



# Spring Flood Outlook 2023

NWS Quad Cities IA/IL

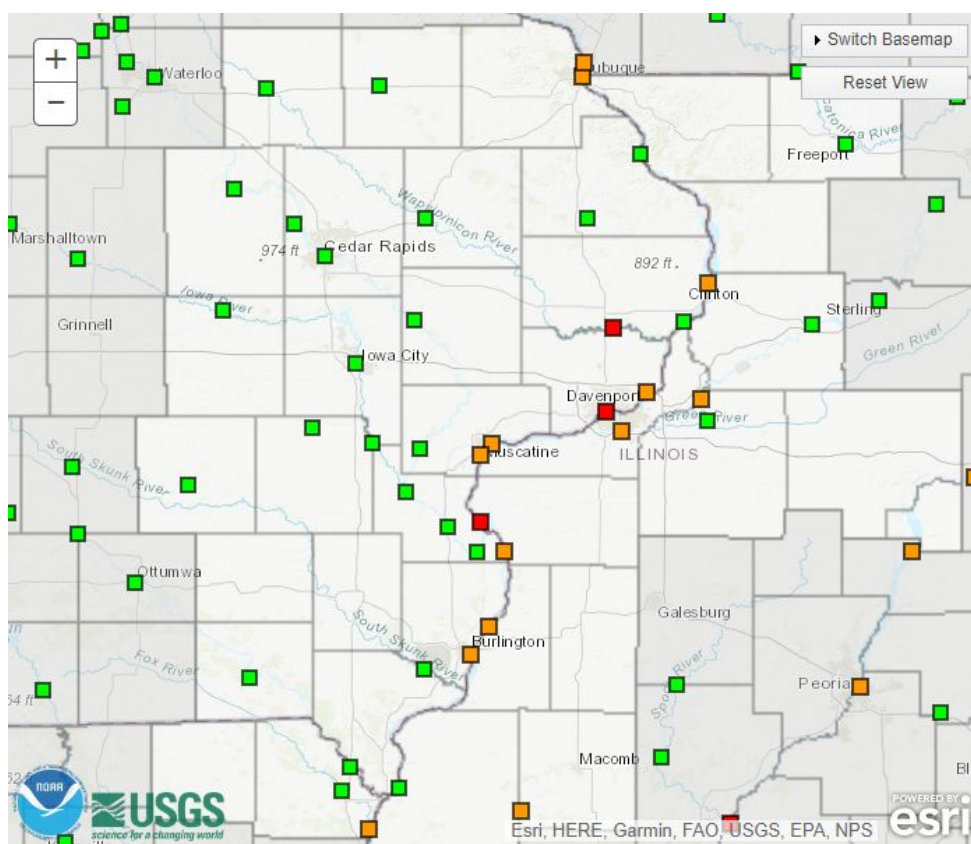
Thursday, February 9, 2023

## Key Messages

- Near to below normal spring flood threat for the NWS Quad Cities service area.
- Future weather—including amount and timing of precipitation as well as rate of snowmelt—will be a big factor in any potential spring flood threat.

## Important Forecast Changes

- First briefing for the spring flood threat.



**Map showing flood risk from February through April**

**Next Update** The second spring flood outlook text product will be issued by NWS offices serving Iowa on February 23, 2023.





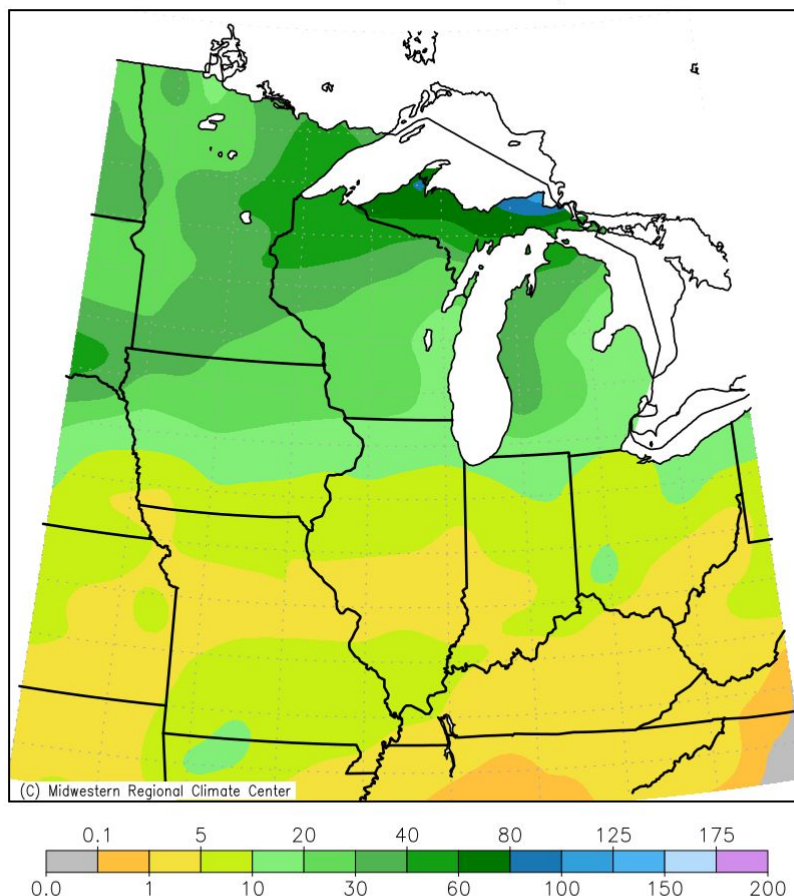
# Factors Considered in this Outlook

2023 Spring Flood Outlook

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- Seasonal Temperatures and Precipitation
- Snow Cover and Liquid Water Equivalent
- Frost Depth
- Soil Moisture
- Current River Streamflows
- Weather Forecasts and Outlooks

Accumulated Snowfall (in)  
December 1, 2022 to February 7, 2023



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 2/8/2023 7:32:23 AM CST





# Seasonal Temperatures/Precipitation

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## Average Winter Temperatures:

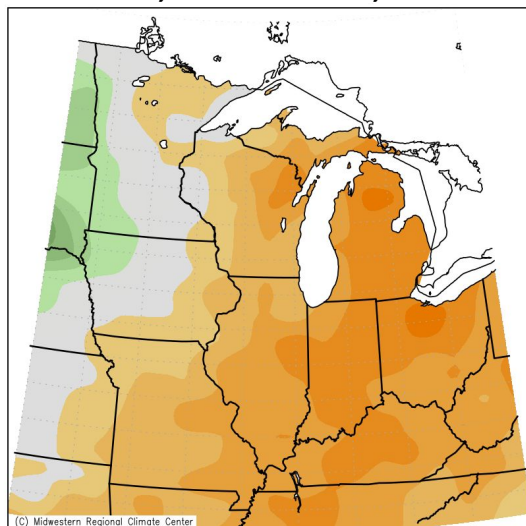
Above normal temperatures this winter, with locations averaging 1-3 degrees above normal locally.

## Winter Precipitation:

- Locally – Near/Above normal
- Upstream (Mississippi River watershed) – Well above normal, especially in MN/WI.

