



# Spring Flood Outlook #3 2022

NWS Quad Cities IA/IL

Thursday, March 10, 2022

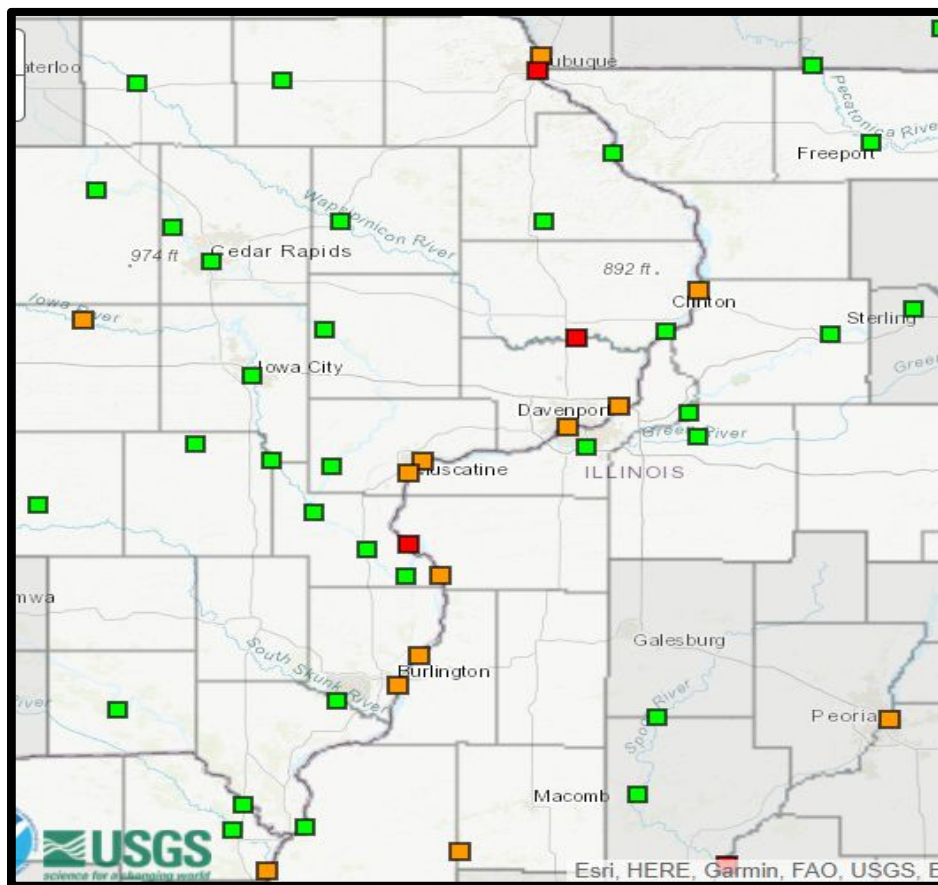
## Key Messages:

- **Mississippi River:** The risk is near normal for all categories of flooding.
- **Tributary rivers:** Near to below normal risk for all categories of flooding.
- Future precipitation events and the rate of snowmelt in the upper Mississippi basin will be the main factors determining the occurrence and severity of any flooding this spring.

NEW

## Important Changes (since Outlook #2)

- Slightly lower flood risk on the Mississippi



Map showing flood risk from March through May





# Factors Considered in this Outlook

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Thursday, March 10, 2022

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







# Seasonal Temperatures/Precipitation

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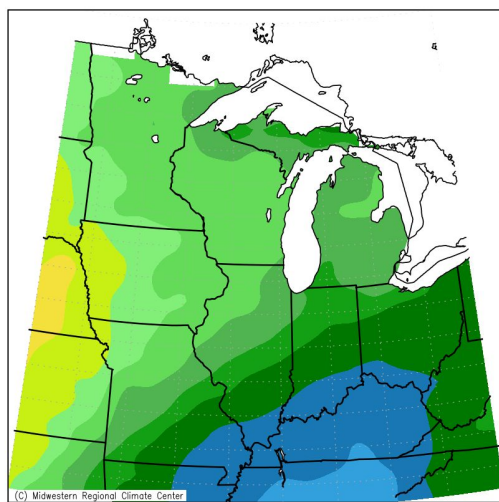
## Average Winter Temperatures:

Near normal temperatures this winter. Above normal south and below normal north of our area.

## Winter Precipitation:

- Locally – Below normal
- Upstream (Mississippi River watershed) – Above normal, especially in northern MN.

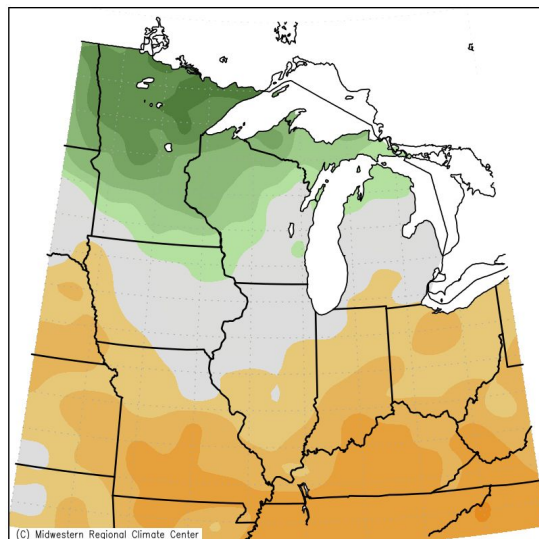
## Seasonal Accumulated Precipitation



0.01 1 3 7.5 15 25 40  
0.00 0.5 2 5 10 20 30 50

Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 3/10/2022 2:24:50 PM CST

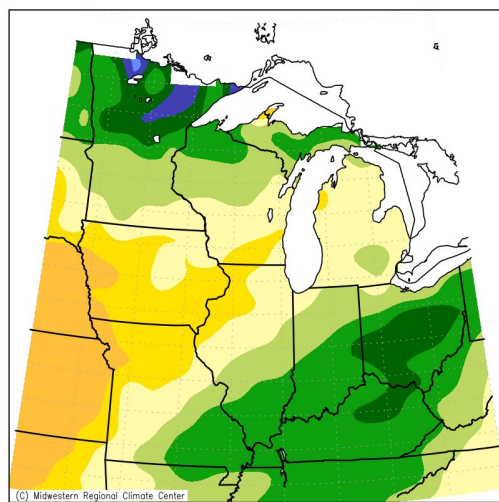
## Average Temperature Departure from Normal Dec 1, 2021 – March 10, 2022



