2024 Second Spring Flood & Water Resources Outlook

Released Thursday, February 29th

NWS La Crosse Second 2024 Spring Flood Outlook

Thursday, February 29th, 2024

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
  - Normal river levels
    - Any rivers running above normal is due to an earlier than normal snowmelt
  - Below normal soil moisture
  - **Below normal (non-existent) snowpack** in Upper Mississippi River Basin
  - Below normal frost depths
    - (No frost in our region, some frost along and north of WI Hwy 29)
  - 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. This year, without the presence of a snowpack, **future precipitation** is the **main driver** of any flood risk moving forward.

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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	Decreased Risk to Neutral	Decreased Risk to Neutral	Decreased Risk to Neutral	Decreased Risk to Neutral
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
Temperature Outlook	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Precipitation Outlook	Neutral	Neutral	Neutral	Neutral

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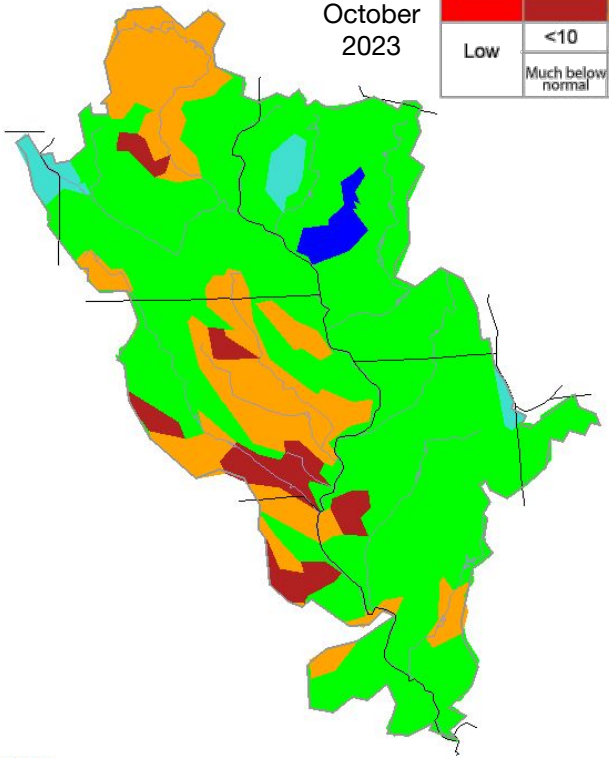
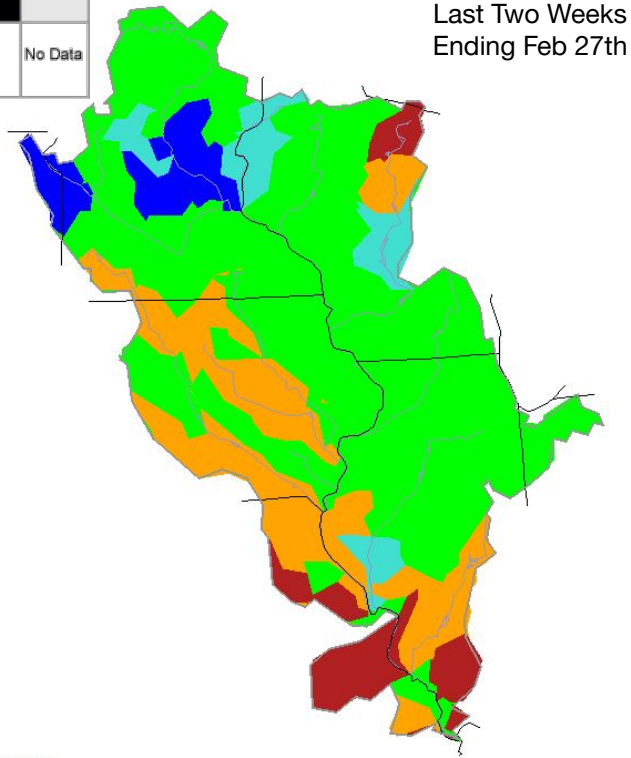
River Levels along the Upper Mississippi Basin - October 2023 vs Last Two Weeks

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		

Last Two Weeks Ending Feb 27th



USGS

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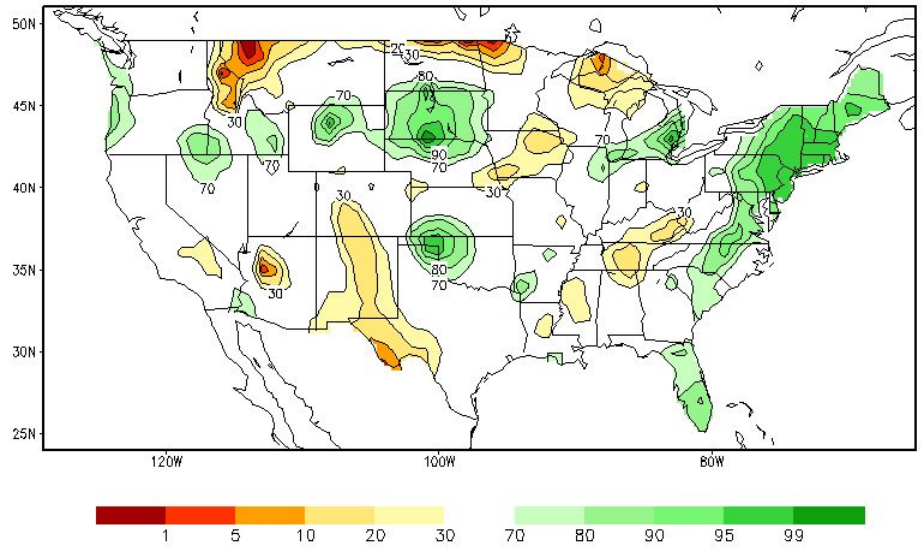
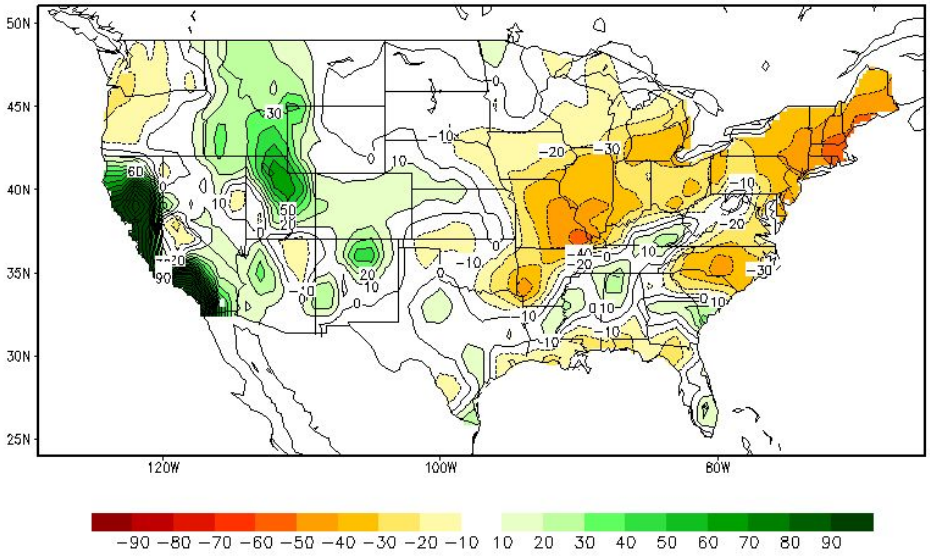
Soil Moisture along the Upper Mississippi Basin - Changes Since the Start of February