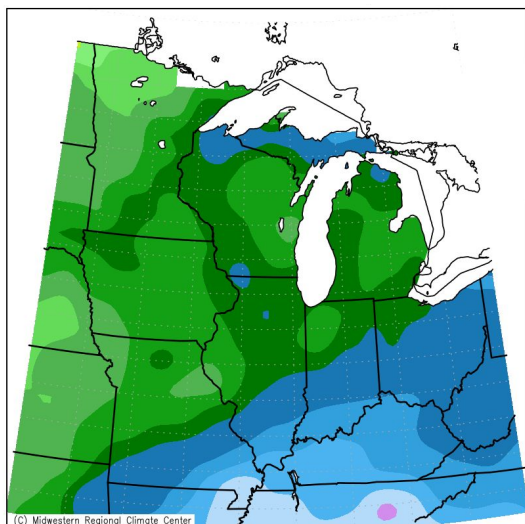
## Average Temperature Departure from Normal

Dec 1, 2022 – Feb 08, 2023



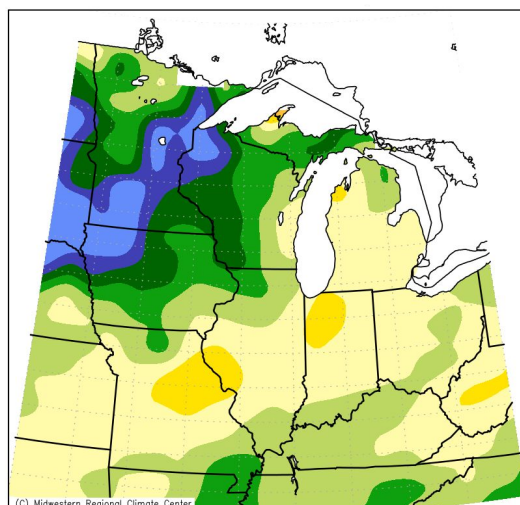
Mean period is 1991–2020.  
Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 2/8/2023 7:33:00 AM CST

## Accumulated Precipitation



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 2/8/2023 7:33:58 AM CST

## Accumulated Precipitation Percent of Mean



Mean period is 1991–2020.  
Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 2/8/2023 7:35:01 AM CST



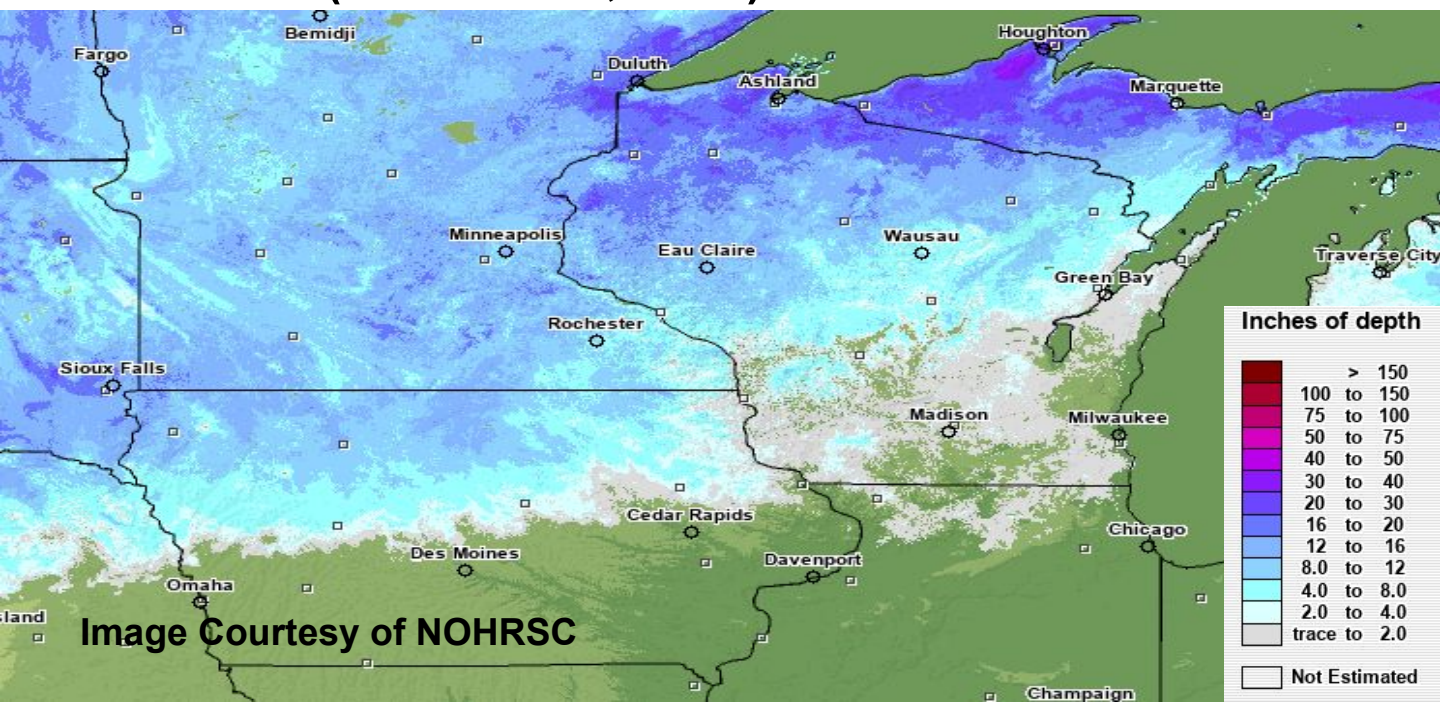


# Snow Cover and Liquid Water Equivalent

2023 Spring Flood Outlook

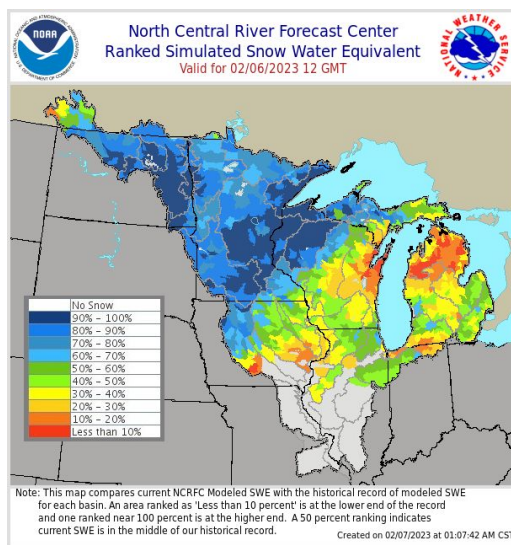
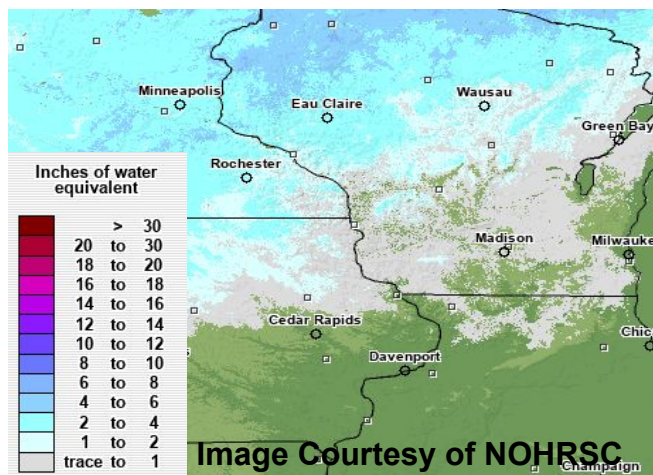
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## Snow Cover (as of Feb 8, 2023)



## Snow Water Equivalent (SWE) as of Feb 8, 2023:

- Widespread SWE of T-2". Deepest snowpack has 4-8" of SWE in north.



## Contribution to flood potential:

- Local snowmelt alone has a limited potential for flooding, due to below normal moisture content. Snowmelt in the north may pose a threat.



