



2023 Initial Spring Flood & Water Resources Outlook

Released Thursday, February 9th





NWS La Crosse First 2023 Spring Flood Outlook

Thursday, February 9th, 2023

Spring Flood Risk by Basin

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





Spring 2023 Flood Outlook Summary

- Current conditions suggest near normal flood risk for Mississippi tributaries and a slightly above normal flood risk for the Mississippi mainstem
 - Near normal river levels
 - Near normal soil moisture
 - **Above normal snowpack** in Upper Mississippi River Basin
 - Near normal snowpack across southern Minnesota, southwest Wisconsin, and northeast Iowa
 - Normal to below normal frost depths
 - Drought across parts of the region going into the winter months
- These conditions can and often change. The biggest factor affecting spring flood risks are the weather conditions during the sensitive period of melting snow. A slow and steady melt, with little to no additional precipitation will lower the flood risk significantly. Conversely, a fast warm up, coupled with moderate to heavy amounts of rainfall **would significantly increase** the flood risk.



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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	Neutral	Neutral	Neutral	Neutral
Soil Moisture	Neutral	Neutral	Neutral	Neutral
Frost Depth	Decreased risk	Decreased risk	Decreased risk	Decreased risk
Snowpack	Increased Risk	Increased Risk	Neutral	Neutral
Past Precipitation	Neutral to Increased Risk	Decreased Risk	Neutral to Decreased Risk	Increased Risk
Temperature Outlook	Neutral	Neutral	Neutral	Neutral
Precipitation Outlook	Neutral to Increased Risk	Neutral to Increased Risk	Neutral to Increased Risk	Neutral to Increased Risk





NWS La Crosse First 2023 Spring Flood Outlook

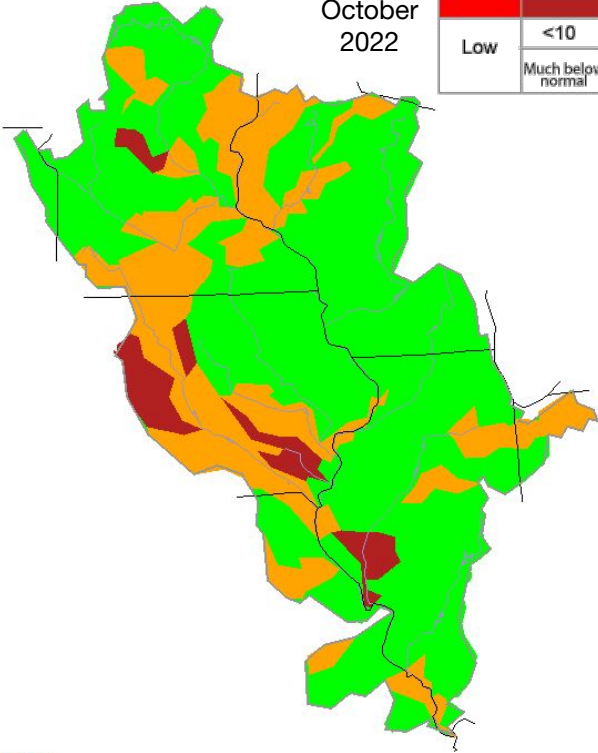
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River Levels along the Upper Mississippi Basin - October 2022 vs January 2023