Soil Moisture Ranking Percentile Last day of JAN, 2024



Calculated Soil Moisture Anomaly Change
FEB 27, 2024 from JAN.31



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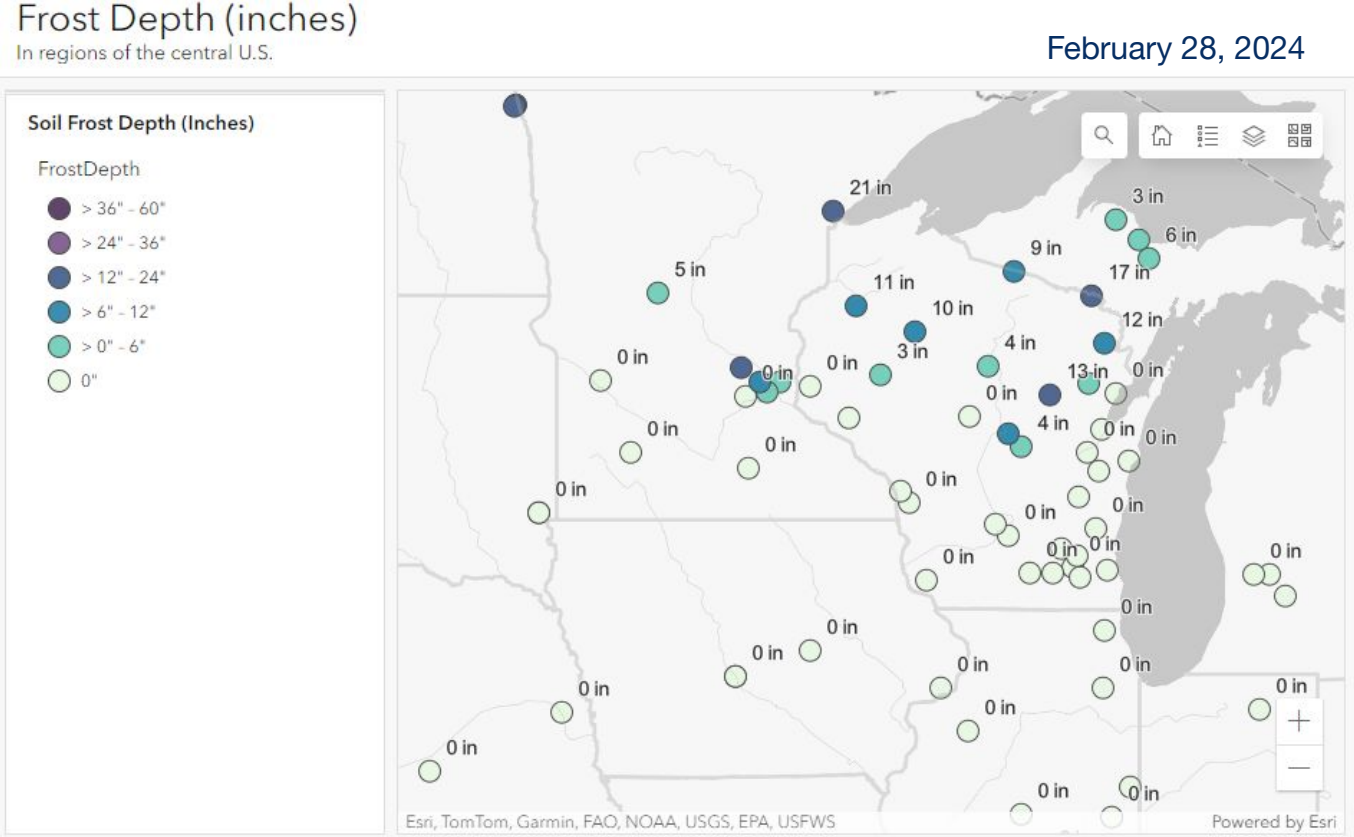
Well Below Normal Frost Depths for Late February



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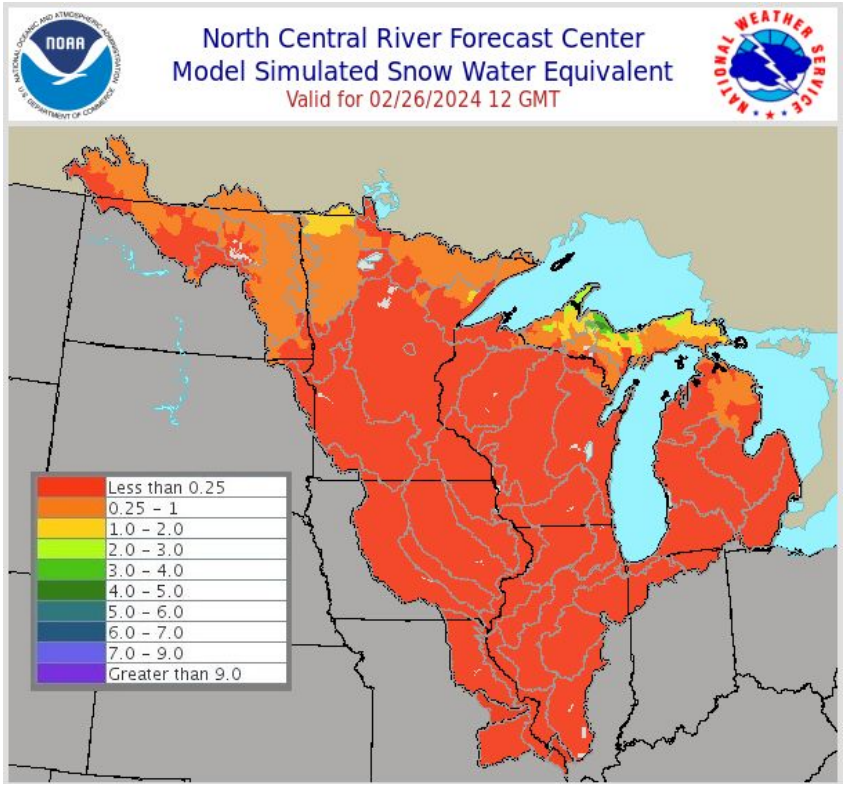
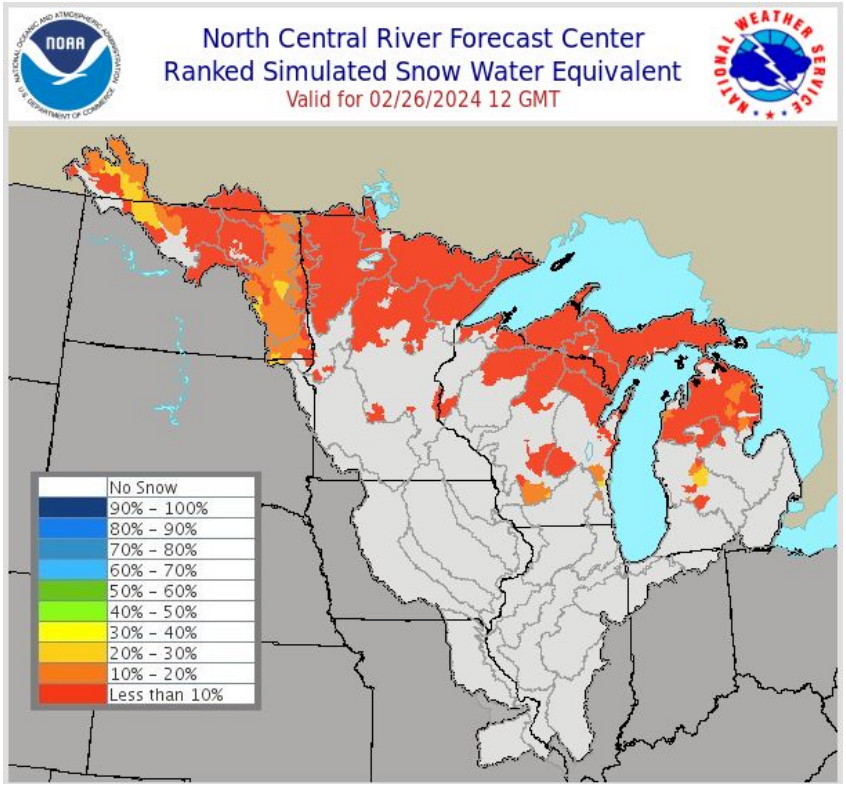
Current Snow Water Equivalent (Amount of Water in Snowpack) and Historical Comparison





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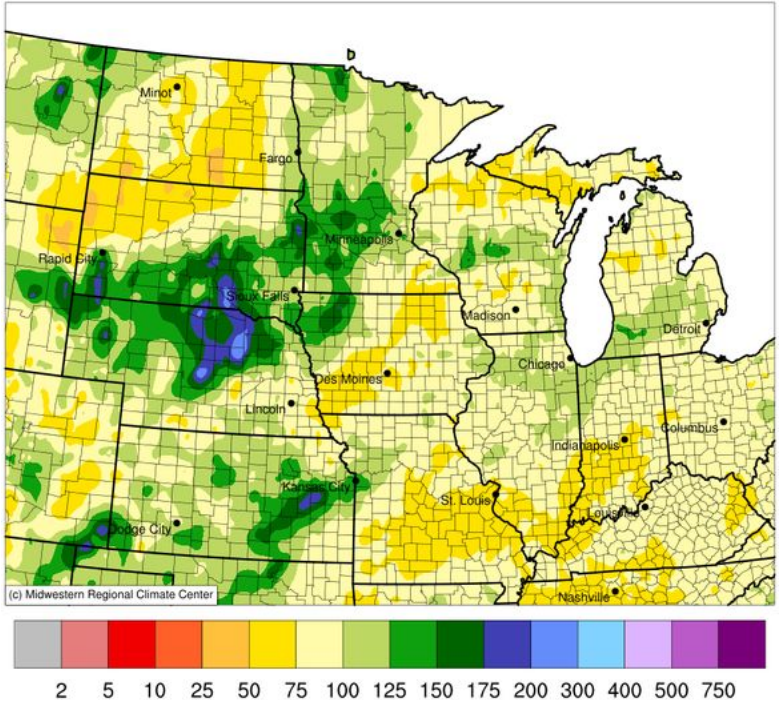
Water Year Precipitation Compared to Normal