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Quad Cities Iowa/Illinois



# Snow Water Equivalent Change This Week

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## 72-Hour Snowmelt

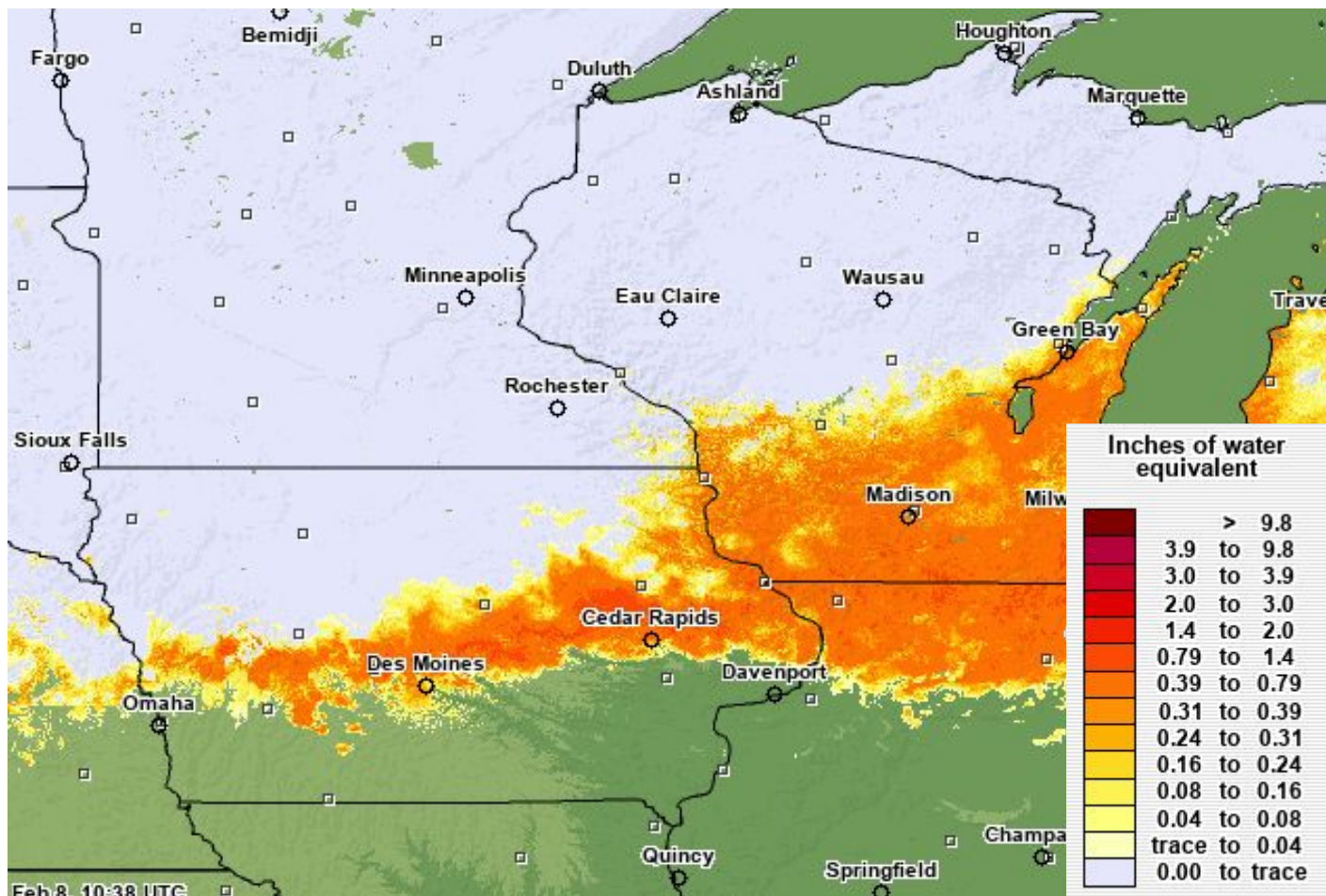


Image Courtesy of NOHRSC

## Contribution to flood potential:

- With mild temperatures seen lately, we have started to see a large reduction in local snowpack. In the north, deep snowpack exists over frozen grounds, leading to impact uncertainty along the Mississippi River.
- With little snowpack remaining locally, not much flooding impact is currently expected. Any new snowfall can impact this in the future.







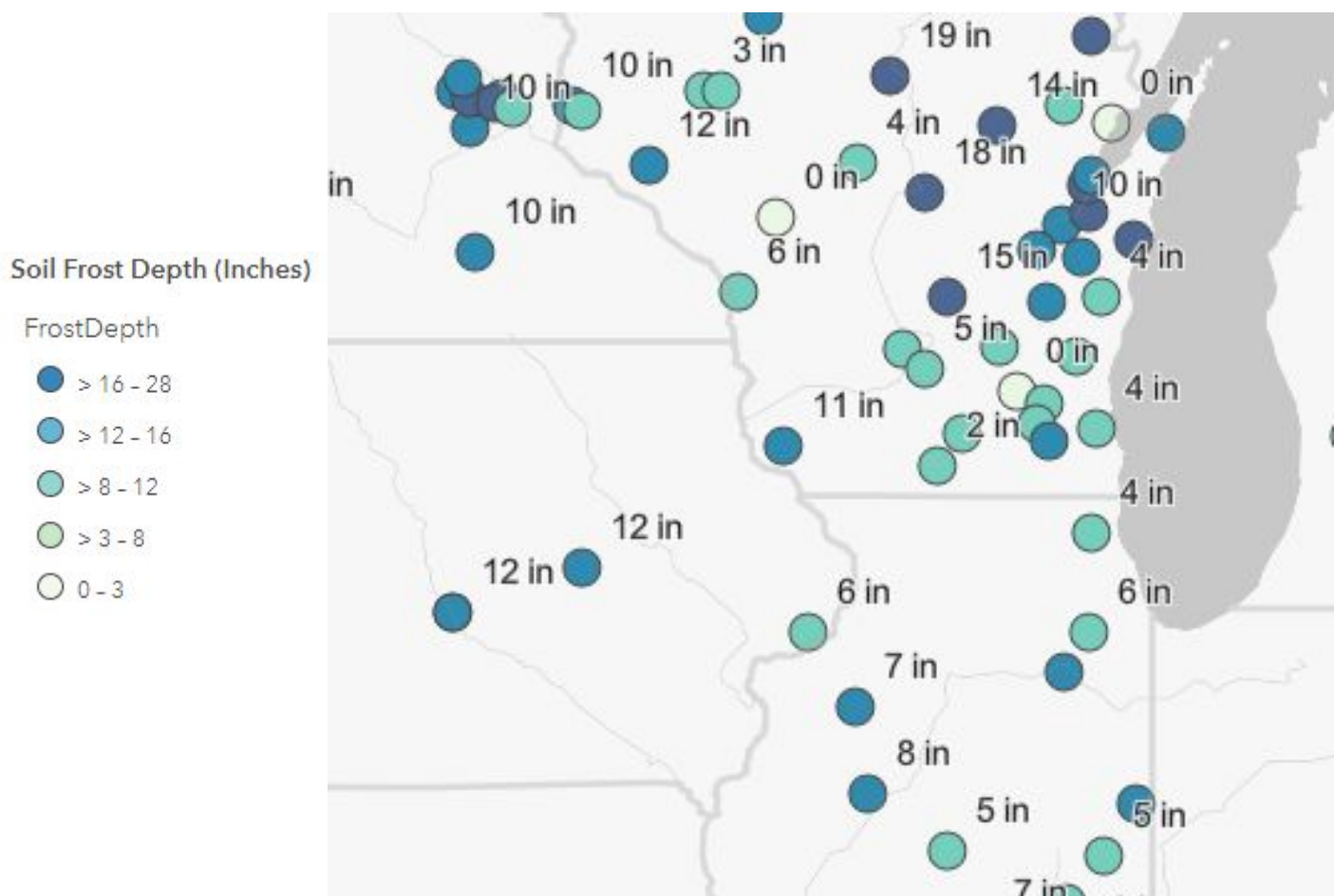
# Frost Depth

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## Frozen ground

- Frost depths range between 2 inches in our south, to near 10 inches in the north, locally. Deeper frost depth in northern Mississippi River Valley, ranging 10 to 25 inches for some.



