



2024 Final Spring Flood & Water Resources Outlook

Released Thursday, March 14th





Spring Flood Risk by Basin

River	Flood Risk
Main Stem Mississippi River	Below Normal
Mississippi Tributaries in Minnesota	Below Normal
Mississippi Tributaries in Iowa	Below Normal
Mississippi Tributaries in Wisconsin	Below Normal





Spring 2024 Flood Outlook Summary

- Current conditions suggest **below-normal** flood risk for Mississippi tributaries and the Mississippi mainstem
 - Below normal river levels
 - Below normal soil moisture
 - **Below normal (non-existent) snowpack** in Upper Mississippi River Basin
 - Below normal frost depths (no frost in our region)
 - Drought across parts of the region going into the winter months - drought has expanded this spring
- These **conditions can change**. The biggest factor affecting spring flood risks are the weather conditions during the sensitive period of melting snow. This year, without the presence of a snowpack, **future precipitation** is the **main (only) driver** of any flood risk moving forward.





How Does Each Factor Affect the Spring Flood Risk by Basin

Factors	Mainstem Mississippi	MN Tributaries (SE MN)	IA Tributaries (NE IA)	WI Tributaries (SW WI)
River Levels	Decreased Risk	Decreased Risk	Decreased Risk	Decreased Risk
Soil Moisture	Decreased Risk	Decreased Risk	Decreased Risk	Decreased Risk
Frost Depth	Decreased Risk	Decreased Risk	Decreased Risk	Decreased Risk
Snowpack	Decreased Risk	Decreased Risk	Decreased Risk	Decreased Risk
Past Precipitation	Decreased Risk	Decreased Risk	Decreased Risk	Decreased Risk
Temp Outlook	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Precip Outlook	Neutral	Neutral	Neutral	Neutral



NWS La Crosse Final 2024 Spring Flood Outlook

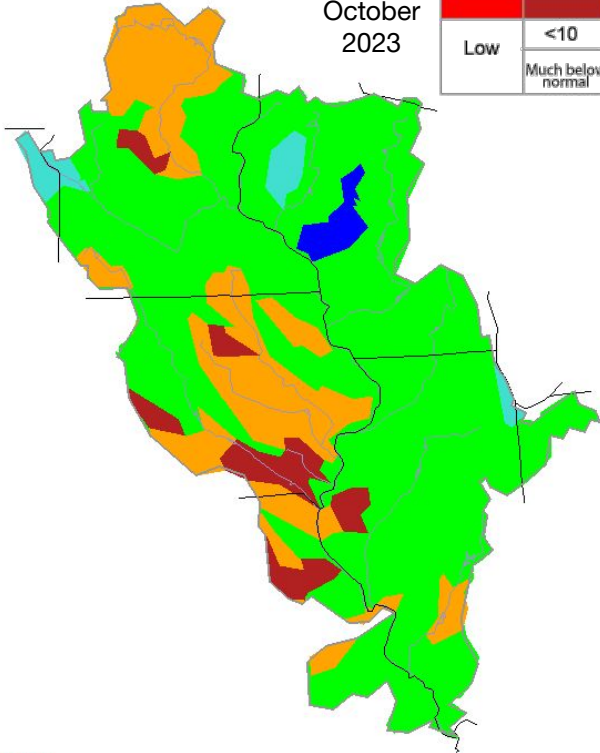
Thursday, March 14th, 2024

River Levels along the Upper Mississippi Basin - October 2023 vs March 2024

October 2023

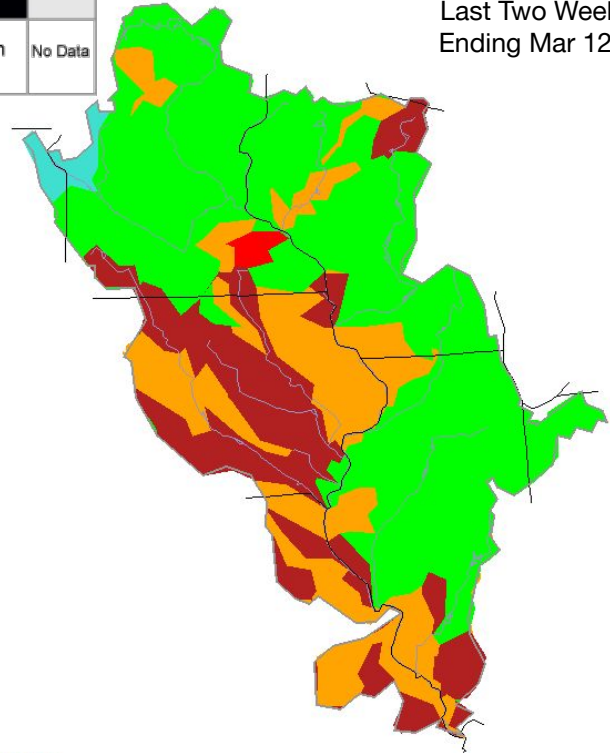
October 2023

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		



Tuesday, March 12, 2024

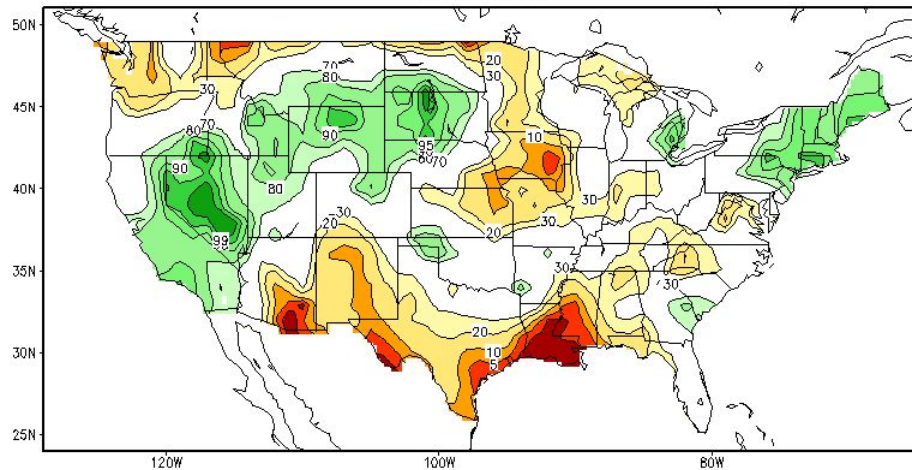
Last Two Weeks Ending Mar 12th



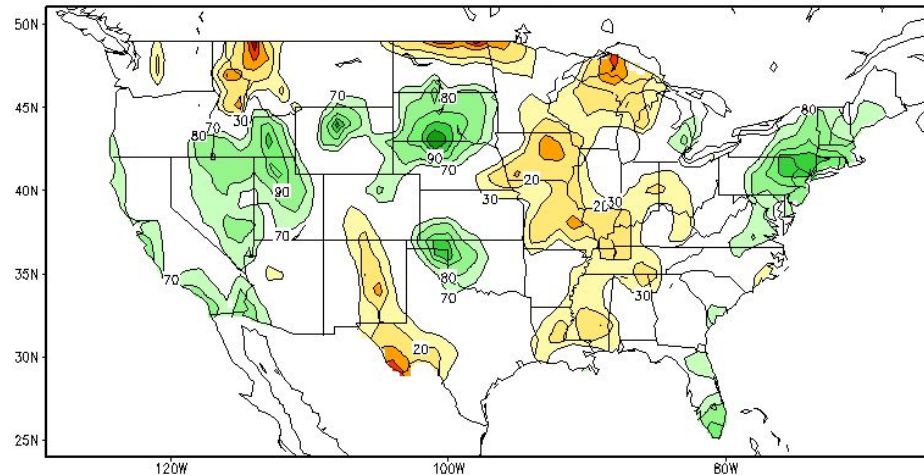


Soil Moisture along the Upper Mississippi Basin - October 2023 vs End of February 2024

