2022 Spring Flood Outlook

February 24, 2022
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Covering the Upper Mississippi, Minnesota, and Chippewa (WI) basins and tributaries

Key Messages

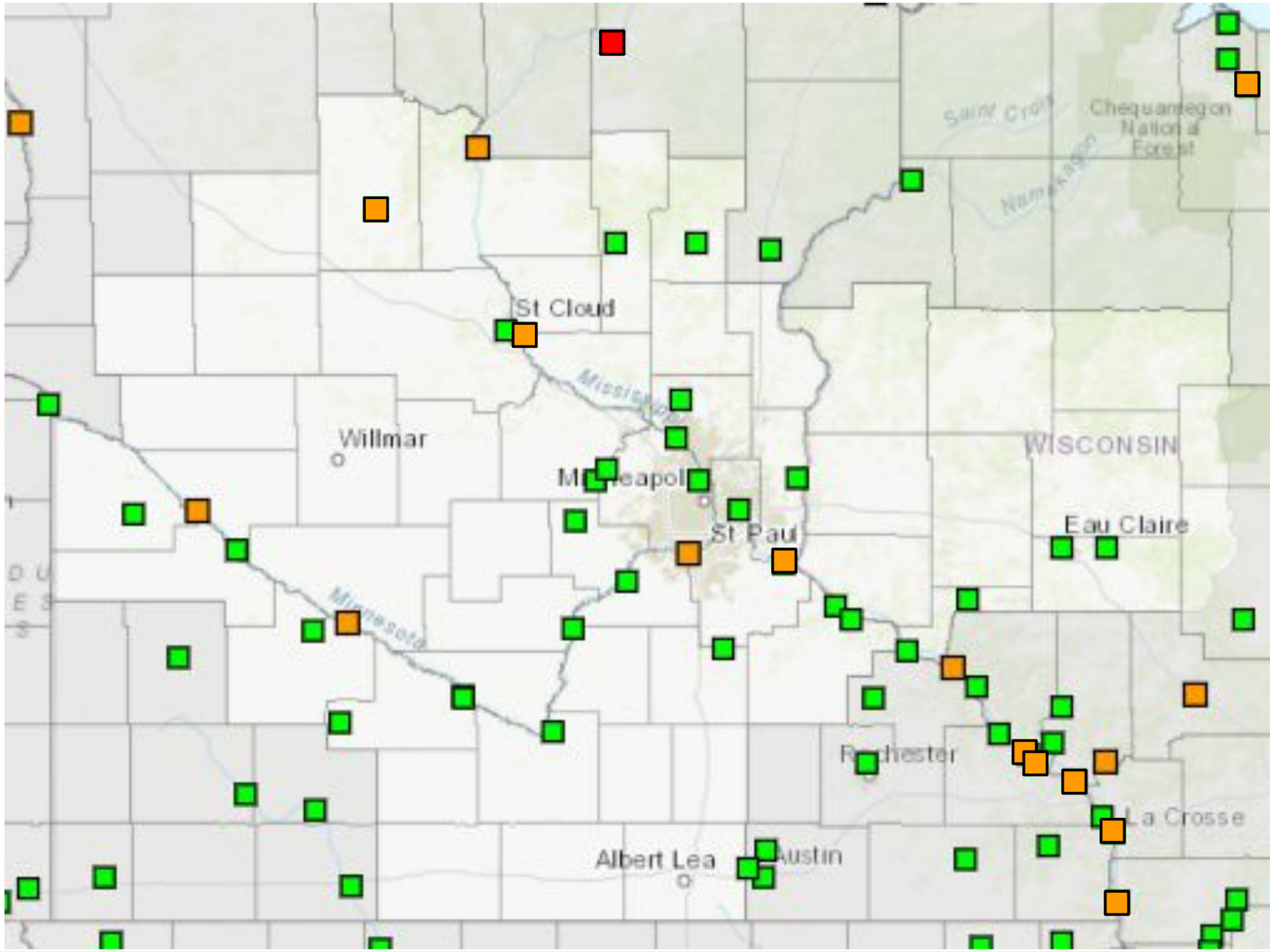
- The early flood outlook for the Twin Cities service area is **Average/Normal.**
- Nearly every spring flood parameter is near what we'd expect for late February.
- The headwaters of the Mississippi and St. Croix Rivers have the most snowpack, but there is also plenty of room to intercept runoff due to the recent drought.

Important Updates

- There is a slight increase in probability for Minor flooding on the Mississippi River and northern tributaries.
- The CPC Drought Outlook no longer forecasts improvement for central/southern MN and WI (pg 5).

Next Scheduled Briefing

- Thursday, March 10



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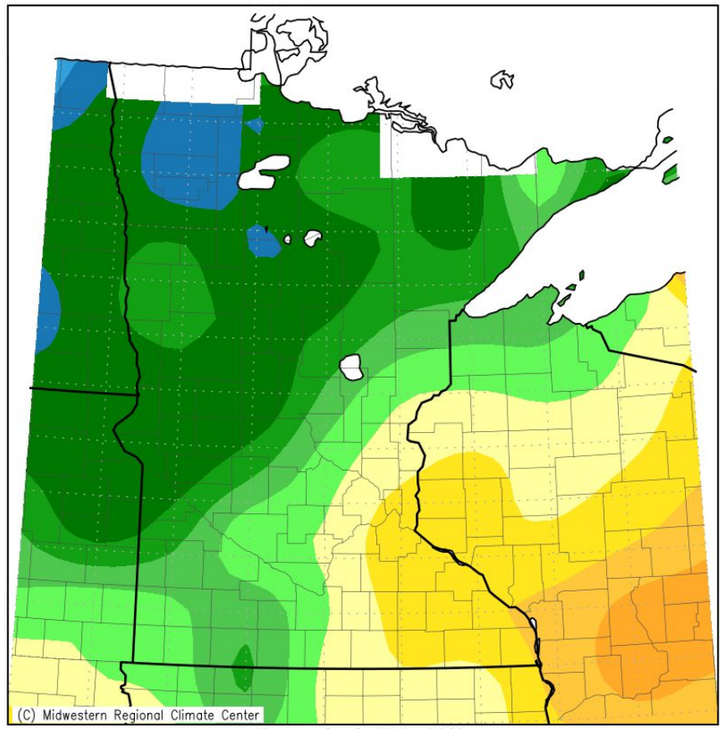
Precipitation and Snowfall so far

Water year precipitation (left image) has been 1-3 inches above normal in the west and north, while an inch or two below normal in Wisconsin and southeast. This helped alleviate the drought somewhat in the west and north.

For snowfall (right image), all basins have received within 25 percent of normal snowfall for the season so far, except for the Mississippi headwaters which are running 50-75 percent above normal.