-8 -6 -4 -2 0 2 4

Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 3/10/2022 2:23:40 PM CST

## Accumulated Precipitation Percent of Mean



25 50 75 100 125 150 175 200 300

Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 3/10/2022 2:25:49 PM CST

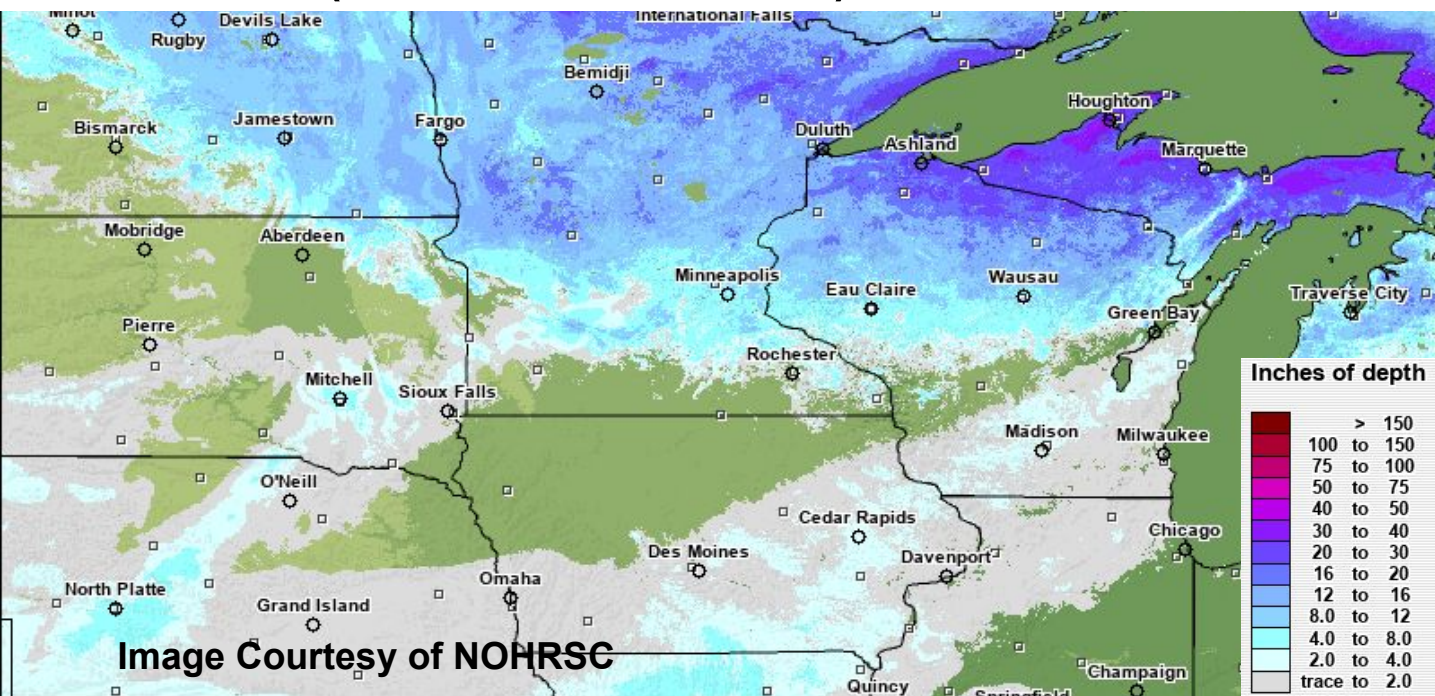


# Snow Cover and Liquid Water Equivalent

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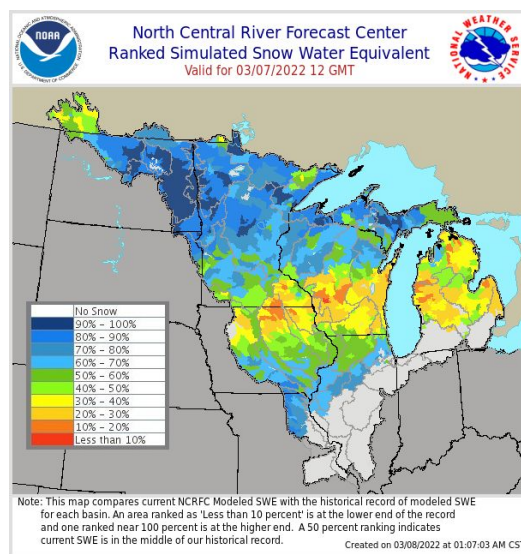
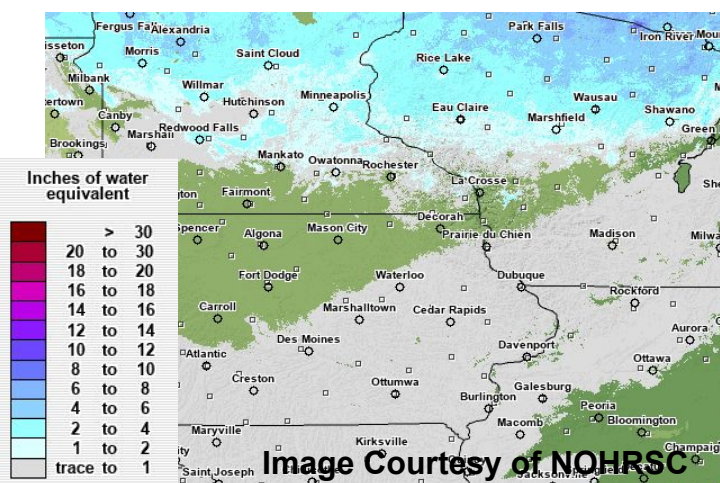
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## Snow Cover (as of March 10, 2022)



## Snow Water Equivalent (SWE) as of March 7, 2022:

- Widespread SWE of T-1". Deepest snowpack has 2-4" of SWE in north



## Contribution to flood potential:

- Local snowmelt alone has a limited potential for flooding due to below normal moisture content. Snow melt from the north will lead to uncertainty in the flood potential.