## Contribution to flood potential:

- Shallow frost (less than 1 foot for much of the local area) has potential to thaw early in the season, allowing snowmelt and rain to infiltrate into the ground, limiting runoff.





# Soil Moisture

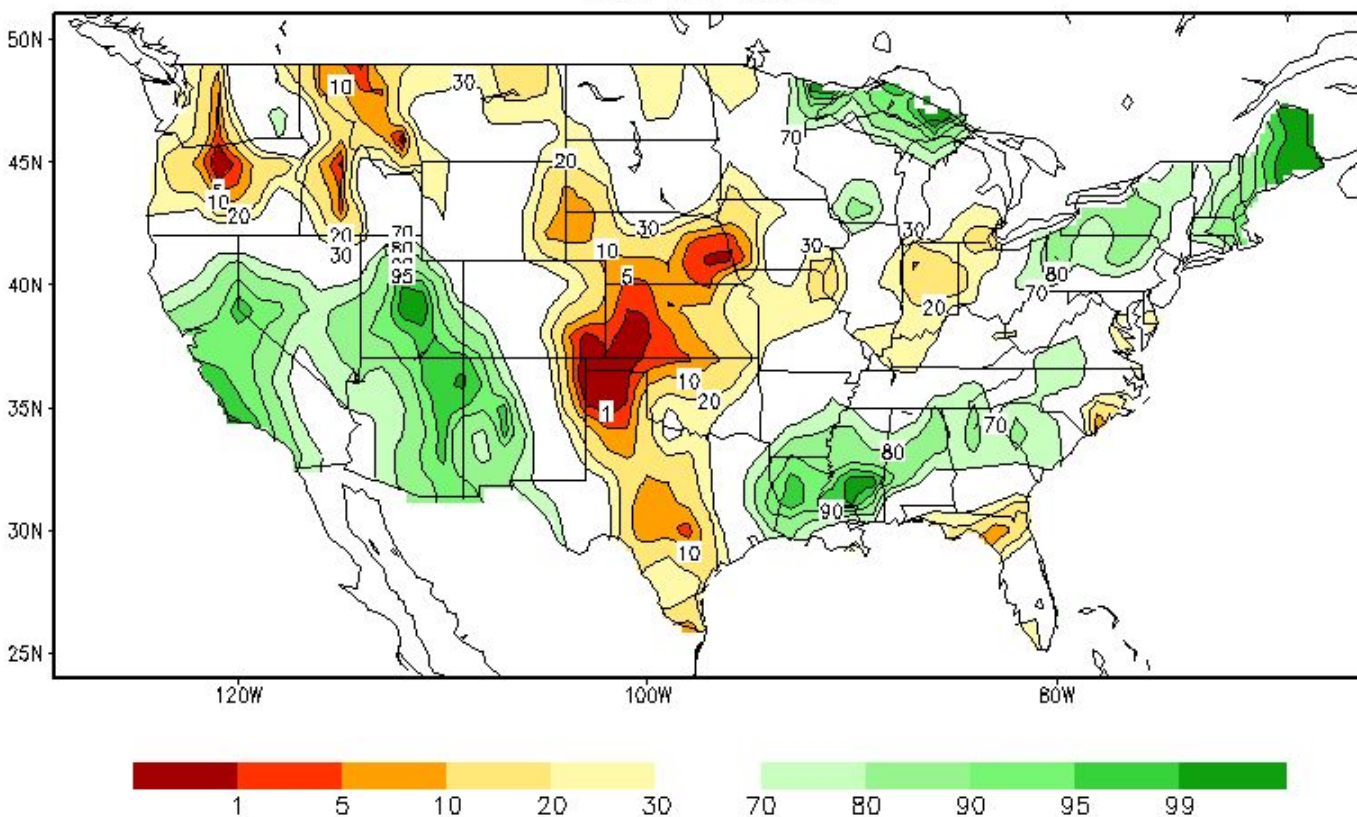
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## Dryer Soils, with some under Moderate Drought Conditions:

- Near to below normal soil moisture locally.
- Regionally, soil moisture is near normal, with above normal conditions in the upper Mississippi River Valley and the below normal area locally.

Calculated Soil Moisture Ranking Percentile  
FEB 07, 2023



## Contribution to flood potential:

- With near normal soil moisture, snowmelt or rainfall will have some capacity to infiltrate into the ground after the frost melts. Some areas may start to trend towards more saturation, due to increased snowmelt, which can lead to a lesser amount of infiltration. Although, a lighter snowpack may not have much of an impact, locally.





# Current Drought Conditions

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## Dryer Soils, with some under Moderate Drought Conditions:

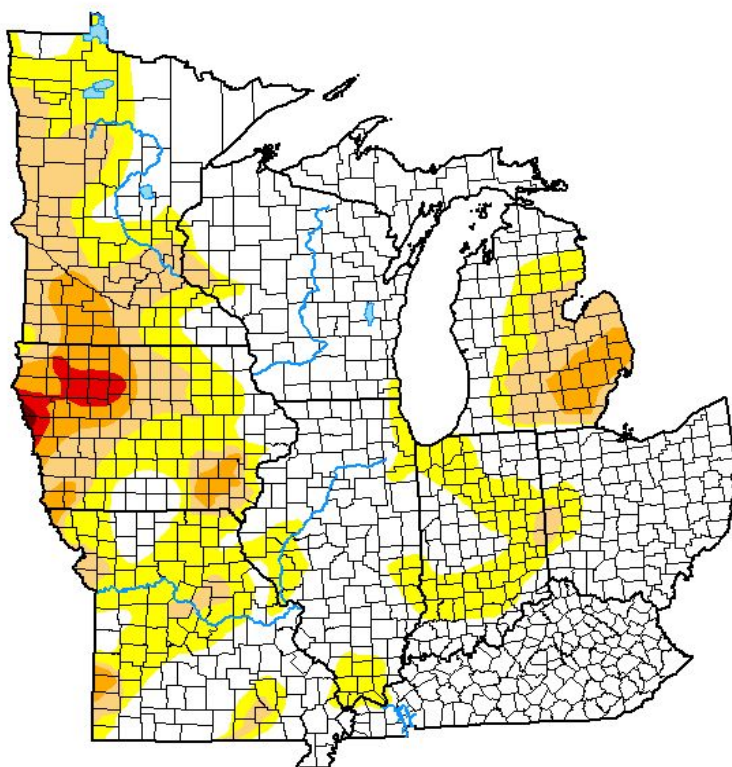
- Locally, we are seeing Abnormally Dry to Severe Drought conditions.

### U.S. Drought Monitor Midwest

January 31, 2023

(Released Thursday, Feb. 2, 2023)

Valid 7 a.m. EST



#### Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme 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:

Rocky Bilotta  
NCEI/NOAA



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

## Contribution to flood potential:

- With the Abnormally Dry conditions, snowmelt or rainfall will have some capacity to infiltrate into the ground after the frost melts. Some areas may start to trend towards more saturation, due to increased snowmelt, which can lead to a lesser amount of infiltration. These conditions have persisted for months now, with no big indication of change yet.



