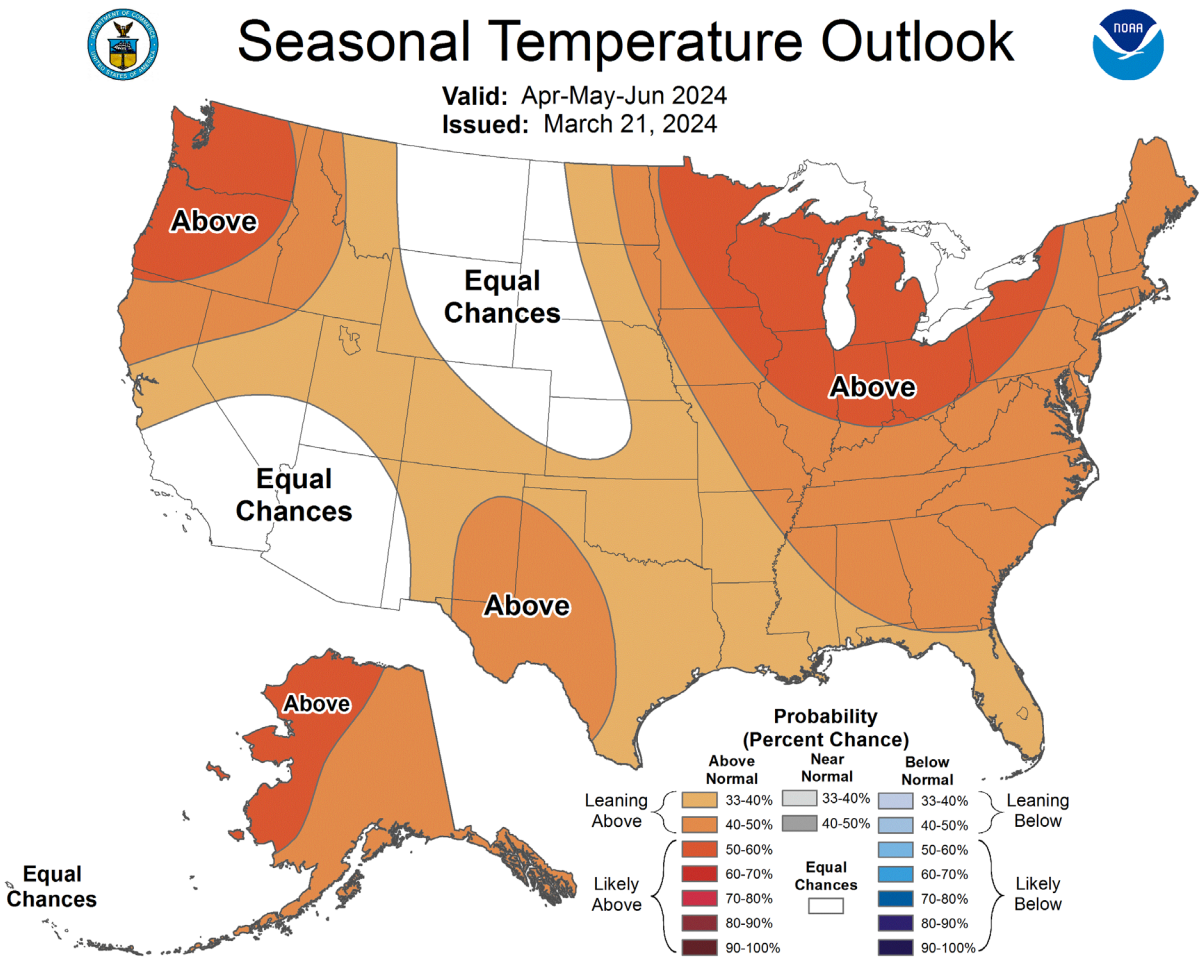


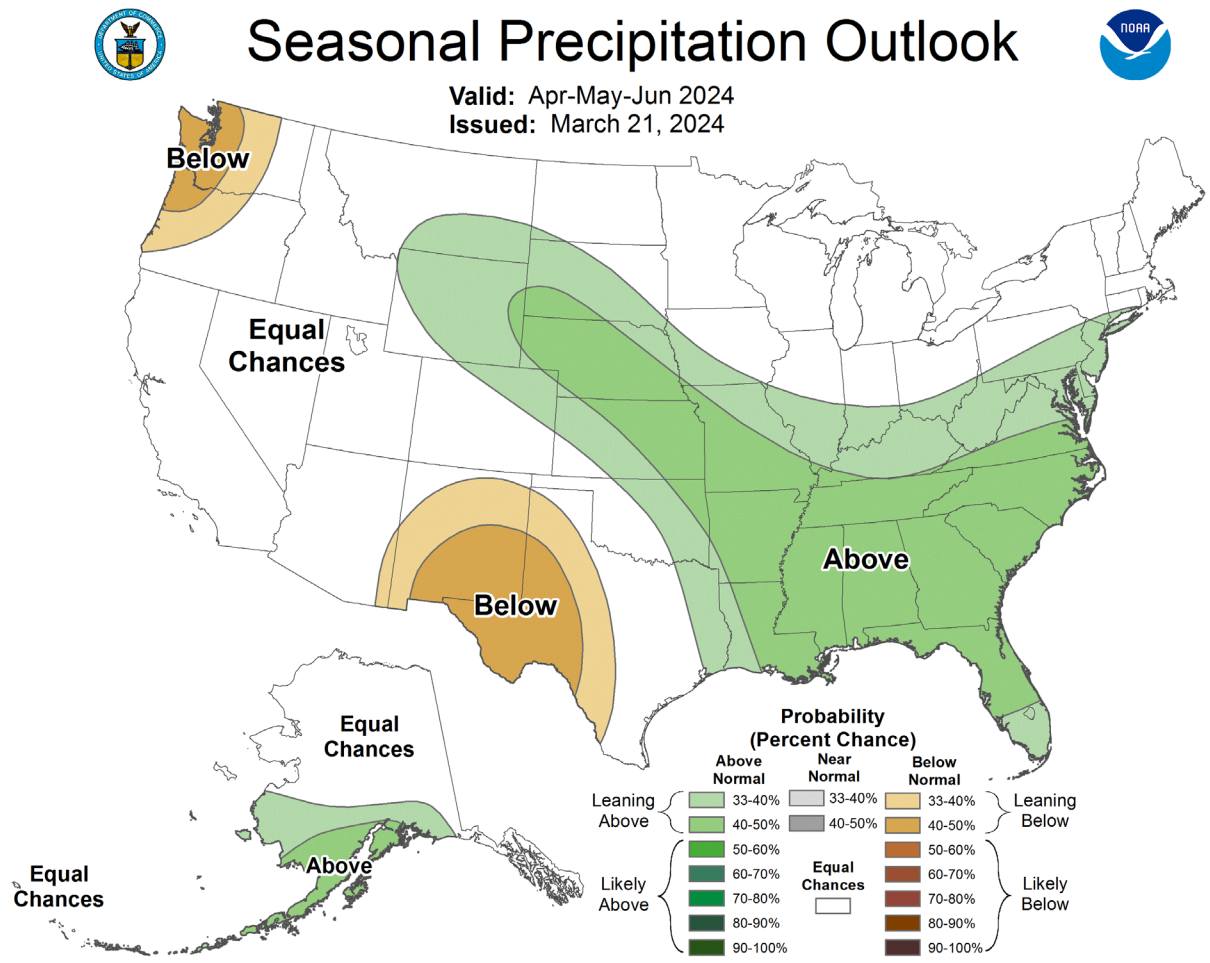


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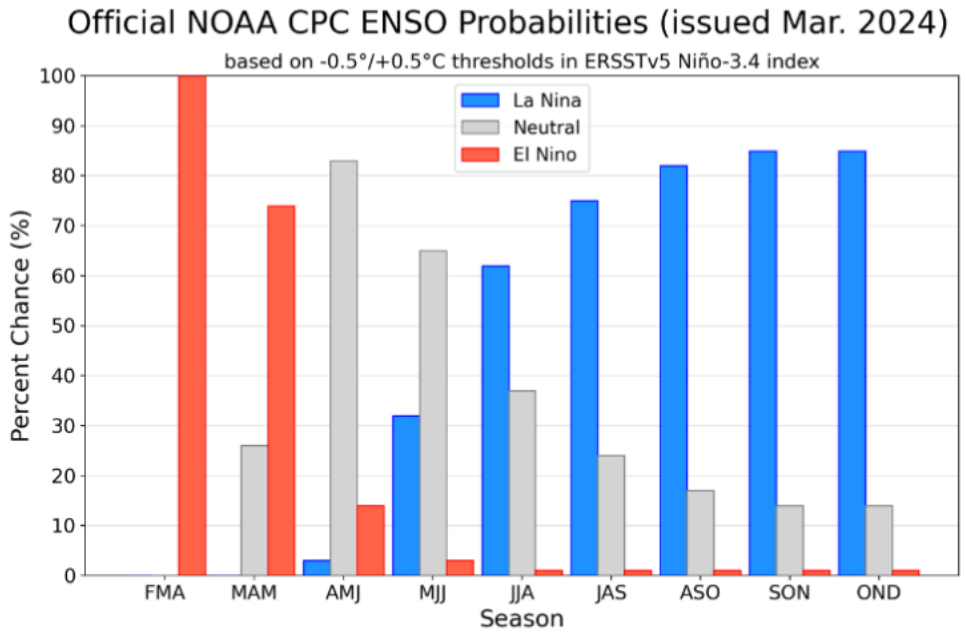



Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N-5°S, 120°W-170°W). Figure updated 14 March 2024.

# Summary

ENSO Alert System Status: El Niño Advisory / La Niña Watch

El Niño conditions are observed.*

Equatorial sea surface temperatures (SSTs) are above average across the central and eastern Pacific Ocean.

The tropical Pacific atmospheric anomalies are consistent with El Niño.