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# Snow Water Equivalent Change This Week

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## 72-Hour Snowmelt

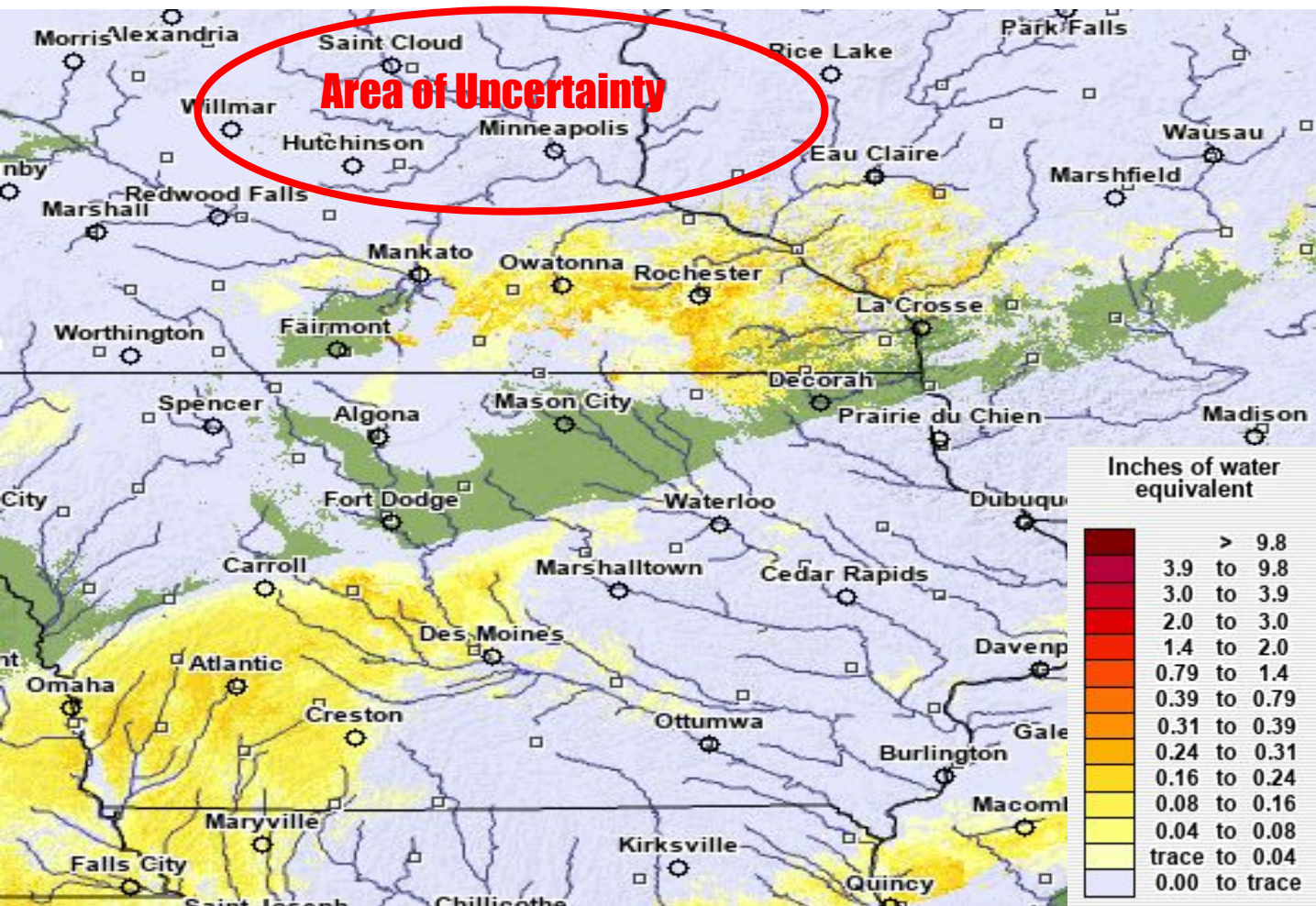


Image Courtesy of NOHRSC

## Contribution to flood potential:

- With little snowpack locally, not much flooding impact is currently expected locally. Melt from the snowpack in the the north may have flooding impact. Any new snowfall can also impact this in the future.