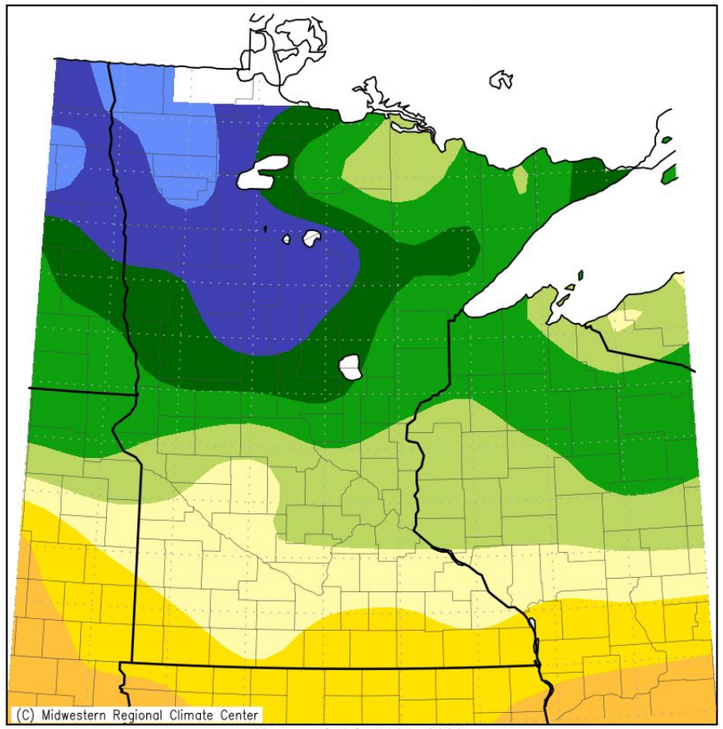
Accumulated Precipitation (in): Departure from Mean
October 1, 2021 to February 23, 2022



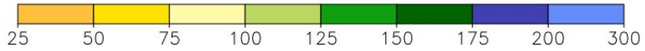
Mean period is 1991–2020.

Midwestern Regional Climate Center
cli–MATE: MRCC Application Tools Environment
Generated at: 2/23/2022 2:03:46 PM CST

Accumulated Snowfall: Percent of Mean
October 1, 2021 to February 23, 2022



Mean period is 1991–2020.



Midwestern Regional Climate Center
cli–MATE: MRCC Application Tools Environment
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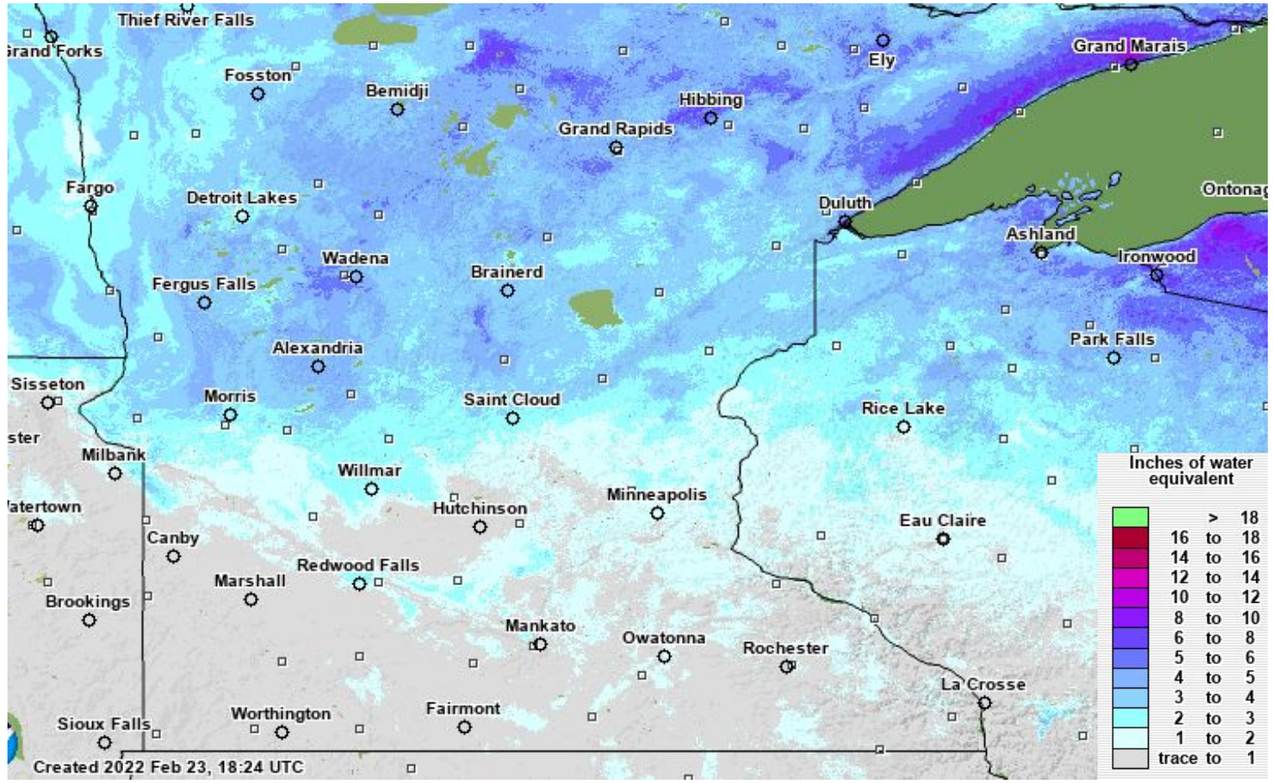
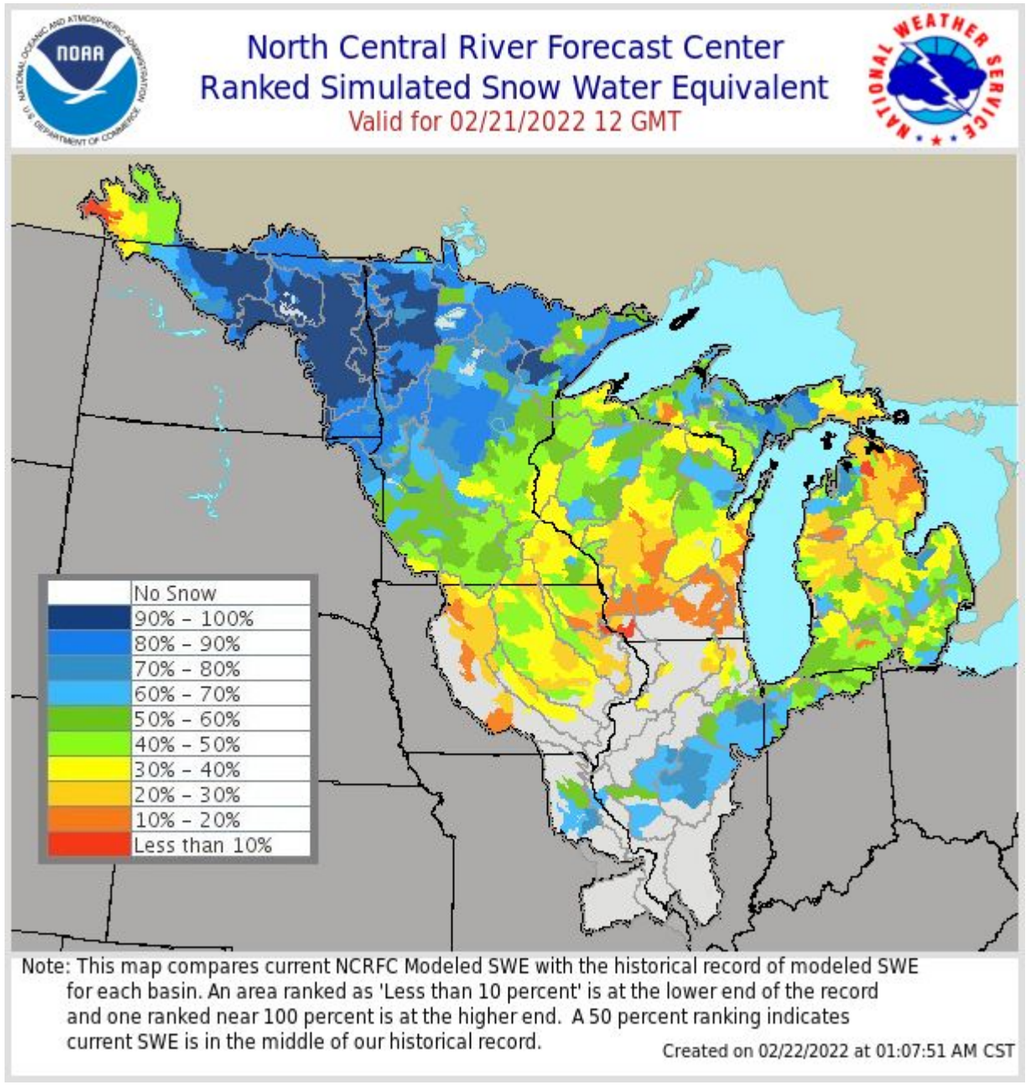
Snow Water Equivalent (SWE)





This results in modeled Snow Water Equivalent (SWE) (above) around 2-5 inches north and 0.5-2 inches south. These are also very close to normal (right image), with slightly above normal readings in the Mississippi headwaters.