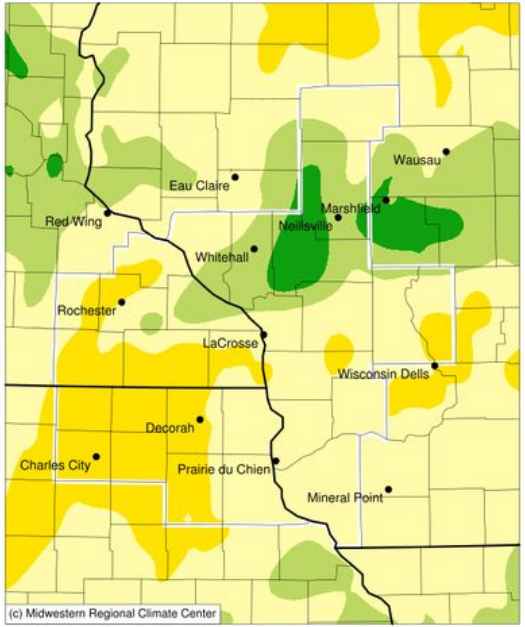
Accumulated Precipitation (in): Percent of 1991-2020 Normals

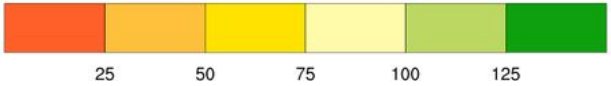
October 01, 2023 to February 28, 2024



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

October 01, 2023 to February 28, 2024





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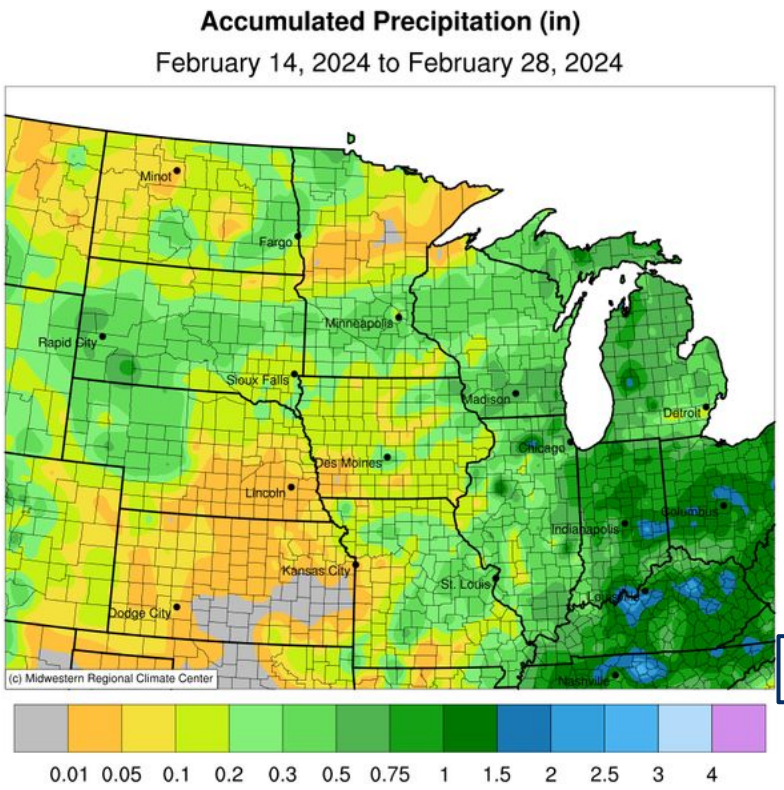
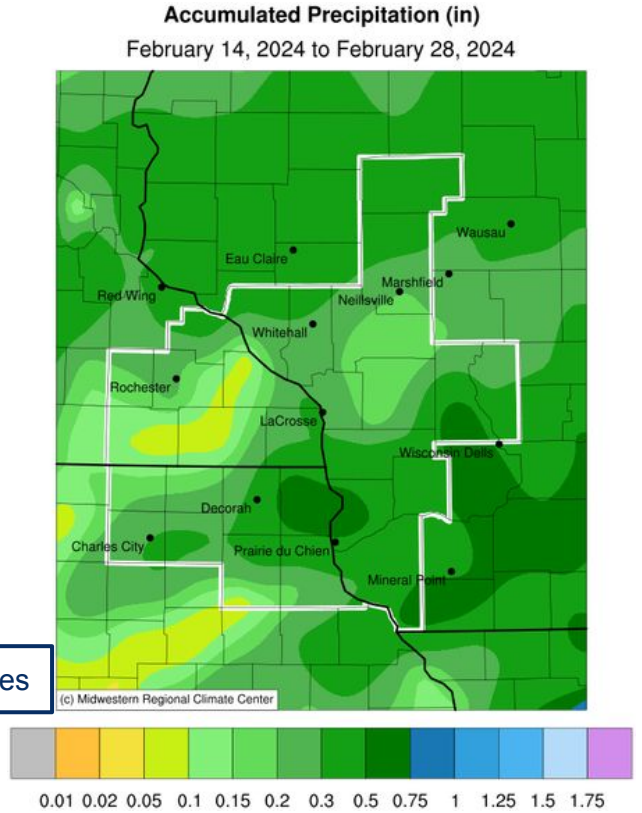
Precipitation Since the Last Spring Flood Outlook (Feb 15th) - Two Weeks



*Different Scales



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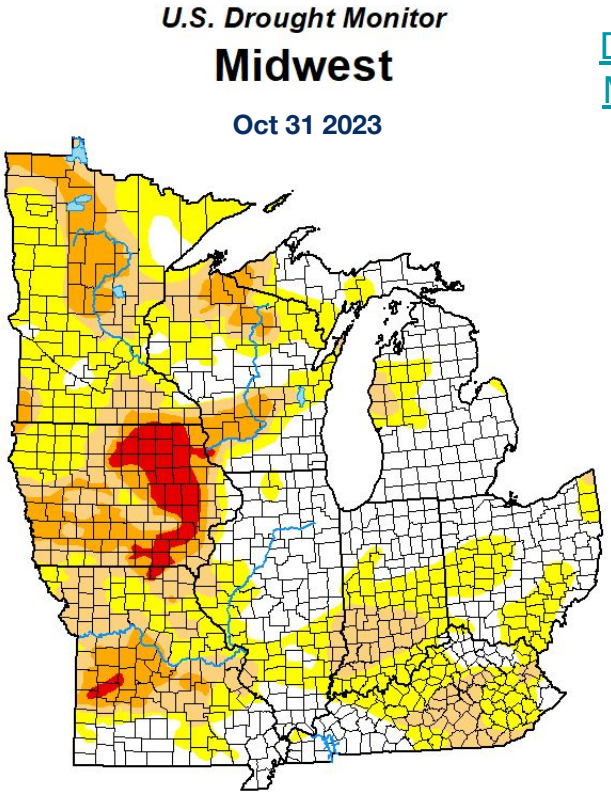
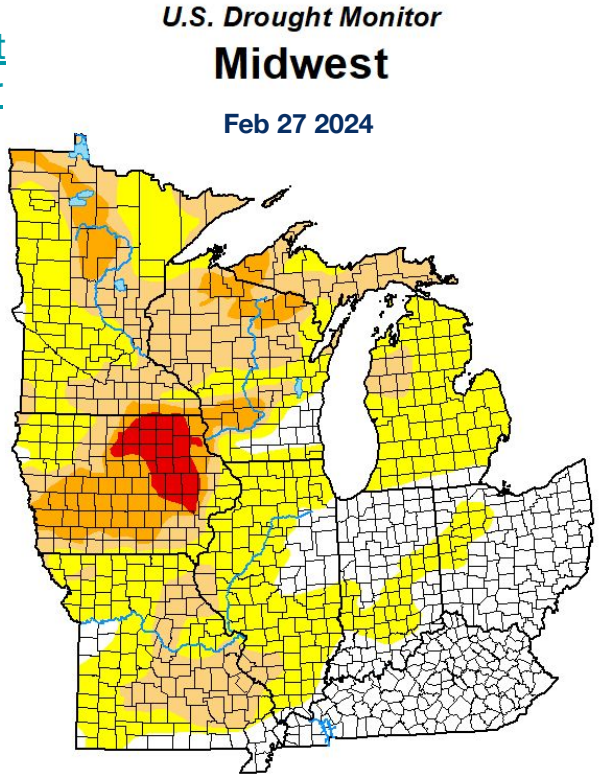
Drought Comparison - October 31st, 2023 vs February 27th, 2024