October 2022

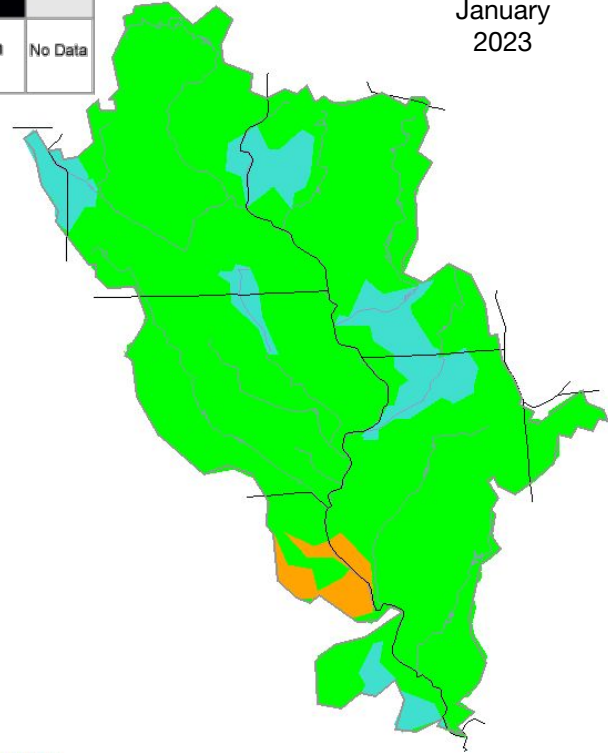
October
2022

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		



January 2023

January
2023



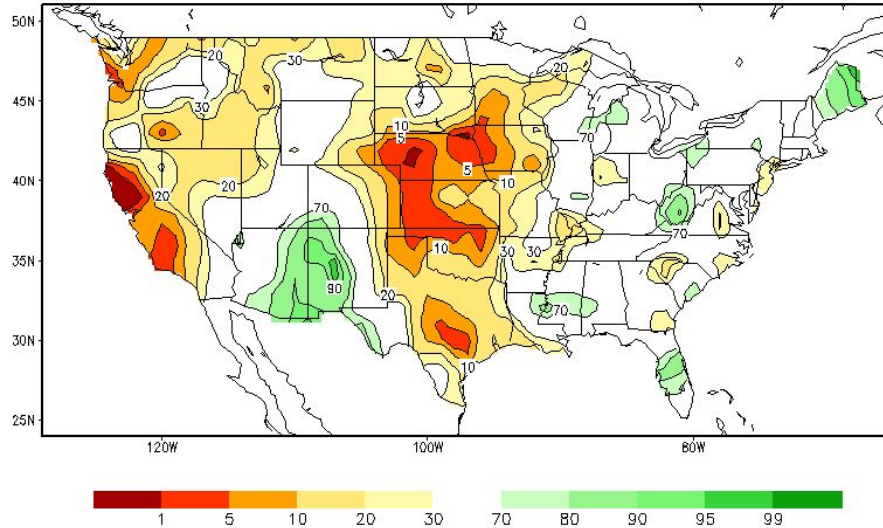


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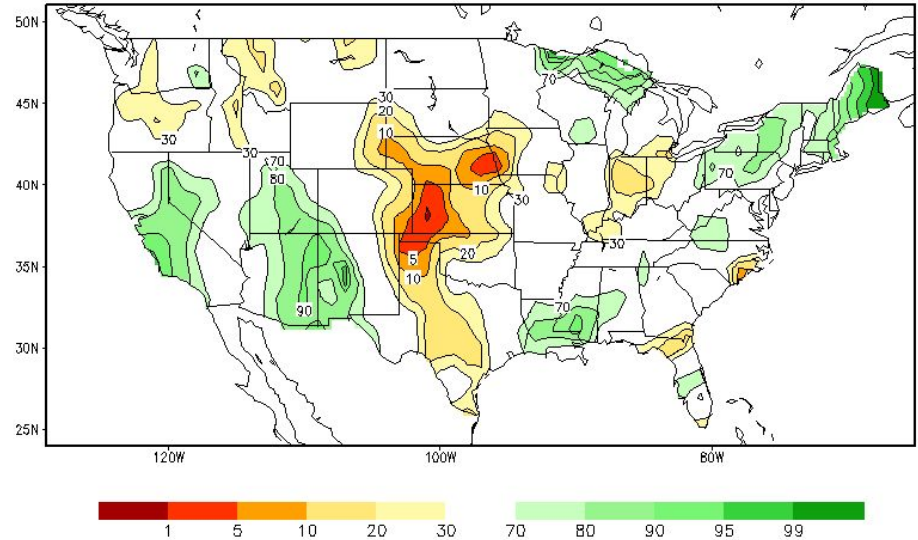
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Soil Moisture along the Upper Mississippi Basin - October 2022 vs January 2023

Calculated Soil Moisture Ranking Percentile
OCT, 2022



Calculated Soil Moisture Ranking Percentile
JAN, 2023





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Last Week's Cold Snap did Increase Frost Depths

Frost Depth Trends at NWS La Crosse

February 2nd, 2023: 3 Inches, Snow depth 5 inches

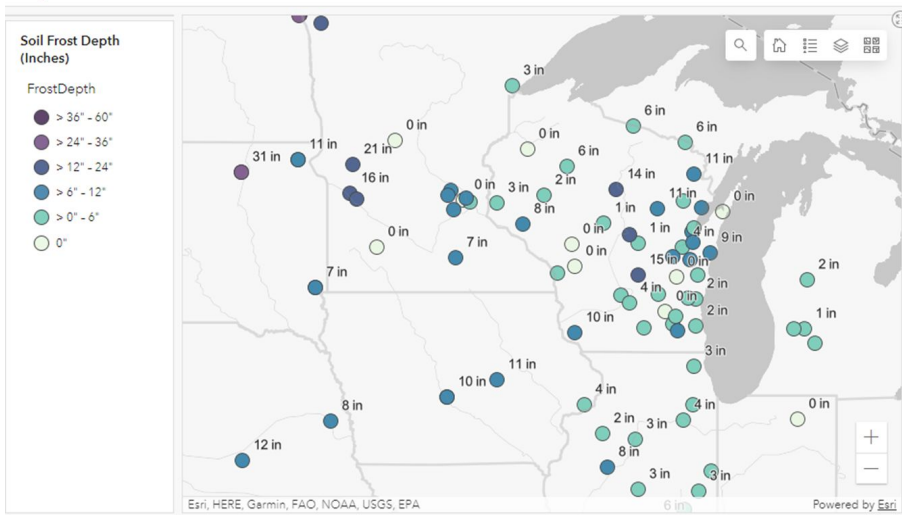
February 8th, 2023: 6 Inches, Snow depth 2 inches

February 9th, 2023: 6 inches, Snow depth 1 inches

Frost Depth (inches)

In regions of the central U.S.

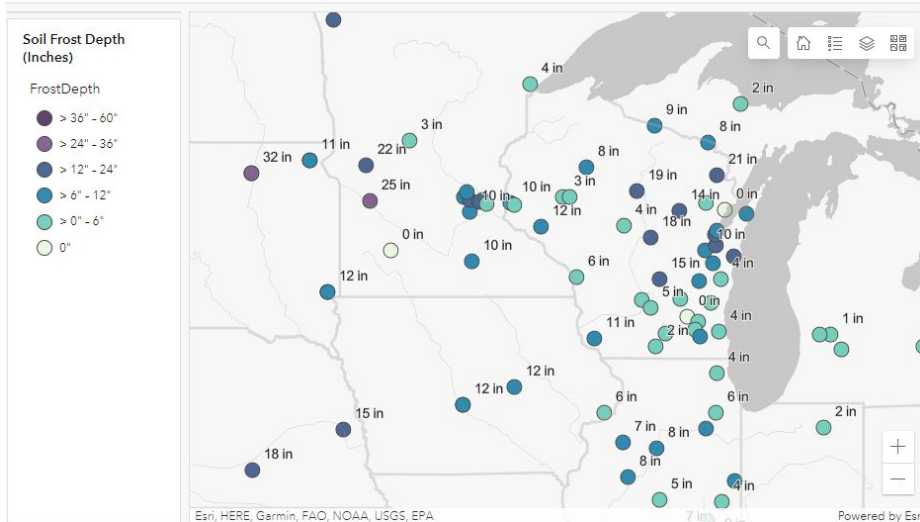
February 2nd, 2023



Frost Depth (inches)

In regions of the central U.S.