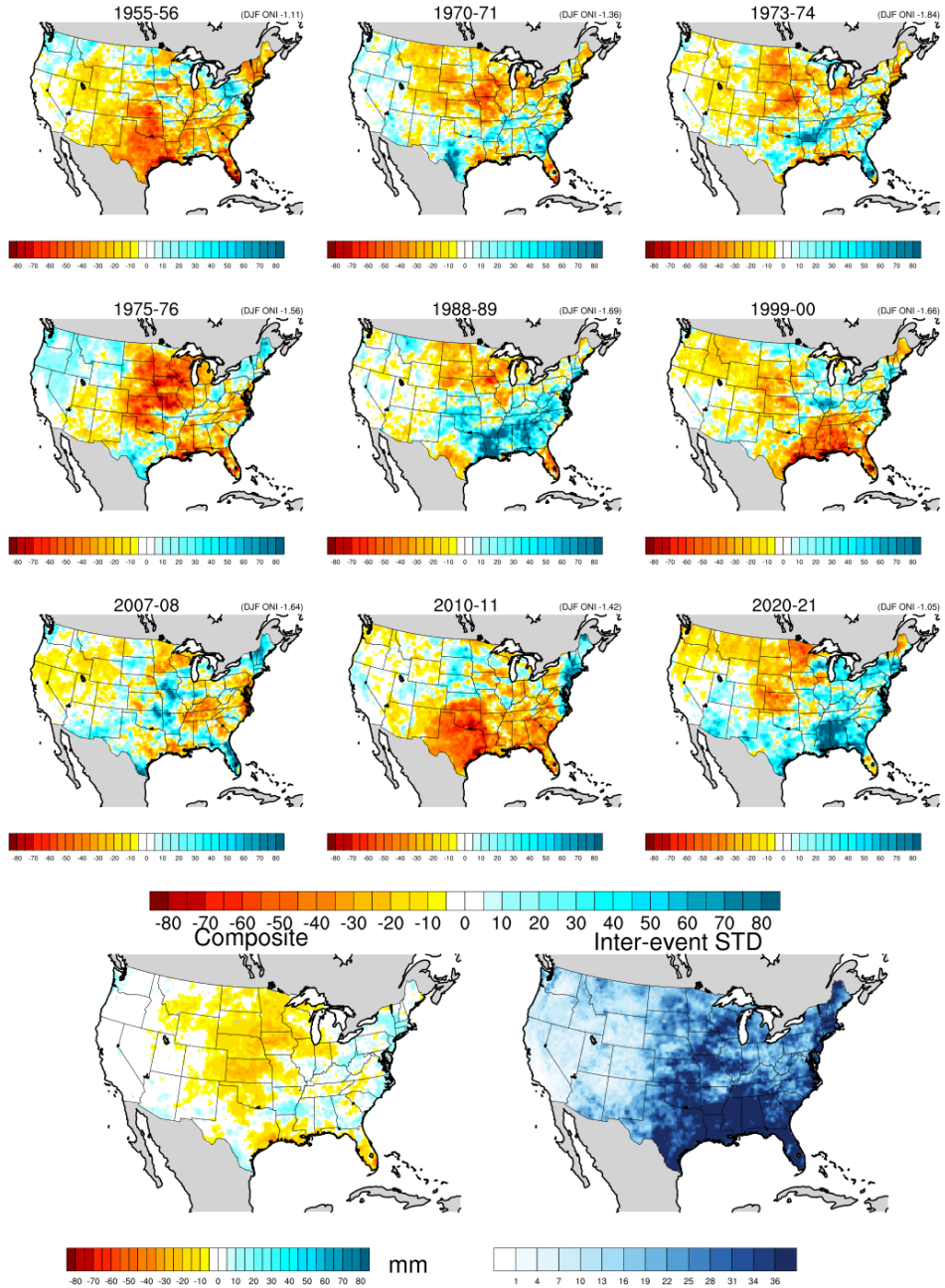
A transition from El Niño to ENSO-neutral is likely by April-June 2024 (83% chance), with increasing odds of La Niña developing in June-August 2024 (62% chance).*

* Note: These statements are updated once a month (2nd Thursday of each month) in association with the ENSO Diagnostics Discussion, which can be found by clicking here.

Update prepared by:
Climate Prediction Center / NCEP
18 March 2024

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

Jun-Aug Precipitation Anomalies from NCEI's nclimGrid During La Niña
1991-2020 climo




NOAA/PSL

*Missouri precipitation during years with a flip from El Nino to La Nina in one season or less (back to 1950):*

| | |
|---|---|
| 1954 | -5.20" |
| 1964 | -2.94" |
| 1973 | +16.64" (wettest year on record) |
| 1983 | +0.68" |
| 1988 | -6.29" |
| 1998 | +9.37" |
| 2010 | +4.07" |
| 2016: | -1.06" |

https://psl.noaa.gov/enso/difference/

# Looking Ahead…

- Above normal precipitation during Spring 2024 is necessary for drought recovery
- Seasonal outlooks are forecasting a higher probability of above normal precipitation during April and May
- El Niño pattern will switch to La Niña during Summer 2024
- There is still a lot of uncertainty surrounding 2024’s long-range weather outlooks but La Niña can be associated with dry and warm conditions in the High Plains and Upper Midwest

# Contact Information

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320 Anheuser-Busch Natural Resources Building | Columbia MO 65211
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**W:** http://climate.missouri.edu