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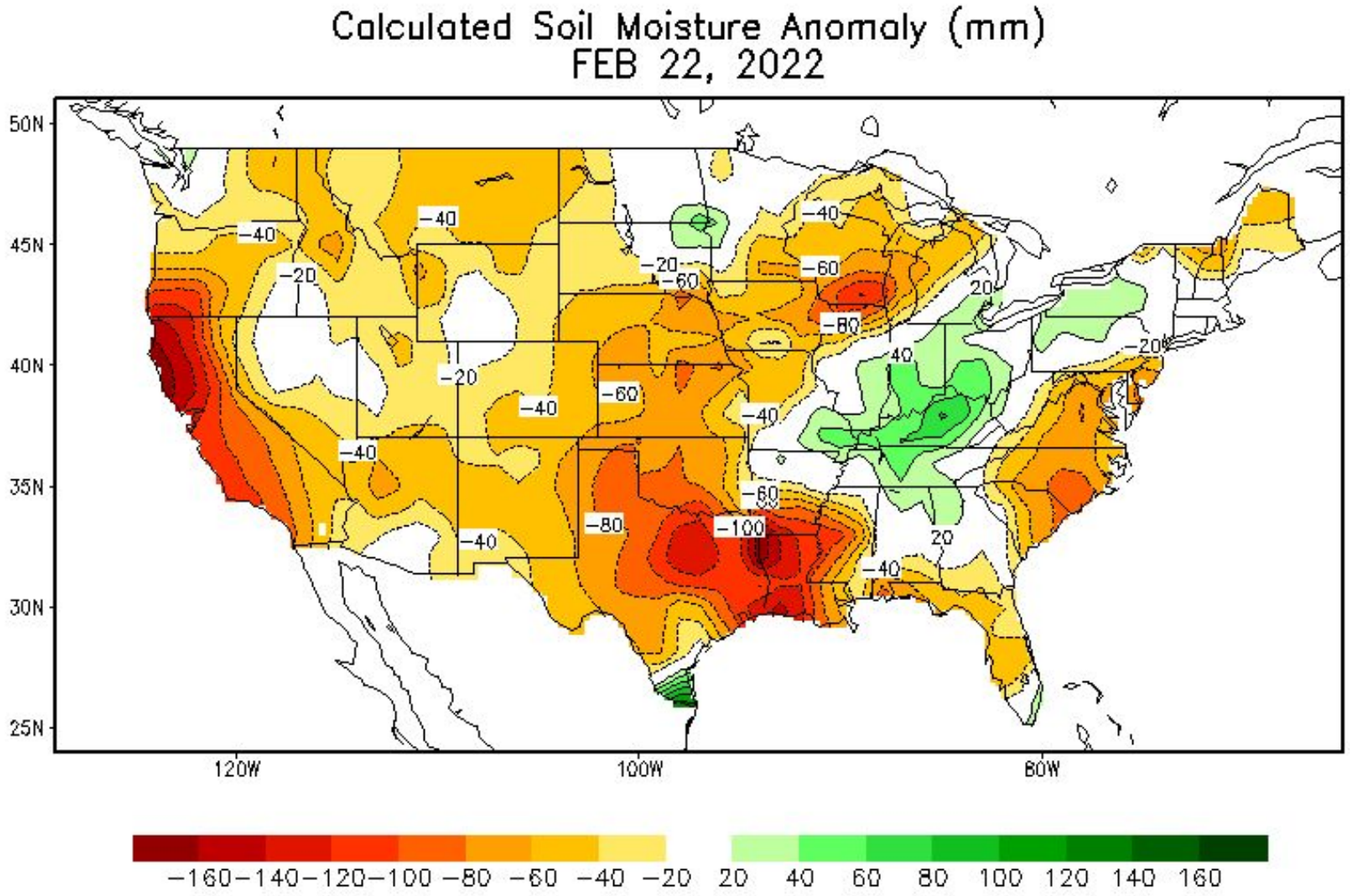
Soil Moisture and Frost Depth

The increased precipitation last autumn resulted in improved soil moisture conditions before freeze-up this year; while there is still a small deficit over most of the area, it has improved greatly since mid summer.

Frost Depth (not shown) is also very much near normal for mid February over the entire area, with most readings showing from 18 to 28 inches of frost in the soil.



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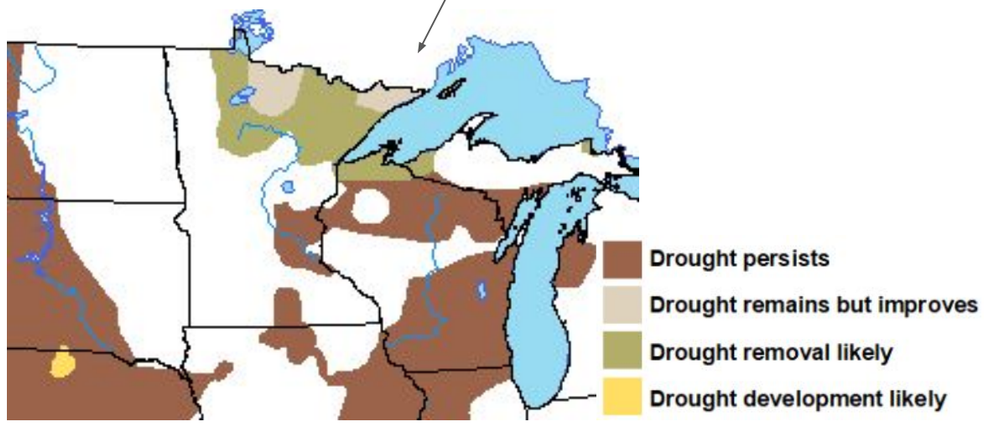
Drought

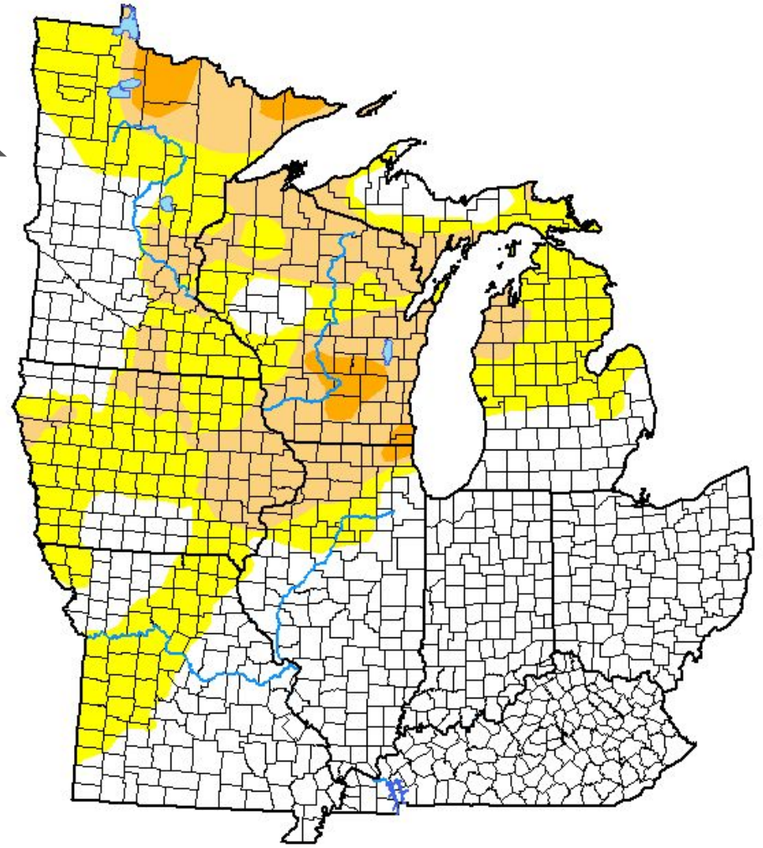
While the drought has improved since summer, there remains minor to moderate drought from eastern Minnesota into much of Wisconsin.