Drought Monitor



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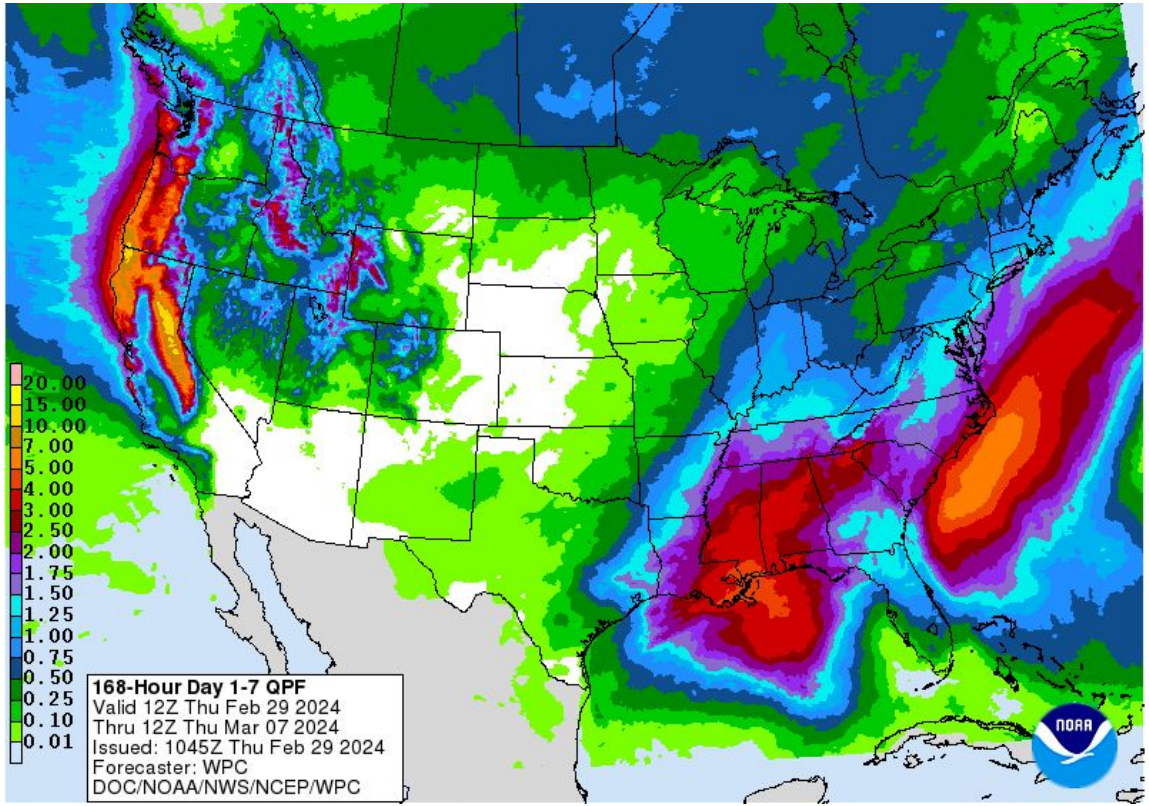
Precipitation Forecast for the Next 7 Days



*Note this is liquid equivalent precipitation, not snowfall amounts

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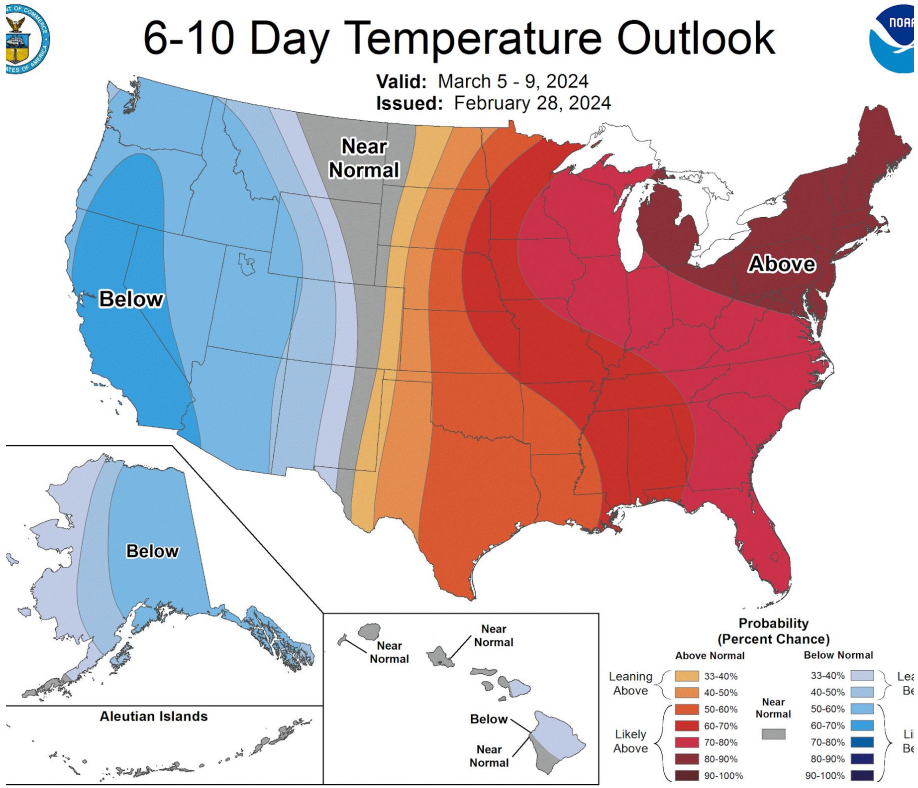
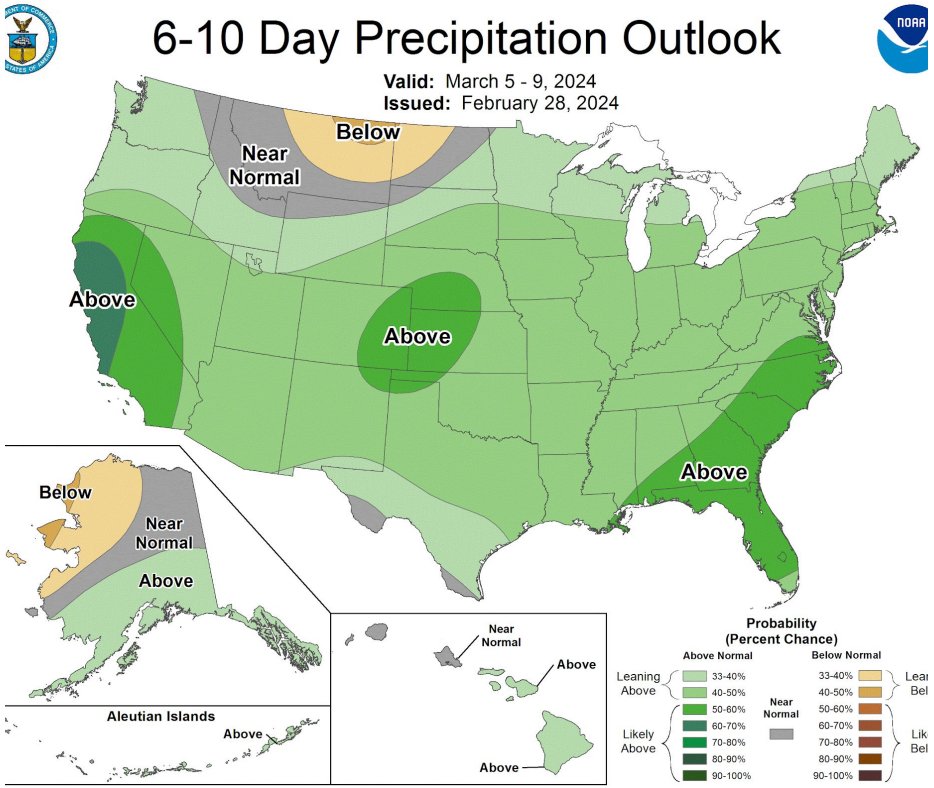
Temperature and Precipitation Outlook - 6 to 10 Day