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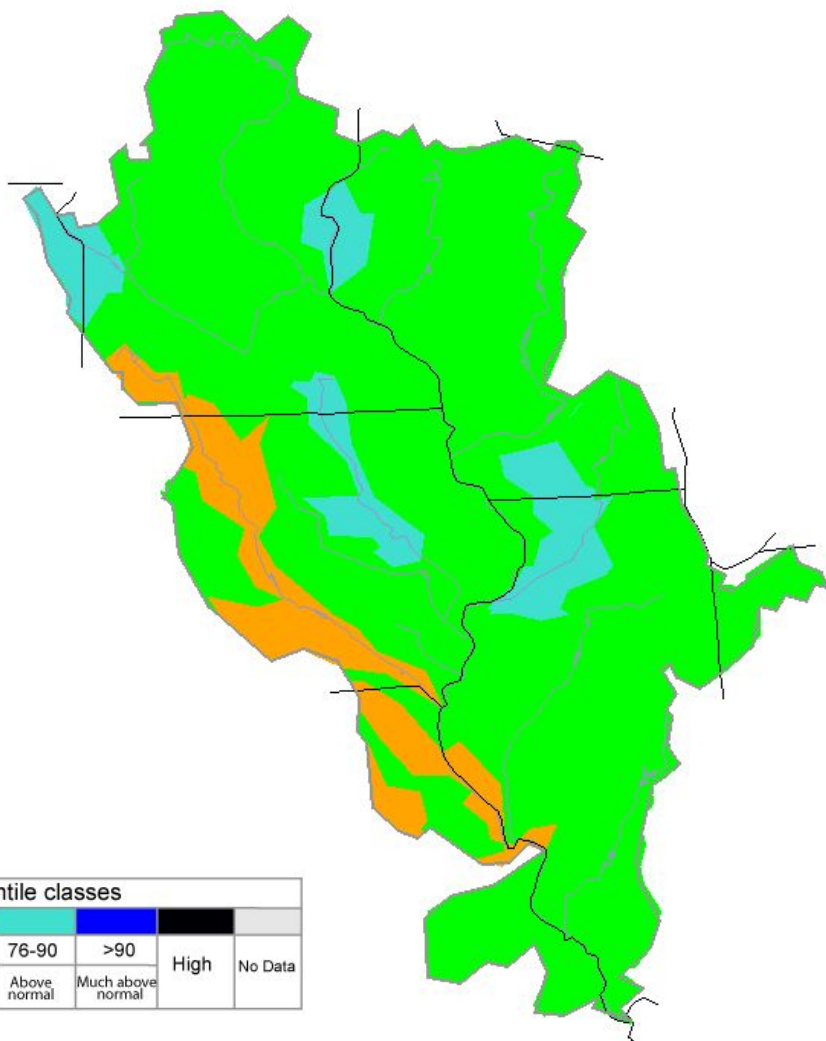
# Streamflows

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Streamflows are generally near normal across IA, IL, and MO, with a few watersheds observing above/below normal streamflows. Above normal temperatures are expected, which can inhibit further ice development on the rivers at this time.

Tuesday, February 07, 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		



## Contribution to flood potential:

- Rivers near or below normal levels indicate there is capacity in the rivers for runoff from snowmelt water and spring rains.





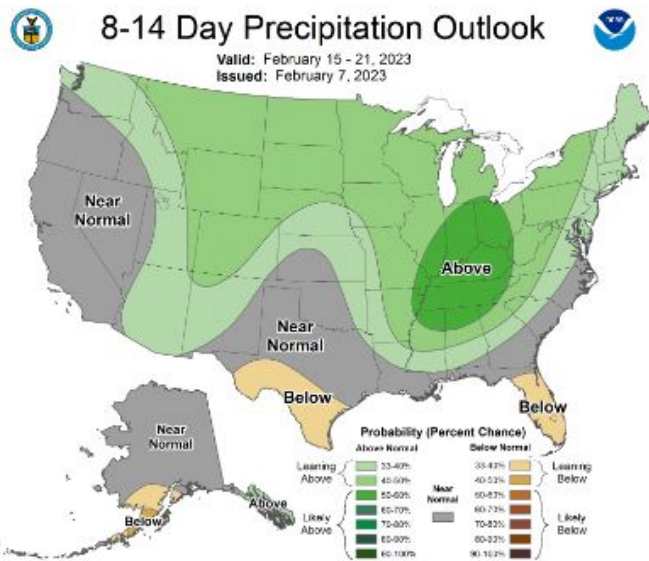
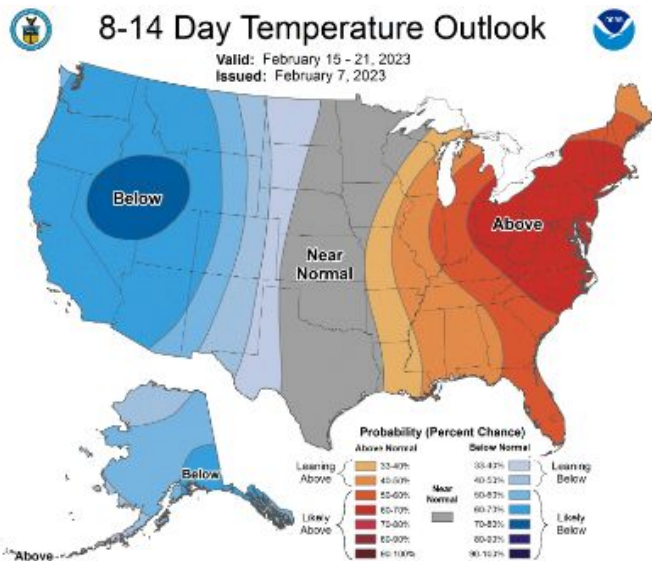
# Weather Outlooks

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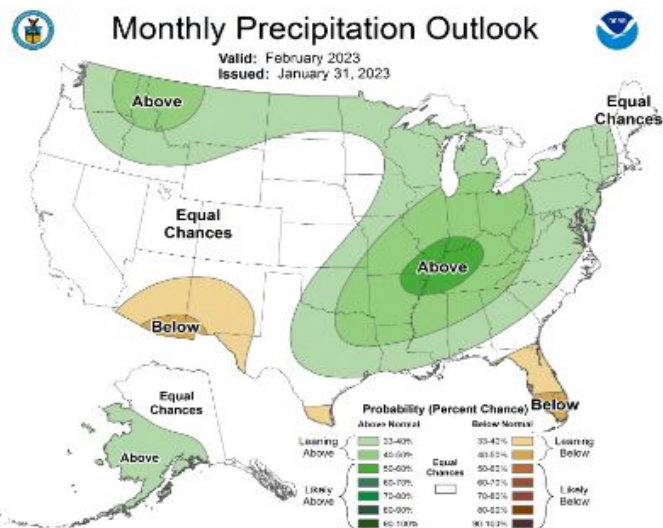
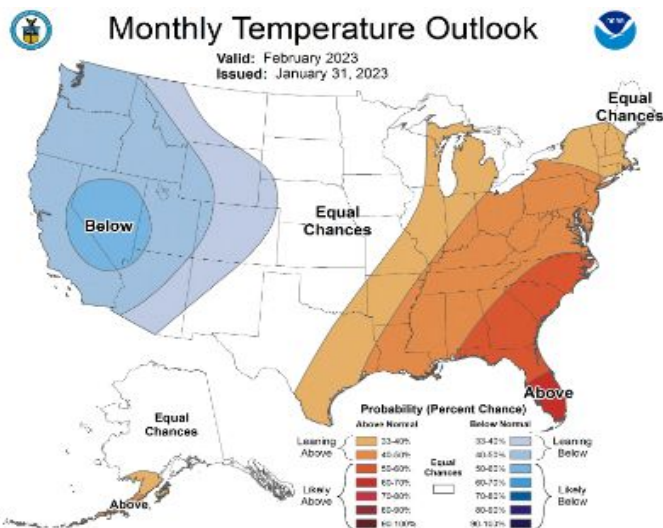
## Week 2 Temperature and Precipitation Outlooks (2/14-2/20):

- Above normal temperatures and precipitation are expected, with some indication of increased rainfall potential in the next two weeks.



## February Outlook:

- Looking through the remainder of February, near normal conditions can be expected, with a slight chance of above normal precipitation.