Calculated Soil Moisture Ranking Percentile
OCT, 2023



Soil Moisture Ranking Percentile Last day of FEB, 2024



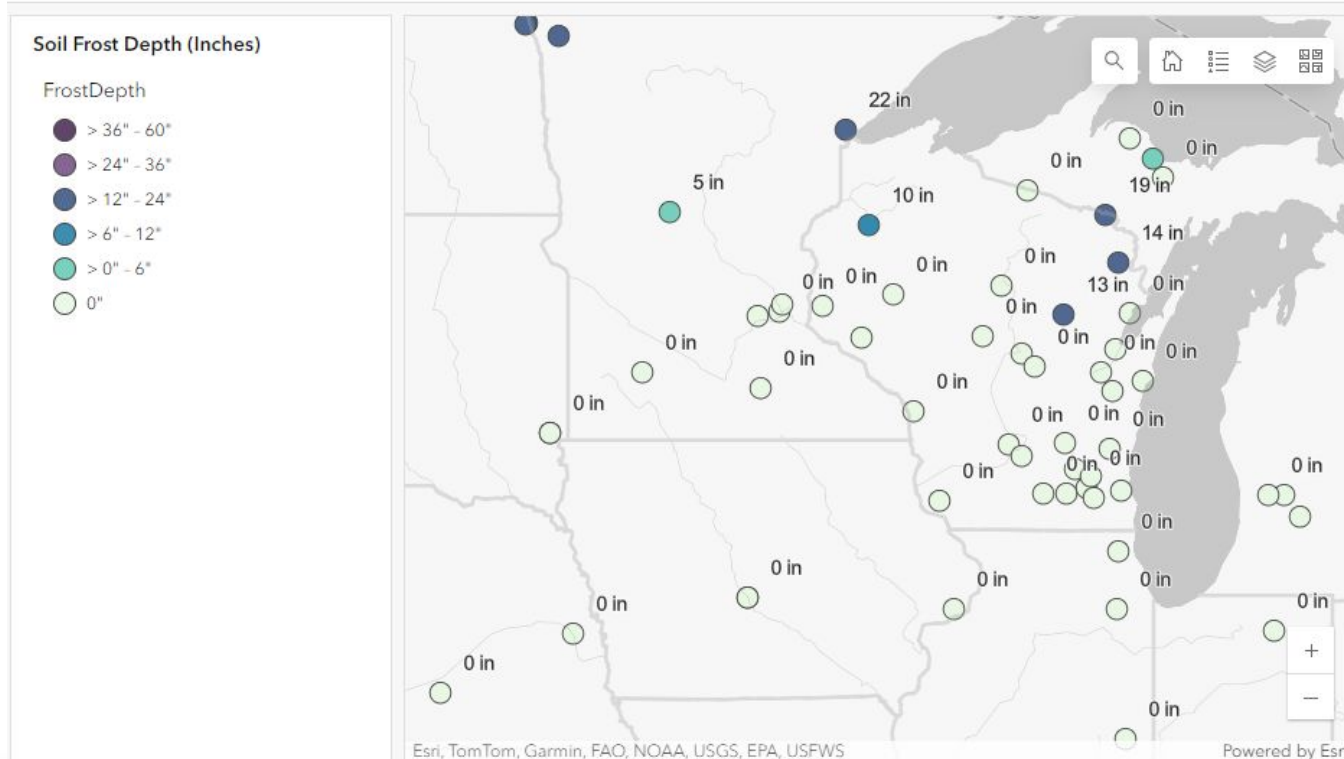


Well Below Normal Frost Depths for Mid-March

Frost Depth (inches)

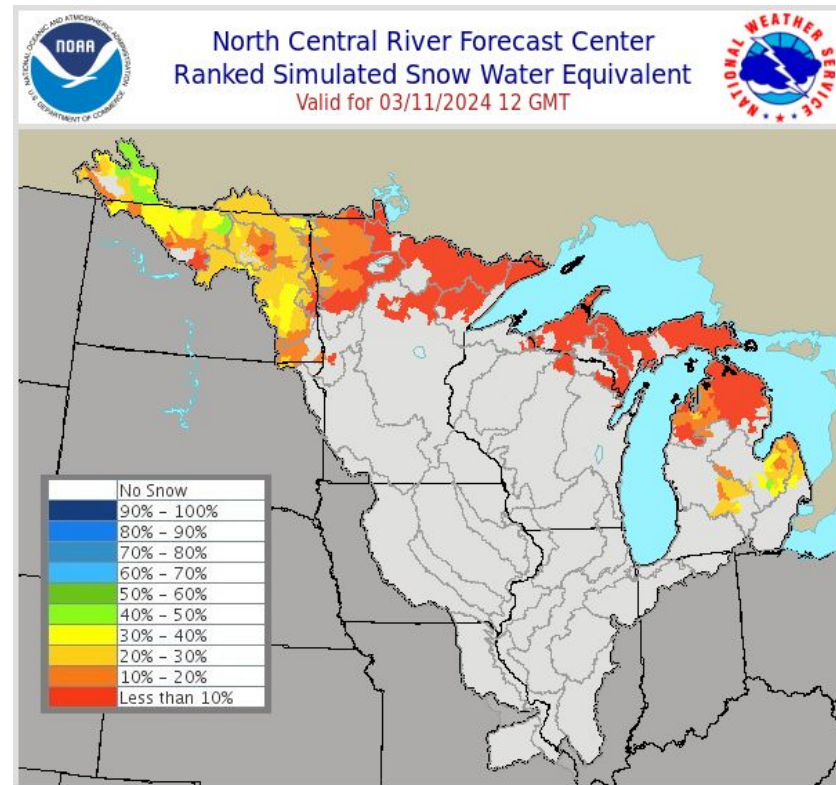
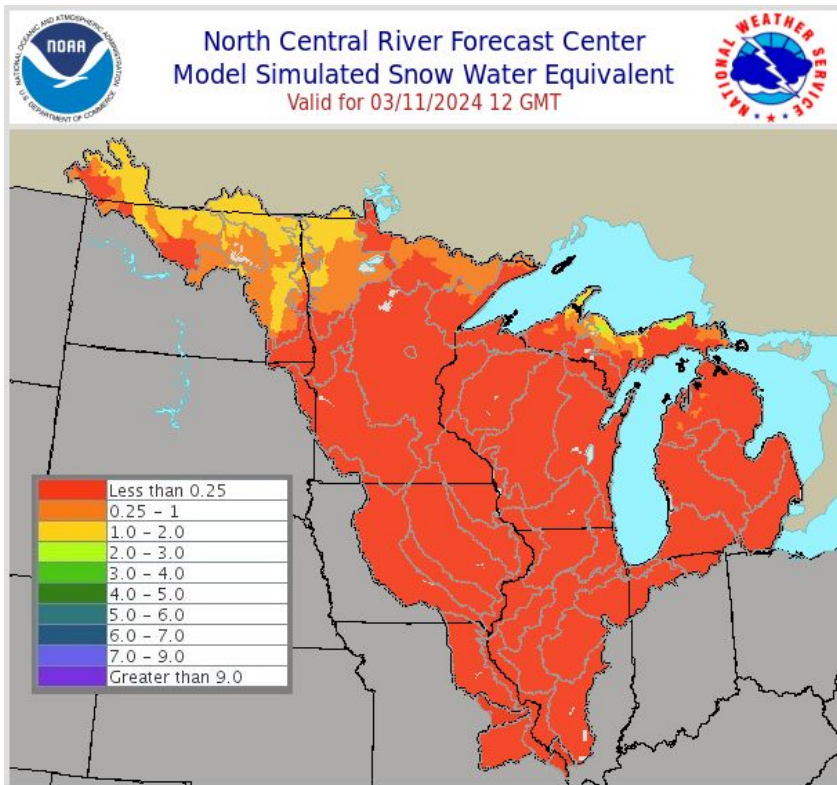
In regions of the central U.S.

March 13, 2024





Current Snow Water Equivalent (Amount of Water in Snowpack) and Historical Comparison

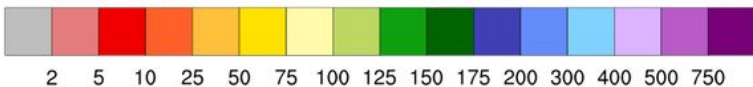
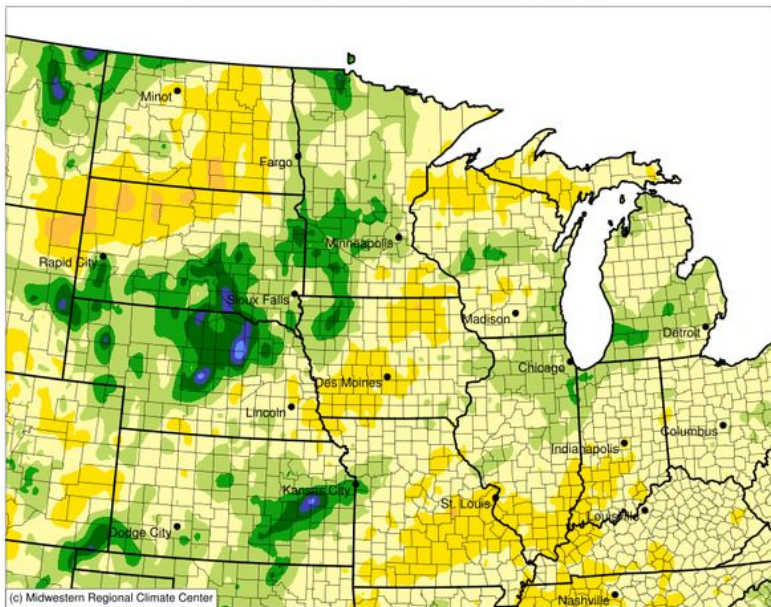