The Climate Prediction Center outlook now only shows improvement in northern MN and WI through the spring; drought expected to persist locally.



U.S. Drought Monitor

Midwest



February 22, 2022

(Released Thursday, Feb. 24, 2022)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	55.15	44.85	18.94	2.28	0.00	0.00
Last Week 02-15-2022	52.33	47.67	21.19	2.39	0.00	0.00
3 Months Ago 11-23-2021	65.66	34.34	17.79	4.96	0.53	0.00
Start of Calendar Year 01-04-2022	63.32	36.68	15.25	2.41	0.00	0.00
Start of Water Year 09-28-2021	57.44	42.56	23.36	12.29	4.16	0.00
One Year Ago 02-23-2021	57.44	42.56	8.63	1.18	0.33	0.00

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

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droughtmonitor.unl.edu

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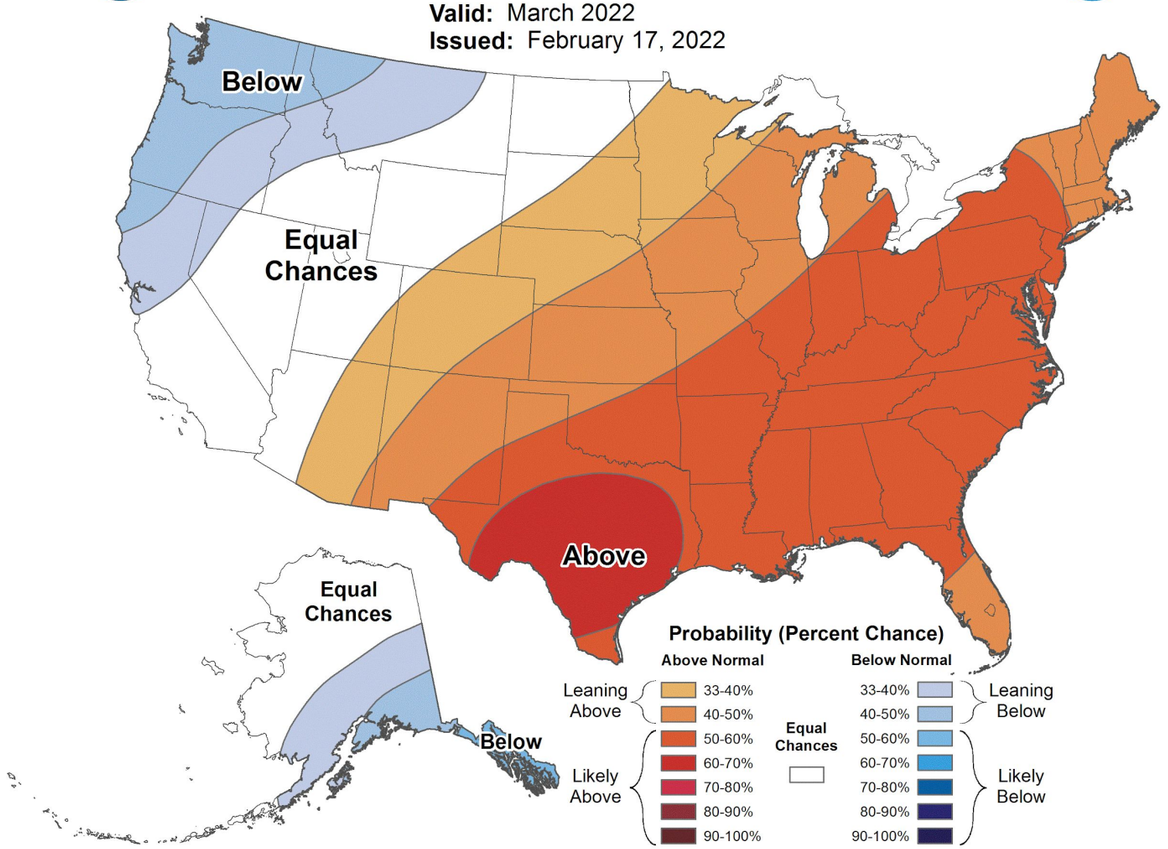
Climate Prediction Center Outlook for March

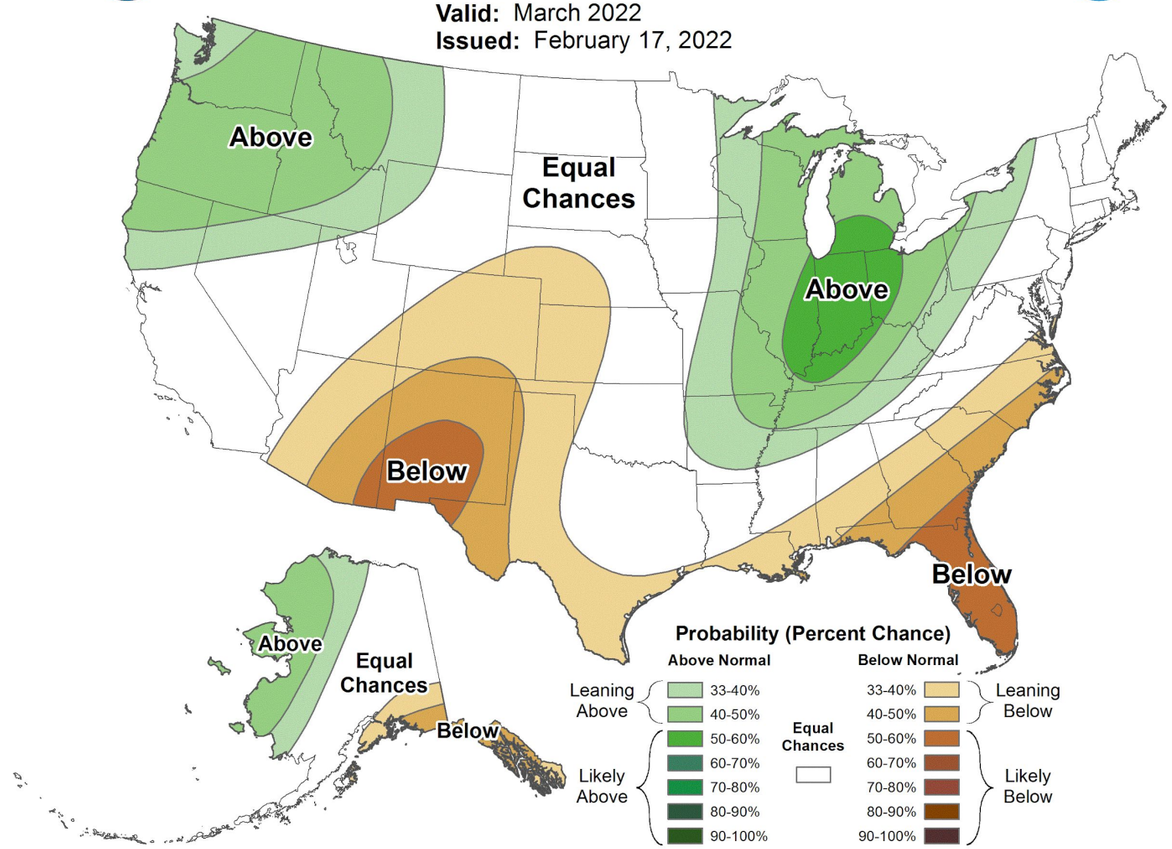
Monthly Temperature Outlook

Valid: March 2022
Issued: February 17, 2022



Monthly Precipitation Outlook

Valid: March 2022
Issued: February 17, 2022



CPC and models indicate that we could see a milder March, a change from our January and February patterns. Highest likelihood of heavy precipitation is centered to our southeast.