February 8th, 2023



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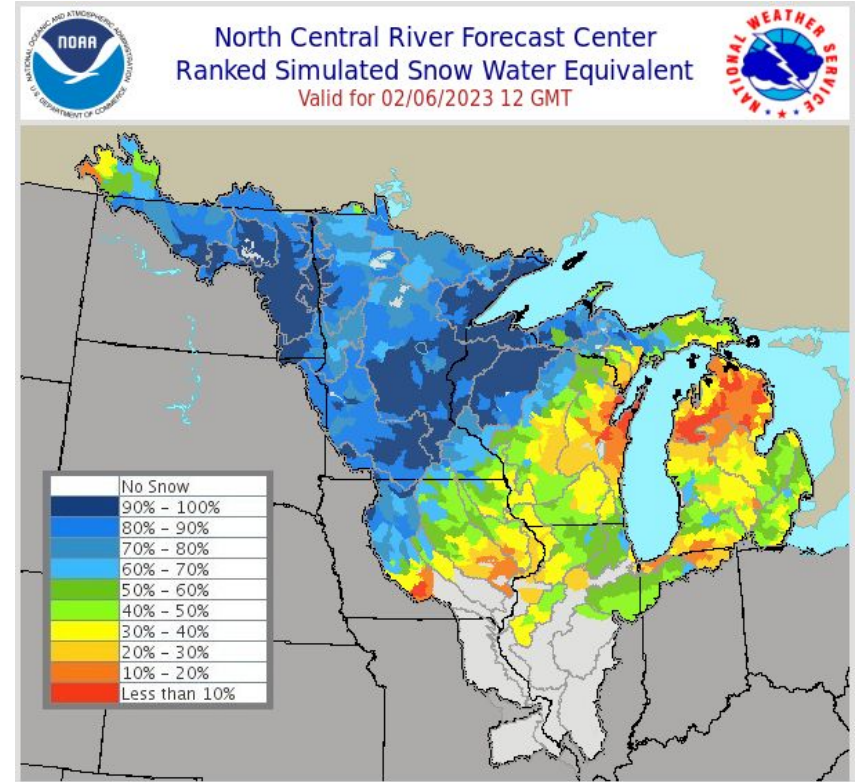
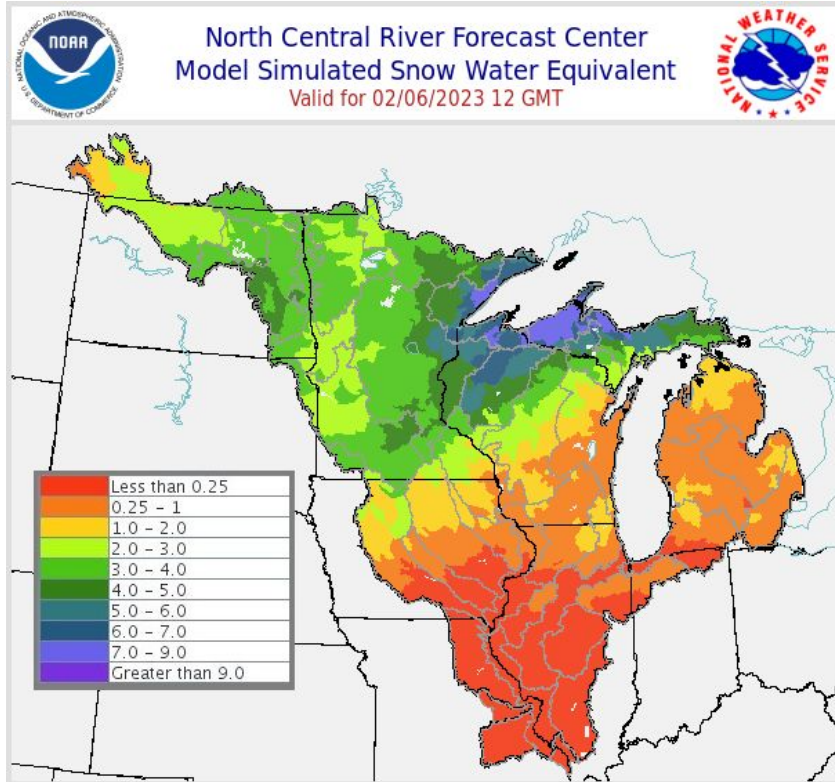
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Current Snow Water Equivalent (Amount of Water in Snowpack) and Historical Comparison





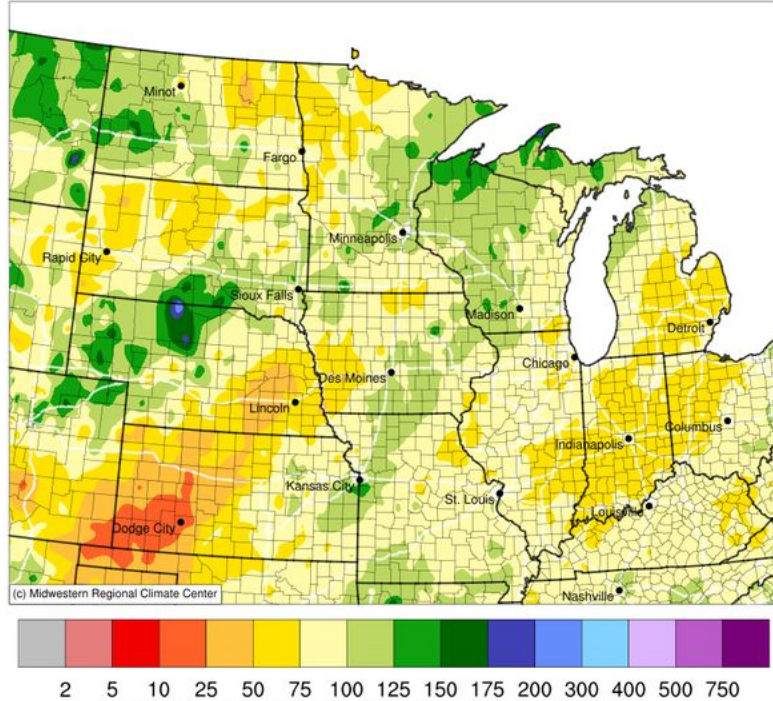
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Water Year Precipitation Compared to Normal

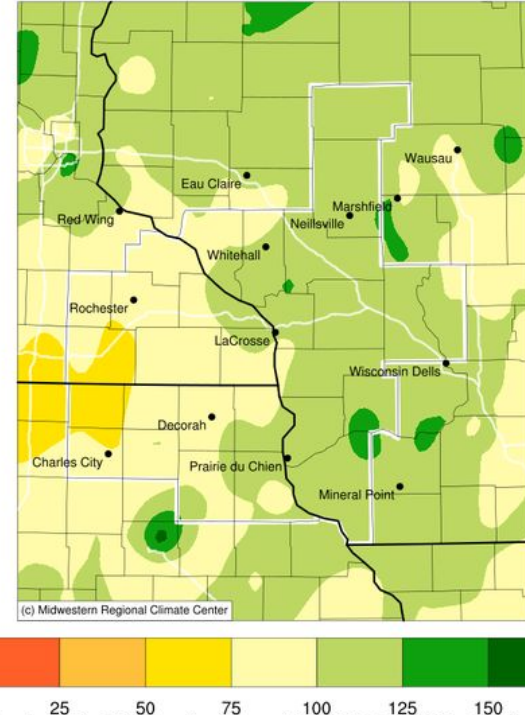
Accumulated Precipitation (in): Percent of 1991-2020 Normals