Water Year Precipitation Compared to Normal

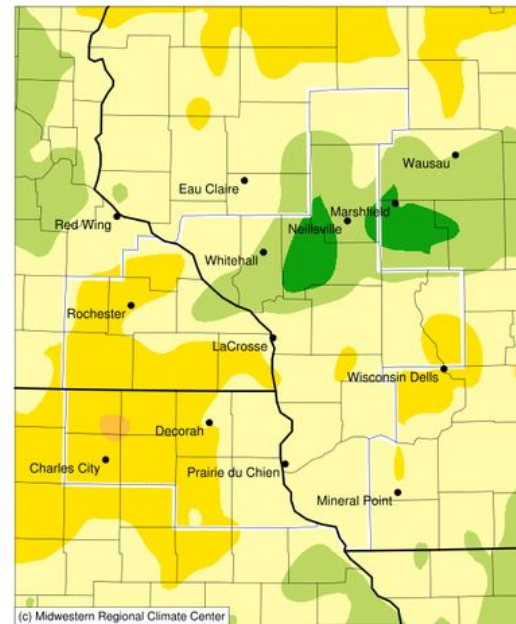
Accumulated Precipitation (in): Percent of 1991-2020 Normals

October 01, 2023 to March 13, 2024



Accumulated Precipitation (in): Percent of 1991-2020 Normals

October 01, 2023 to March 13, 2024



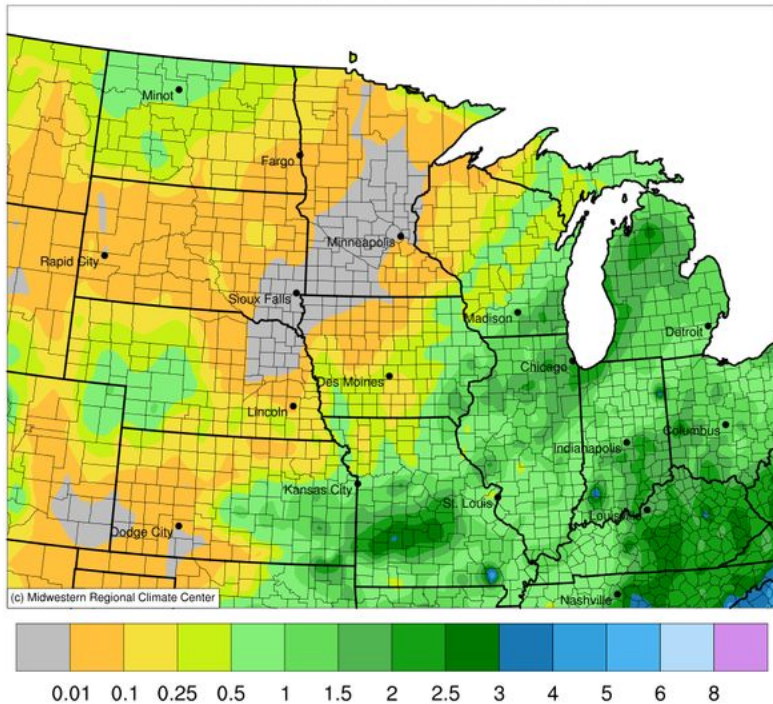


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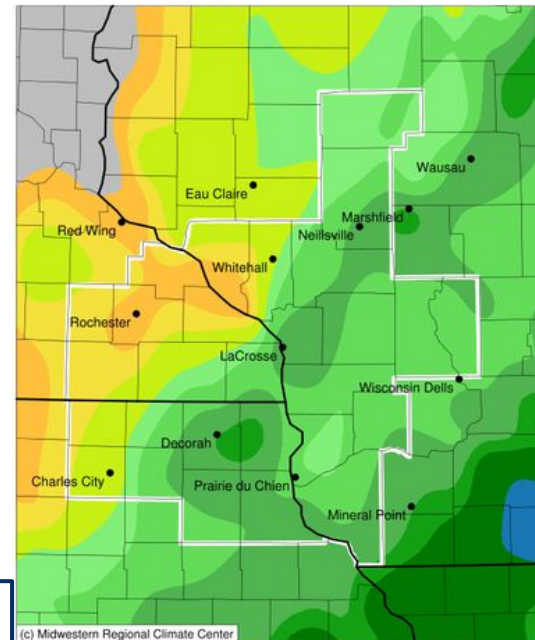
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Precipitation Since the Last Spring Flood Outlook (Feb 29th) - Two Weeks