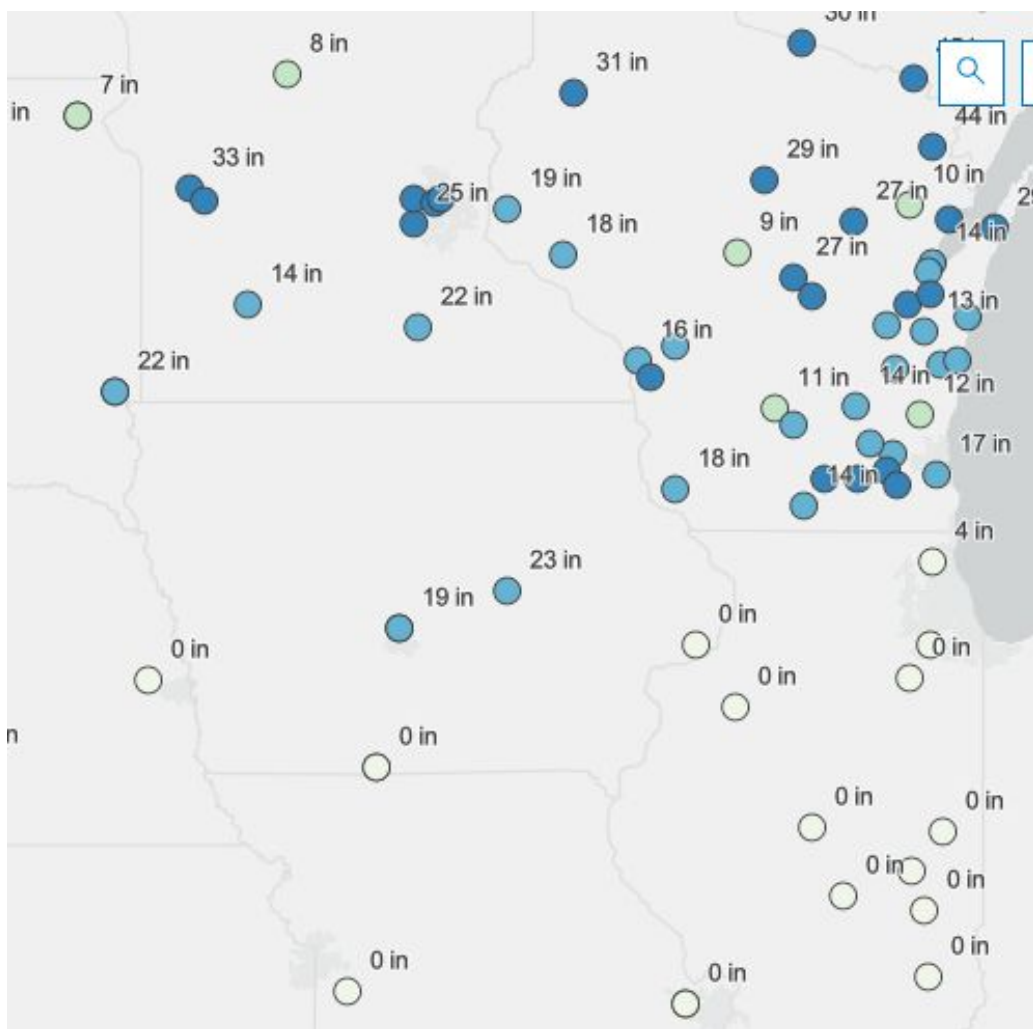
# Frost Depth

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## Frozen ground

- Much deeper frost depth in northern Mississippi River Valley, ranging 10 to 30 inches for some.



Soil Frost Depth (Inches)

FrostDepth

- > 16 - 28
- > 12 - 16
- > 8 - 12
- > 3 - 8
- 0 - 3

## Contribution to flood potential:

- Shallow frost locally allows more snowmelt and rain to infiltrate into the ground, limiting runoff. Deeper frost depth across the upper Mississippi basin raises concern of a rapid snowmelt and significant runoff.



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# Soil Moisture

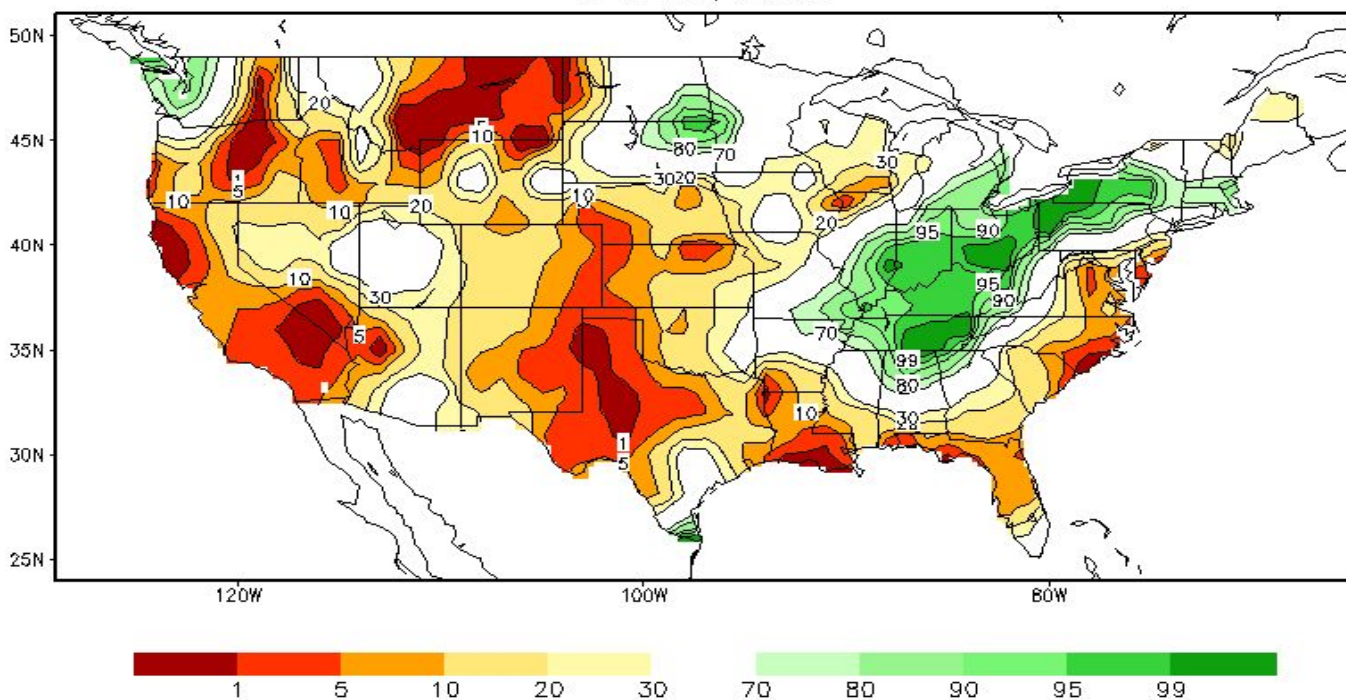
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## Drier Soils, with some under Moderate Drought Conditions:

- Below normal soil moisture over much of the area.
- Soil moisture is near to above normal in the upper Mississippi River Valley.

Calculated Soil Moisture Ranking Percentile  
MAR 09, 2022



## Contribution to flood potential:

- With the relatively dry soils, snowmelt or rainfall will have some capacity to infiltrate into the ground as the frost depth continues decreasing. Some areas may start to trend towards more saturation, due to increased snowmelt, which can lead to a lesser amount of infiltration.