October 01, 2022 to February 08, 2023



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

October 01, 2022 to February 08, 2023



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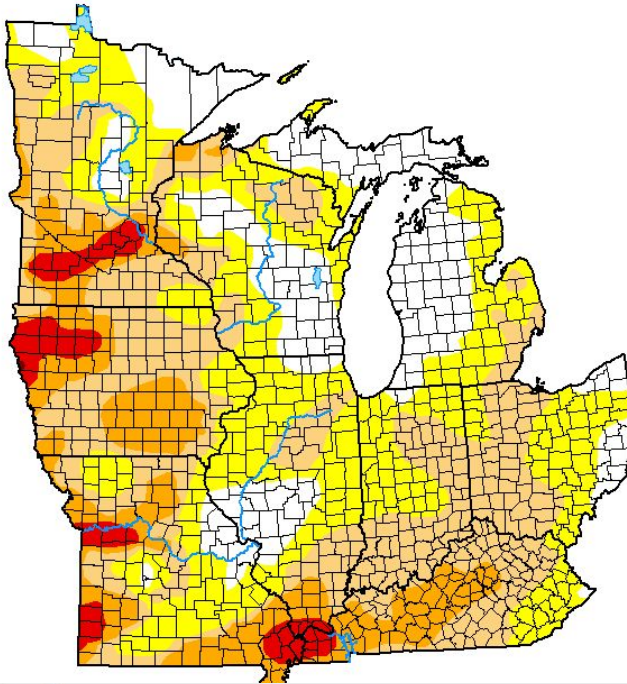
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Drought Comparison - November 1st, 2022 vs January 31st, 2023

U.S. Drought Monitor Midwest

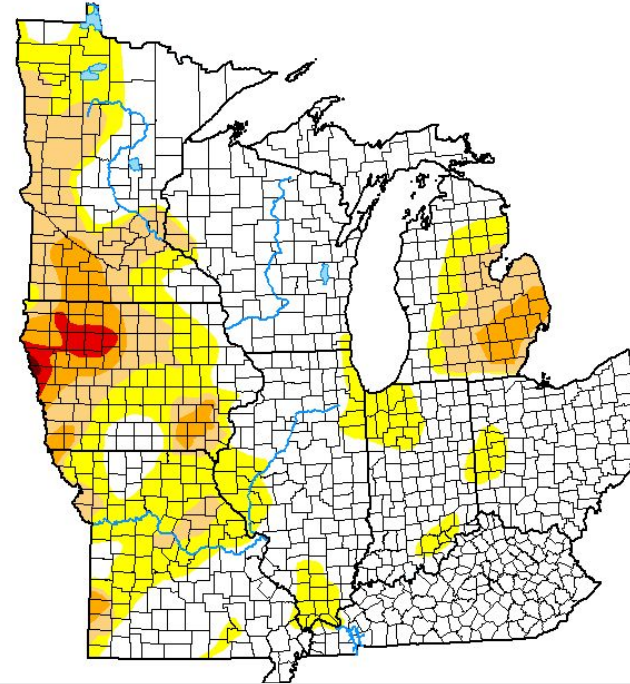
Nov 1 2022



[Drought](#)
[Monitor](#)

U.S. Drought Monitor Midwest

Feb 09 2023



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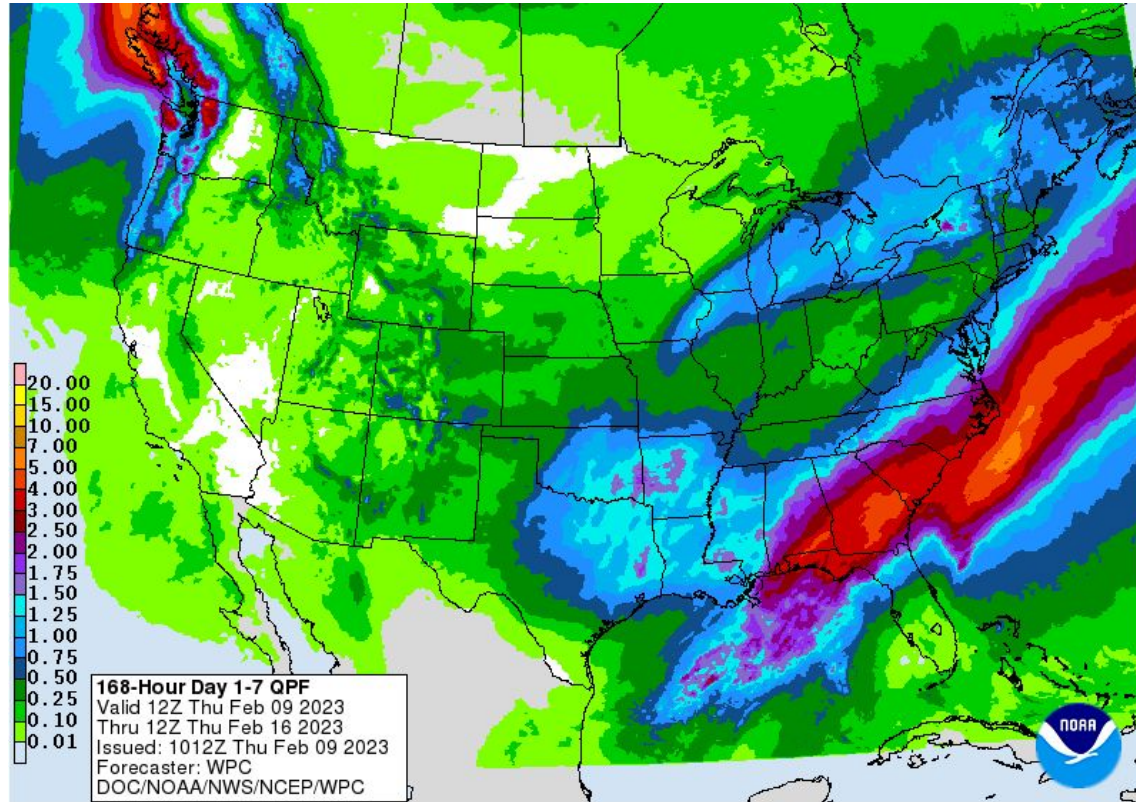
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Precipitation Forecast for the Next 7 Days