Accumulated Precipitation (in)
February 29, 2024 to March 13, 2024



Accumulated Precipitation (in)
February 29, 2024 to March 13, 2024



*Different Scales



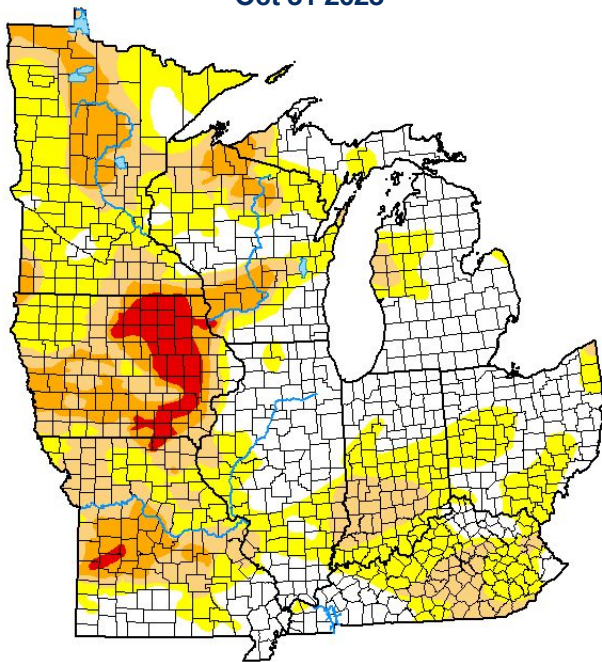


Drought Comparison - October 31st, 2023 vs February 13th, 2024

U.S. Drought Monitor

Midwest

Oct 31 2023

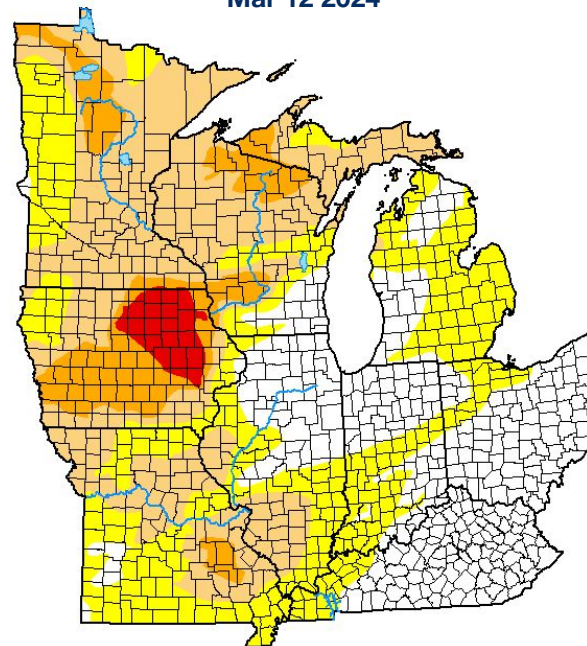


Drought
Monitor

U.S. Drought Monitor

Midwest

Mar 12 2024

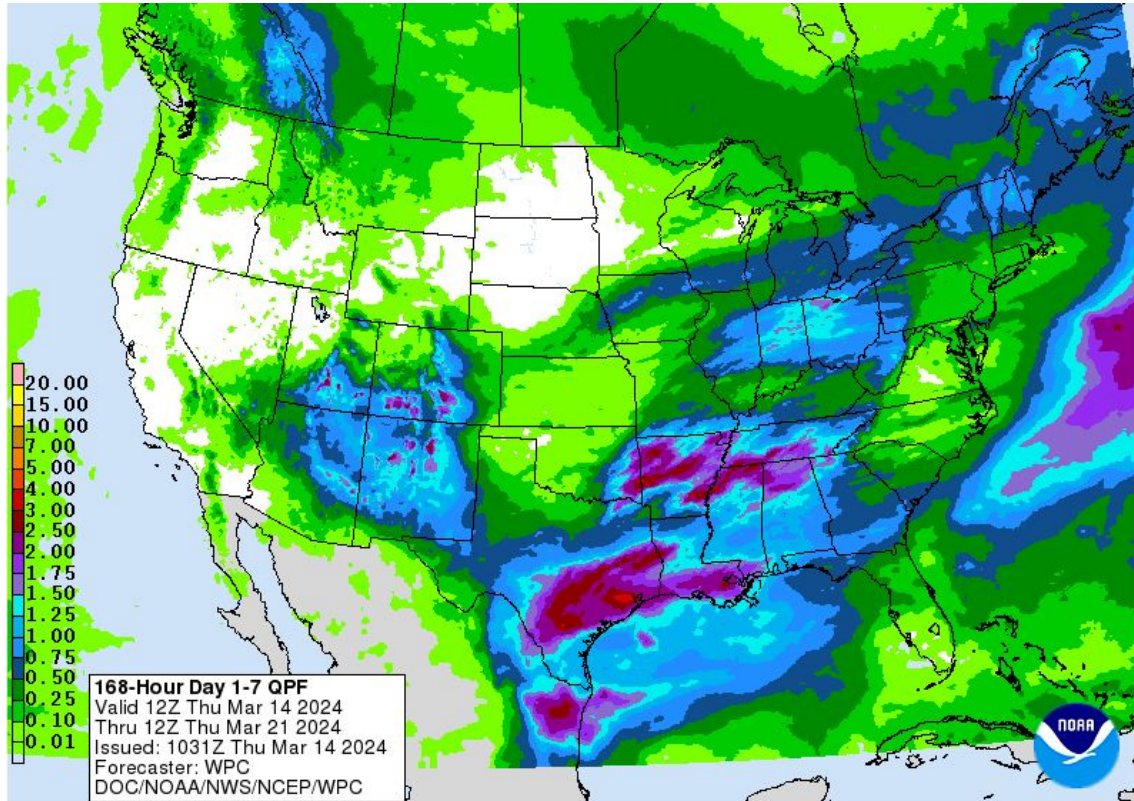




NWS La Crosse Final 2024 Spring Flood Outlook

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Precipitation Forecast for the Next 7 Days



*Note this is liquid equivalent precipitation, not snowfall amounts





NWS La Crosse Final 2024 Spring Flood Outlook

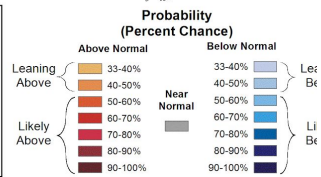
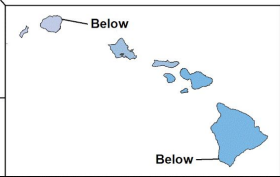
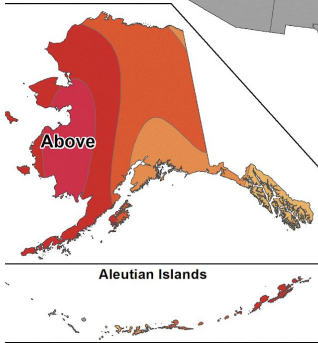
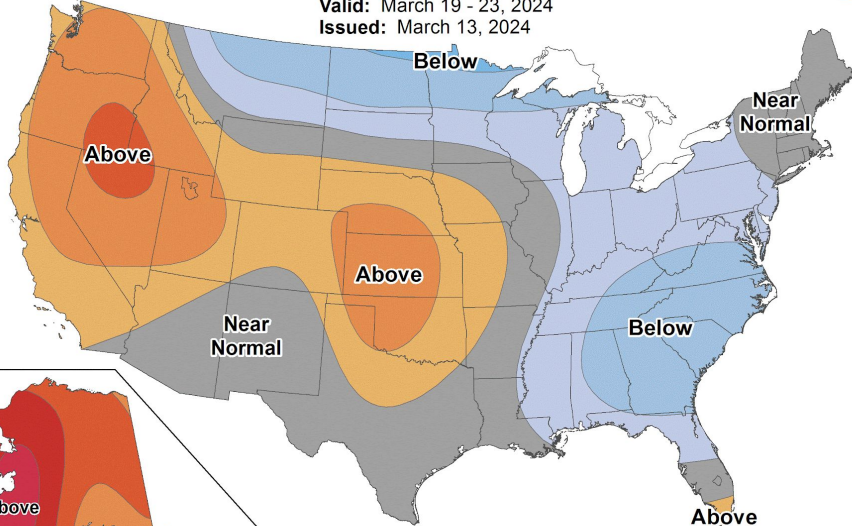
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Temperature and Precipitation Outlook - 6 to 10 Day



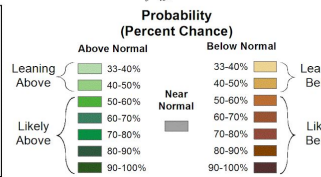
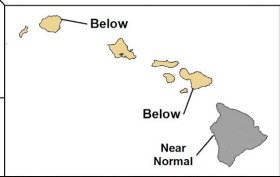
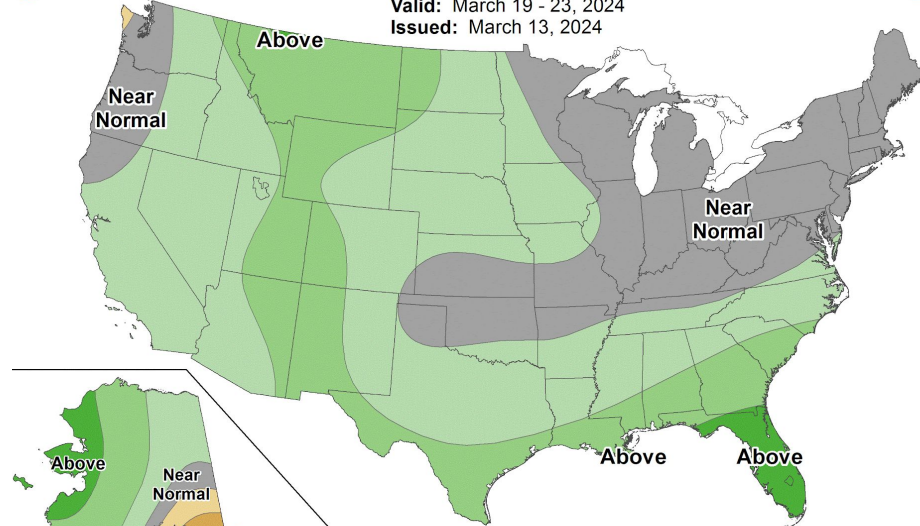
6-10 Day Temperature Outlook

Valid: March 19 - 23, 2024
Issued: March 13, 2024



6-10 Day Precipitation Outlook

Valid: March 19 - 23, 2024
Issued: March 13, 2024





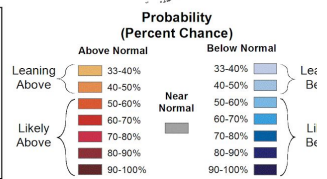
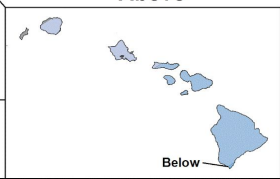
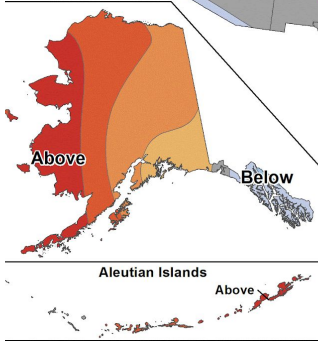
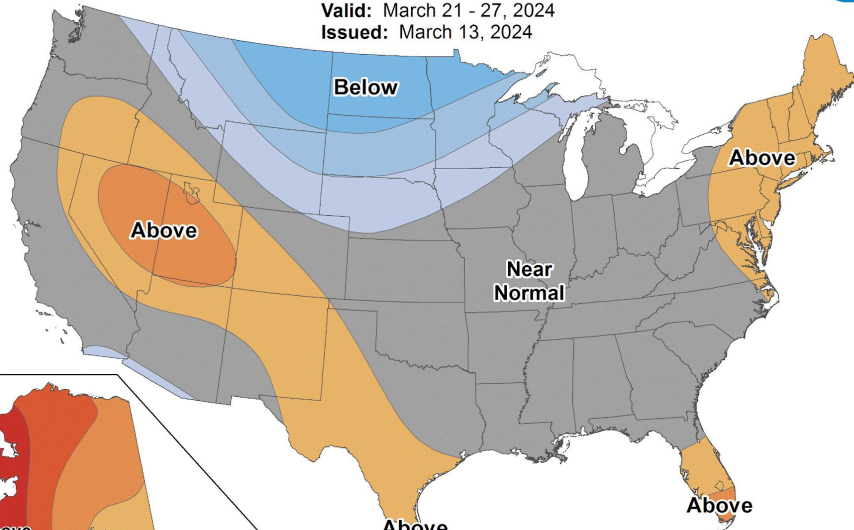
Temperature and Precipitation Outlook - 8 to 14 Day