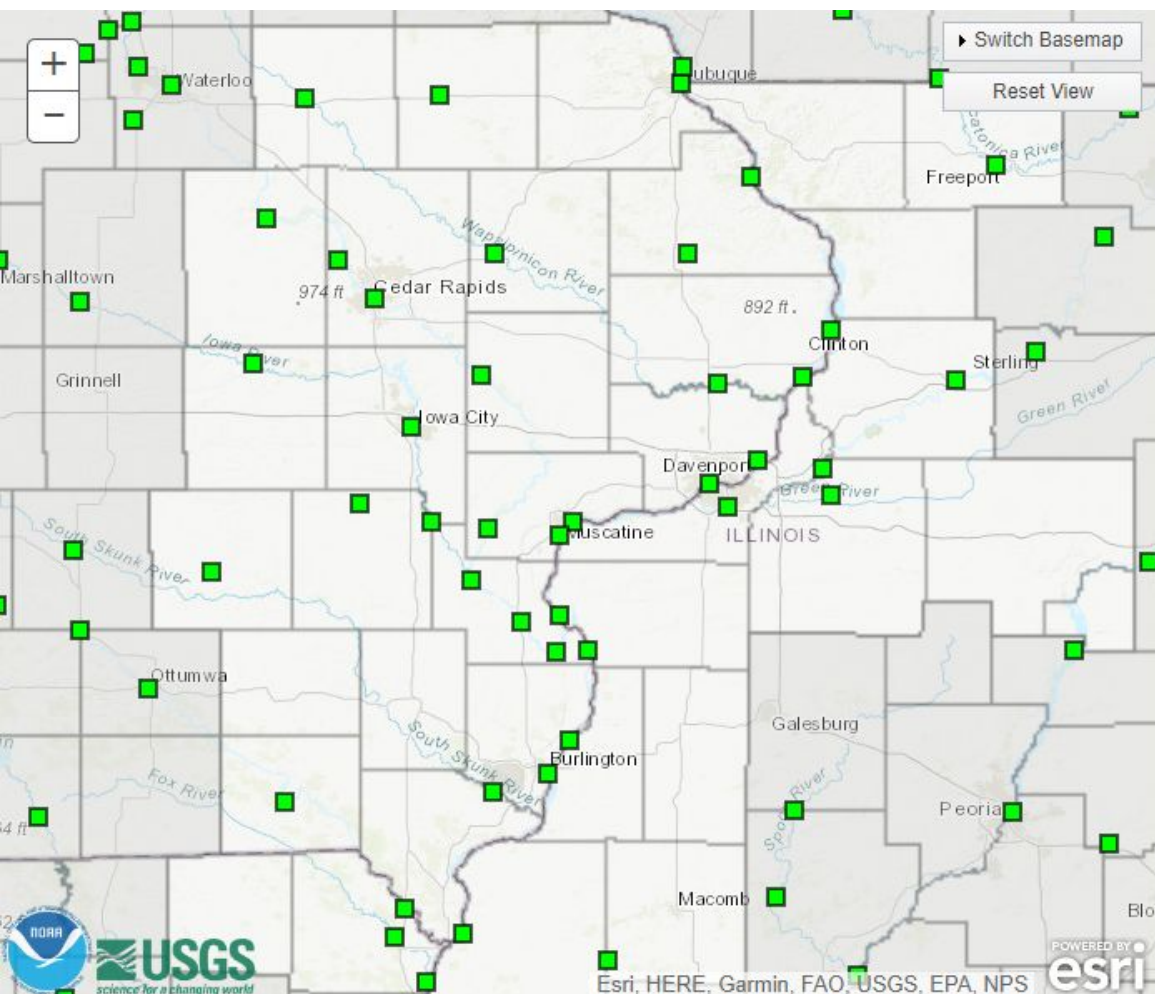
# Forecast/Outlooks: High Probabilities

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## No locations with high chances for flooding:

- Greater than 95% chance to reach the labeled flood stage



- High-end chances (>95%) are low all around at the moment. With continued snow melt and spring precipitation, these chances may fluctuate on future outlooks.







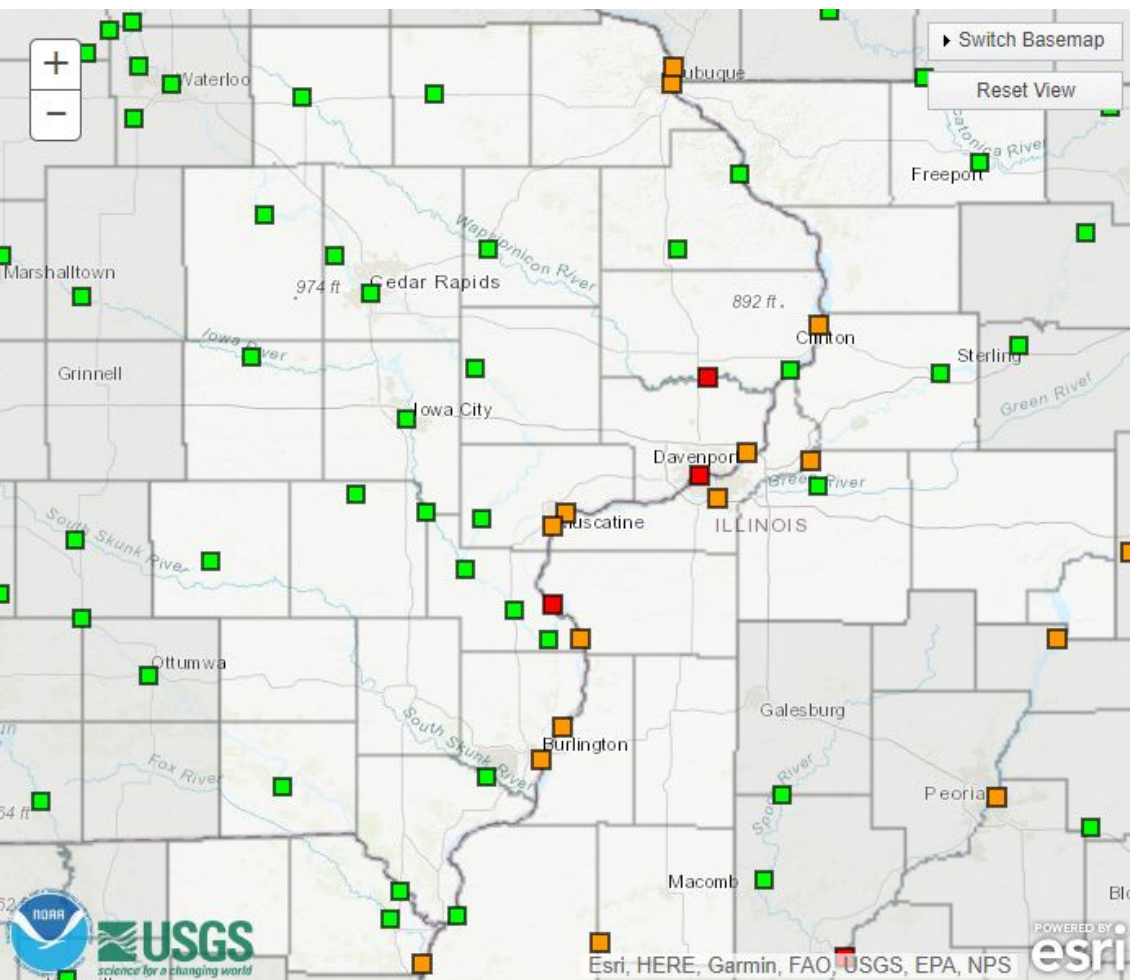
# Forecast/Outlooks: 50% Chance

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## Locations with chances for flooding:

- Greater than 50% chance to reach the labeled flood stage



- The Mississippi River will have a 50% or higher chance for reaching minor to near moderate flood stage, generally near and downstream of the Quad Cities.
- Some local rivers have greater than a 50% probability of reaching minor flooding. The lower Wapsipinicon and Rock Rivers also have an increased chance for minor flooding.