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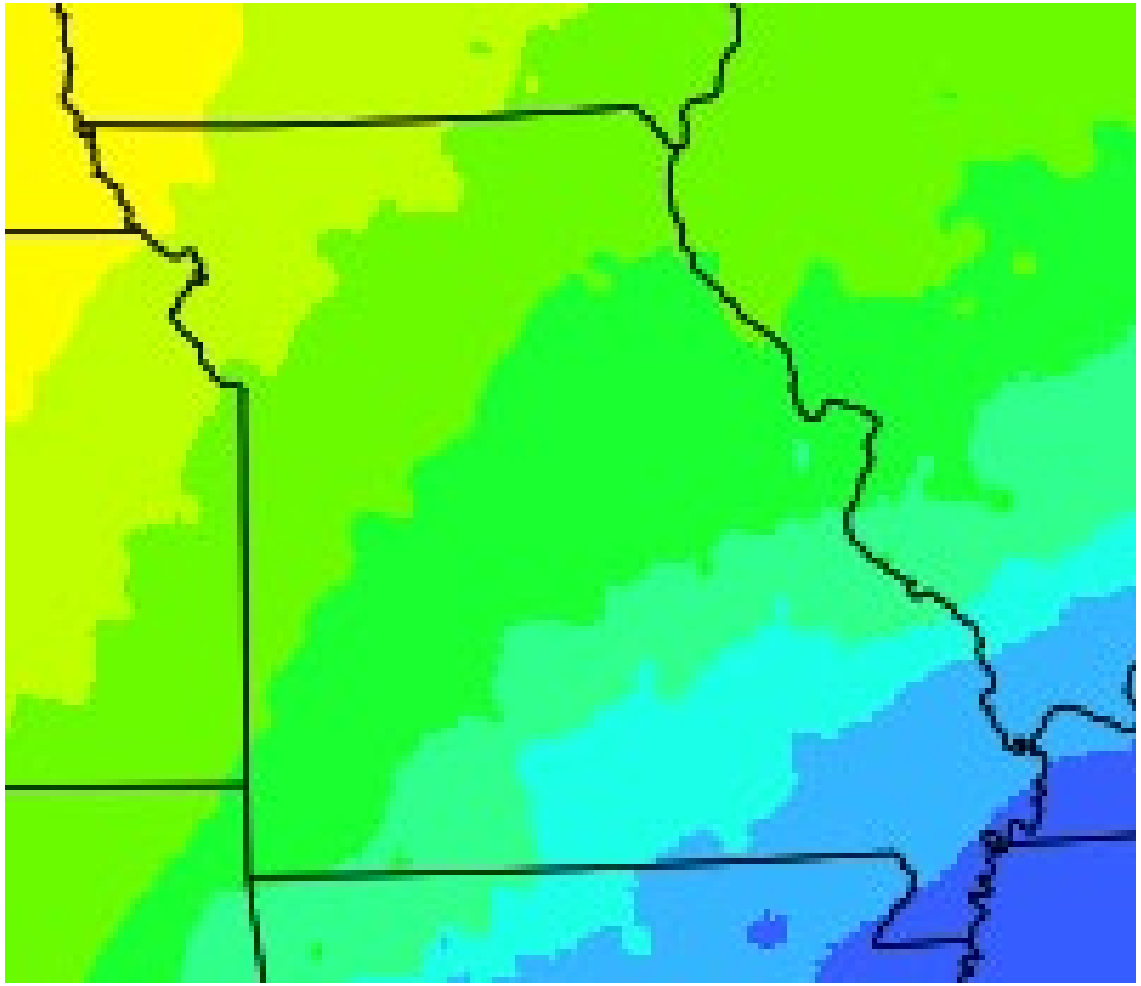
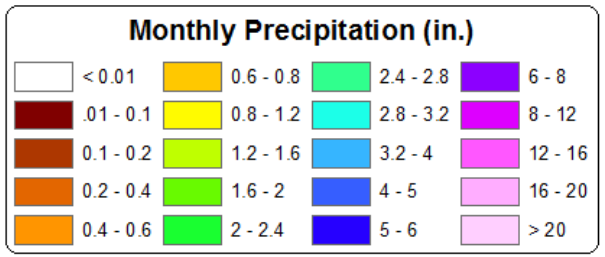
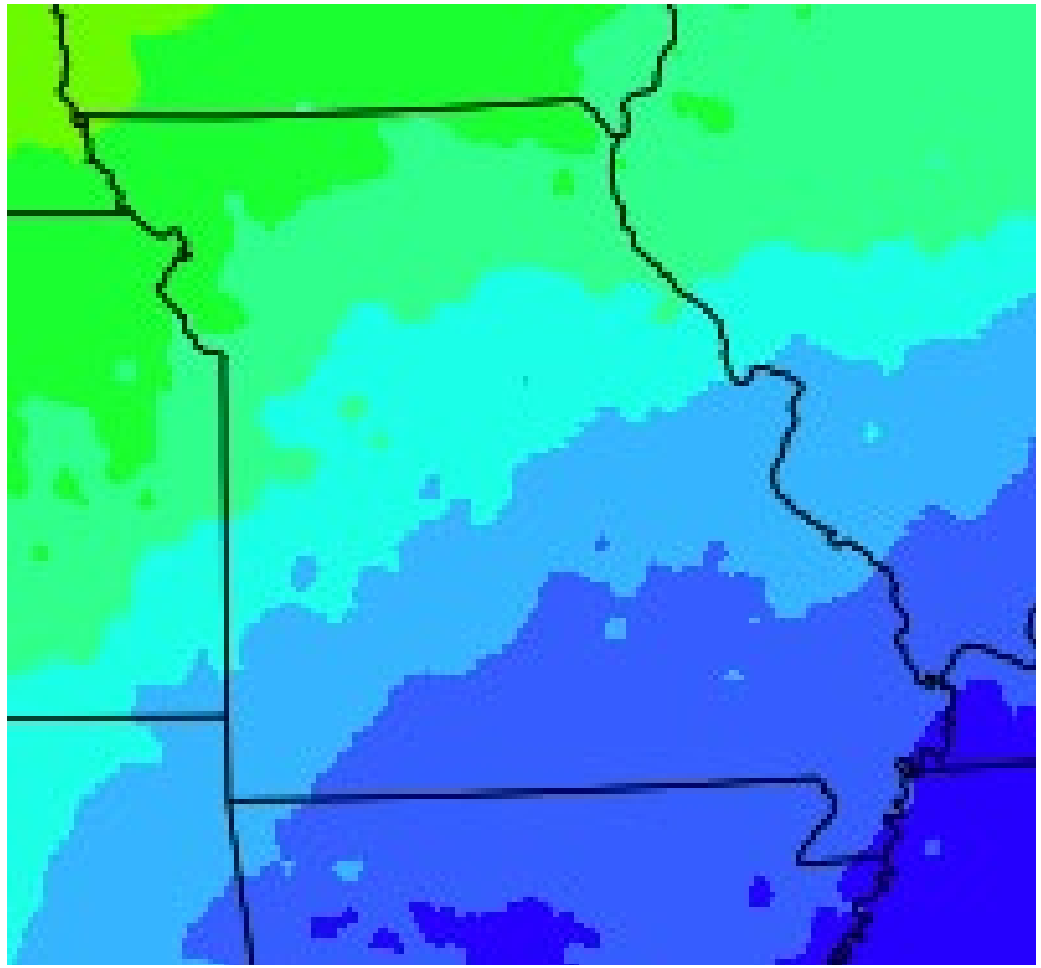
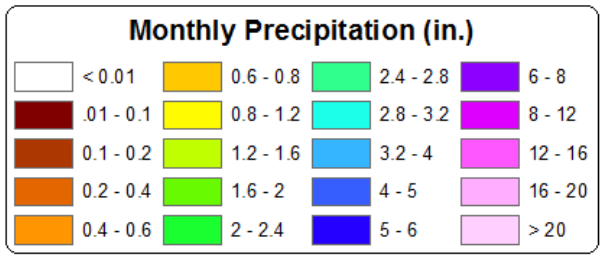