*Note this is liquid equivalent precipitation, not snowfall amounts



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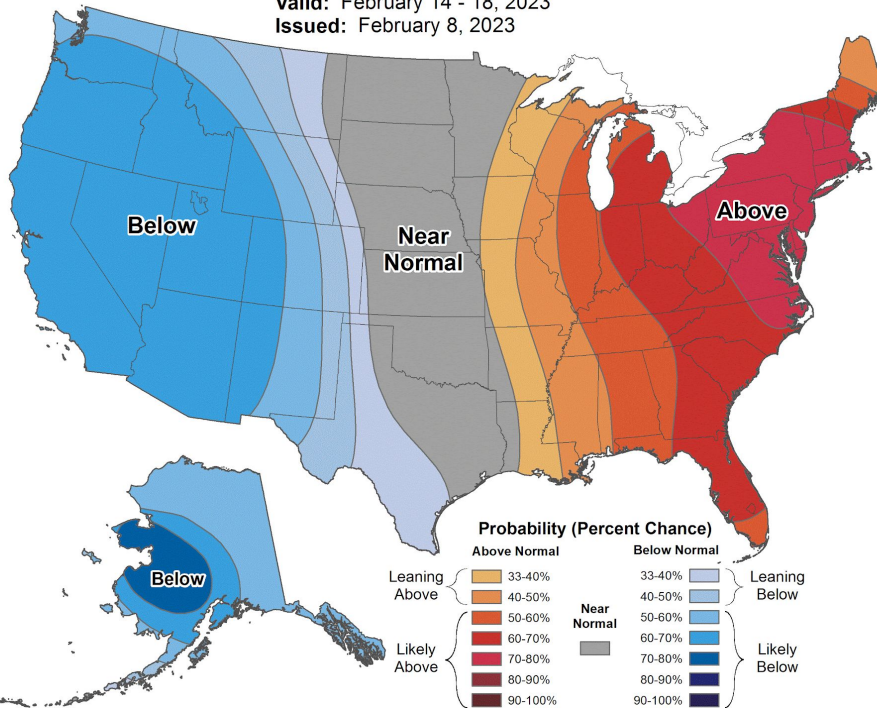
Temperature and Precipitation Outlook - 6 to 10 Day



6-10 Day Temperature Outlook

Valid: February 14 - 18, 2023

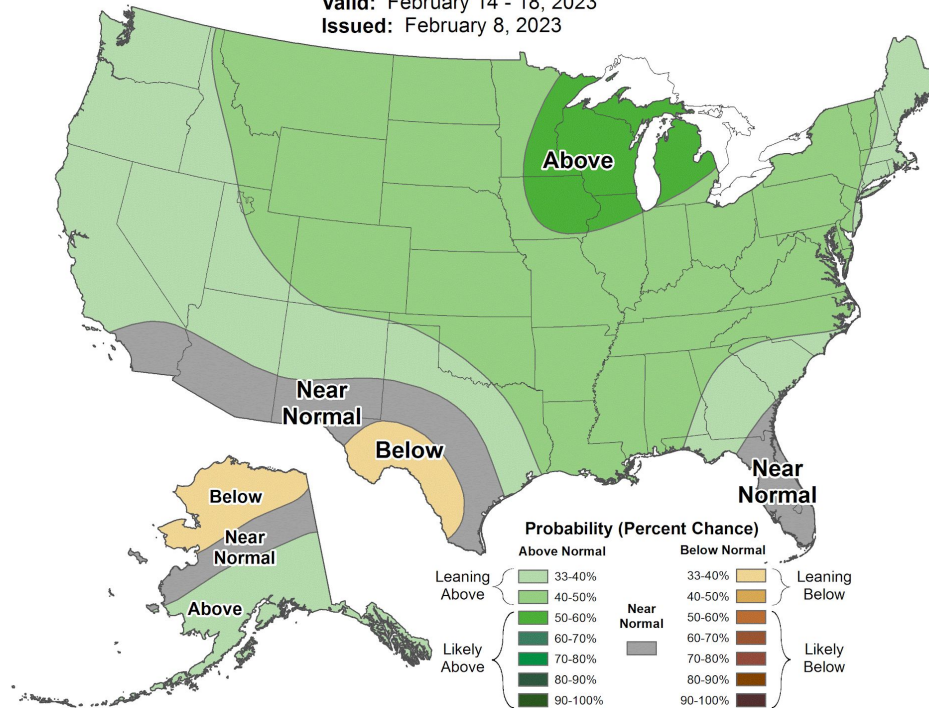
Issued: February 8, 2023



6-10 Day Precipitation Outlook

Valid: February 14 - 18, 2023

Issued: February 8, 2023



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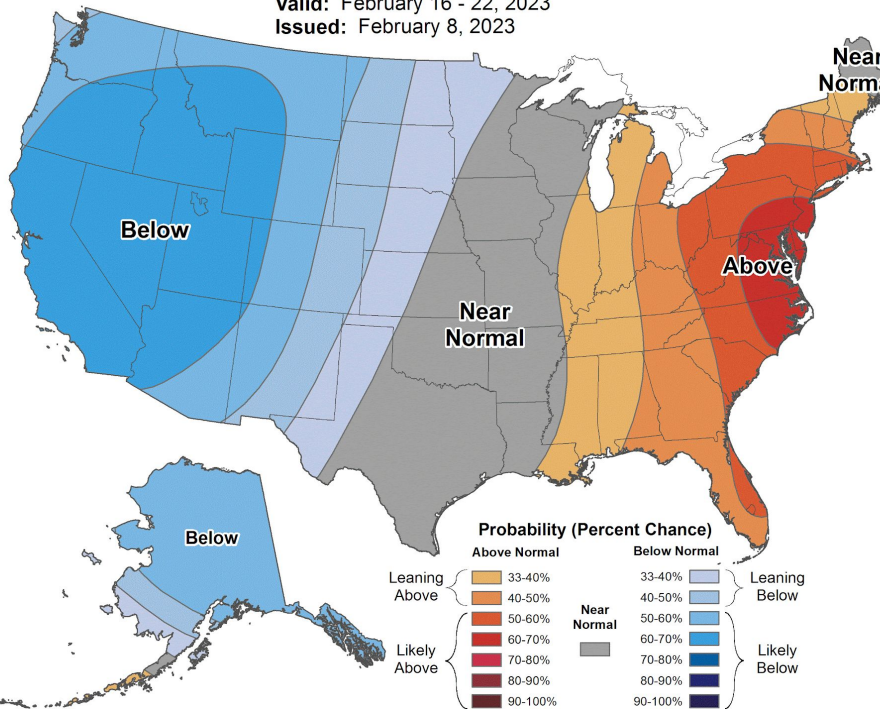
Temperature and Precipitation Outlook - 10 to 14 Day