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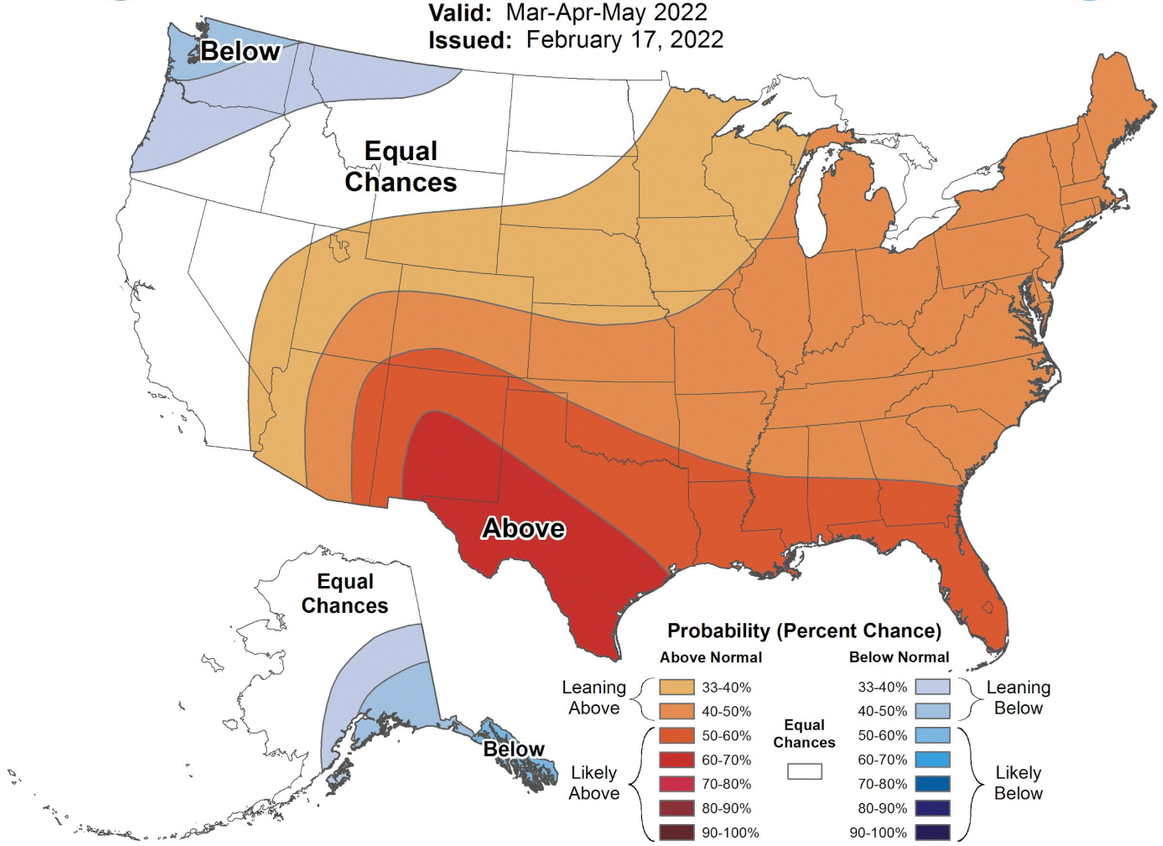
Climate Prediction Center Outlook for Spring

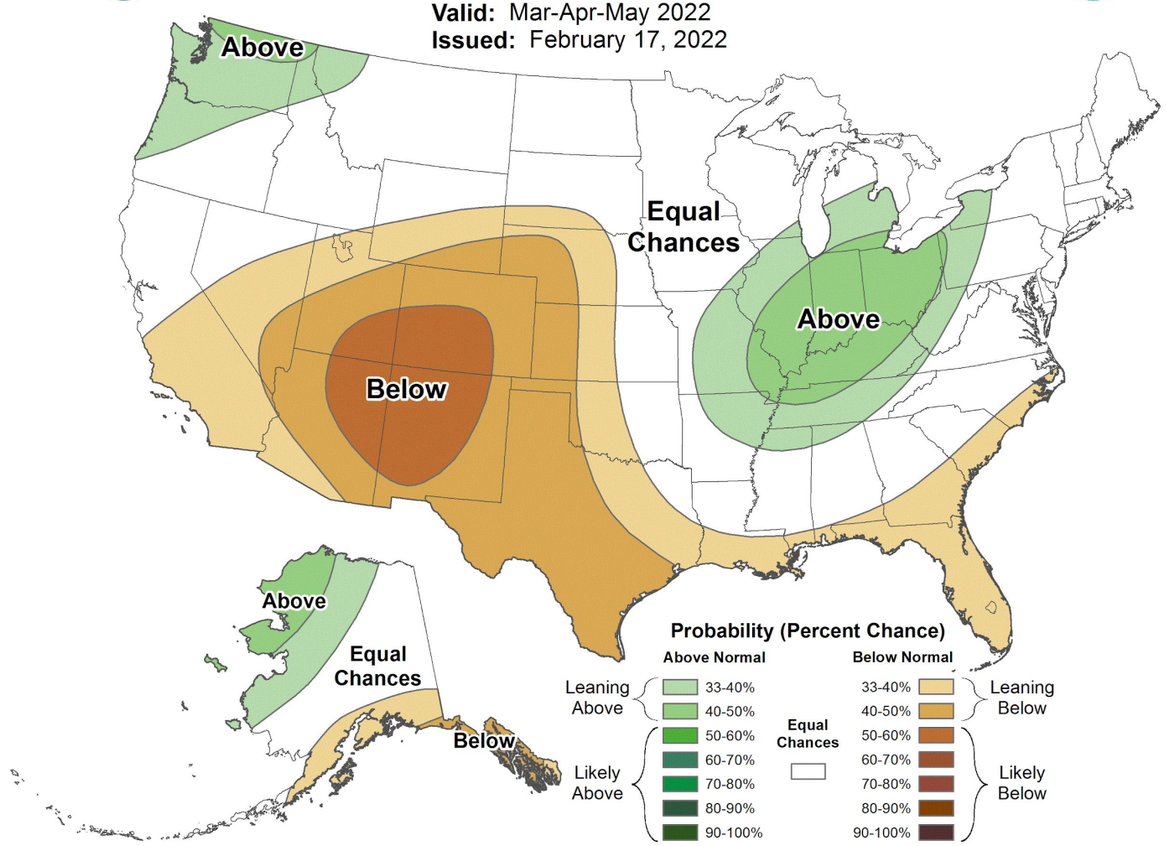
Seasonal Temperature Outlook

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



Seasonal Precipitation Outlook

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



CPC indicates a slight increase in probabilities for warmer than normal temperature, while moving the highest likelihood of above normal precipitation farther southeast.