8-14 Day Temperature Outlook



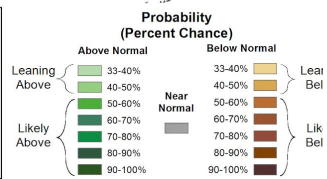
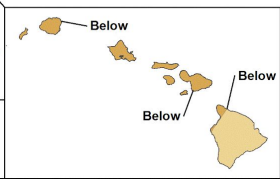
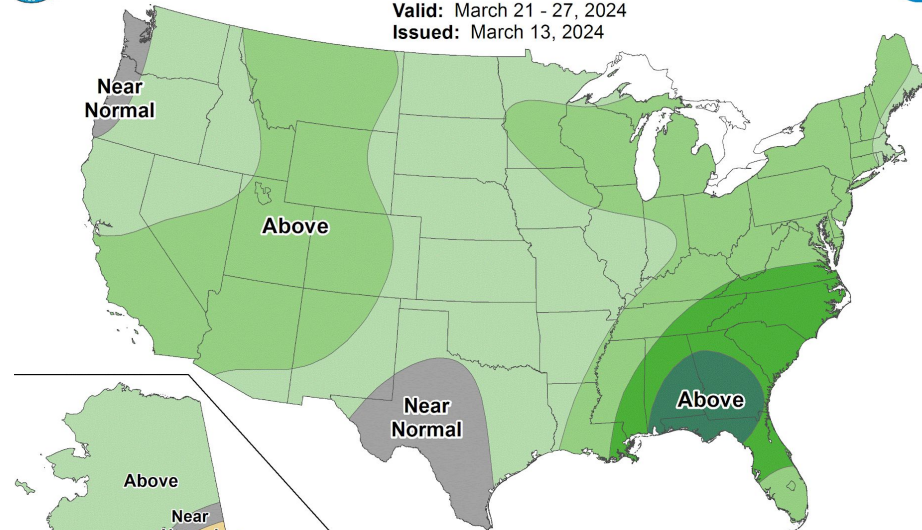
Valid: March 21 - 27, 2024
Issued: March 13, 2024



8-14 Day Precipitation Outlook



Valid: March 21 - 27, 2024
Issued: March 13, 2024





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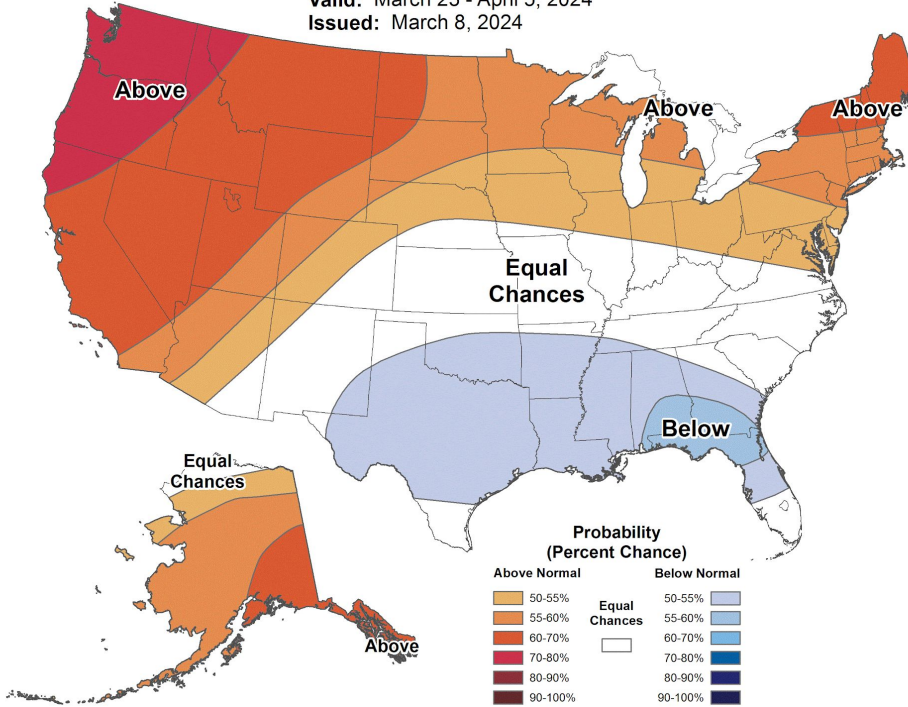
Temperature and Precipitation Outlook - 3 to 4 Week



Weeks 3-4 Temperature Outlook



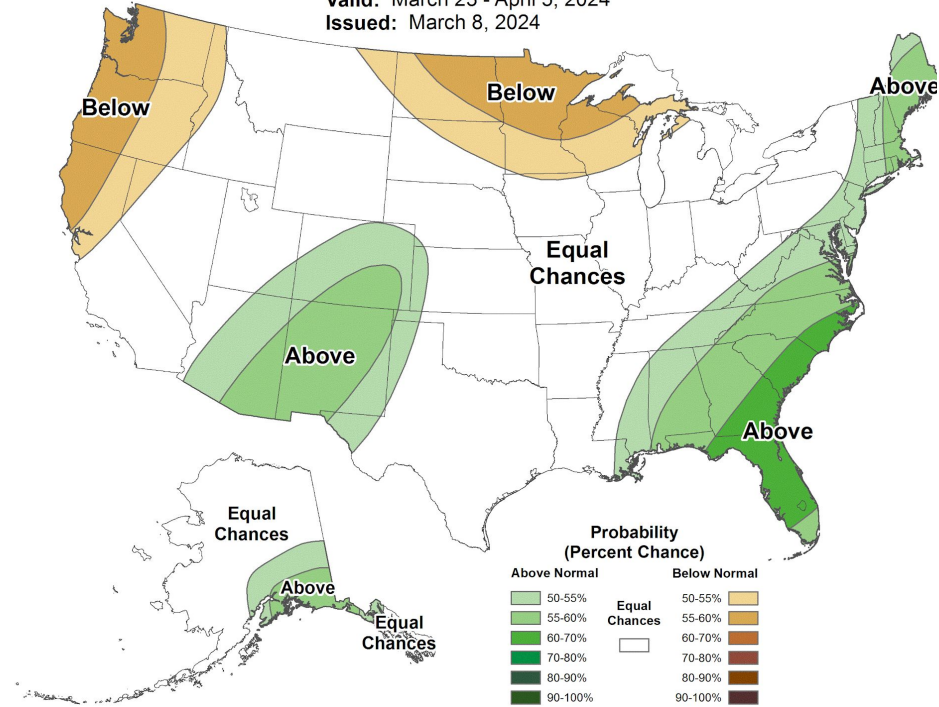
Valid: March 23 - April 5, 2024
Issued: March 8, 2024



Weeks 3-4 Precipitation Outlook



Valid: March 23 - April 5, 2024
Issued: March 8, 2024





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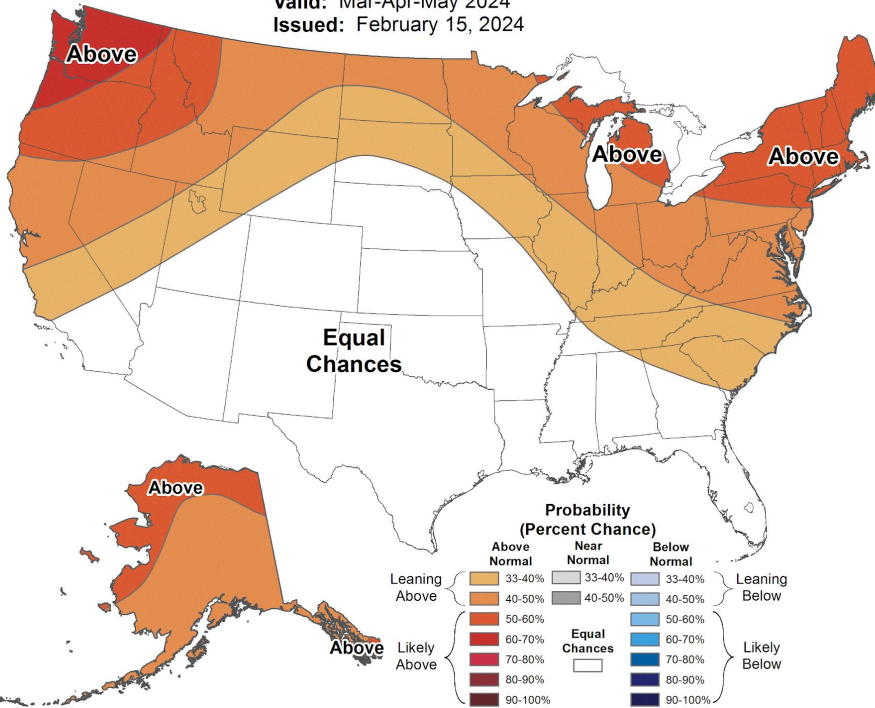
Temperature and Precipitation Outlook - February through April