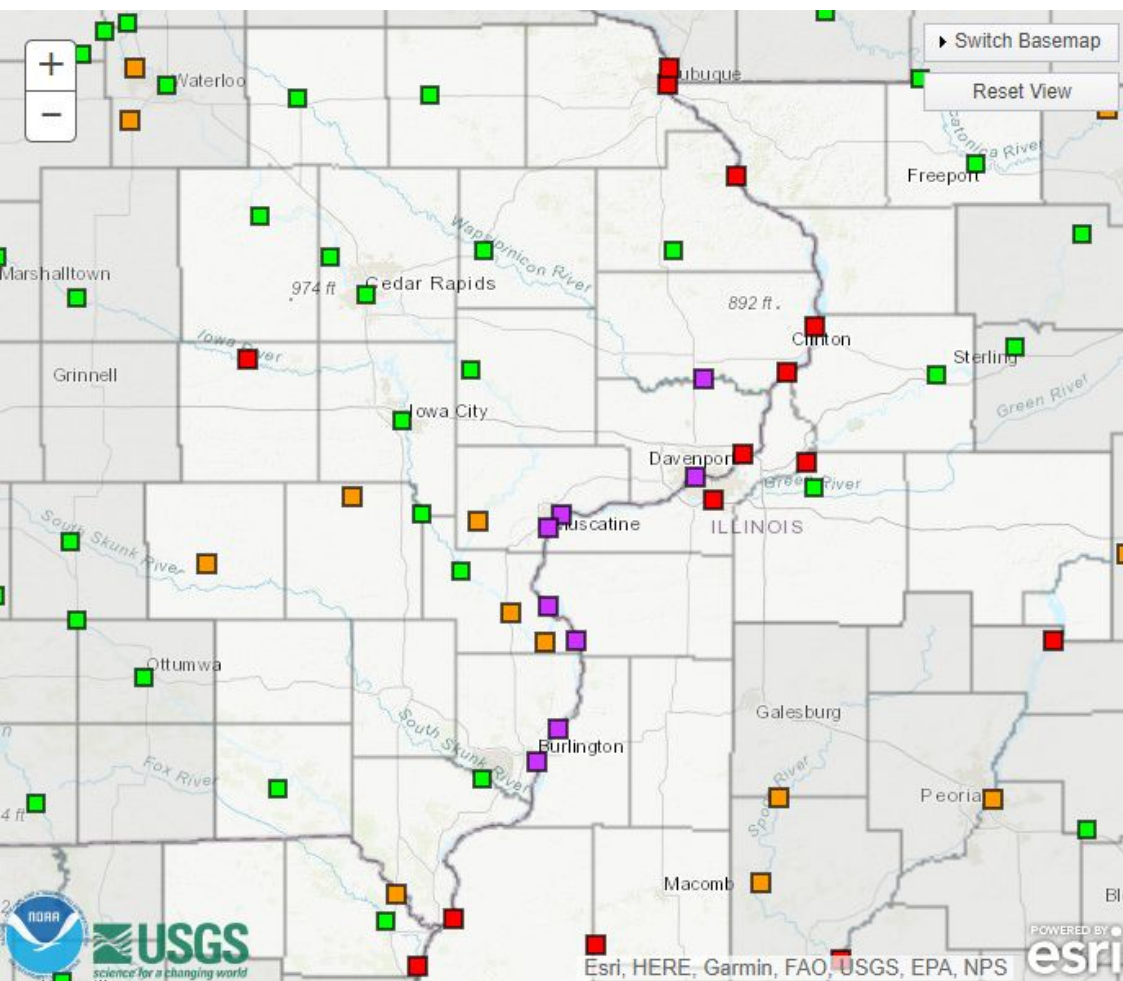
# Forecast/Outlooks: Lower Probabilities

2023 Spring Flood Outlook

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## Locations with chances for flooding:

- Greater than 25% chance to reach the labeled flood stage



- This graphic shows that the many rivers in the local area have at least a small (25%) chance of reaching flood stage, with several along the Mississippi showing at least a low probability of rising to moderate or major flood levels.





# Comparison To Normal

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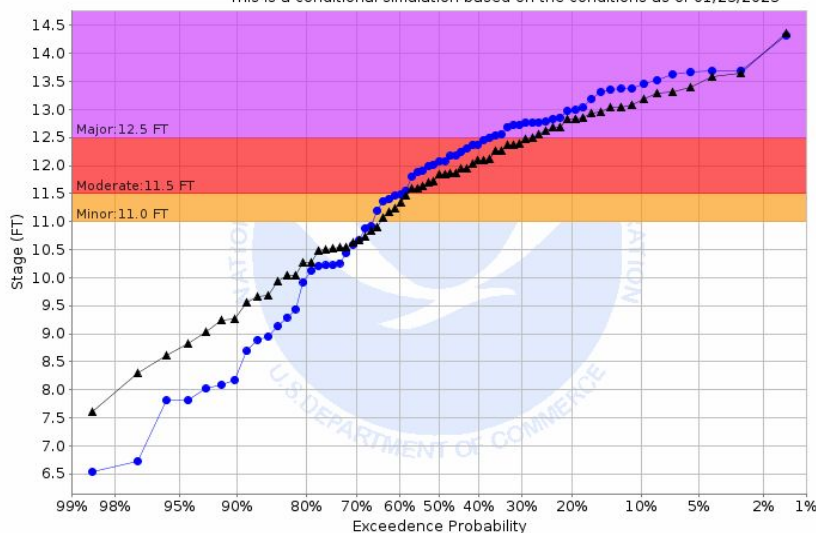
## How far outside of normal is the flood risk?

Closer the lines are together the closer to normal the flood threat is.

▲ Conditional Simulation  
● Historical Simulation

### Example of higher risk Wapsipinicon River locations: DeWitt, IA (DEWI4)

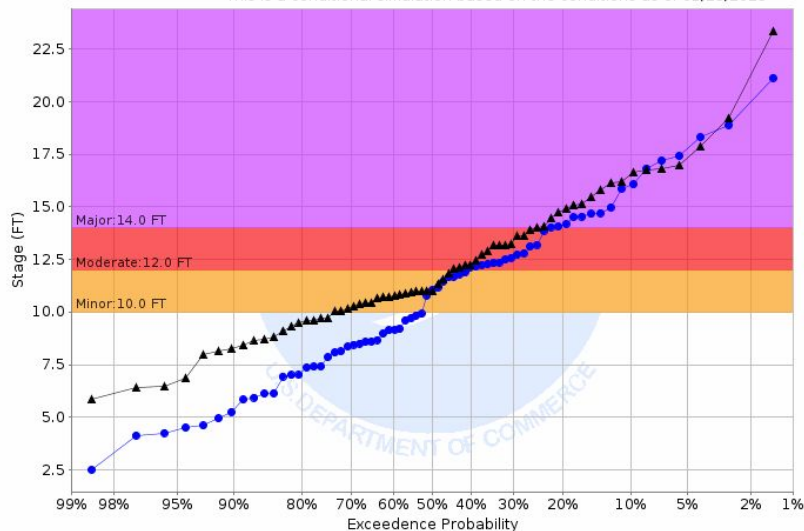
Chance of Exceeding River Stage at Wapsipinicon River at De Witt 4S (DEWI4)  
Forecast for the period 01/30/2023 - 04/30/2023  
This is a conditional simulation based on the conditions as of 01/23/2023



This graphic shows the probability of the Wapsipinicon River at DeWitt reaching Major Flood stage (12.5 ft) this year is roughly around 28%. In a normal year, this gage has around a 40% chance of reaching 12.5 ft.

### Example of lower risk locations - most local rivers: Gladstone, IL (GLDI2)

Chance of Exceeding River Stage at Mississippi River at Gladstone 4WNW - L&D 18 (GLD)  
Forecast for the period 01/30/2023 - 04/30/2023  
This is a conditional simulation based on the conditions as of 01/23/2023



For the Mississippi River at Gladstone, the risk for reaching Major Flood Stage (14.0 ft) this year is 22%. In a normal year, this gage has around a 20% chance of reaching 14.0 ft. There is also a near normal chance for Moderate Flood Stage, 12.0 ft (about 45%).