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Overall Outlook: Average Threat for Spring Snowmelt Flooding

Looking at all the current/known factors we evaluate for the flood threat, all are fairly close to normal so far for 2022.

Much will be determined by what happens with our temperatures and rainfall/snowfall in March and early April (as we say every year!). A major warm rain event at the wrong time can always produce flooding.

Overall, our flood threat outlook for this season is currently Average for the Minnesota, Upper Mississippi, and Chippewa (WI) basins and tributaries.

Threat	Impact to Potential Spring Flooding	Link to Image
Current River levels	**Little Impact / Normal**	USGS WaterWatch
Soil moisture	**Near to Just Below Normal**	CPC Soil Moisture
Frost Depth*	**Near Normal**	Frost Depth Map
Snowpack/Liquid Equivalent	**Near Normal except above in Mississippi headwaters**	Snow Analysis
March Precipitation	**Not a strong signal either way**	March CPC Outlook
Rate of Spring Snowmelt	**To Be Determined**	Choose Snowmelt from list here
Spring Precipitation	**To Be Determined**	Precip Forecast (in season)

Continue on to find out more about particular locations…

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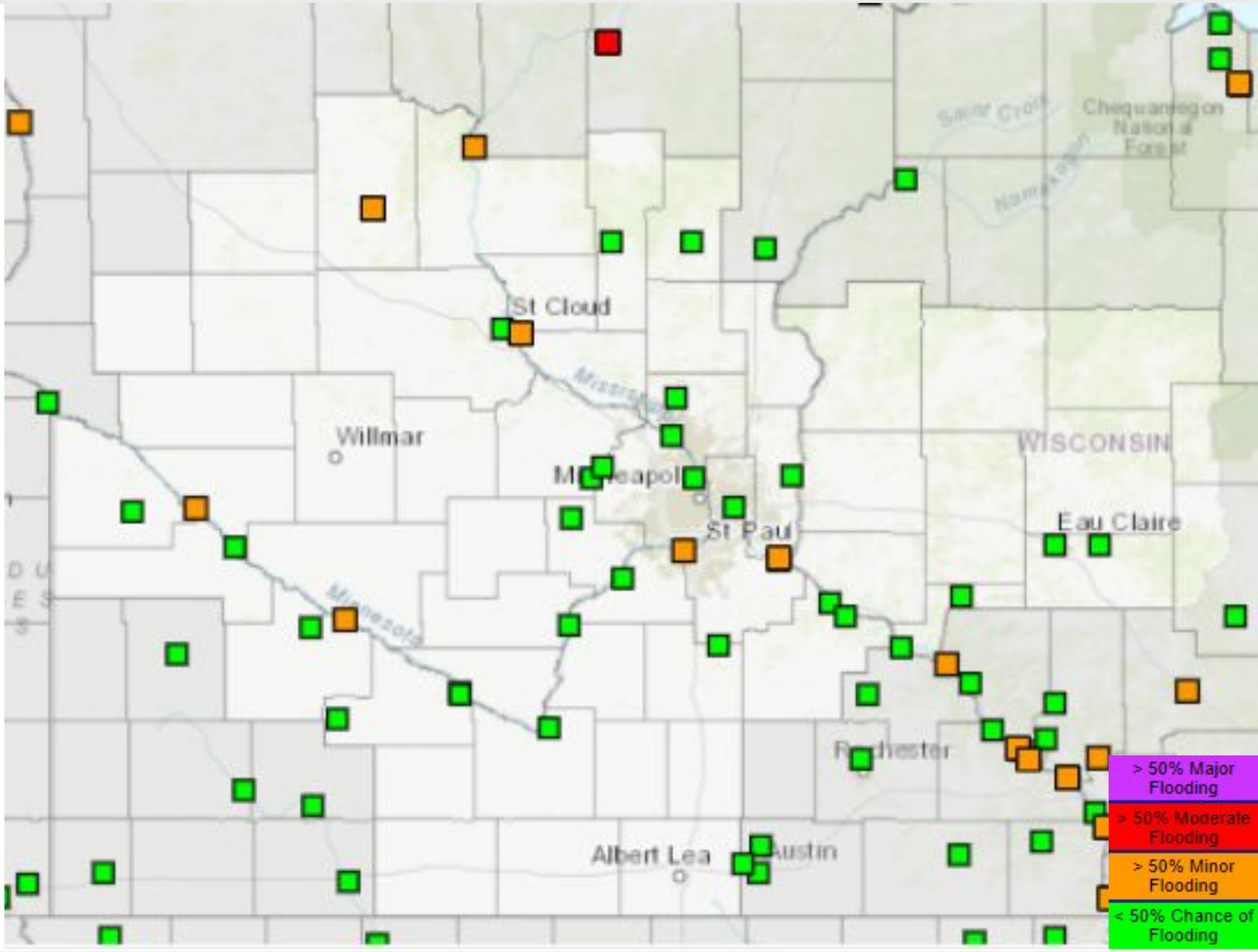
Overall Outlook: Average Threat for Spring Snowmelt Flooding

Going back to our Long Range Flood Threat map, a few more locations in the Mississippi basin have been added to the 50 percent chance of reaching minor Flood Stage, in addition to those sites on the Minnesota mentioned last time.

This is still very much in the "normal/average" category of flood threat for our area.

There are other areas, particularly the Red River of the North, with a higher threat; see the North Central River Forecast Center outlook page for more info there.



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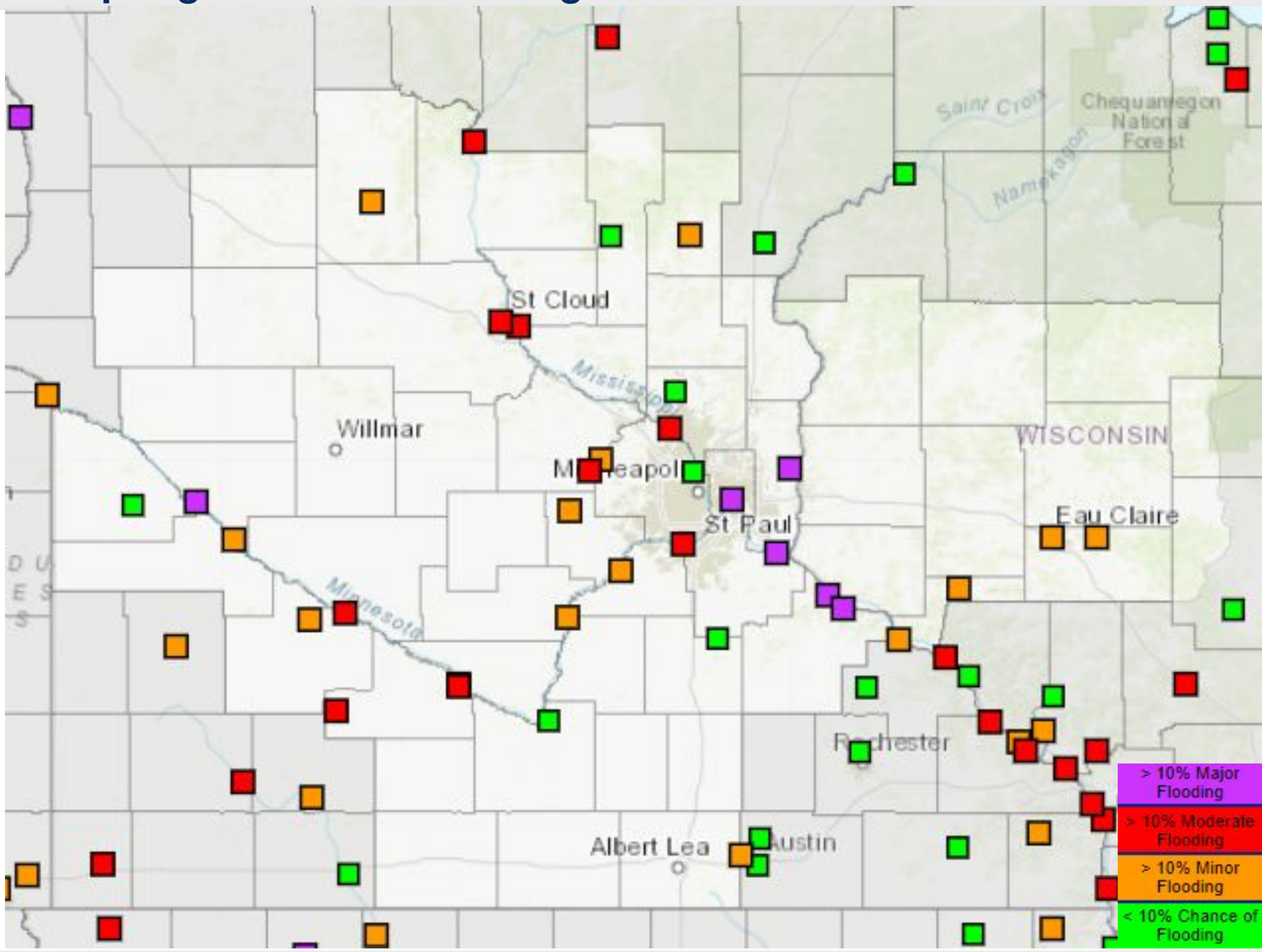
Overall Outlook: Average Threat for Spring Snowmelt Flooding

