



2022 Early Spring Flood Outlook

February 10, 2022
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Covering the Upper Mississippi, Minnesota, and Chippewa (WI) basins and tributaries

Key Messages

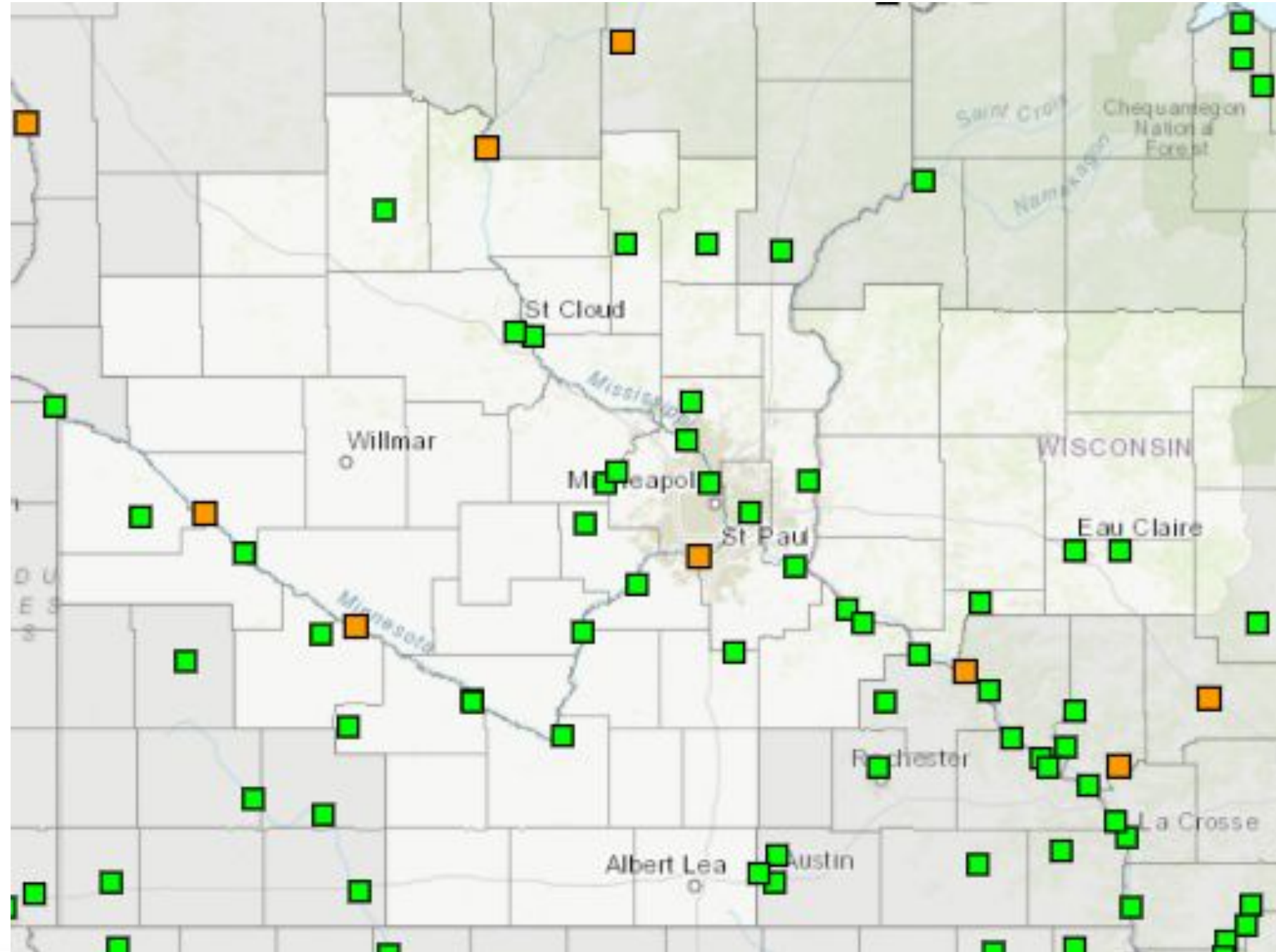
- The early flood outlook for the Twin Cities service area is **Average/Normal**
- Nearly every spring flood parameter is near what we'd expect for mid February
- While the headwaters of the Mississippi and St. Croix Rivers have the most snowpack, they also have plenty of room to intercept runoff due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

NEW Important Updates

- First Issuance

Next Scheduled Briefing

- Thursday, February 24





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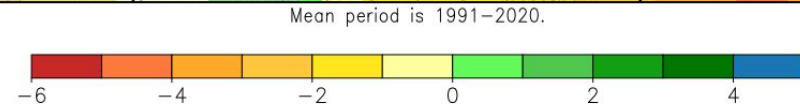
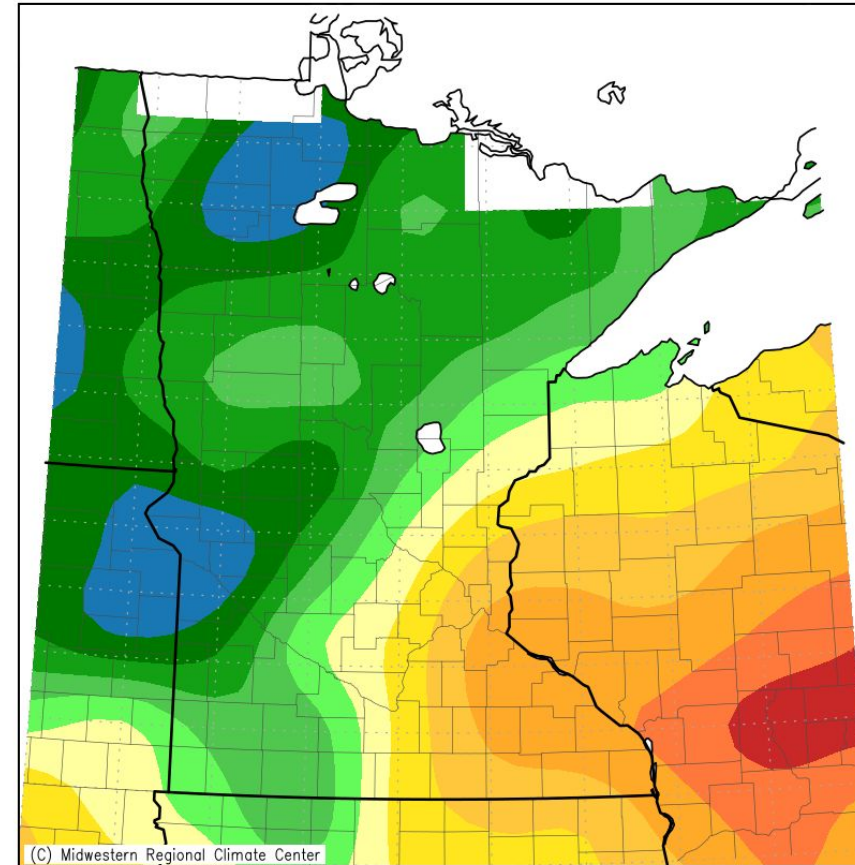
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Precipitation and Snowfall so far

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.