Seasonal Temperature Outlook



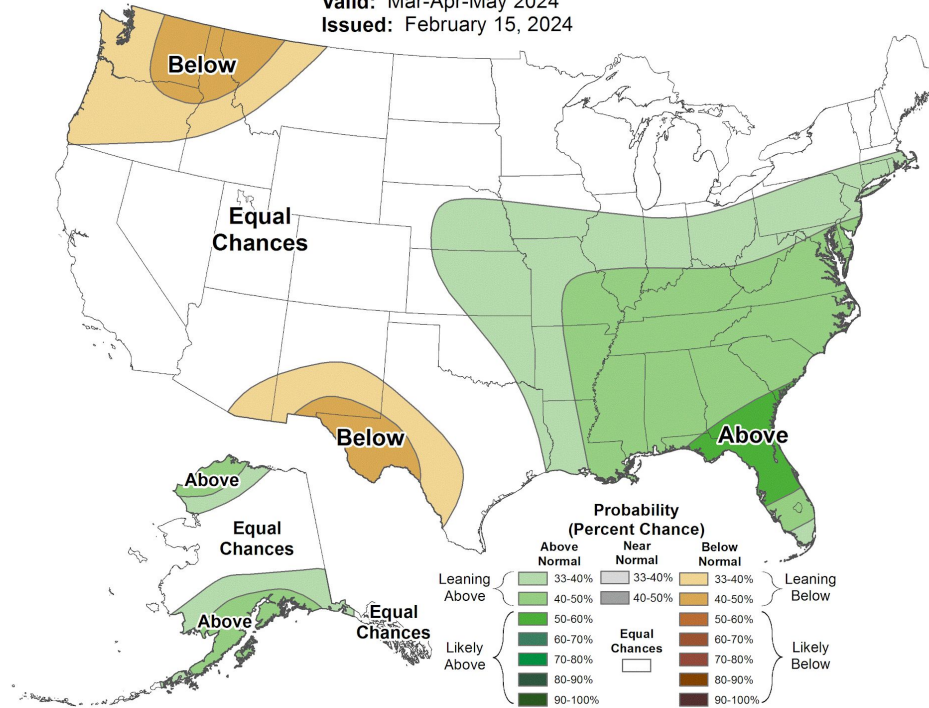
Valid: Mar-Apr-May 2024
Issued: February 15, 2024



Seasonal Precipitation Outlook



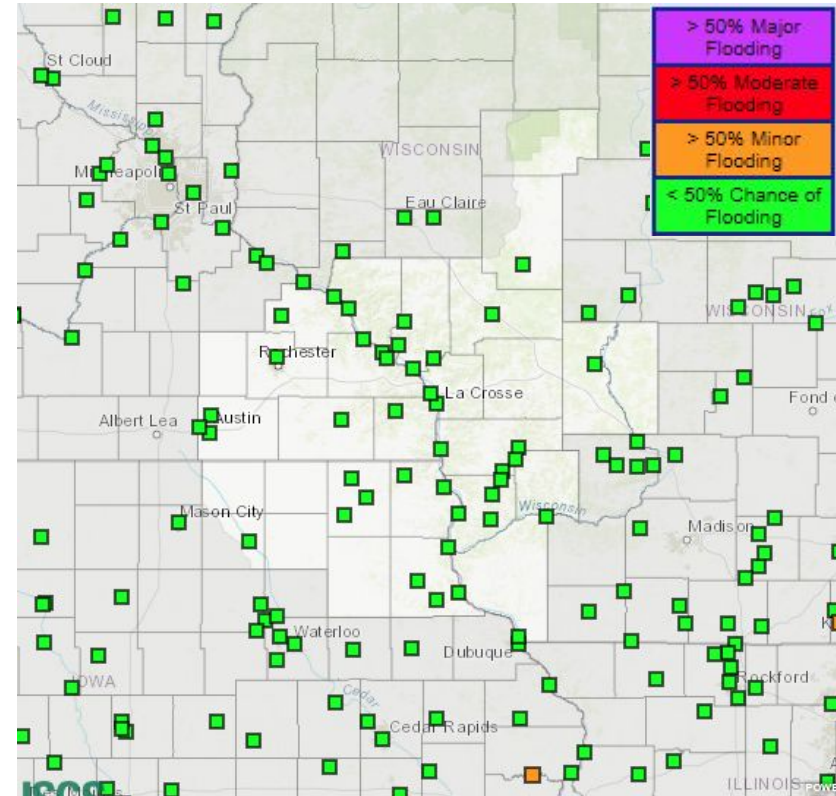
Valid: Mar-Apr-May 2024
Issued: February 15, 2024





Chance of Exceeding Minor Flood Stage

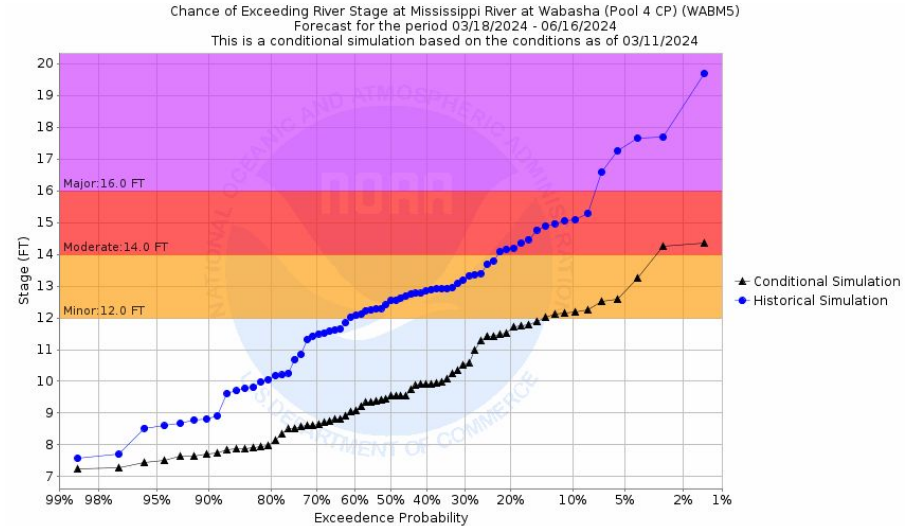
- No points in our local area have a greater than 50% chance of minor flooding.
- [AHPS Long-Range Flood Risk](#)
- New NWPS Website (AHPS Replacement) [Long-Range Flood Risk](#)





Long Range Flood Risk - [Available on AHPS](#) (Advanced Hydrologic Prediction Service)

- Blue line is considered the historical normal chance for flooding (based on historical averages)
- The black line is based on this winter's conditions (current river levels, amount of snow received, etc...)
- When the black line is to the right of the blue line, chances for higher river levels and flooding are lower than the historical average
- Conversely, if the black line was to the left of the blue line, chances for higher river levels and flooding are higher than the historical average



Example from Mississippi River at Wabasha (WABM5)

- Note, black line is to the right of the blue (lower than normal chance)
- 15% (3%) chance of exceeding minor (moderate) flood stage over the next 90 days

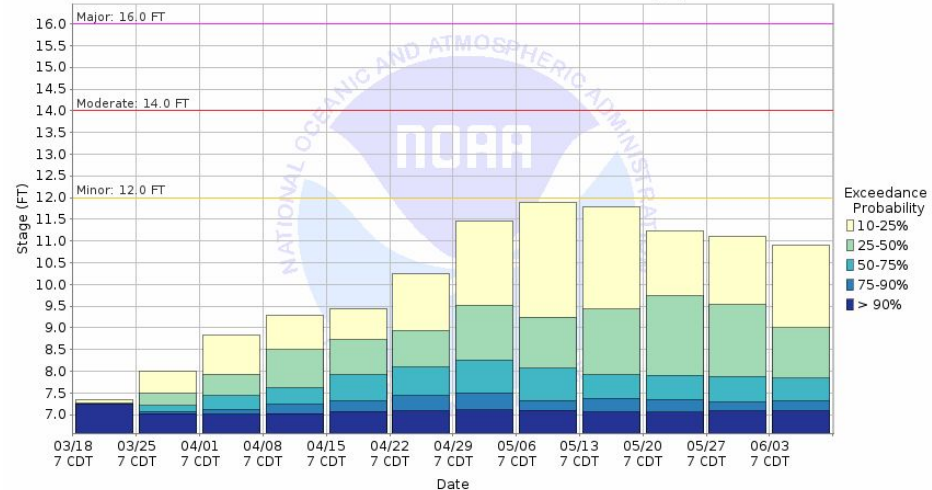




Long Range Flood Risk - [Available on AHPS](#) (Advanced Hydrologic Prediction Service)

- The bar graph to the right represents the exceedance probabilities each week through the spring melt season
- The yellow color of the bar graph represents the 10 to 25% exceedance probability
 - Essentially, there is a 10 to 25% chance that the river reaches that particular level during that particular week
- The exceedance probabilities increase as colors become more blue - 25 to 50%(light green), 50 to 75% (teal), 75 to 90%(Light blue), and > 90% (dark blue)

Weekly Chance of Exceeding River Stage at Mississippi River at Wabasha (Pool 4 CP) (WABM5)
 Forecast for the period 03/18/2024 - 06/16/2024
 This is a conditional simulation based on the conditions as of 03/11/2024



Example from Mississippi River at Wabasha (WABM5)

- Note, there's less than a 10% chance for Wabasha to reach Minor Flood Stage until the last week of April. This is when seasonal thunderstorms typically begin to occur.