# Current Drought Conditions

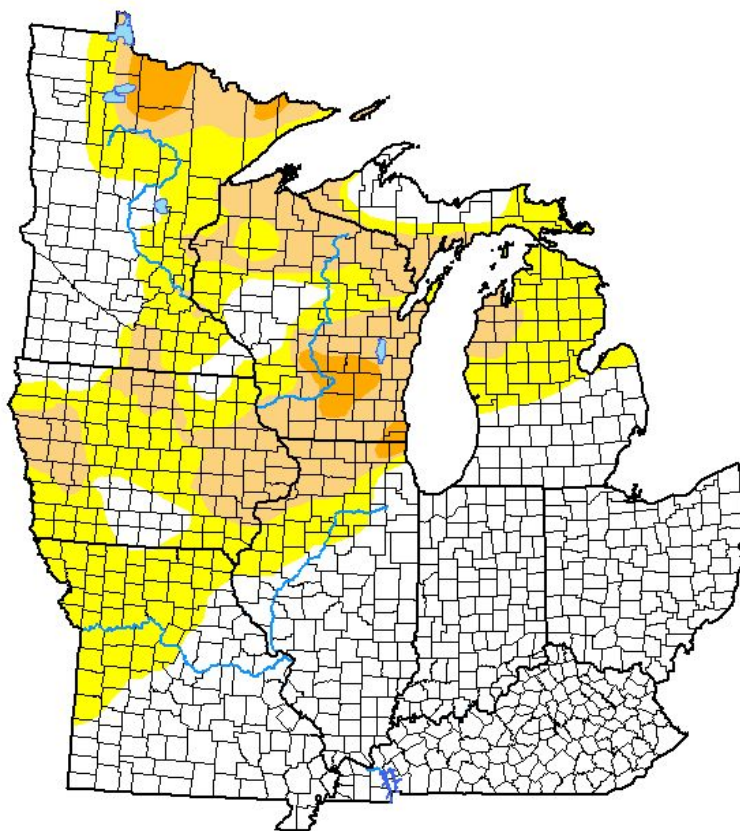
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## Drier Soils, with some under Moderate Drought Conditions:

- Abnormally dry to moderate drought conditions are seen over eastern IA, northwest IL, and northeast MO.

### U.S. Drought Monitor Midwest



**March 8, 2022**

(Released Thursday, Mar. 10, 2022)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	57.04	42.96	17.60	2.10	0.00	0.00
<b>Last Week</b> 03-01-2022	54.95	45.05	19.34	2.28	0.00	0.00
<b>3 Months Ago</b> 12-07-2021	60.60	39.40	17.44	4.88	0.23	0.00
<b>Start of Calendar Year</b> 01-04-2022	63.32	36.68	15.25	2.41	0.00	0.00
<b>Start of Water Year</b> 09-28-2021	57.44	42.56	23.36	12.29	4.16	0.00
<b>One Year Ago</b> 03-09-2021	46.93	53.07	11.59	1.24	0.33	0.00

#### Intensity:

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

Brian Fuchs  
National Drought Mitigation Center



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

## Contribution to flood potential:

- With moderate drought conditions, snowmelt or rainfall will have the capacity to infiltrate into the ground once frost in the ground is gone.



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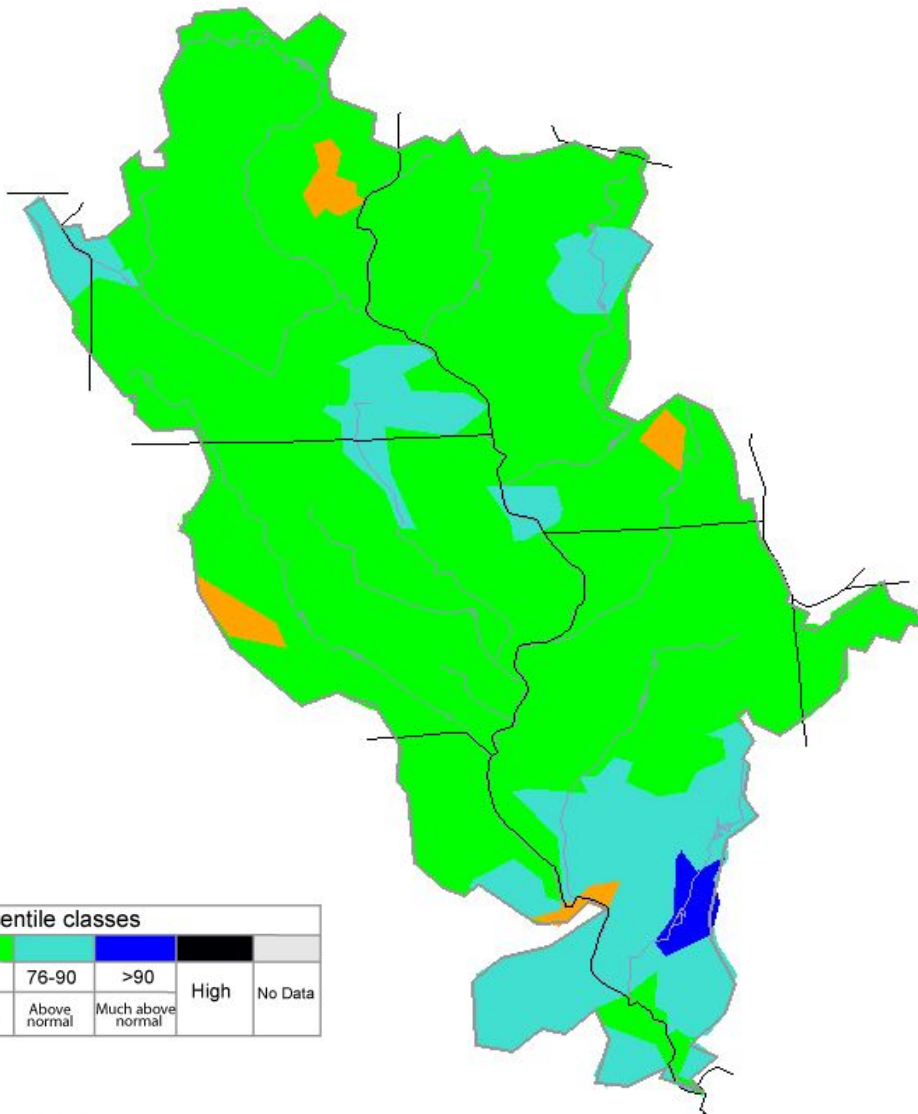
# Streamflows

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Streamflows are near to slightly above normal across IA, IL, and MO. This will help in the event of a heavy precipitation events in the future, as the rivers will be able to hold more water than if river levels were high.