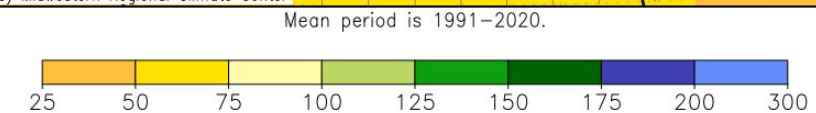
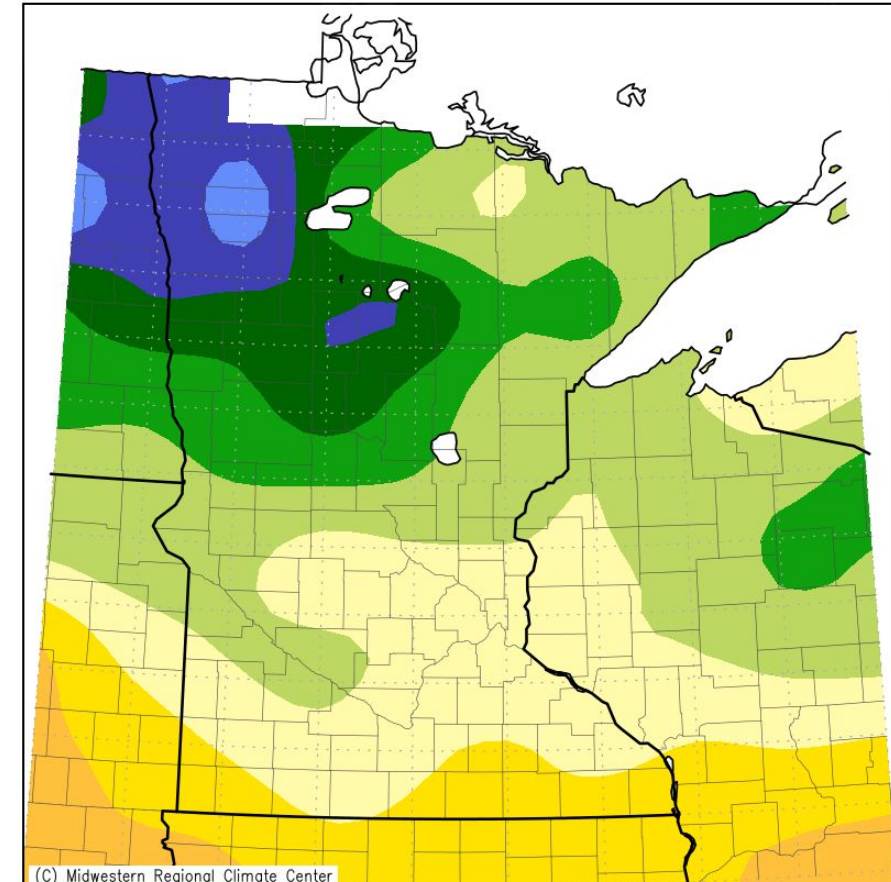
For snowfall (right image), all basins have received within 25 percent of normal snowfall for the season so far, with even a little more in the upper Mississippi headwaters.

Accumulated Precipitation (in): Departure from Mean
September 1, 2021 to February 9, 2022