| 1991-2020 Missouri Statewide Mean Monthly Precipitation | |
|---|---|
| | Missouri Precip (in.) |
| Jan | 2.09 |
| Feb | 2.02 |
| Mar | 3.21 |
| Apr | 3.97 |
| May | 4.66 |
| Jun | 4.62 |
| Jul | 3.71 |
| Aug | 3.71 |
| Sep | 4.10 |
| Oct | 3.19 |
| Nov | 2.91 |
| Dec | 2.31 |
| Total: | 40.50 |




https://prism.oregonstate.edu/ https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/statewide



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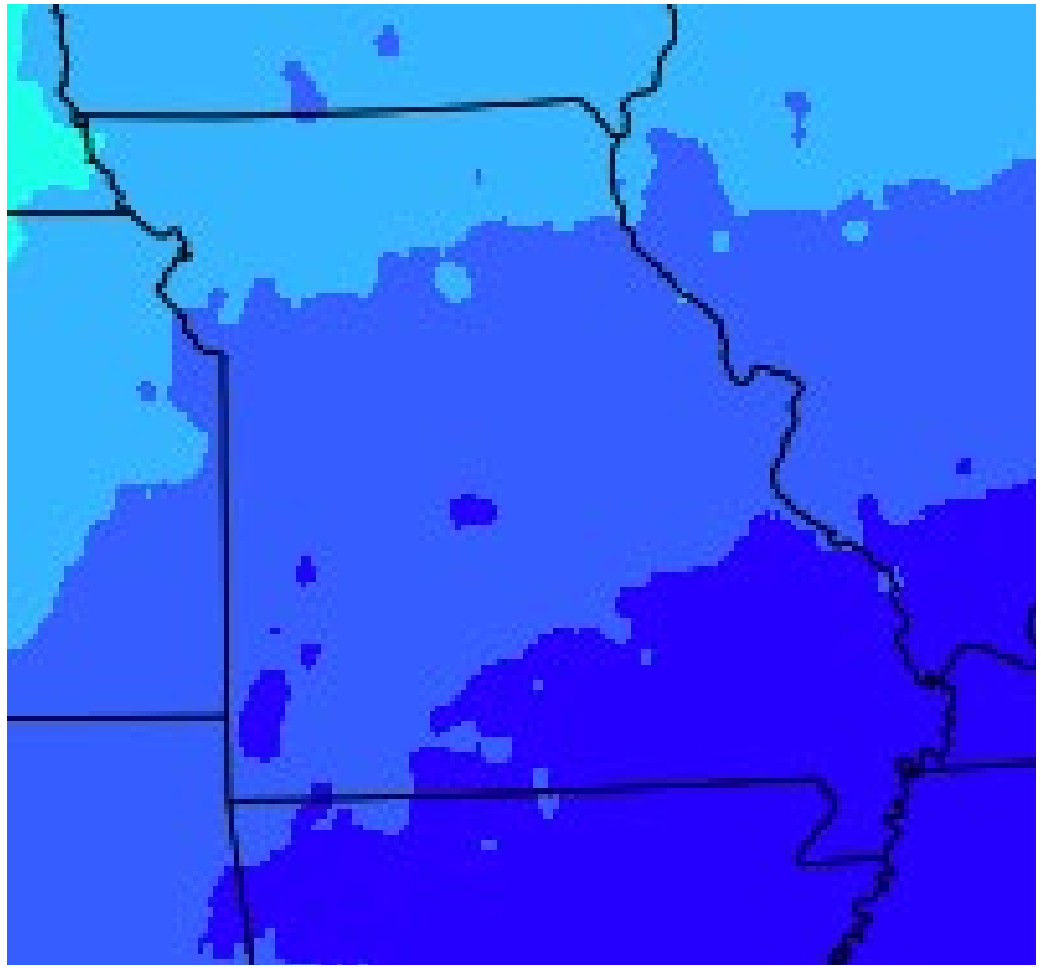