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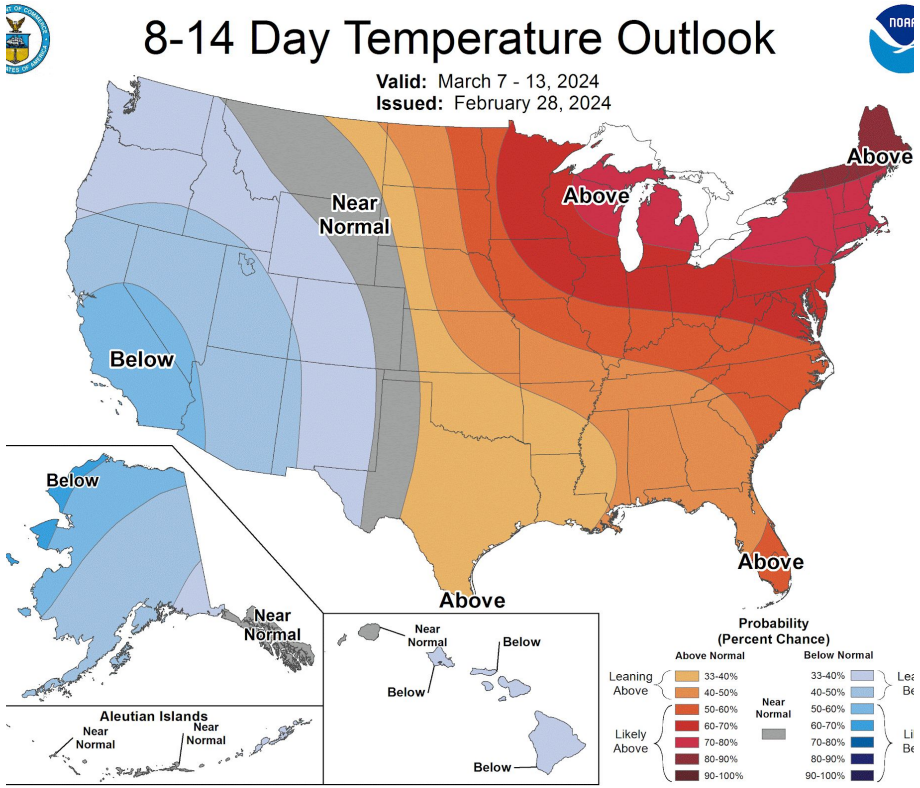
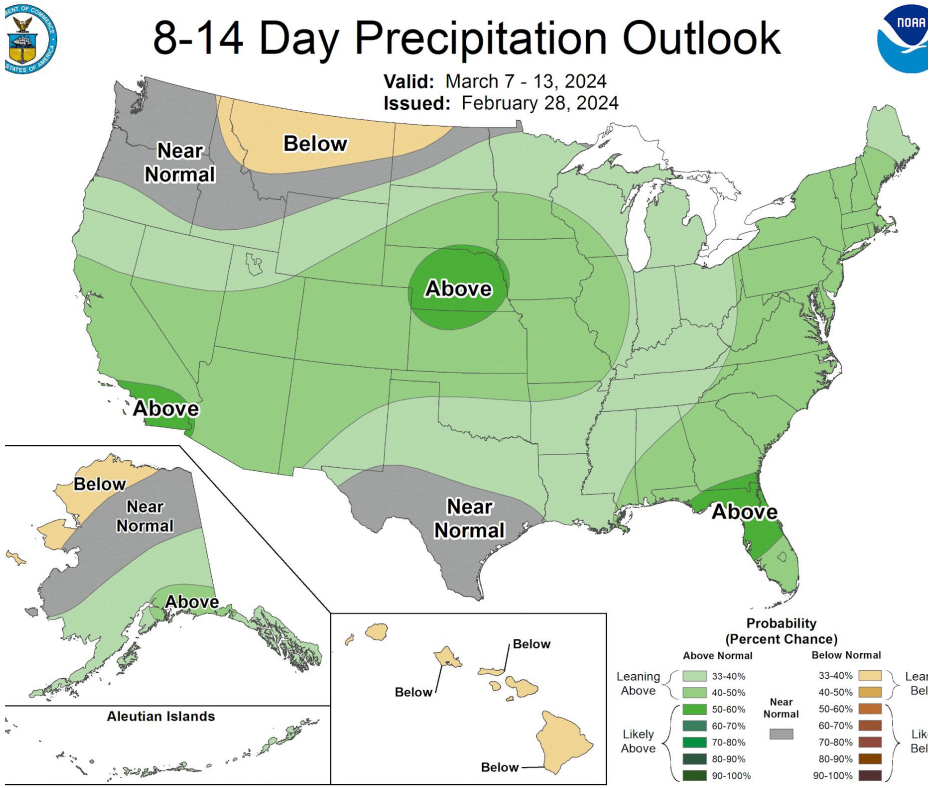
Temperature and Precipitation Outlook - 8 to 14 Day





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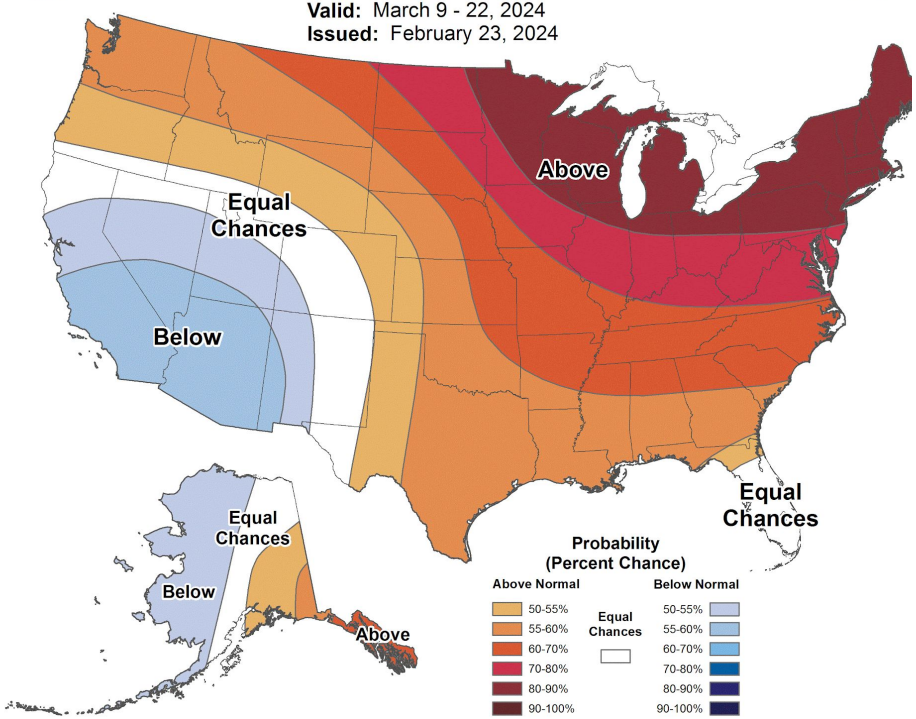
Temperature and Precipitation Outlook - 3 to 4 Week