8-14 Day Temperature Outlook

Valid: February 16 - 22, 2023

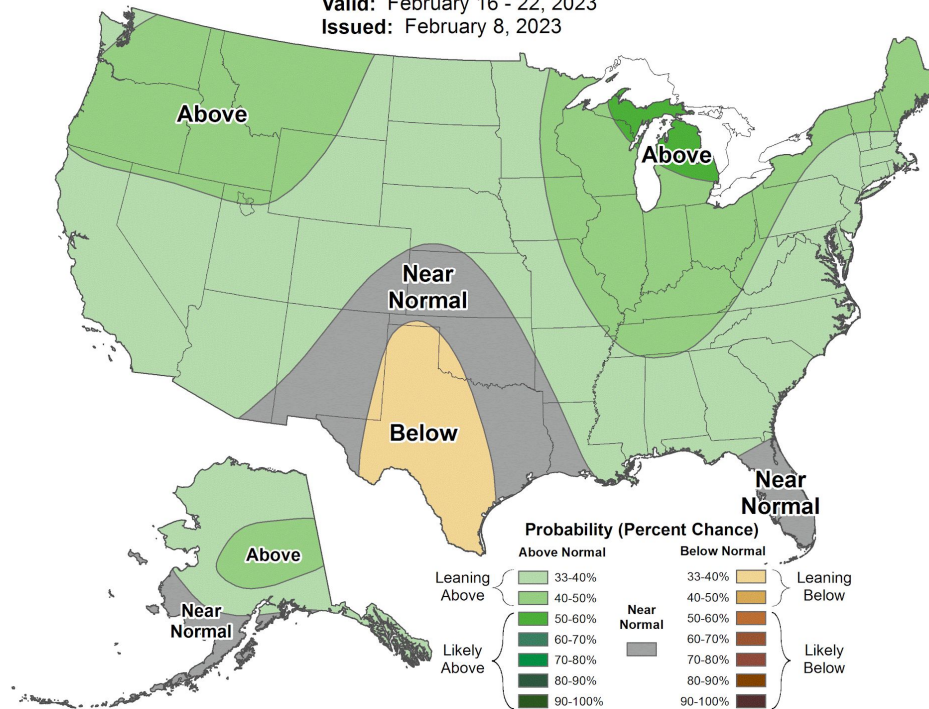
Issued: February 8, 2023



8-14 Day Precipitation Outlook

Valid: February 16 - 22, 2023

Issued: February 8, 2023



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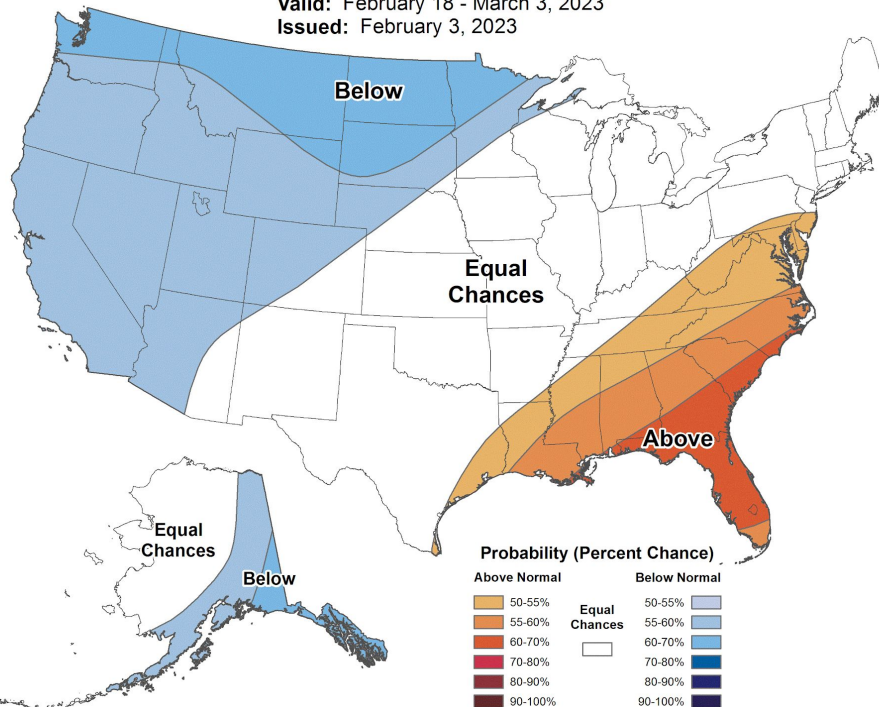
Temperature and Precipitation Outlook - 3 to 4 Week