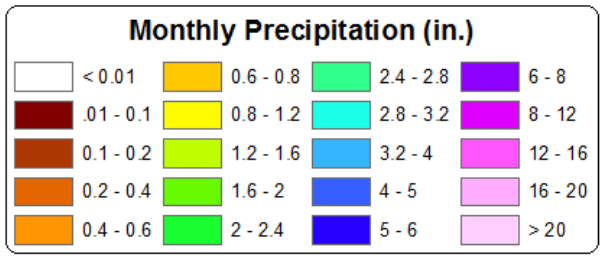


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# February 2024 Summary

**Kansas City**
- Temperature — *3rd Warmest*
- Precipitation — *5th Driest*

**St. Louis**
- Temperature — *2nd Warmest*
- Precipitation — *5th Driest*

**Springfield**
- Temperature — *2nd Warmest*
- Precipitation — *27th Driest*

**Columbia**
- Temperature — *2nd Warmest*
- Precipitation — *4th Driest*

**Cape Girardeau**
- Temperature — *Warmest*
- Precipitation — *Driest*

**Missouri Average Temperature**
February

| Date | Average Temperature | Rank (out of 130) | Anomaly *1901-2000 Mean: 33.8°F* |
|---|---|---|---|
| February 2024 | 45.9°F | 130 | 12.1°F |
| February 2017 | 45.1°F | 129 | 11.3°F |
| February 1930 | 43.4°F | 128 | 9.6°F |
| February 1976 | 43.3°F | 127 | 9.5°F |
| February 1954 | 43.2°F | 126 | 9.4°F |
| February 1999 | 42.4°F | 125 | 8.6°F |
| February 2000 | 42.2°F | 124 | 8.4°F |
| February 1932 | 41.8°F | 123 | 8.0°F |
| February 1998 | 41.2°F | 122 | 7.4°F |
| February 1992 | 41.1°F | 121 | 7.3°F |

- February 2024 was **Missouri's warmest February on record**
- The statewide average temperature in February (45.9 °F) was 2.3 °F higher than Missouri's average March temperature (43.6 °F)
- Missouri's average temperature this winter (DJF) was 38.5 °F (+ 6.4 °F), making it the state's second warmest winter behind 1932

*Ranks based on data from 1895 to 2023 (129 years)*

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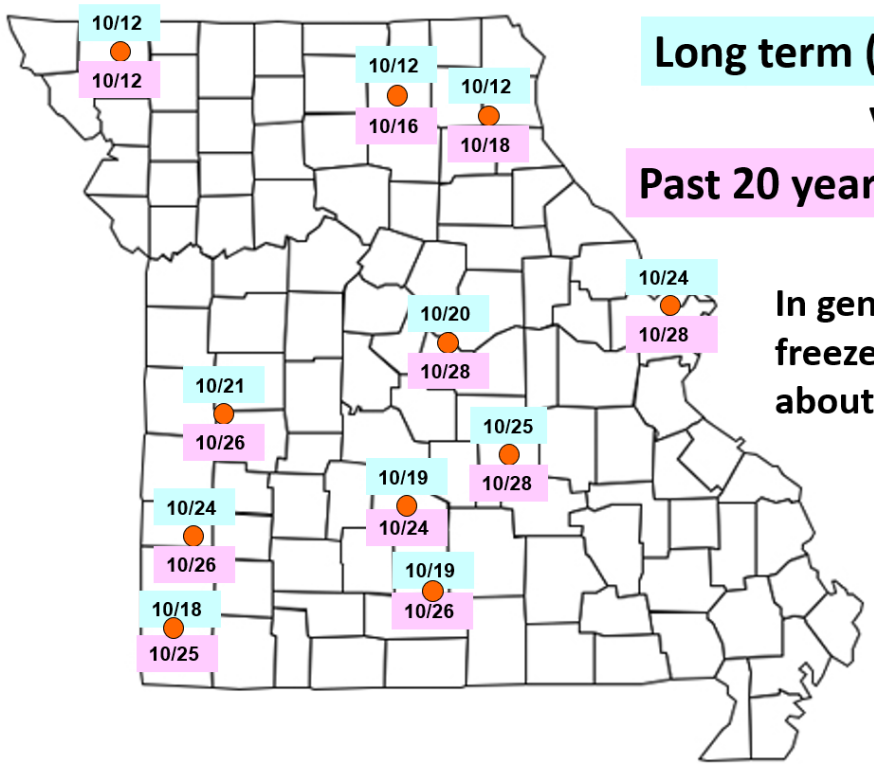
| | |
|---|---|
| **Kansas City** | |
| • Temperature | *3rd Warmest* |
| • Precipitation | *5th Driest* |
| **St. Louis** | |
| • Temperature | *2nd Warmest* |
| • Precipitation | *5th Driest* |
| **Springfield** | |
| • Temperature | *2nd Warmest* |
| • Precipitation | *27th Driest* |
| **Columbia** | |
| • Temperature | *2nd Warmest* |
| • Precipitation | *4th Driest* |
| **Cape Girardeau** | |
| • Temperature | *Warmest* |
| • Precipitation | *Driest* |

- Missouri's statewide average precipitation during February 2024 was 0.61" (-1.41")
- 2024 was Missouri's 9th driest February on record
- Saline, Randolph, and Scotland counties recorded their driest February on record
- Missouri's wintertime (DJF) precipitation was close to normal (+ 0.31")
  - *Not a lot of snow!*