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 2/9/2022 2:37:12 PM CST

Accumulated Snowfall: Percent of Mean
September 1, 2021 to February 9, 2022



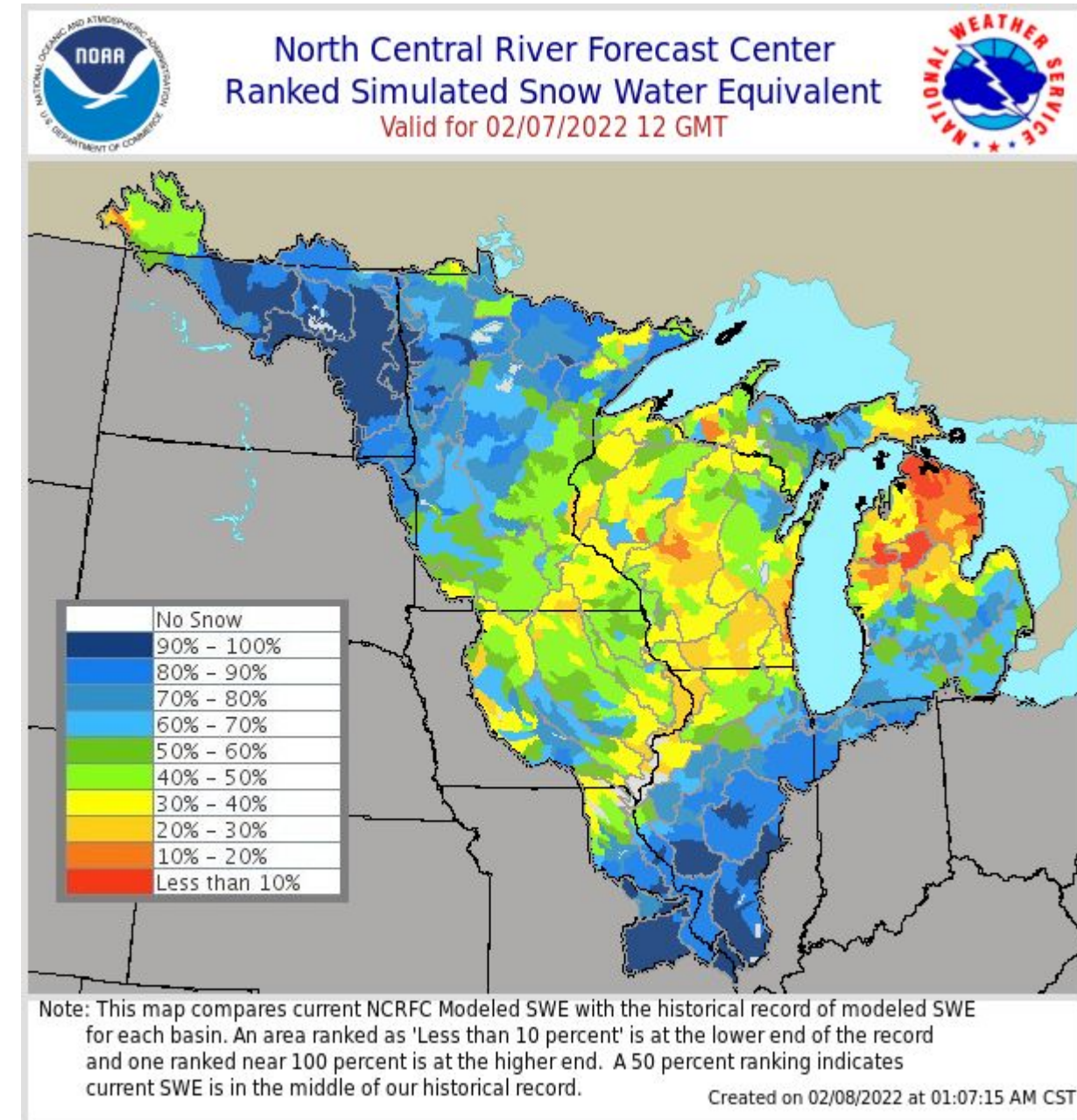
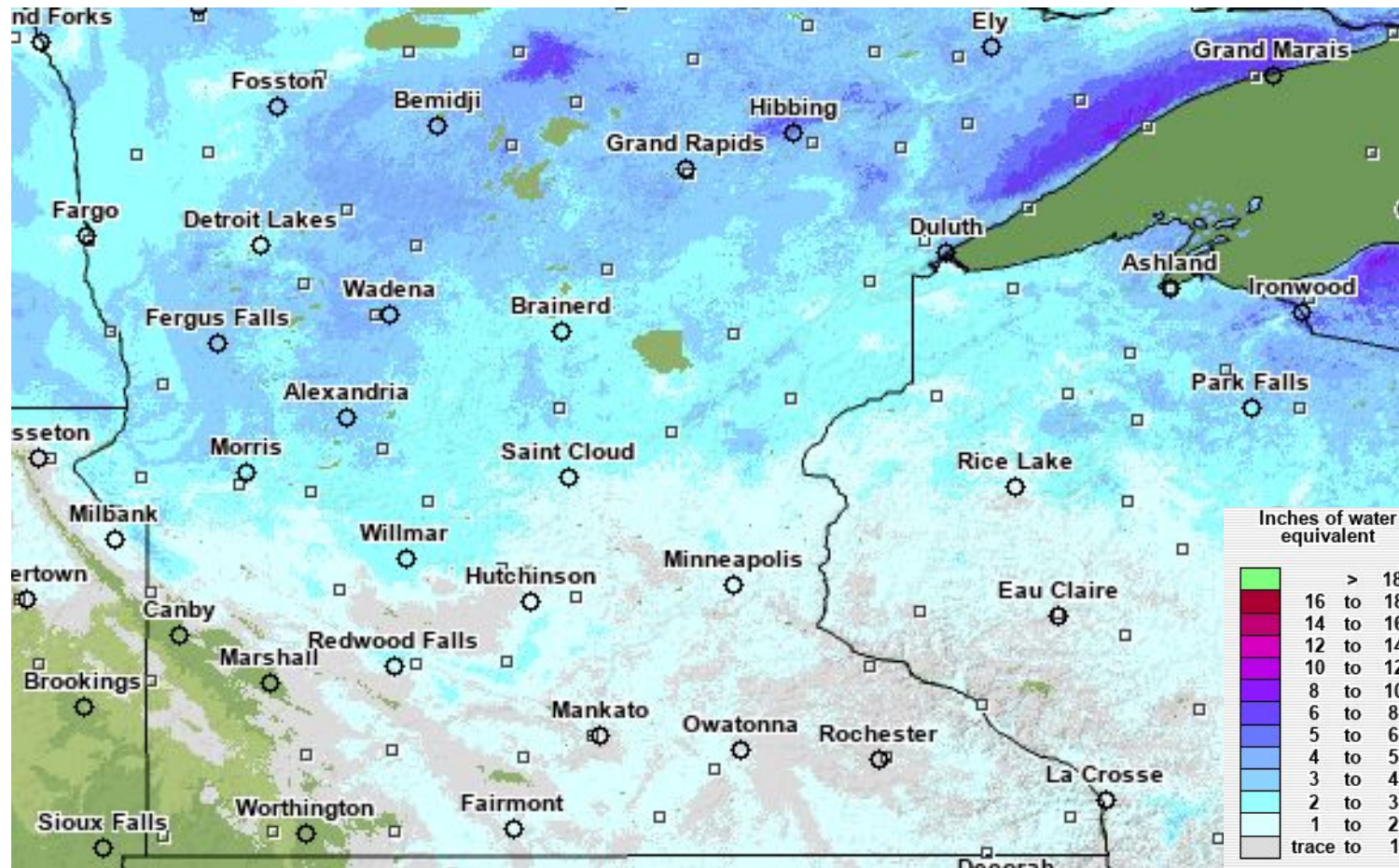
Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 2/9/2022 2:40:25 PM CST



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Snow Water Equivalent (SWE)



This results in Snow Water Equivalent (SWE) measurements (above) around 2-4 inches north and 1-2 inches south. These also very close to normal (right image), with slightly above normal readings in the Mississippi headwaters and upper Minnesota basin.