Wednesday, March 09, 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		



## Contribution to flood potential:

- Rivers near normal levels indicate there is capacity in the rivers for runoff from snowmelt water and spring rains, while those above normal will have less capacity.





# Weather Outlooks

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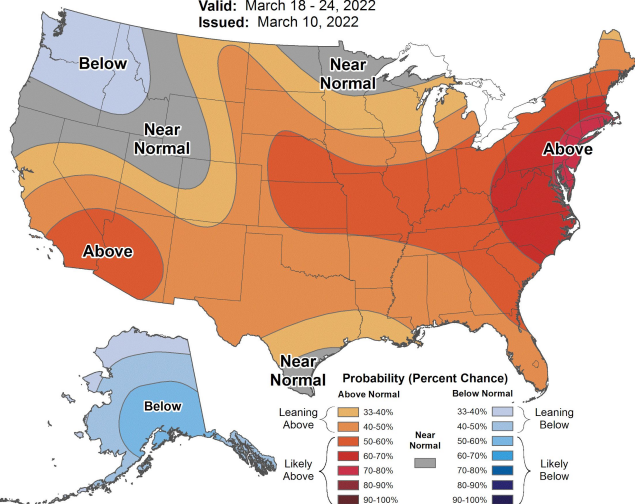
## Week 2 Temperature and Precipitation Outlooks (3/18-3/24):

- Above normal temperatures and above normal precipitation are favored.



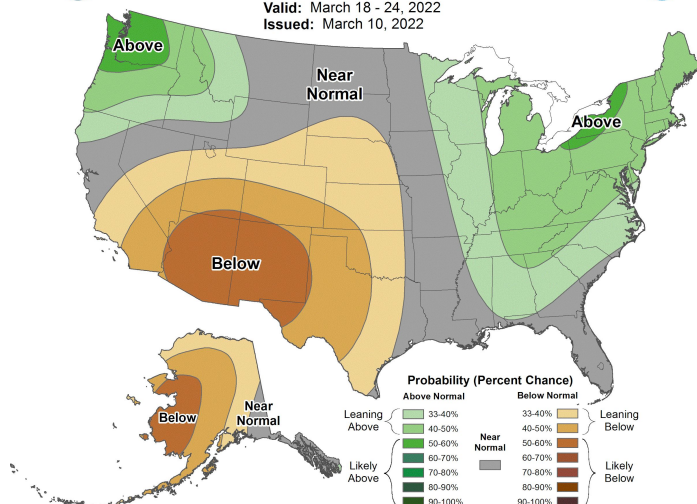
### 8-14 Day Temperature Outlook

Valid: March 18 - 24, 2022  
Issued: March 10, 2022



### 8-14 Day Precipitation Outlook

Valid: March 18 - 24, 2022  
Issued: March 10, 2022



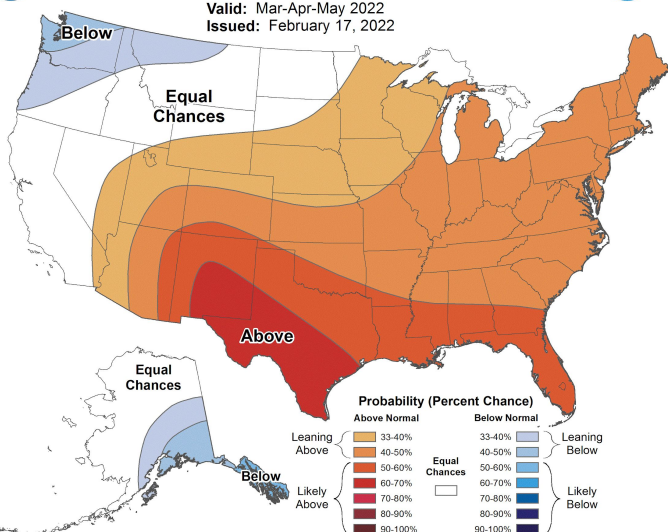
## March-May Outlook:

- Looking through May, there are low probabilities favoring above normal temperatures and precipitation.