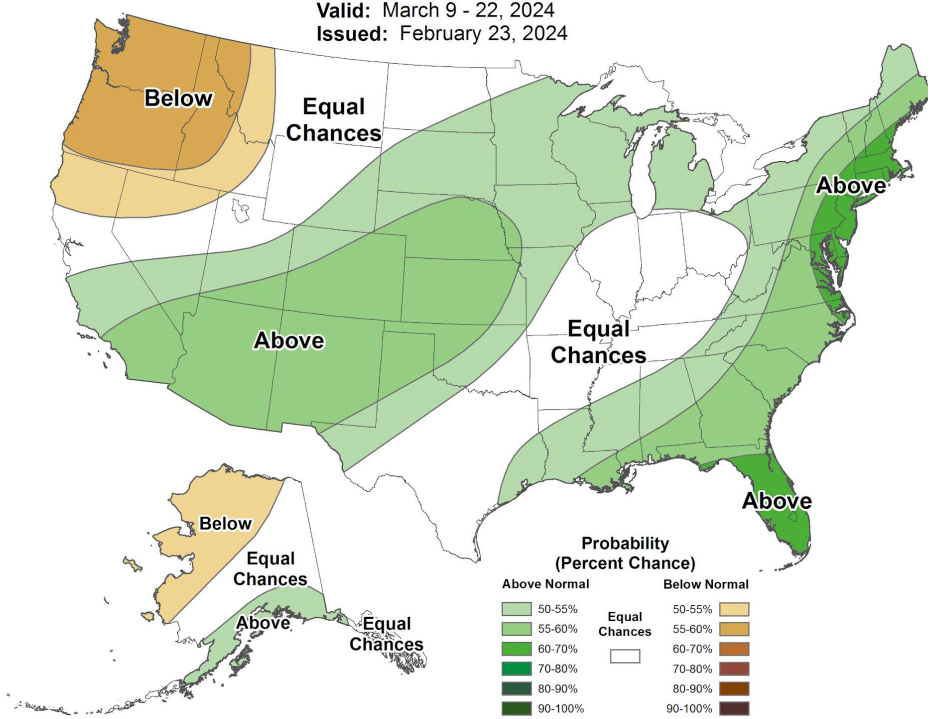
Weeks 3-4 Temperature Outlook

Valid: March 9 - 22, 2024
Issued: February 23, 2024



Weeks 3-4 Precipitation Outlook

Valid: March 9 - 22, 2024
Issued: February 23, 2024



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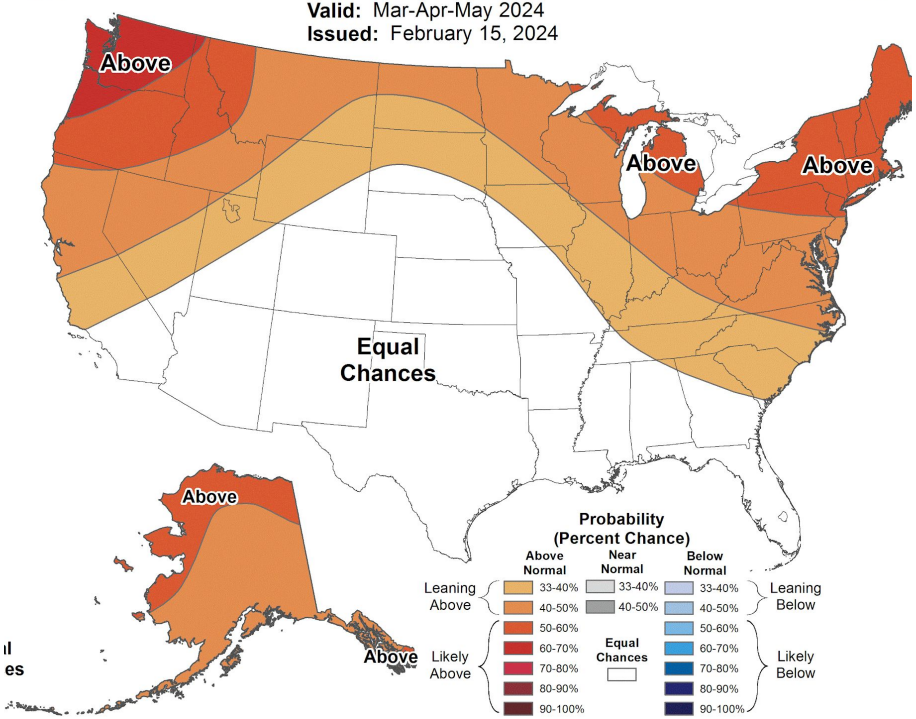
Temperature and Precipitation Outlook - February through April

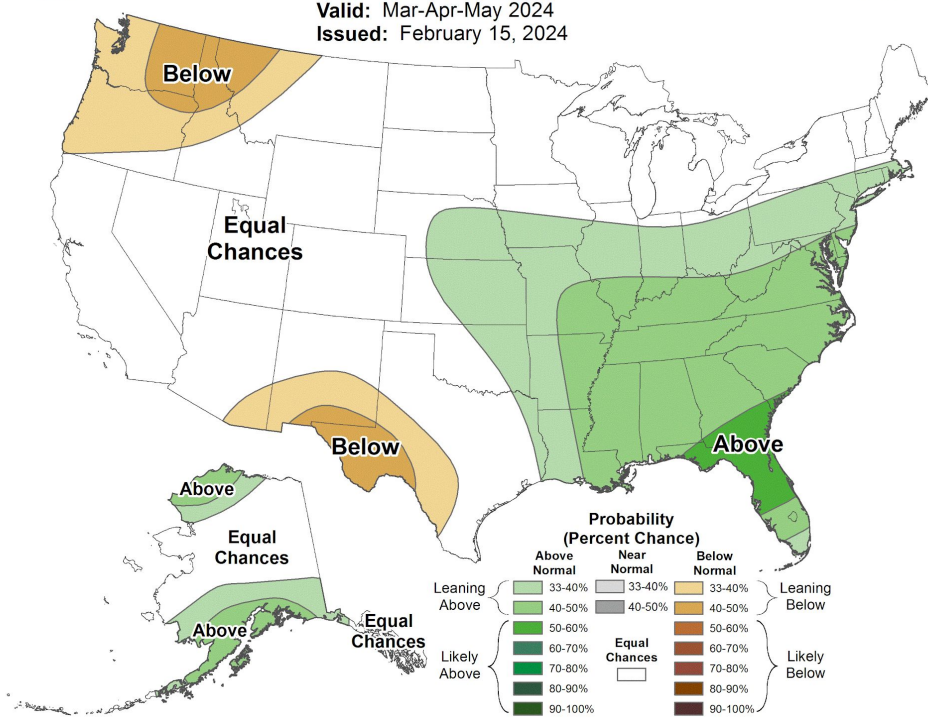
Seasonal Temperature Outlook

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



Seasonal Precipitation Outlook

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



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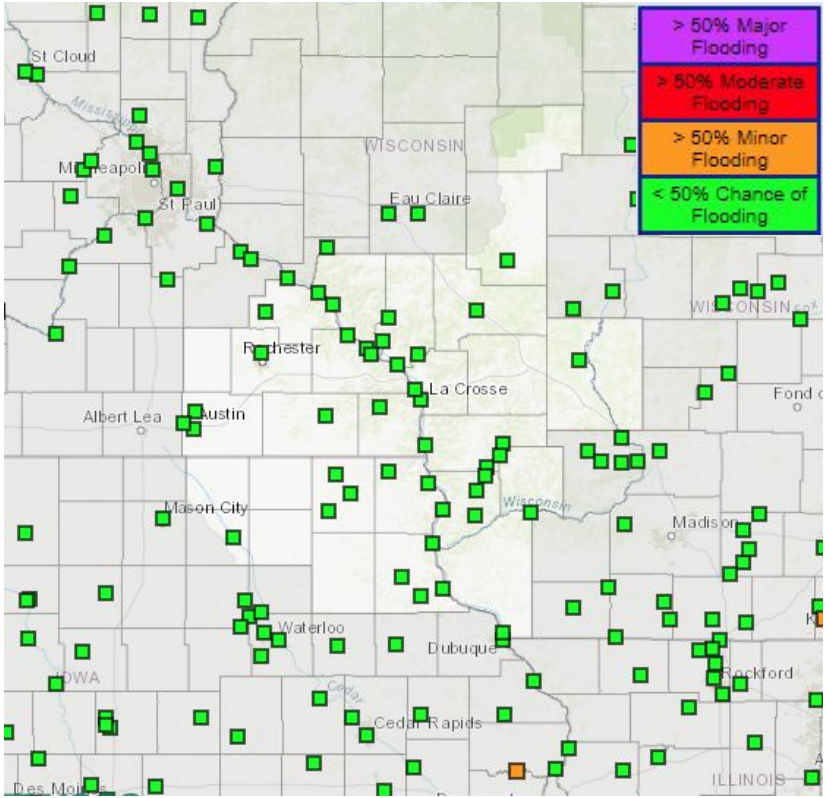
Chance of Exceeding Minor Flood Stage