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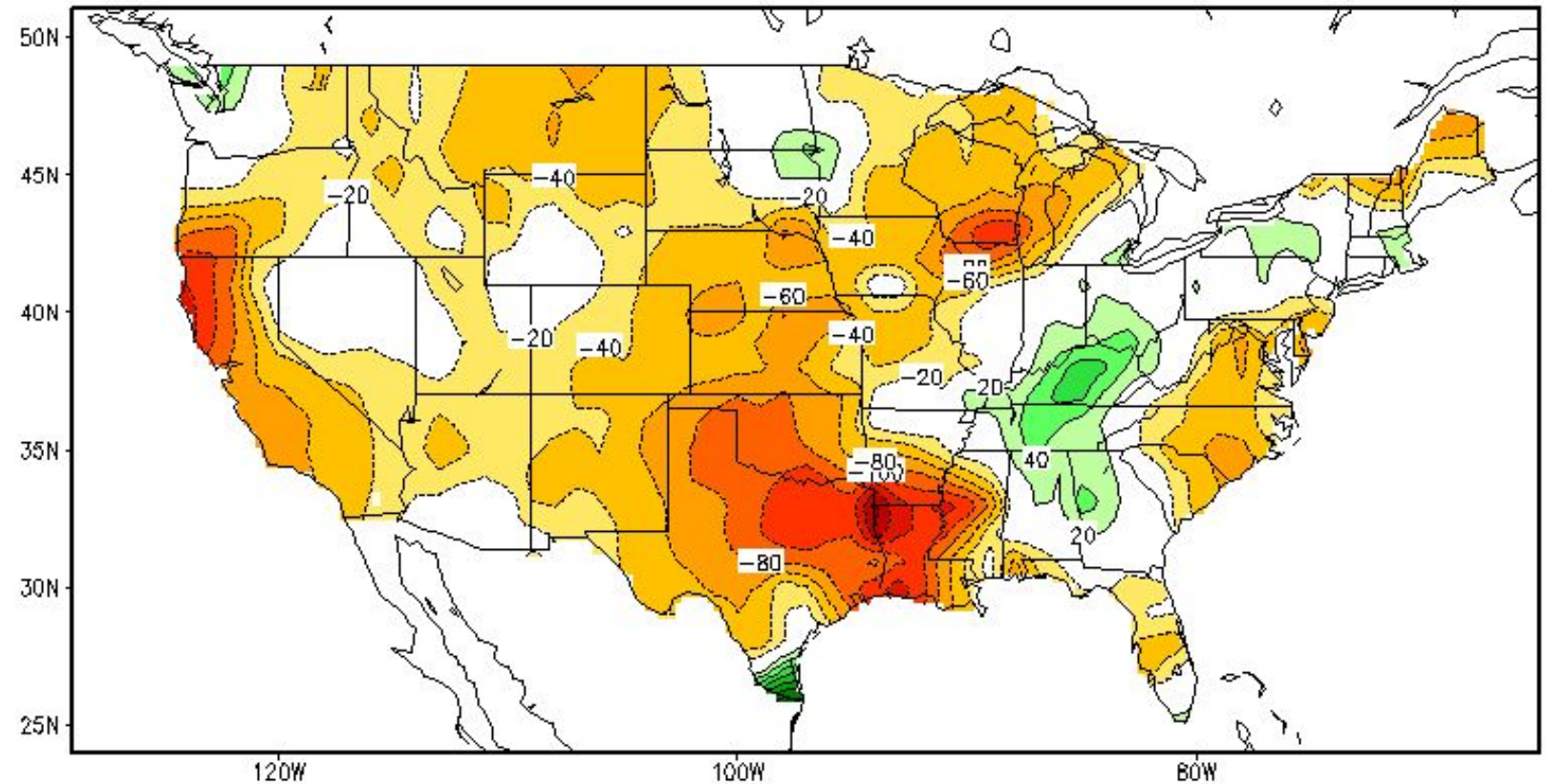
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Soil Moisture and Frost Depth

The increased precipitation last autumn resulted in improved soil moisture conditions before freezeup 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.

Calculated Soil Moisture Anomaly (mm)
FEB 08, 2022





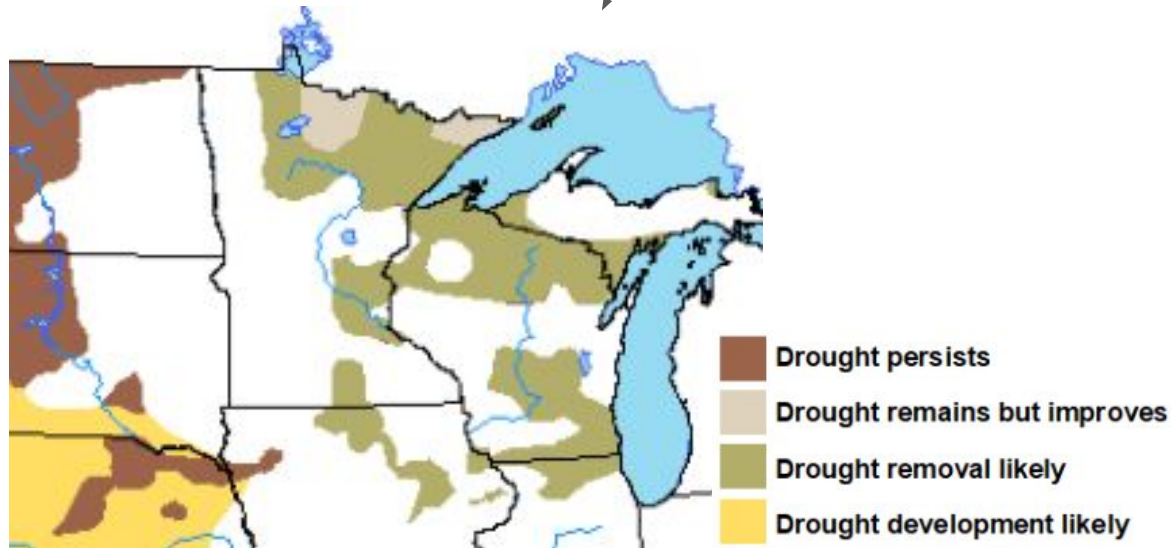
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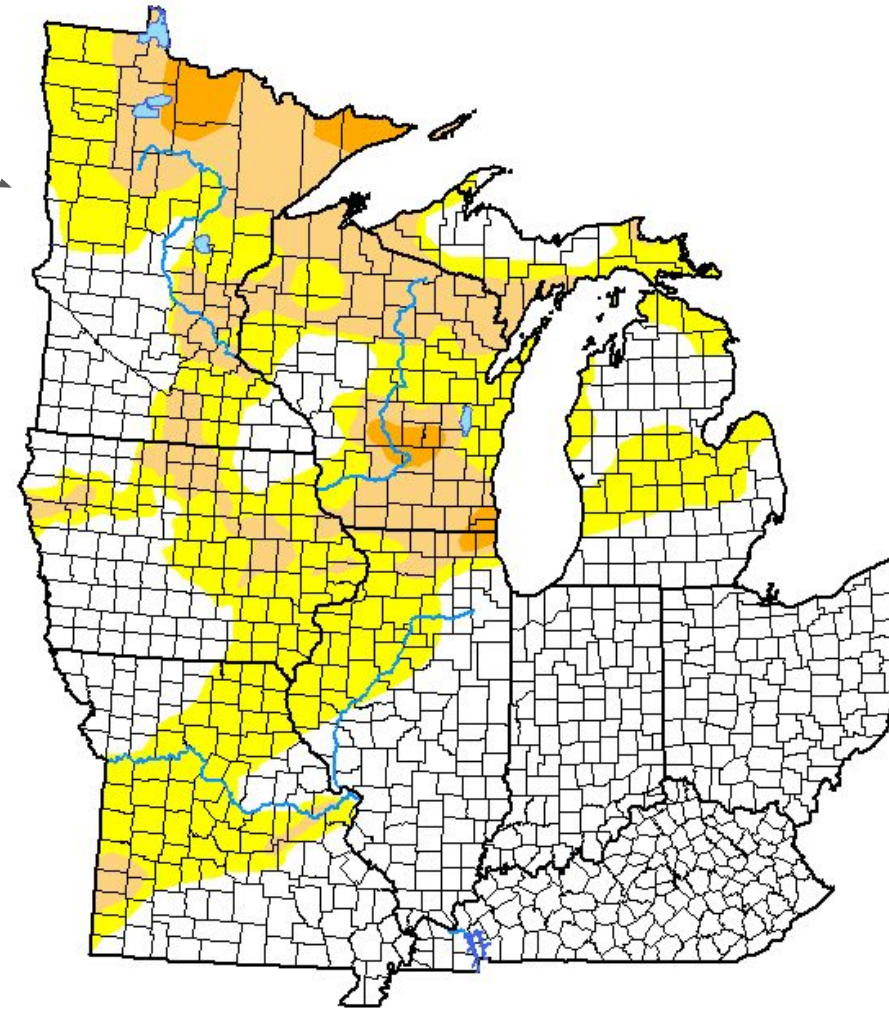
Drought

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

The Climate Prediction Center does anticipate further improvement through April, however.