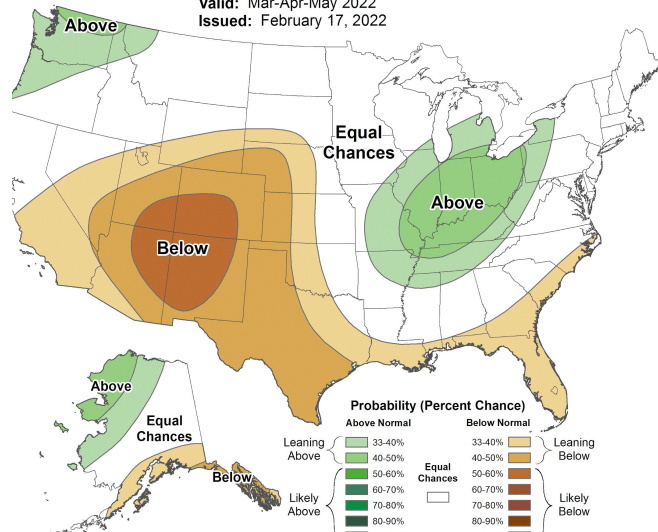
### Seasonal Temperature Outlook

Valid: Mar-Apr-May 2022  
Issued: February 17, 2022



### Seasonal Precipitation Outlook

Valid: Mar-Apr-May 2022  
Issued: February 17, 2022







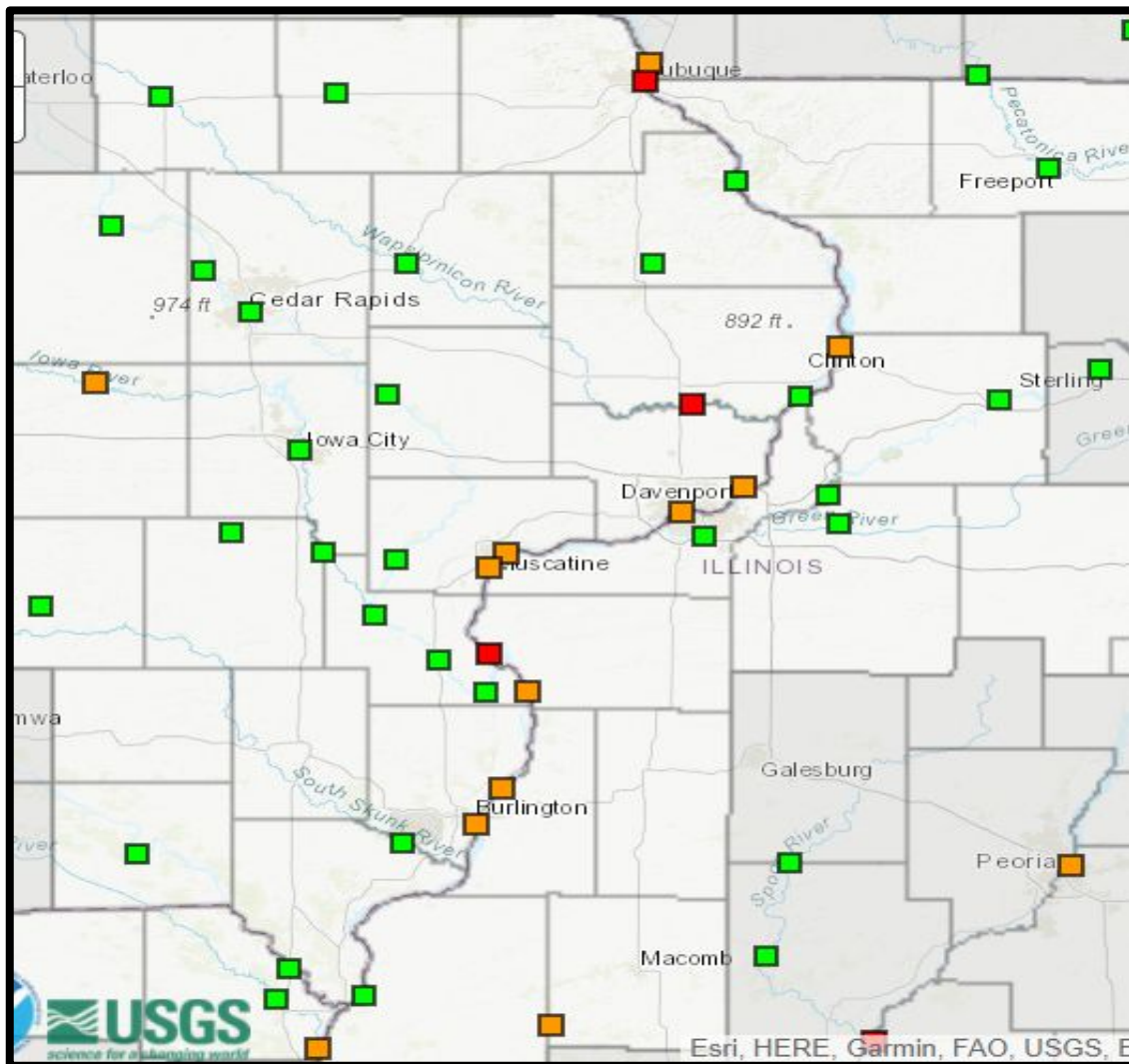
# Long Range Flood Risk Outlook

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## Locations with chances for flooding:

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



- Highest chance of flooding on the Mississippi River. (slight decrease since the second outlook)
- Lower flood risk on tributaries.





# Comparison To Normal

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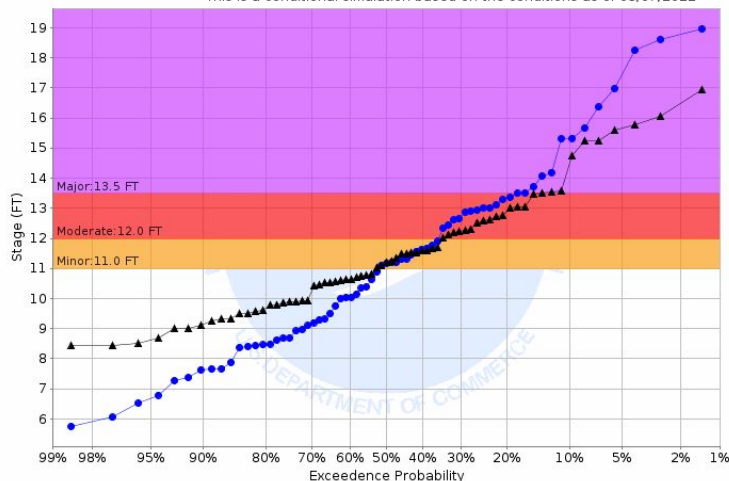
## How far outside of normal is the flood risk?

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

▲ Conditional Simulation  
● Historical Simulation

Example of higher risk location (but still near normal risk): Mississippi at Le Claire

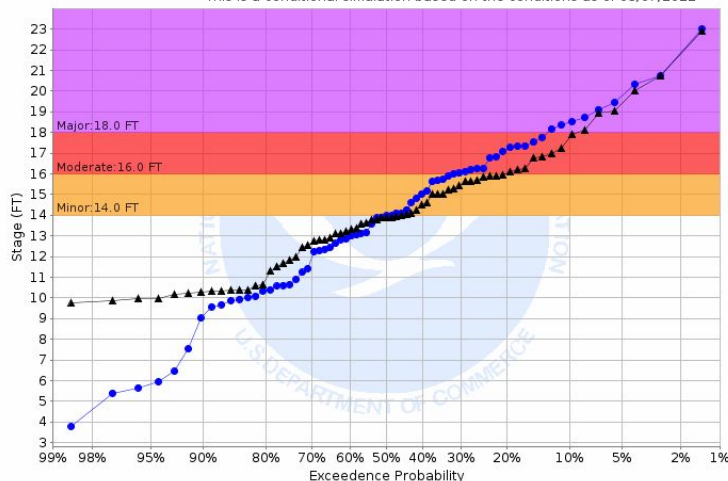
Chance of Exceeding River Stage at Mississippi River at Le Claire - L&D 14 (LECI4)  
Forecast for the period 03/14/2022 - 06/12/2022  
This is a conditional simulation based on the conditions as of 03/07/2022



This graphic shows the probability of the Mississippi River at Le Claire (L/D 14) reaching Minor Flood stage this year is around 53%. In a normal year, the chance is 52%.