*Ranks based on data from 1895 to 2023 (129 years)*

https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/

## Median Date of First Fall Frost (≤ 32°F)




**Long term (1895-2019)**

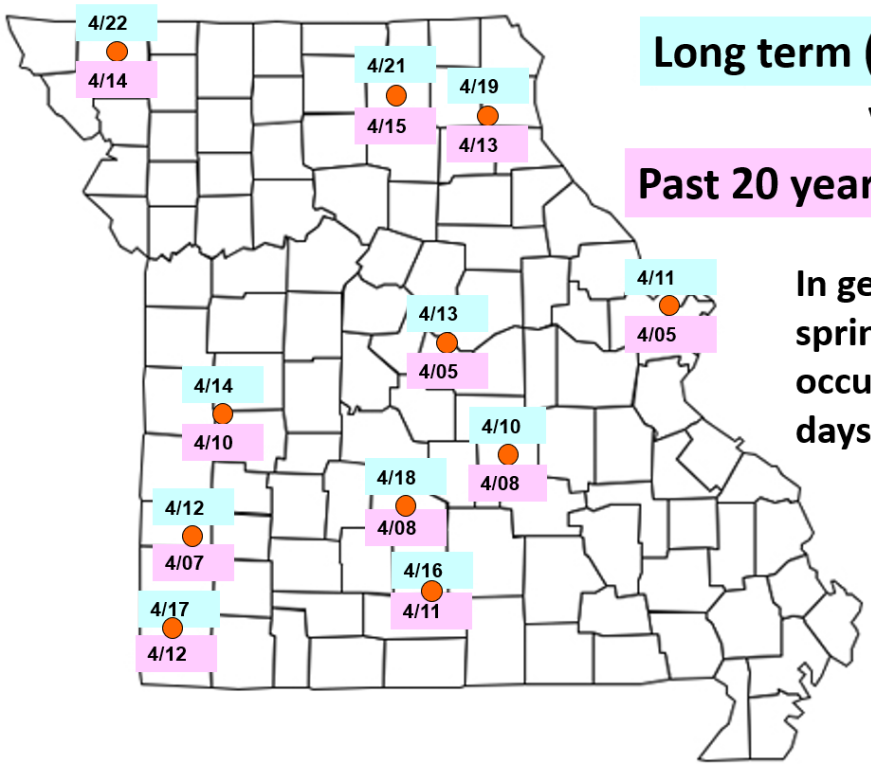
**vs.**

**Past 20 years (2000-2019)**

**In general, the first fall freeze is occurring about 5 days *later*…**

Missouri Climate Center Frost/Freeze Guide:
https://ipm.missouri.edu/frostfreezeguide/