# Probabilistic Outlook Information

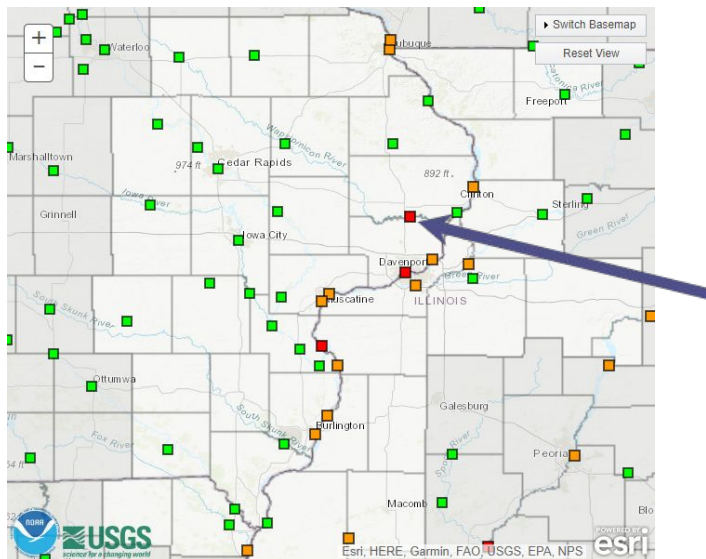
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Where to find the information:

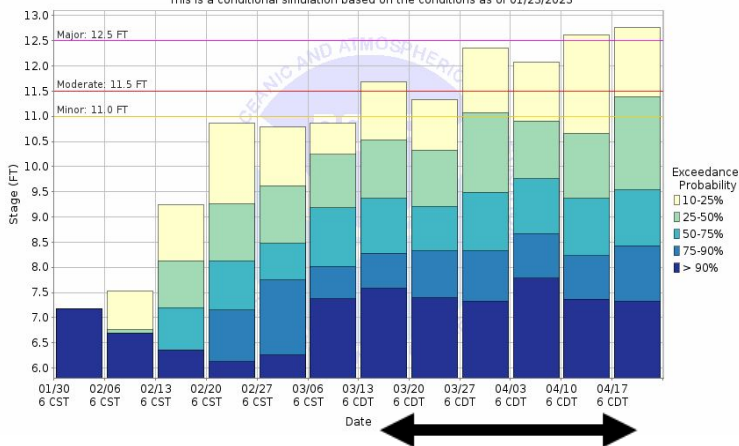
[https://water.weather.gov/ahps2/long\\_range.php?wfo=dvn](https://water.weather.gov/ahps2/long_range.php?wfo=dvn)

- To see the graphs, choose a location from the map.



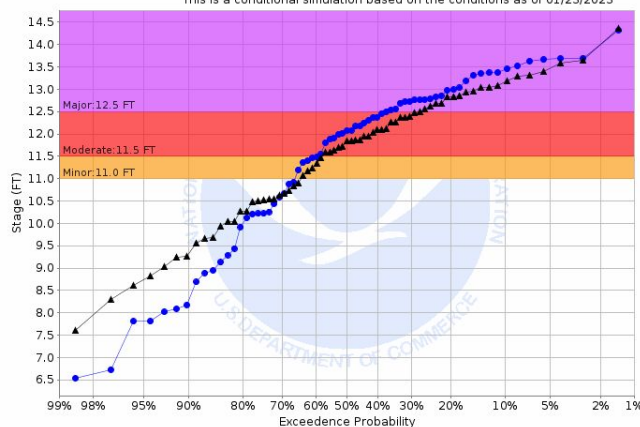
- Choosing the Probability Information Tab will get you to the graphical analysis of the probabilities.

Weekly Chance of Exceeding River Stage at Wapsipicon River at De Witt 4S (DEW4)  
Forecast for the period 01/30/2023 - 04/30/2023  
This is a conditional simulation based on the conditions as of 01/23/2023



This graph shows the most likely timing of high river levels.

Chance of Exceeding River Stage at Wapsipicon River at De Witt 4S (DEW4)  
Forecast for the period 01/30/2023 - 04/30/2023  
This is a conditional simulation based on the conditions as of 01/23/2023



This graph shows the probability compared to normal of reaching particular river levels through the entire 3 month period.





# Information Sources

2023 Spring Flood Outlook

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- Quad Cities WFO Forecast Discussions (technical weather and hydrology discussion) - [forecast.weather.gov/product.php?site=DVN&issuedby=DVN&product=AFD](https://forecast.weather.gov/product.php?site=DVN&issuedby=DVN&product=AFD)
- Advanced Hydrological Prediction Service (AHPS) – [water.weather.gov/ahps](https://water.weather.gov/ahps)
- North Central River Forecast Center – [www.weather.gov/ncrfc](https://www.weather.gov/ncrfc)
- Probabilistic Information - [https://water.weather.gov/ahps2/long\\_range.php?wfo=dvn](https://water.weather.gov/ahps2/long_range.php?wfo=dvn)
- Midwest Regional Climate Center (MRCC) – <http://mrcc.isws.illinois.edu/>
- US Geological Survey (USGS) WaterWatch page – <http://waterwatch.usgs.gov>
- National Operational Hydrologic Remote Sensing Center (NOHRSC) – [www.nohrsc.noaa.gov](https://www.nohrsc.noaa.gov)
- NOAA Climate Prediction Center – [www.cpc.ncep.noaa.gov](https://www.cpc.ncep.noaa.gov)
- NOAA Weather Prediction Center – [www.wpc.ncep.noaa.gov](https://www.wpc.ncep.noaa.gov)
- US Drought Monitor – [droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

**The Spring Flood Outlook will be updated**  
**February 23, 2023**





# Summary

2023 Spring Flood Outlook

Thursday, February 9, 2023

- The threat for spring flooding across the region will be driven by the amounts, location, and frequency of spring rains, and to a lesser extent, the pace of the snowmelt in the north.
- Snow cover and snow water equivalent are below normal across much of the area, which decreases the overall flood threat. However, the northern reaches of the Mississippi River basin are above normal. A rapid snowmelt occurring over still frozen ground would increase the flood threat on the Mississippi River this spring. A slow, steady melt would decrease the threat.
- Abnormally Dry to Severe drought conditions and near to below normal soil moisture will reduce the flood risk as well as reduce the risk for long term flooding. Once the soil is frost-free, there will be more storage available in the soil to handle spring rains.
- River levels in the upper Mississippi watershed are currently running near normal, providing more capacity to handle heavy spring rains.

## Flood Quick Facts and Preparedness:

### Quick facts you should know about flooding:

- Flooding can be caused by heavy rain, rapid snow melt, coastal storms, storm surge, waterway overflow, ice jamming, levee overtopping, dam failure, or from wastewater systems.
- Flooding has occurred in every U.S. state and territory.
- It only takes 6 inches of fast-moving water to knock you off your feet.
- A car can be moved in as little as 2 feet of water.
- 90% of all U.S. natural disasters declared by the President involve flooding.

### Preparedness:

**Know your risk:** Are you in a flood-prone area? Know your zone: [www.fema.gov/flood-zones](http://www.fema.gov/flood-zones)

-You must purchase separate flood insurance for your home. There is a 30 day wait period between when you buy a flood insurance policy and when it goes into effect. Plan ahead!

-A **Flood Watch** is issued when conditions are favorable for flooding. *Time to prepare!*

-A **Flood Warning** is issued when flooding is imminent or occurring. *Time to act!*

**Never drive into flood waters! Turn around, don't drown!**

Find out more information at: [www.weather.gov/dvn/2023\\_springfloodoutlook](http://www.weather.gov/dvn/2023_springfloodoutlook)

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