Probabilities of reaching Moderate or greater flooding is still less than 50 percent at all locations in our area this spring.

To check the upper end, here is the 10 percent probability map (right); a few locations have around a 10 percent chance of seeing Major flood stage; This covers the case of if we see a sudden warmup and heavy rainfall event at just the wrong time.

This too falls well within an “average” flood threat for any particular spring season.



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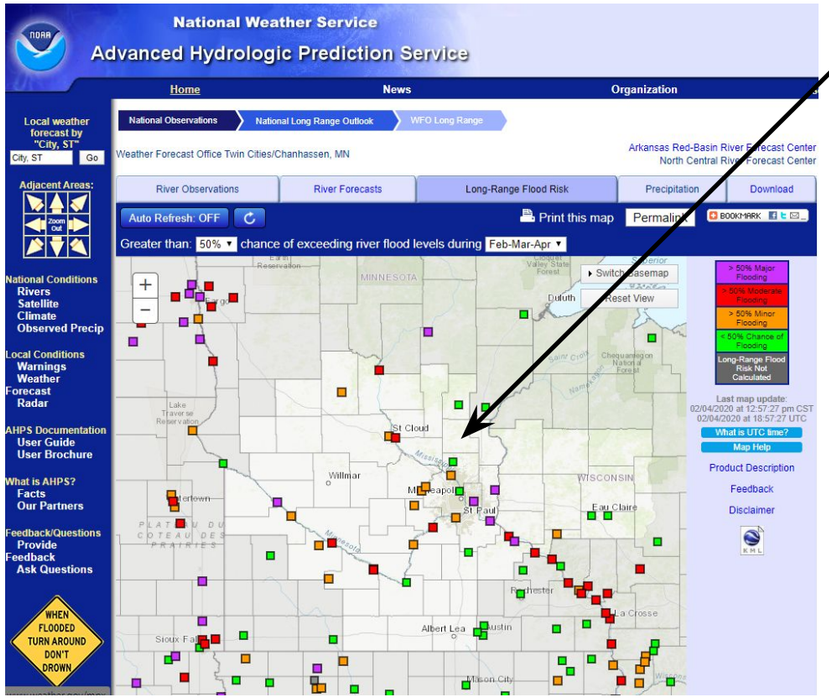
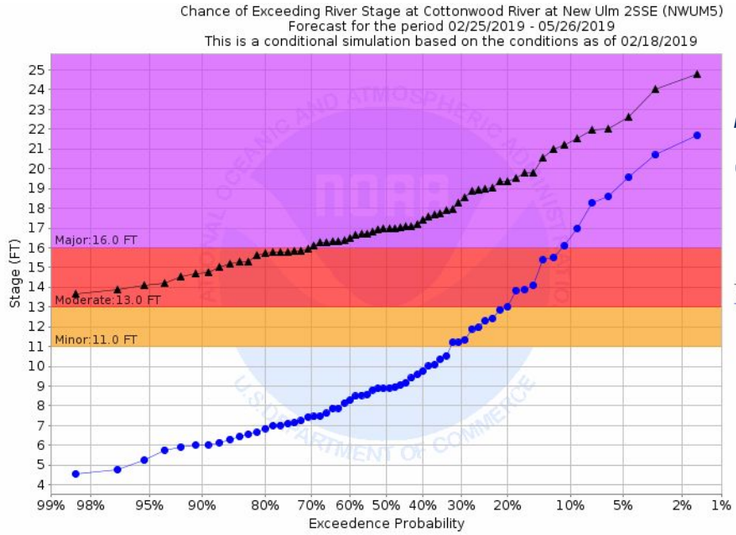
Find your Long Range Outlook Graph

Long range flood risk graphs are available at: https://water.weather.gov/ahps2/long_range.php?wfo=MPX

River forecasters run long range river models, including current soil moisture profiles, snowpack info, and 45-day model precipitation forecasts. The result is a graph of probability of reaching various stages .



Click a point in here, and hover over the "Probability Information" tab. Select the "…during Entire Period" graph. It will look something like this:



EXAMPLE ONLY

The Black Line represents the current forecast – Blue Line represents historical average. When the black line is to the left/above of the blue line, the flood threat is above normal.