## Median Date of Last Spring Frost (≤ 32°F)




**Long term (1895-2019)**

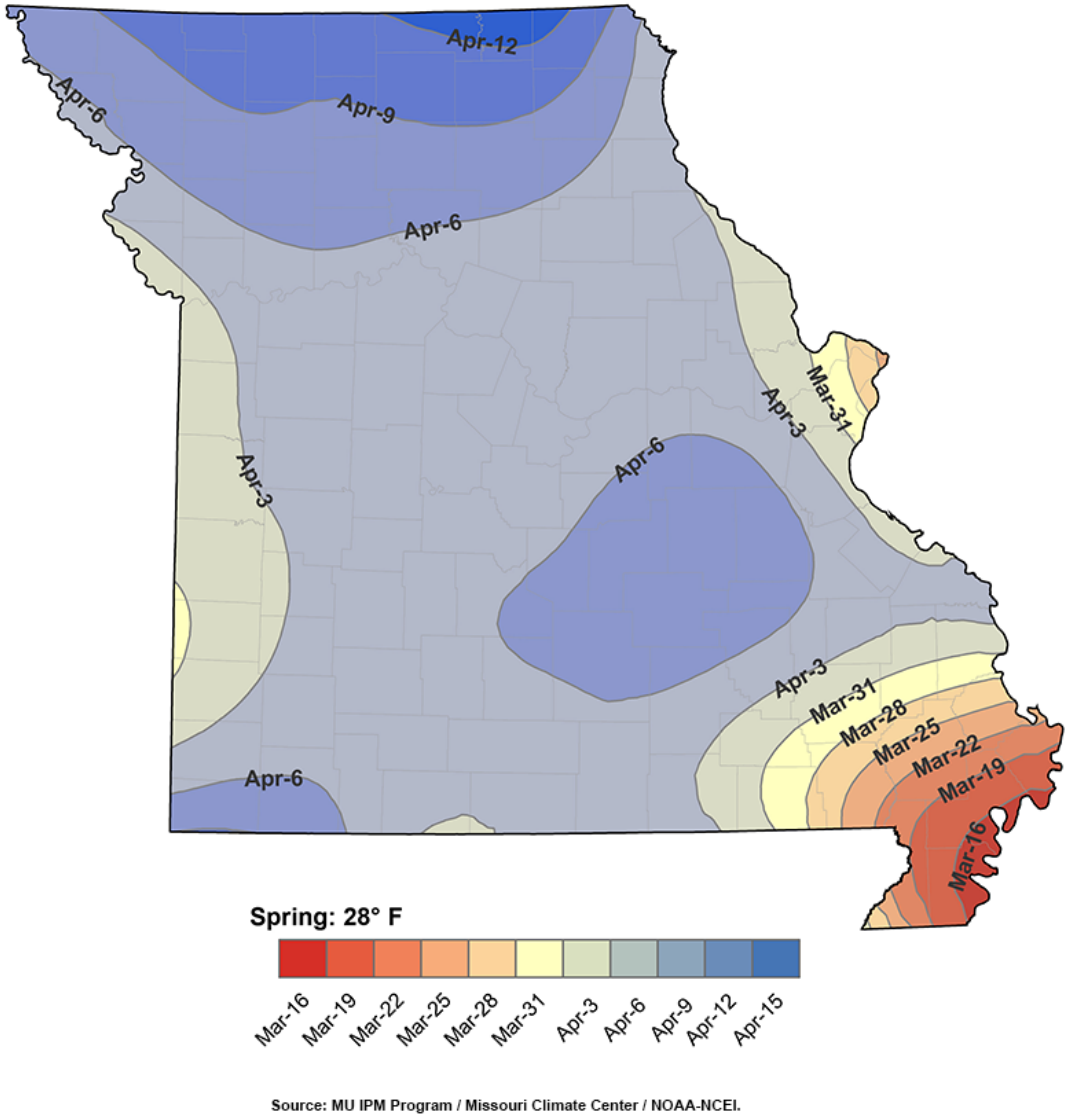
**vs.**

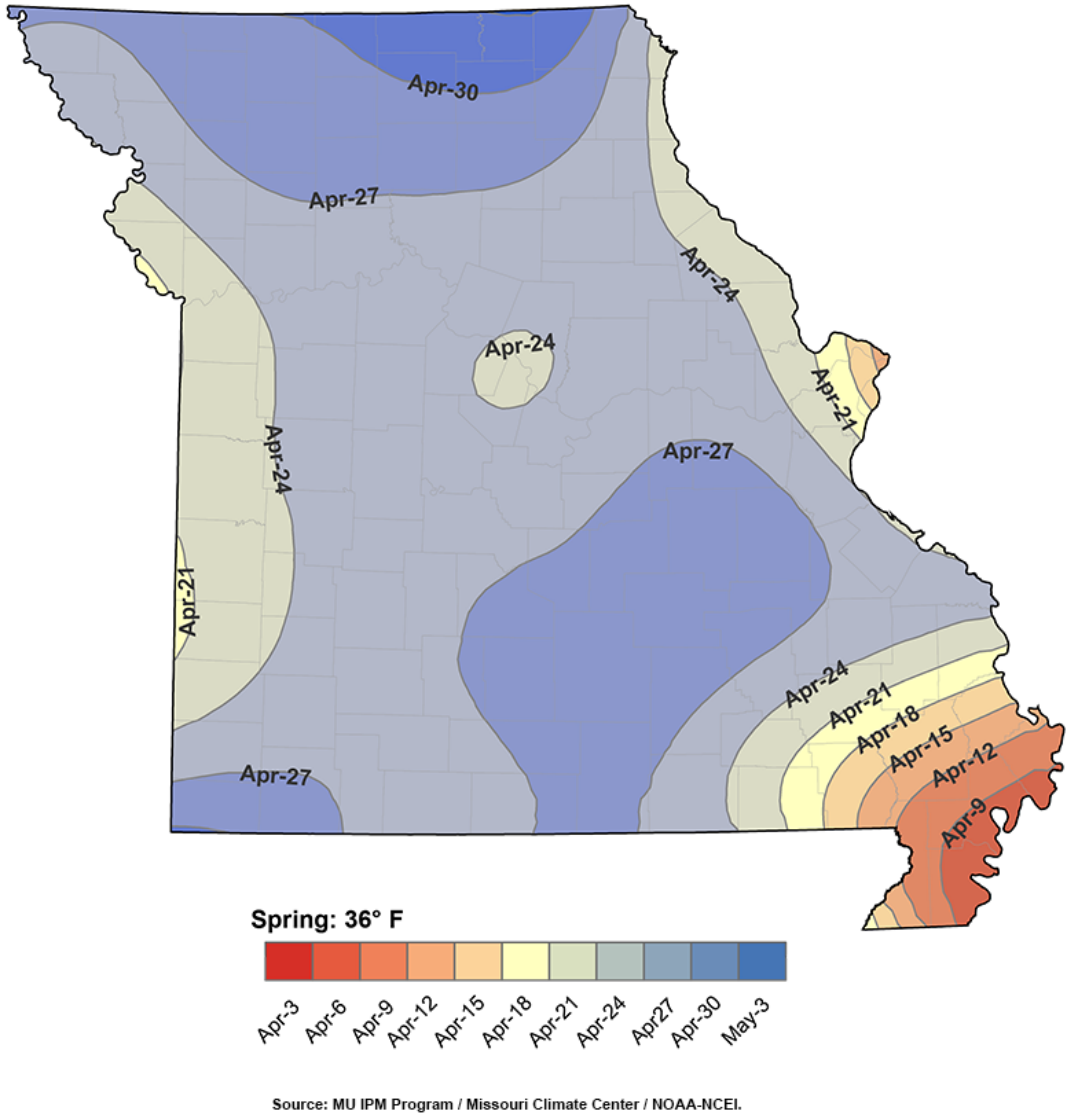
**Past 20 years (2000-2019)**

**In general, the last spring freeze is occurring about 6 days *earlier*…**

**Source: NOAA/Missouri Climate Center**

# Median Date of Last Spring Hard Freeze and Frost




https://ipm.missouri.edu/frostfreezeguide/