Weeks 3-4 Temperature Outlook

Valid: February 18 - March 3, 2023

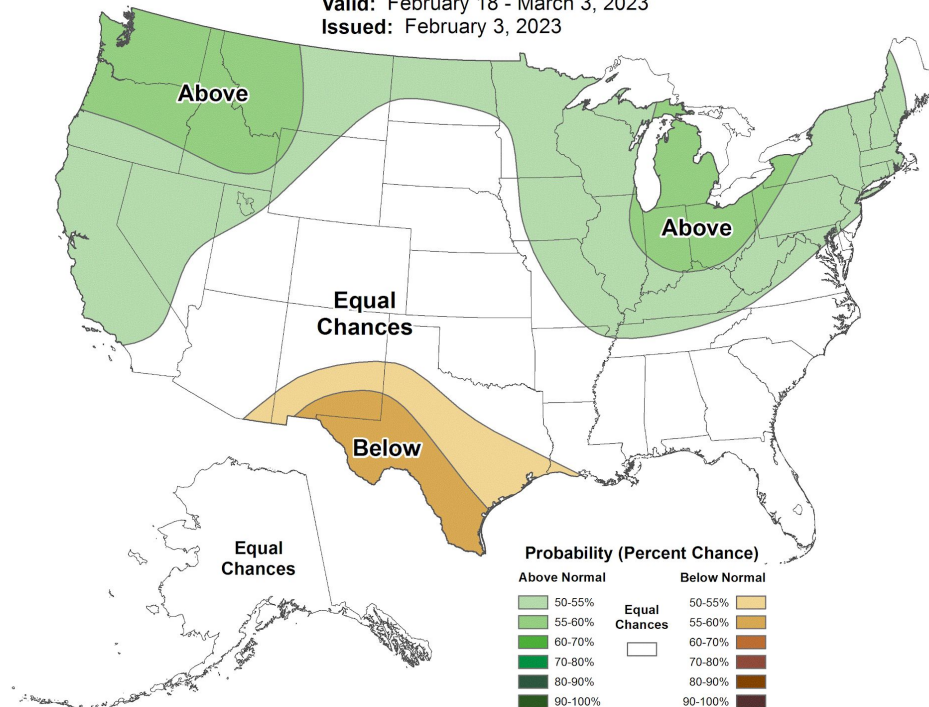
Issued: February 3, 2023



Weeks 3-4 Precipitation Outlook

Valid: February 18 - March 3, 2023

Issued: February 3, 2023



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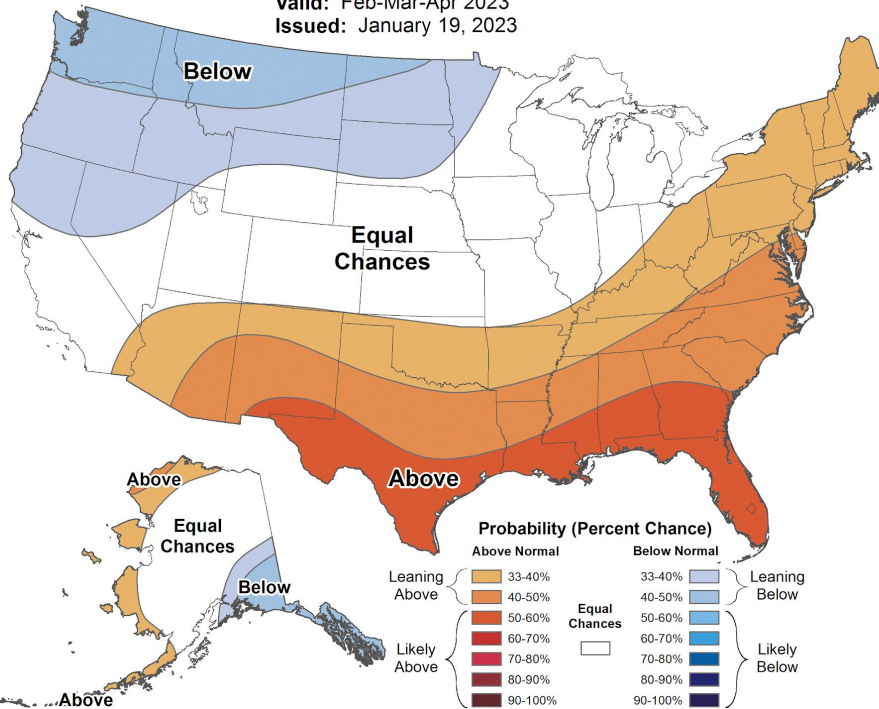
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Temperature and Precipitation Outlook - February through April