U.S. Drought Monitor Midwest



February 1, 2022
(Released Thursday, Feb. 3, 2022)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	56.80	43.20	16.62	1.97	0.00	0.00
Last Week 01-25-2022	61.09	38.91	15.64	2.07	0.00	0.00
3 Months Ago 11-02-2021	63.70	36.30	19.42	5.33	1.13	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 02-02-2021	62.33	37.67	9.83	1.83	0.40	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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National Drought Mitigation Center



droughtmonitor.unl.edu





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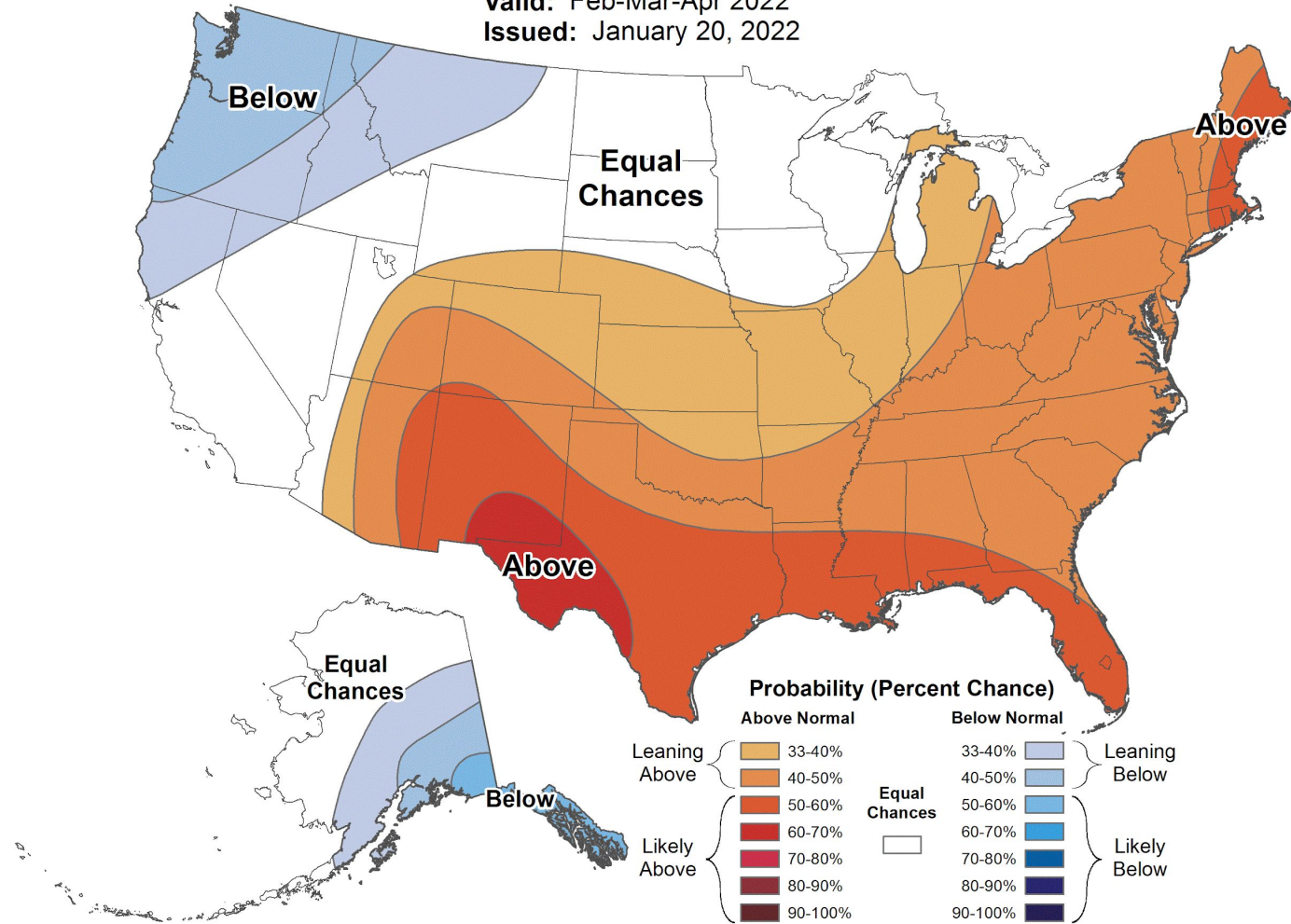
Climate Prediction Center Outlook for Spring