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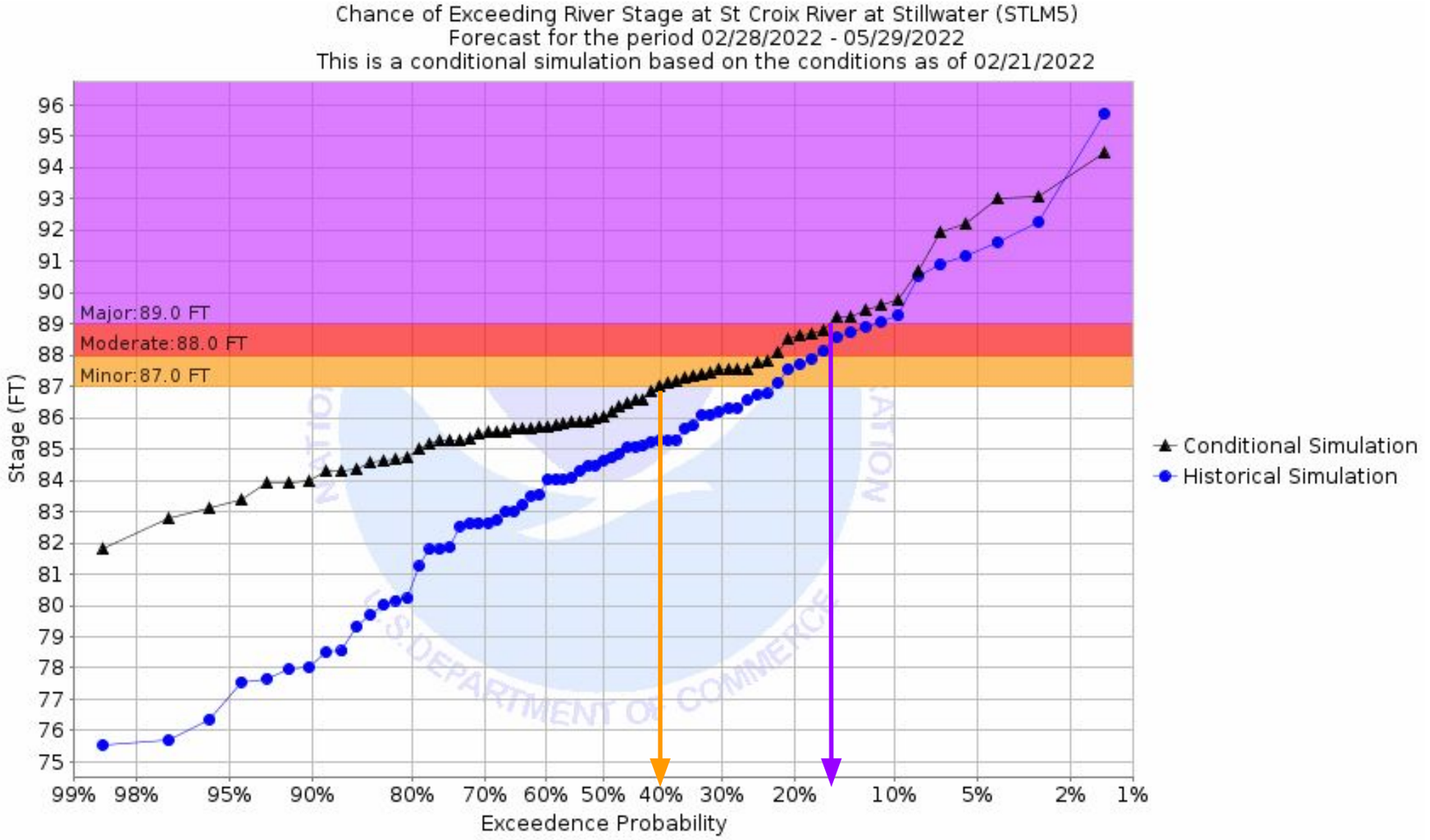
Long Range Forecast Probability Graphic

Let's look at the St. Croix River at Stillwater, for example.

The black line intersects Minor Flood Stage right about 40 percent (orange arrow), meaning there is about a 40 percent chance of reaching minor flood stage. This is now a little above normal. (blue line).

When we look at Major Flood Stage, the black line shows about a 17 percent probability (purple arrow), also very close to the normal value.



The **Black Line** represents the current forecast – **Blue Line** represents historical average. When the black line is to the left/above of the blue line, the flood threat is above normal.

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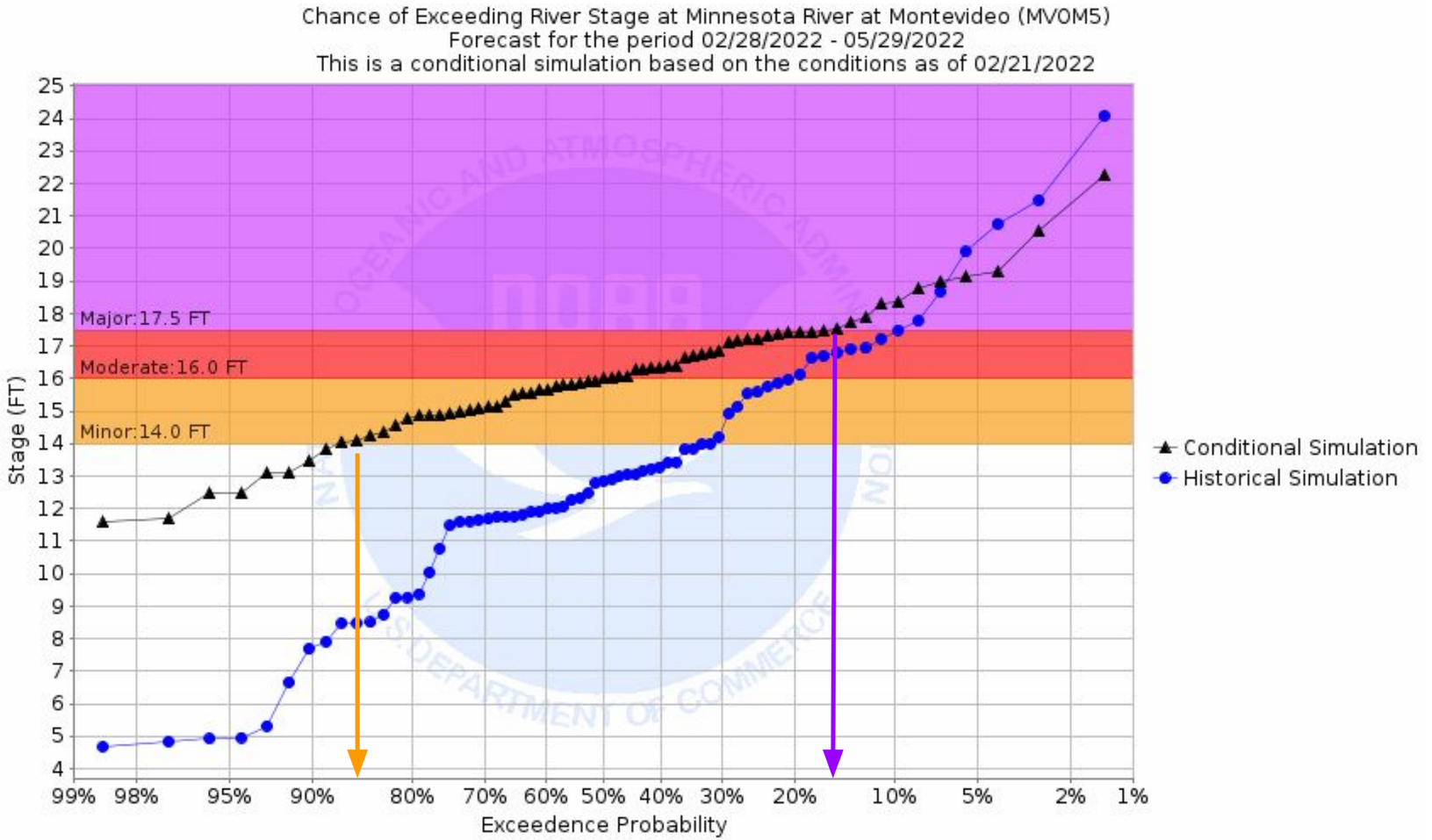
Long Range Forecast Probability Graphic

Here is a look at a higher threat location, such as the Minnesota River at Montevideo.

The black line intersects Minor Flood Stage around 85 percent, meaning there is about a 85 percent chance of reaching minor flood stage. The normal value is about 30 percent (blue line).

When we look at Major Flood Stage, the black line shows about a 17 percent probability, close to the normal of about 10 percent.



The **Black Line** represents the current forecast – **Blue Line** represents historical average. When the black line is to the left/above of the blue line, the flood threat is above normal.

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Bottom Line

Overall, our flood threat outlook for this season is currently Average, or close to normal, for the Minnesota, Upper Mississippi, and Chippewa (WI) basins and tributaries.

We'll learn more as we move into March as the weather pattern takes shape; thus far, no major storms on the 7-10 day horizon.

As always, be prepared for the potential for spring flooding, and keep an eye on the outlooks and forecasts from your National Weather Service.

Be safe and enjoy your spring!

Threat	Impact to Potential Spring Flooding	Link to Image
Current River levels	**Little Impact / Normal**	USGS WaterWatch
Soil moisture	**Near to Just Below Normal**	CPC Soil Moisture
Frost Depth*	**Near Normal**	Frost Depth Map
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Questions or need more info? Email us at nws.twincities@noaa.gov