National Water Prediction Service (NWPS) set to replace our Advanced Hydrologic Prediction Service (AHPS) on or about March 27th, 2024.

- Biggest Changes:
 - Observation/Forecast flood status in same icon (circle/square respectively)
 - Robust search and filter capabilities
 - Functional legend to create specific displays for your situational awareness
 - Bookmark the URL to retain your settings for the next time
 - New Hazard Map – get all details for any watch/warning in effect, anywhere
 - Improved precipitation maps
 - Daily snow information maps
 - Long Range Outlook Map – see quick view on mouse over



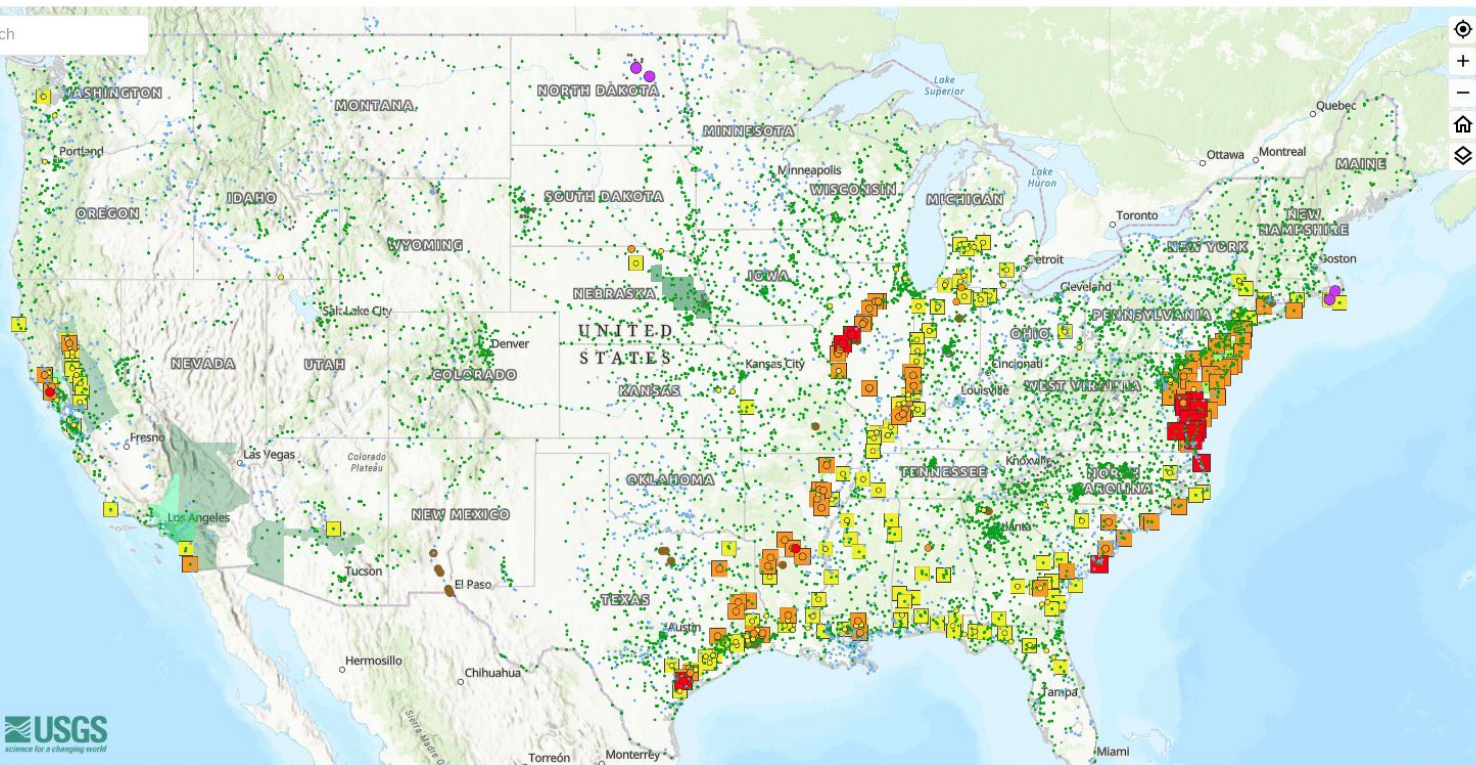


NWS La Crosse Final 2024 Spring Flood Outlook

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NWPS Landing Page - Customizable Layers Available on the Right - Bookmark the link to save!

Search



Map

Topographic

Layers

River Gauge

- Observations & Forecasts
- Long Range Flood Outlook

CATEGORIES	OBSERVATION	FORECAST
Major Flood	8	0
Moderate Flood	8	35
Minor Flood	116	223
Action	252	297
No Flood	10435	0
Flood Category Not Defined	4053	0
Low Water Threshold	32	0
Data Not Current	349	0
Out of Service	316	0