Seasonal Temperature Outlook



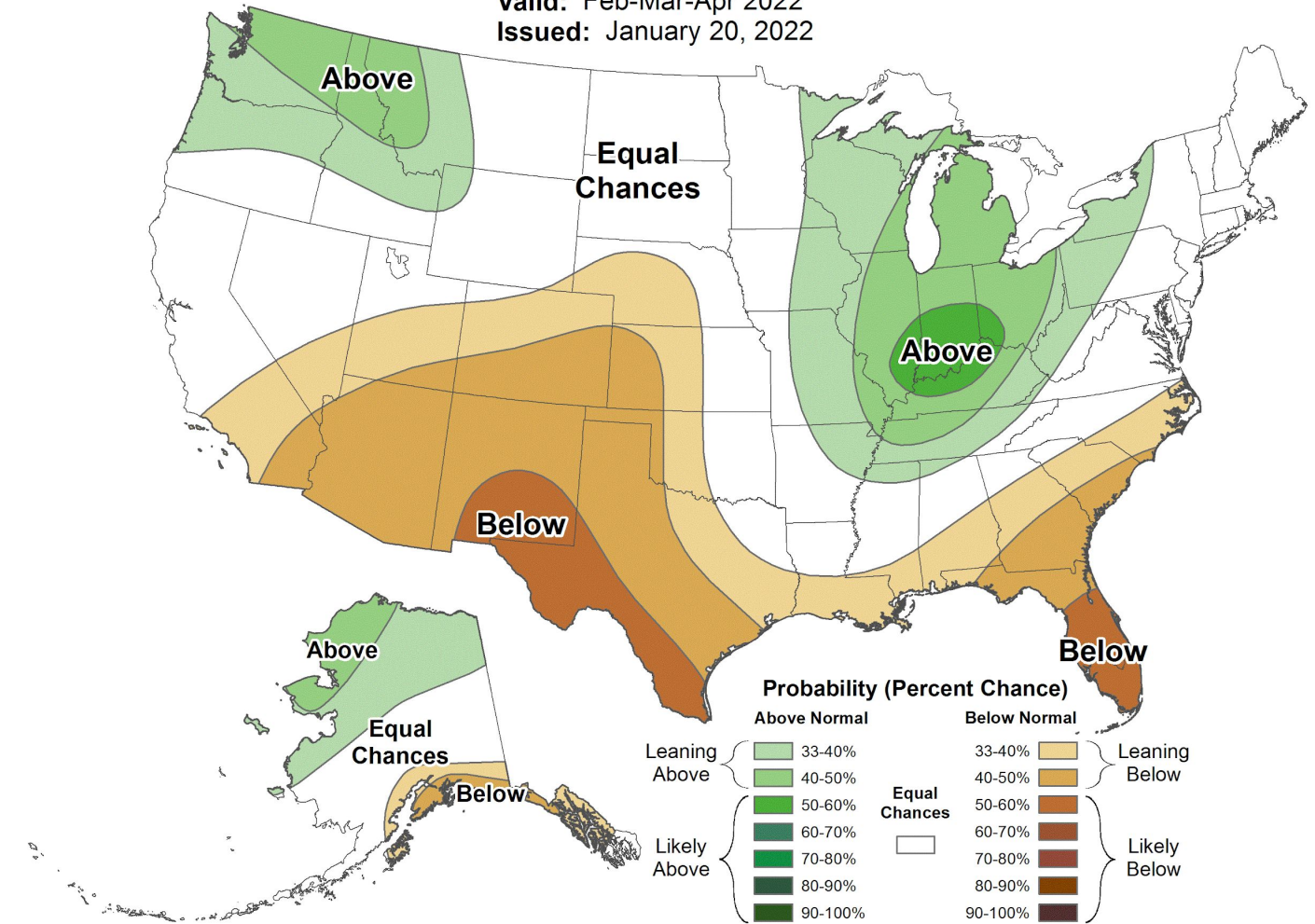
Valid: Feb-Mar-Apr 2022
Issued: January 20, 2022



Seasonal Precipitation Outlook



Valid: Feb-Mar-Apr 2022
Issued: January 20, 2022



CPC indicates a typical La Nina type pattern this spring, with no clear temperature signal and a slightly higher probability of above normal precipitation over the eastern sections of our area.





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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	Snow Analysis
February Precipitation	Not a strong signal either way	February CPC Outlook
Rate of Spring Snowmelt	To Be Determined	24, 48, & 72 hr Snowmelt
Spring Precipitation	To Be Determined	Precip Forecast (in season)

Continue on to find out more about particular locations...



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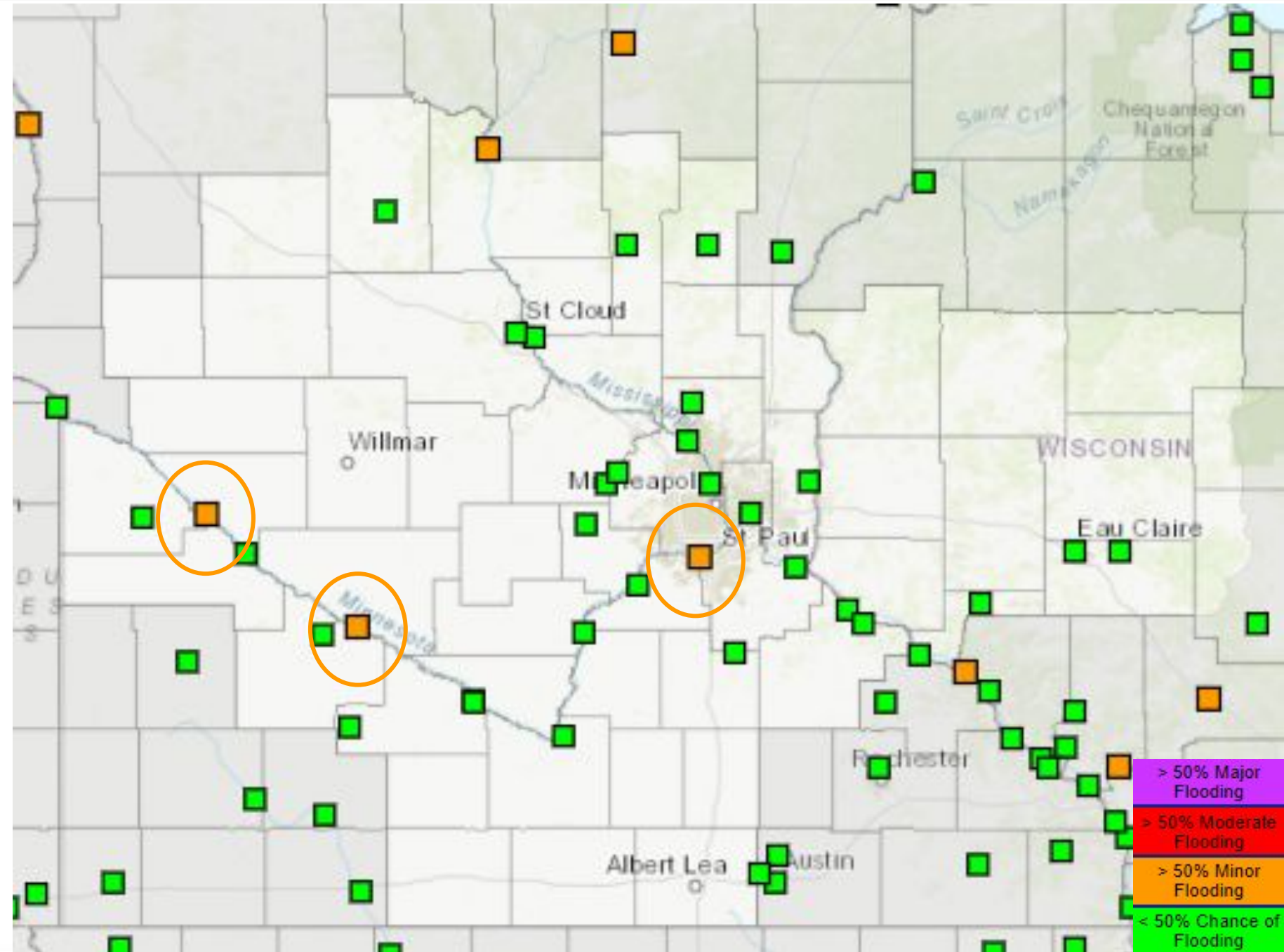
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Overall Outlook: Average Threat for Spring Snowmelt Flooding

Going back to our Long Range Flood Threat map, we see the only basin (in our area) with at least a 50 percent chance of reaching minor flood stage is the Minnesota River.

Thus, given an orderly snowmelt and a fairly normal spring, some minor flooding is possible in the Minnesota

There are others, both upstream and downstream on the Mississippi as well as in the Red River basin with a higher threat; see the [North Central River Forecast Center outlook page](#) for more info.