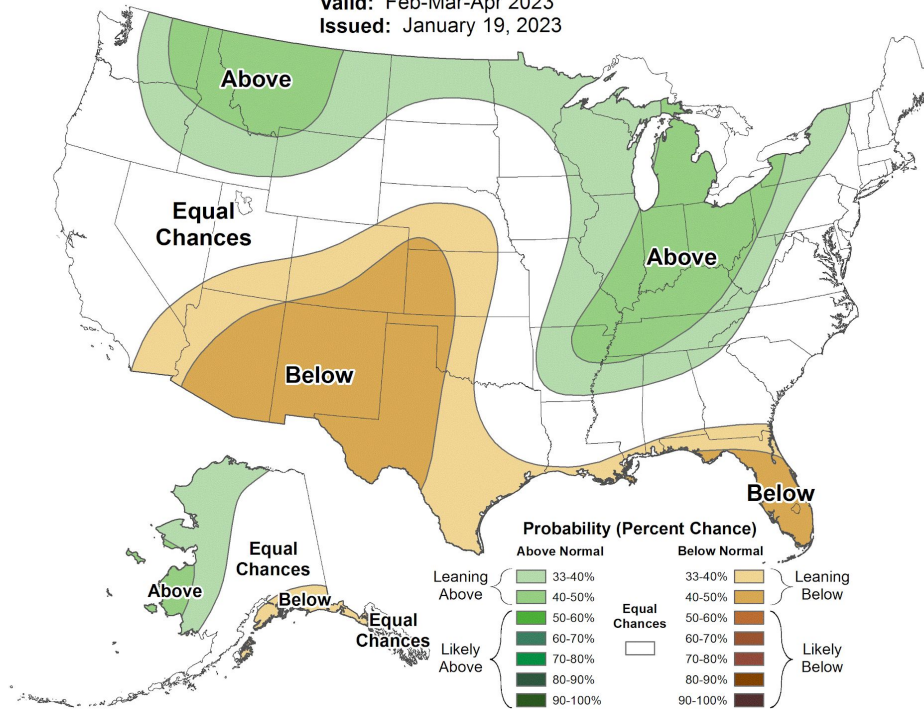
Seasonal Temperature Outlook

Valid: Feb-Mar-Apr 2023
Issued: January 19, 2023



Seasonal Precipitation Outlook

Valid: Feb-Mar-Apr 2023
Issued: January 19, 2023



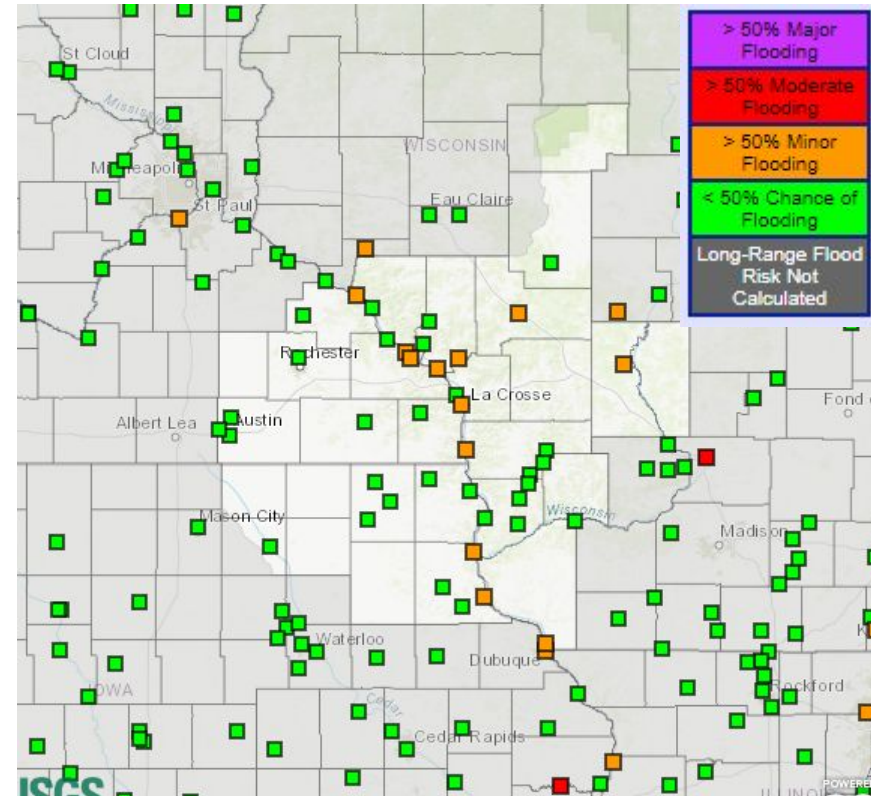


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Chance of Exceeding Minor Flood Stage

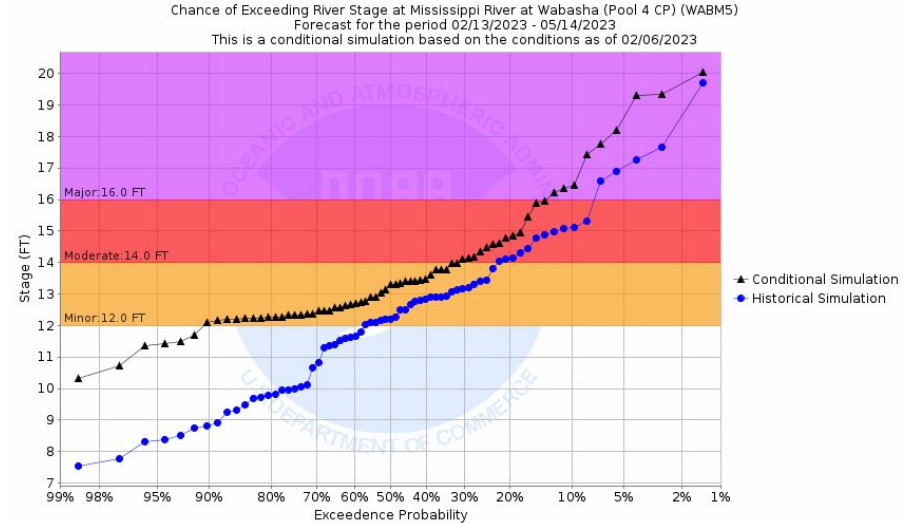
- Points highlighted in orange have a greater than 50% chance of reaching minor flood stage this spring
- Only 1 river point has a higher than 75% chance of reaching minor flood stage
 - Mississippi River at Wabasha has a 91% (32%) chance of reaching minor (moderate) flood stage
 - Normal chances on any given year are 56% (32%)





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 left of the blue line, chances for higher river levels and flooding are higher than the historical average
- Conversely, when the black line is to the left of the blue line, chances higher river levels and flooding are lower than the historical average



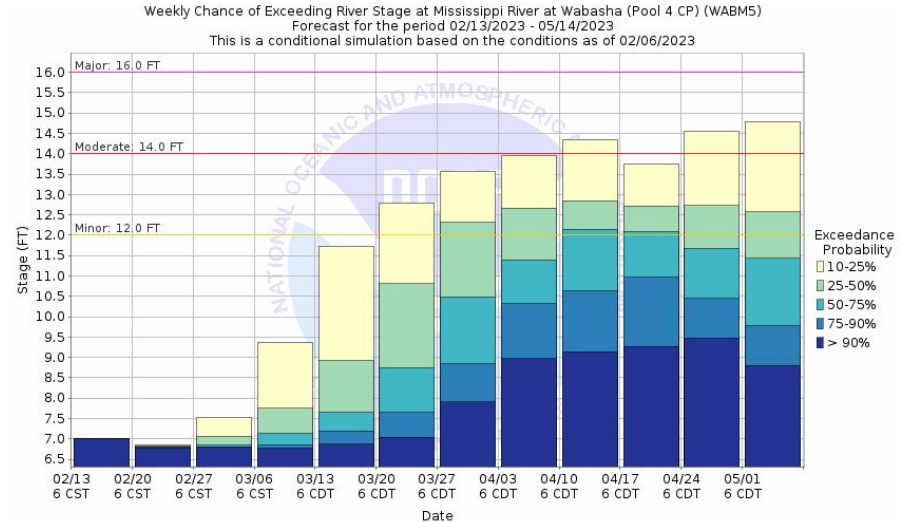
Example from Mississippi River at Wabasha (WABM5)

- Note, black line is to the left of the blue (higher than normal chance)
- 91% (~32%) 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)



Example from Mississippi River at Wabasha (WABM5)

- Note, higher chances of flooding begin in the 3rd to 4th week of March, best chance of reaching minor flood stage is mid-April



Informational Links:

- [Current River Levels and Forecast](#)
- [Long-Range Flood Risk by River Point](#) (Spring Flooding Potential)
- [Latest Hydrographs by Basin](#)
- [1st Spring Flood Outlook Text Information](#)

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

Next Spring Flood Outlook Update: Thursday, February 23rd, 2023