Example of lower risk locations - most local rivers: English River at Kalona

Chance of Exceeding River Stage at English River at Kalona 1SSW (KALI4)  
Forecast for the period 03/14/2022 - 06/12/2022  
This is a conditional simulation based on the conditions as of 03/07/2022



For the English River at Kalona the risk for reaching Moderate Flood Stage (16 ft) this year is 21%. In a normal year, there is a 32% chance of reaching 16 ft.







# Probabilistic Outlook Information

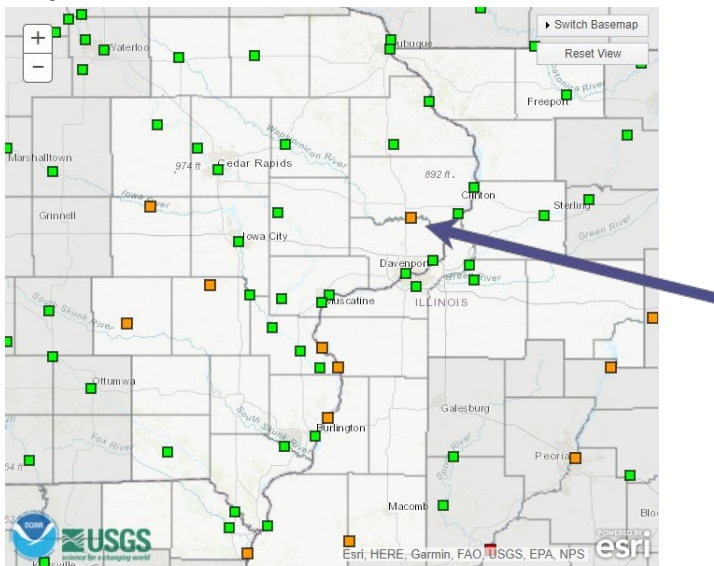
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Thursday, March 10, 2022

Where to find the information:

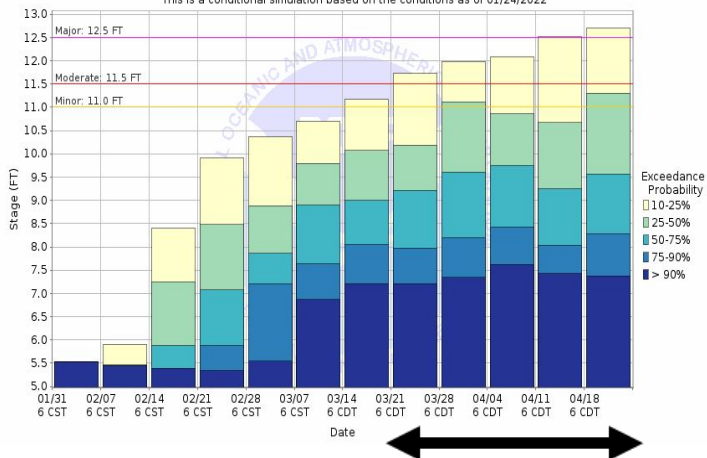
[https://water.weather.gov/ahps2/long\\_range.php?wfo=dvn](https://water.weather.gov/ahps2/long_range.php?wfo=dvn)

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



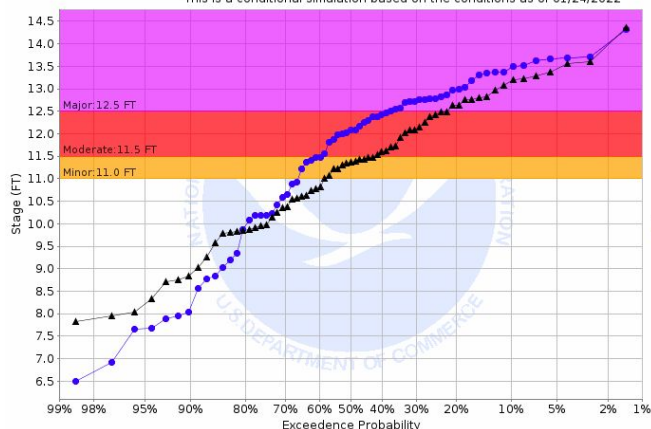
- Choosing the Probability Information Tab will get you to the graphical analysis of the probabilities.

Weekly Chance of Exceeding River Stage at Wapsipicon River at De Witt 4S (DEW4)  
Forecast for the period 01/31/2022 - 05/01/2022  
This is a conditional simulation based on the conditions as of 01/24/2022



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 01/31/2022 - 05/01/2022  
This is a conditional simulation based on the conditions as of 01/24/2022



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





# Information Sources

NWS Quad Cities IA/IL

Thursday, March 10, 2022

- 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**  
**March 10, 2022**







# Summary

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Thursday, March 10, 2022

## Main Points

***Mississippi River: Near normal (decreased)***  
***Tributary Rivers: Near to Below Normal (little change)***

- **Mississippi:** The risk is near normal for all flooding categories.
- **Tributary rivers:** Near to below normal risk for all categories of flooding.
- Future precipitation events and the rate of snowmelt in the upper Mississippi basin will be the main factors determining the occurrence and severity of any flooding this spring.

## 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/2022\\_springfloodoutlook](http://www.weather.gov/dvn/2022_springfloodoutlook)

Contact the NWS Quad Cities Hydro Team at [cr.dvn-hydro@noaa.gov](mailto:cr.dvn-hydro@noaa.gov)

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