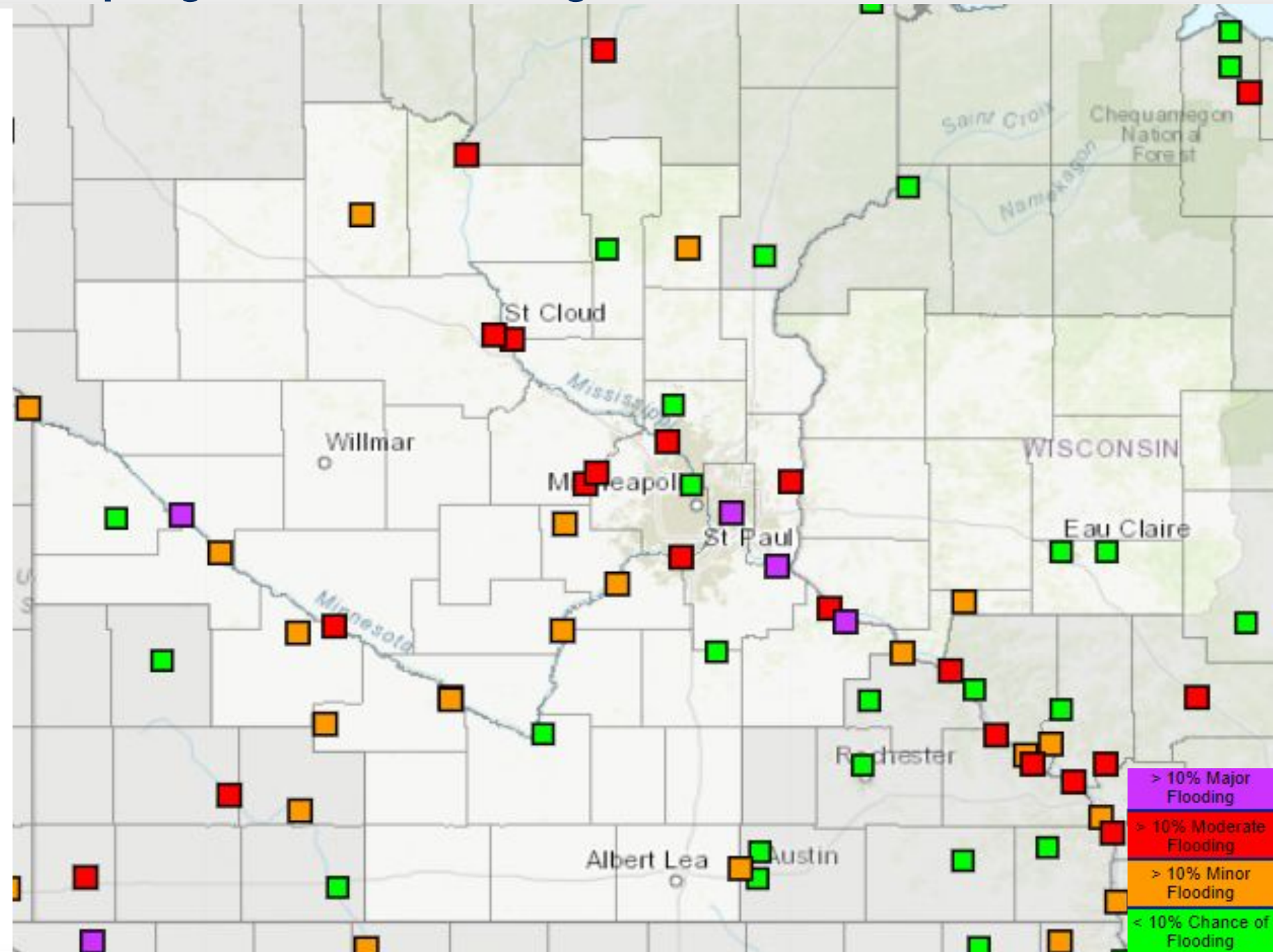
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Overall Outlook: Average Threat for Spring Snowmelt Flooding

If we look at lower probabilities, such as 10 percent, then we could see potential moderate or even major flooding. 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.





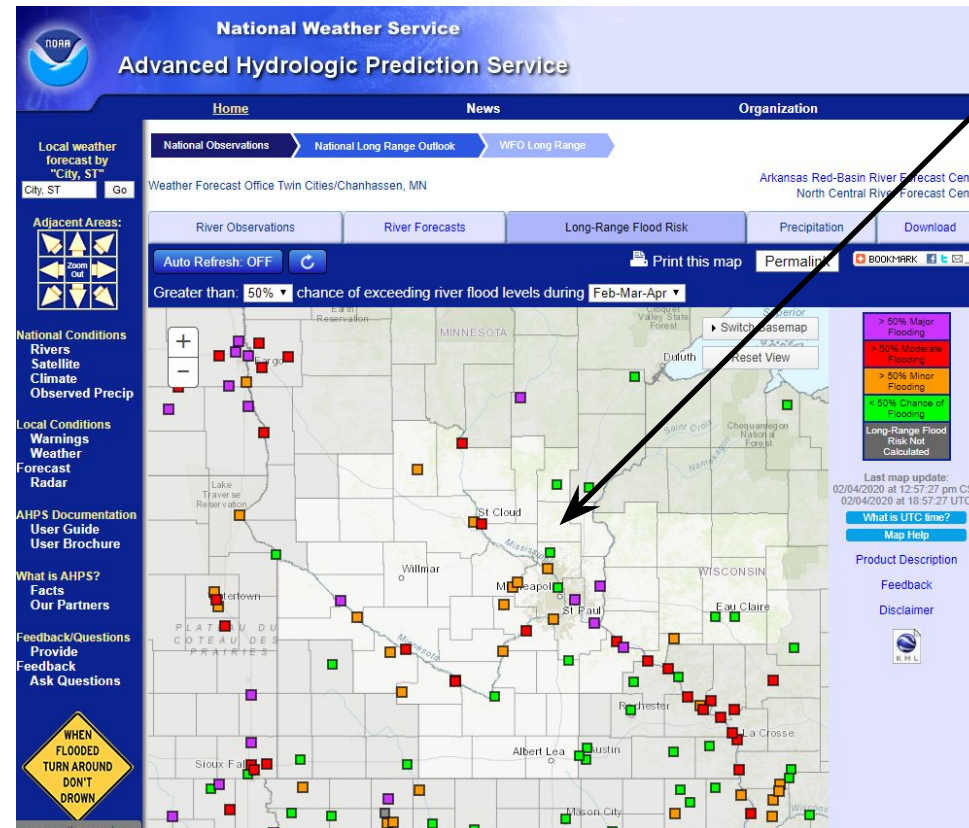
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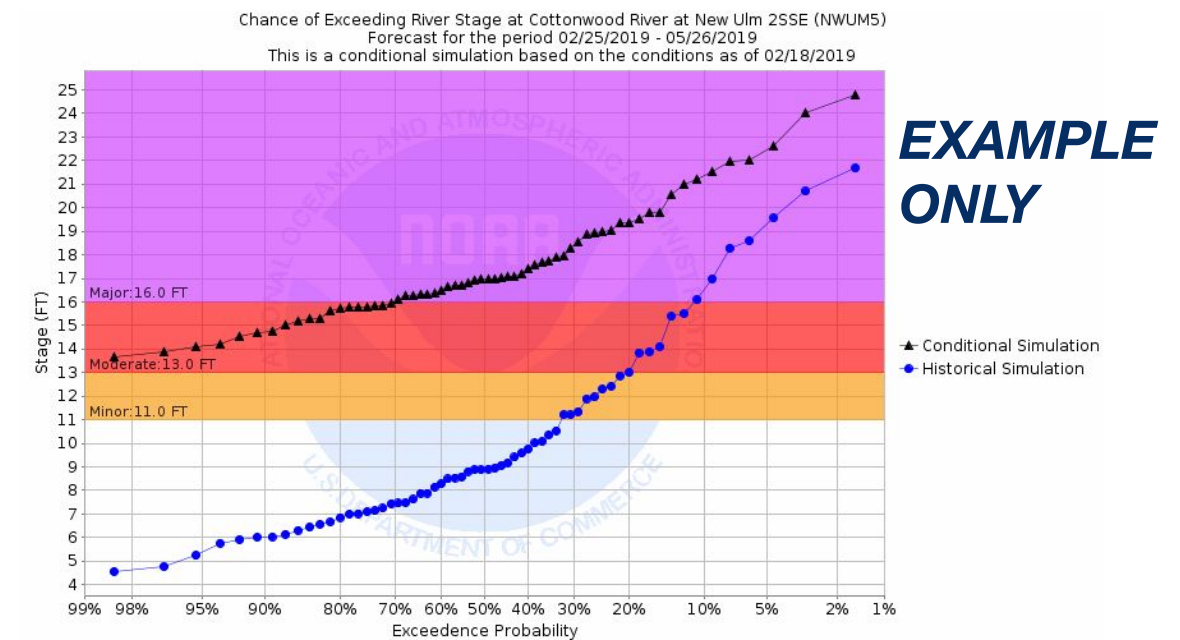
Find your Long Range Outlook Graph