- 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



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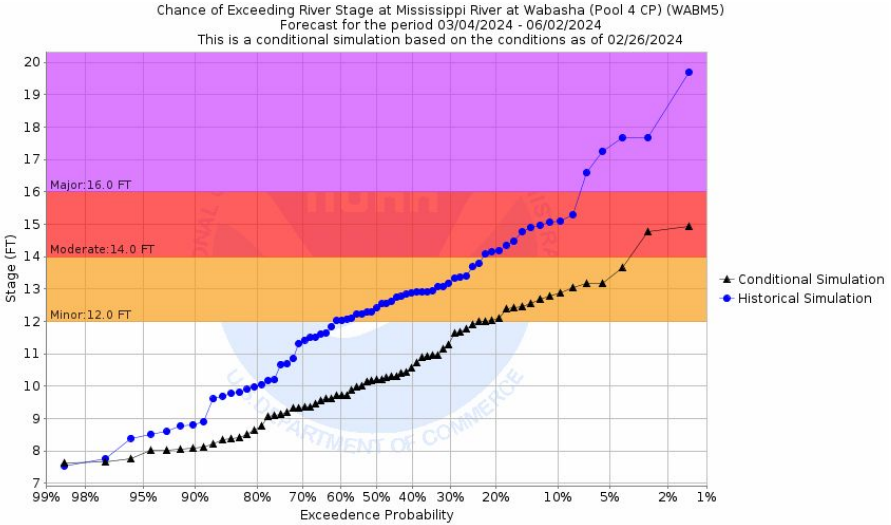
Long-Range River Level Probabilistic Information - Chance of Exceeding Levels During Entire Spring Period

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 right 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)
- 24% (<5%) chance of exceeding minor (moderate) flood stage over the next 90 days

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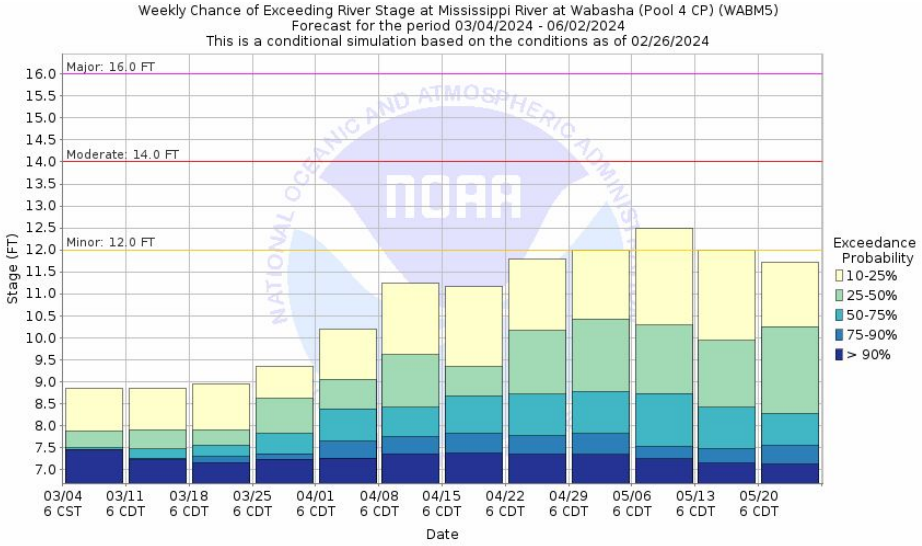
Long-Range River Level Probabilistic Information - Chance of Exceeding Levels by Week through the Season

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

NWS Website Changing this Spring - Currently Scheduled for March 27th

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

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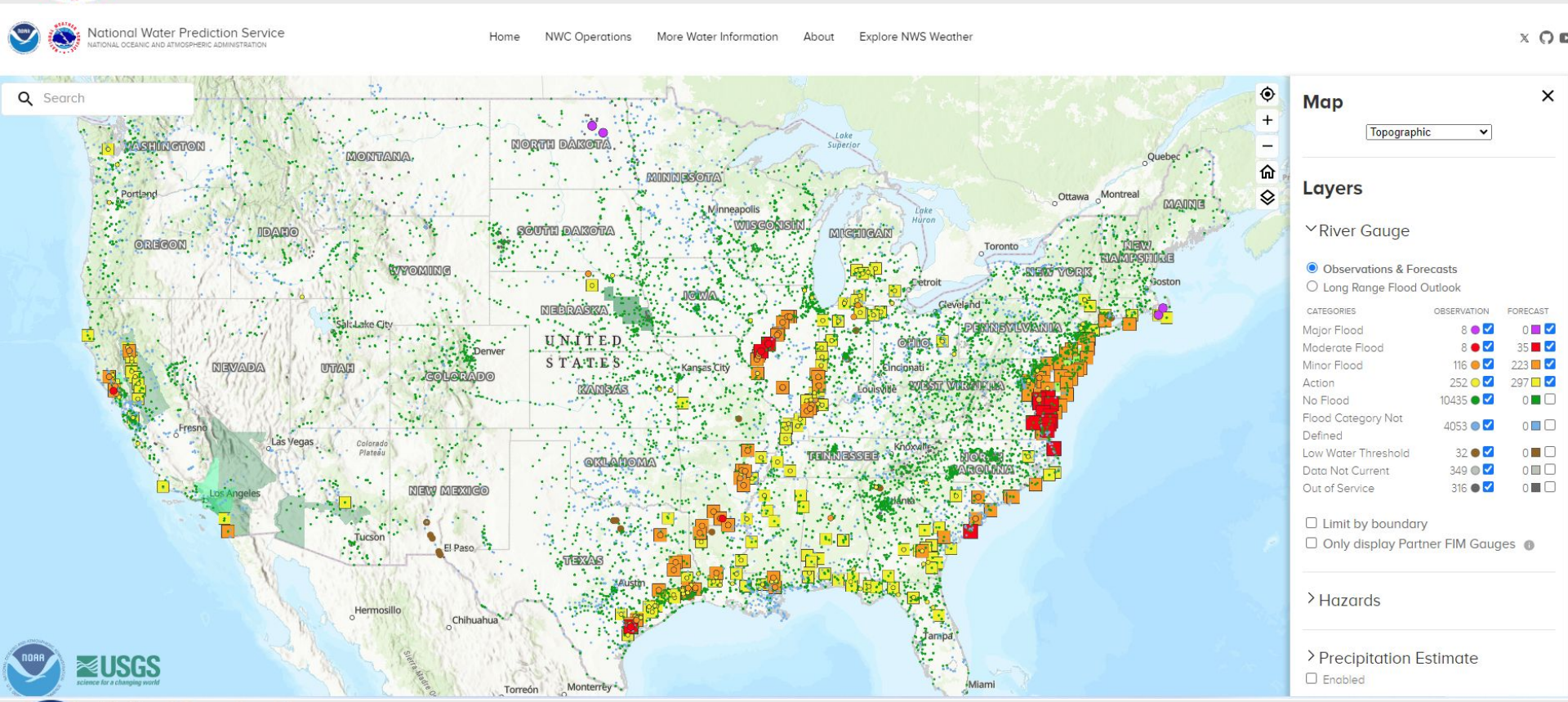
NWPS Landing Page - Customizable Layers Available on the Right - Bookmark the link to save!