- Limit by boundary
- Only display Partner FIM Gauges

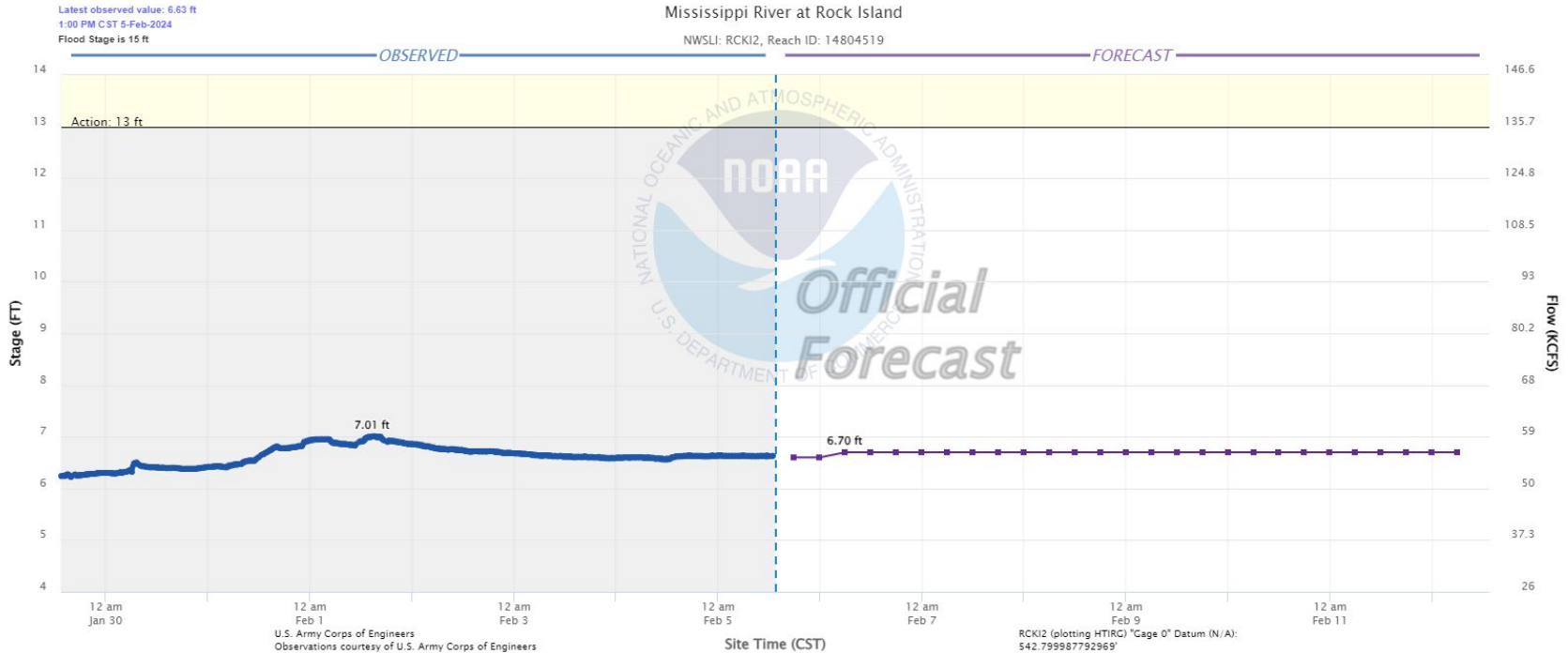
Hazards

Precipitation Estimate
 Enabled





New NWPS Hydrographs



Zoom 1d 2d 7d 14d All

Jan 29, 2024 - Feb 12, 2024

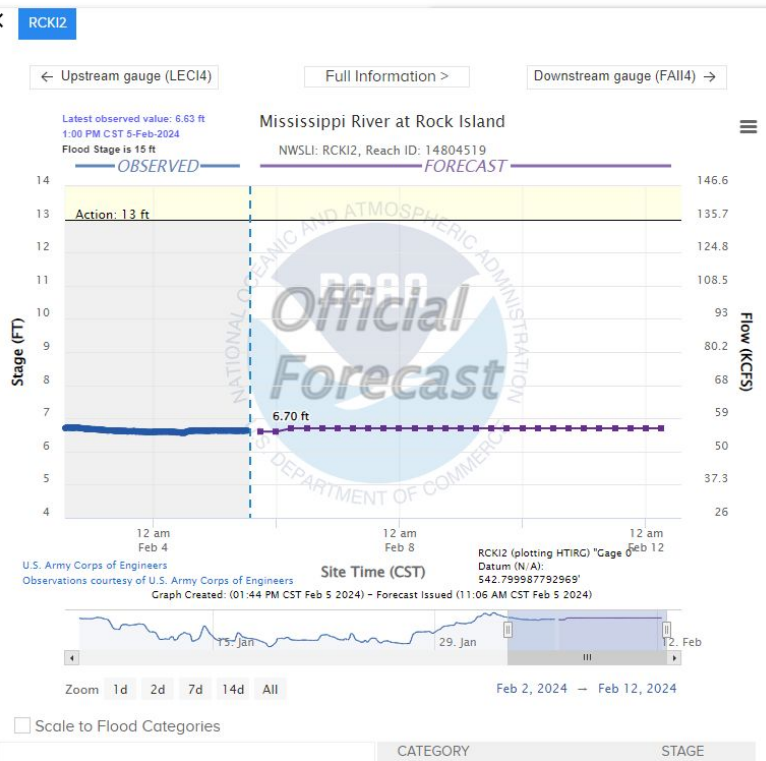
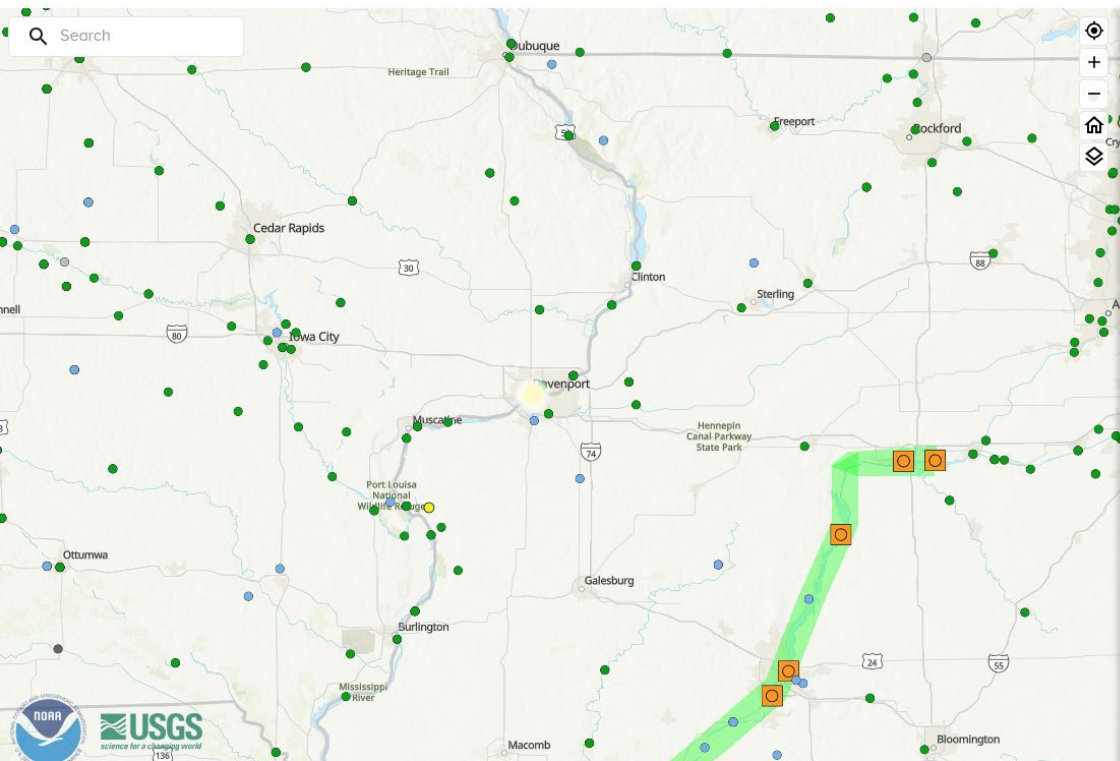




NWS La Crosse Final 2024 Spring Flood Outlook

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Selecting a River Gage Location - Pop Out Information on the Right





Full Information Page

Abundance of Information Available, including the following:

- Hydrograph (Up to the last 30 days of obs & the next 7 days of forecasts (where applicable))
- Gage Metadata (Location, Data Owner/Provider, Website Information)
- Flood Impacts
 - Flood Inundation Mapping (where applicable)
- Recent & Historic Crests
- River Gage & Location Photos
- Probabilistic Forecast Information
 - Seasonal Weekly Chance of Exceeding Levels
 - Chance of Exceeding Levels During Entire Period
 - Experimental 10-Day River Level Probabilistic Forecasts (HEFS)
- Other Unique Local Information





NWPS Probabilistic Information

- Towards the bottom of “Full Information” page
- Image to the right...Experimental, automated river level guidance that uses current river levels, recent precipitation, soil conditions, and snowpack data with 10 days of forecast temperatures (melting snow) and precipitation to create a probabilistic range of future river levels.
 - Official forecasts use 48 hours of forecast rainfall in the spring and fall
 - 24 hours of forecast precipitation in summer

Probability Information

Experimental Short Range Forecast Uncertainty

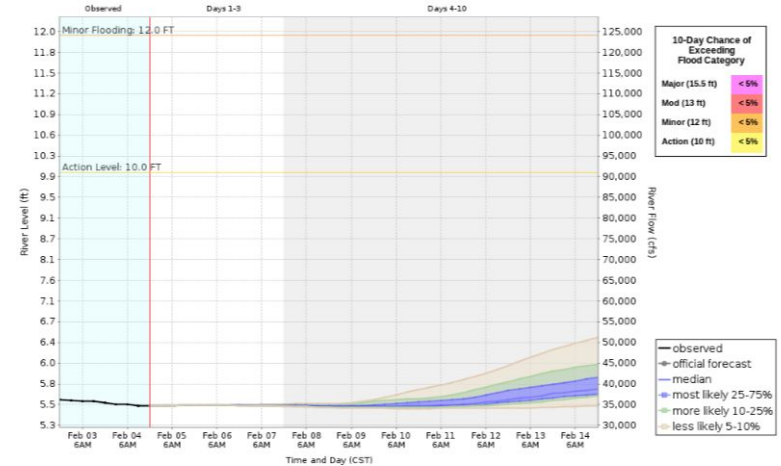
[About this graph](#) | [Product Description Document](#) | [Customer Survey](#)

HEFS - 10 Day River Level Probabilities

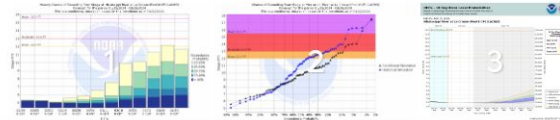
Based on Hydrologic Ensemble Forecast Service Model Simulations
Used to Estimate the Range of Possible River Levels



Feb 05 - Feb 15, 2024
Mississippi River at La Crosse (Pool 8 CP) (LACW3)



Model runtime: 06:00 PM CST Feb 04 2024
North Central River Forecast Center





Informational Links:

- [Current River Levels and Forecast](#)
 - New Website - [Current River Levels and Forecast](#)
- [Long-Range Flood Risk by River Point](#) (Spring Flooding Potential)
 - New Website - [Long-Range Flood Risk by River Point](#)
- [Latest Hydrographs by Basin](#)
- [Spring Flood Outlook Text Information](#)

Please reach out to jordan.wendt@noaa.gov for any questions or comments