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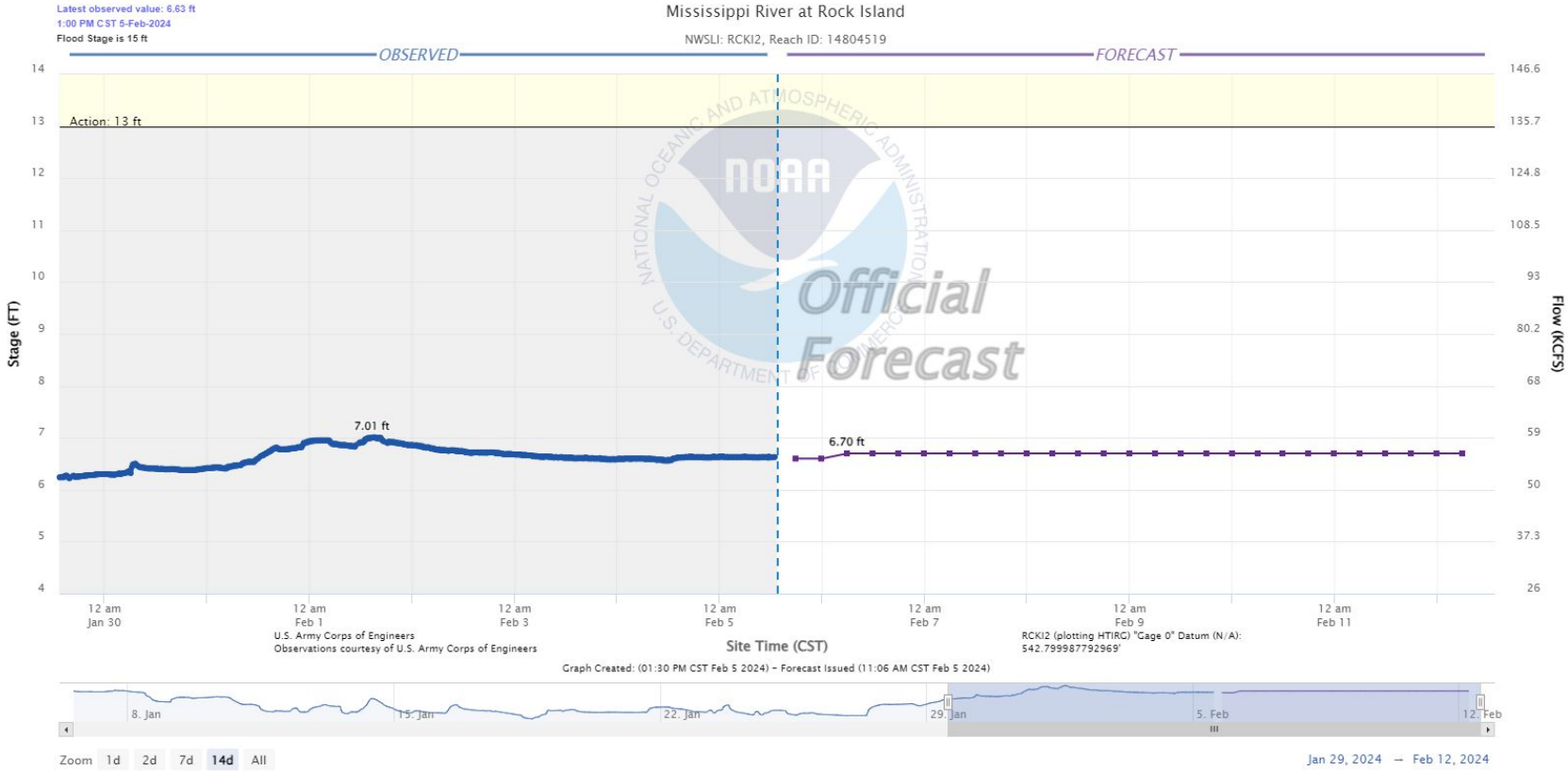
New NWPS Hydrographs



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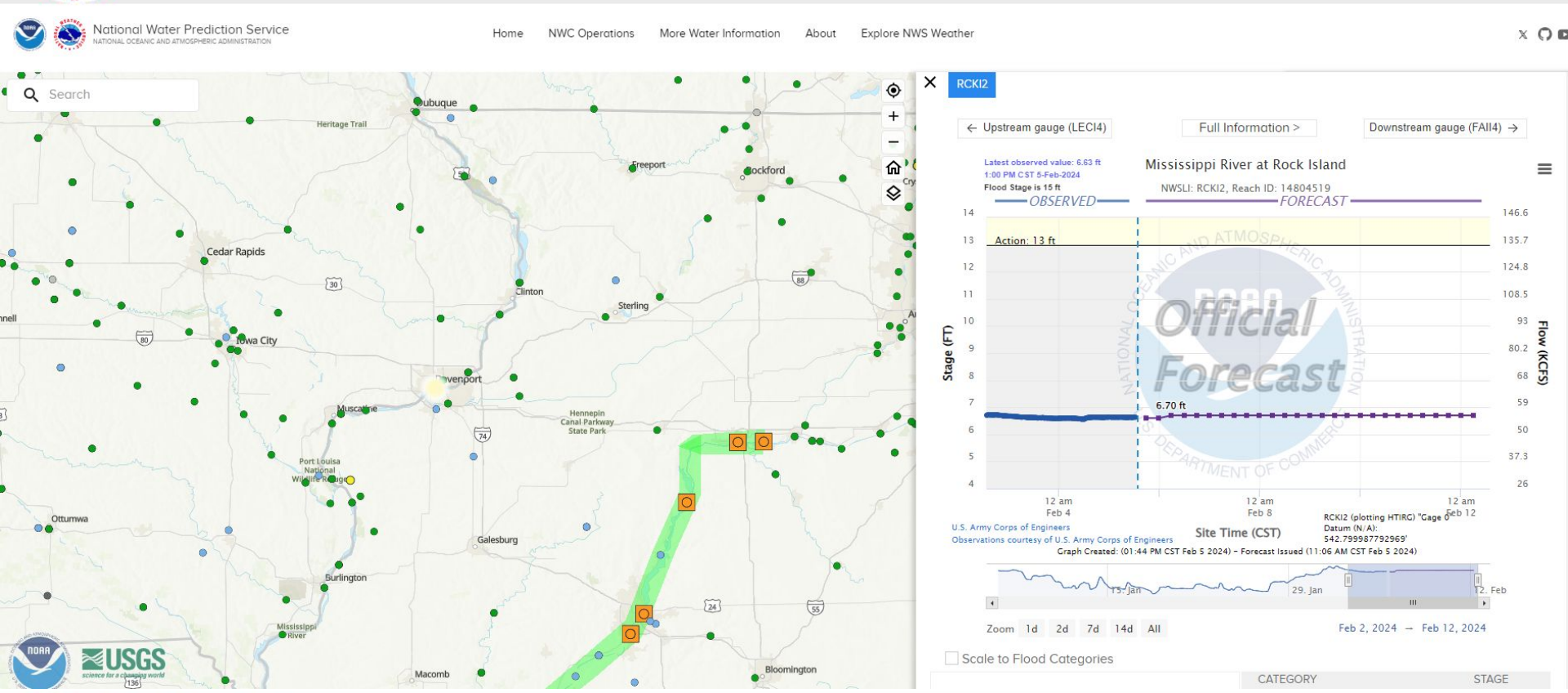
Selecting a River Gage Location - Pop Out Information on the Right



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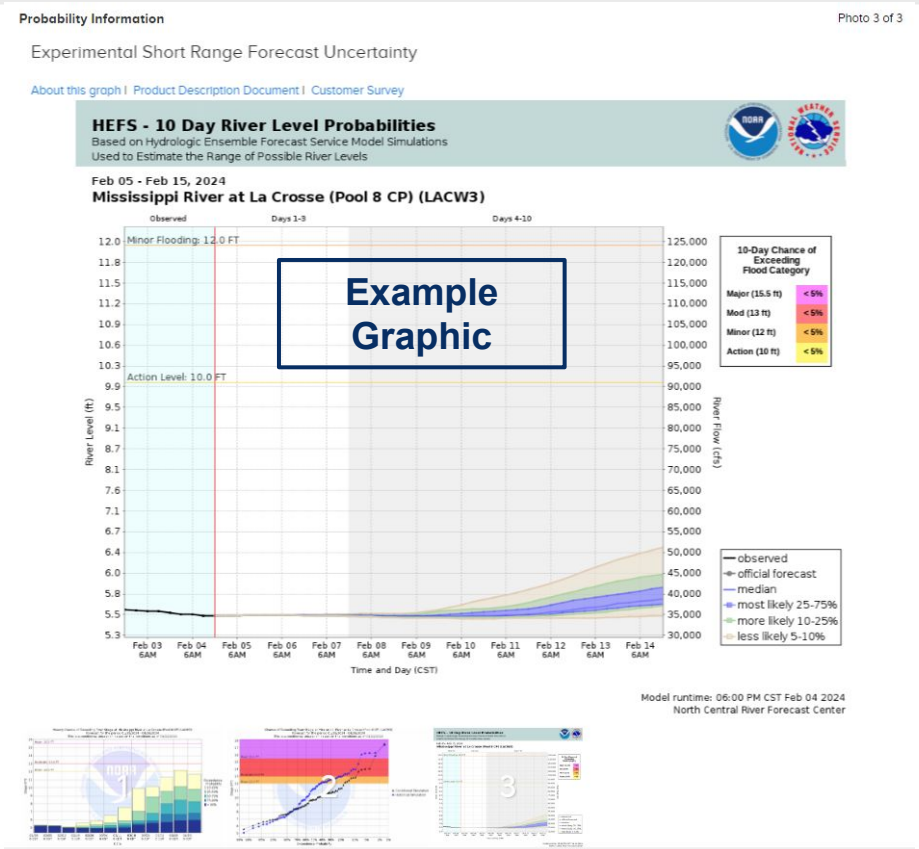
Full Information Page

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



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

Next Spring Flood Outlook Update: Thursday, March 14th, 2024