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:



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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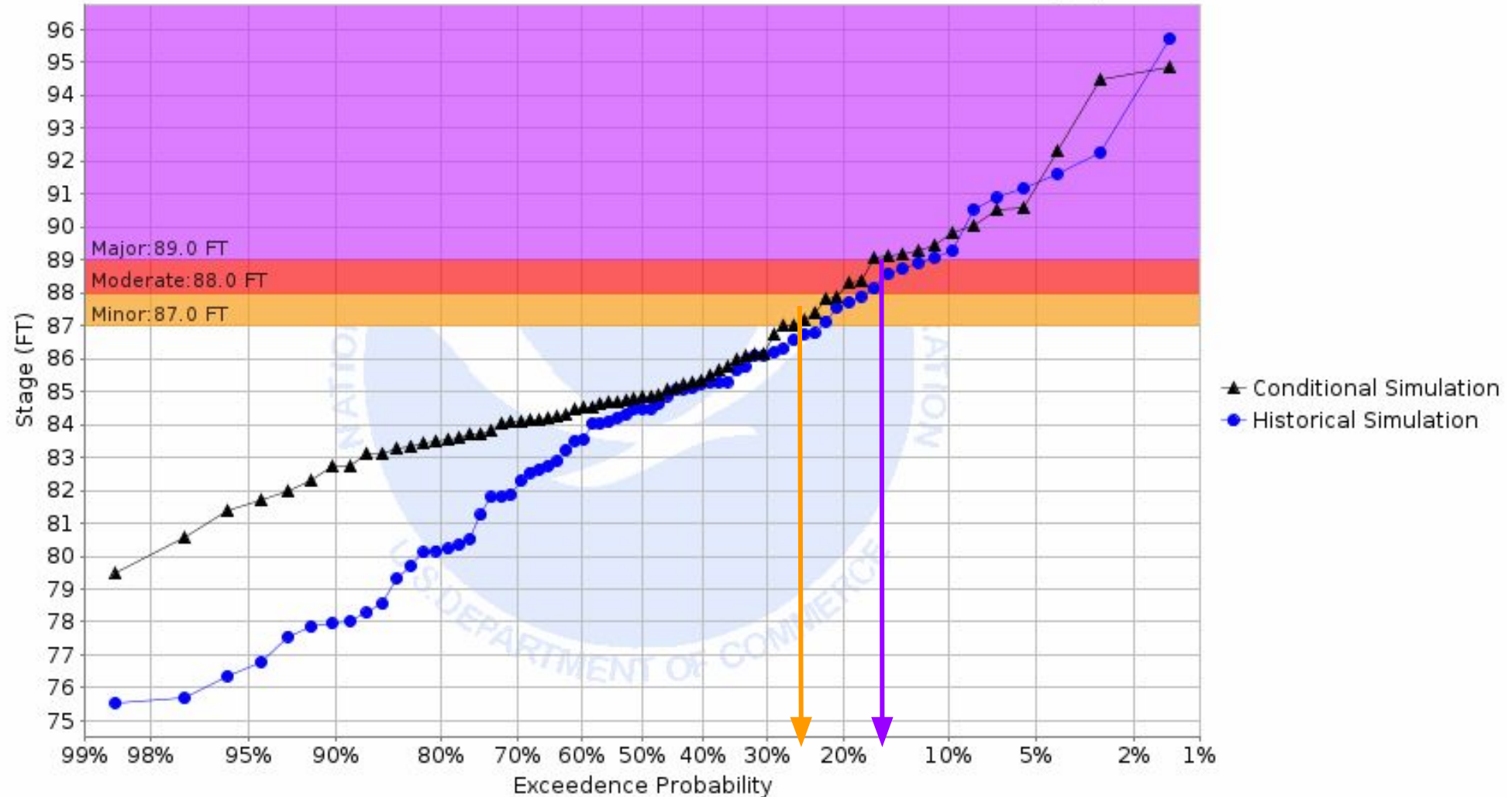
Long Range Forecast Probability Graphic

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

The black line intersects Minor Flood Stage right about 25 percent (orange arrow), meaning there is about a 25 percent chance of reaching minor flood stage. The normal value is nearly the same. (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.

Chance of Exceeding River Stage at St Croix River at Stillwater (STLM5)
Forecast for the period 02/14/2022 - 05/15/2022
This is a conditional simulation based on the conditions as of 02/07/2022



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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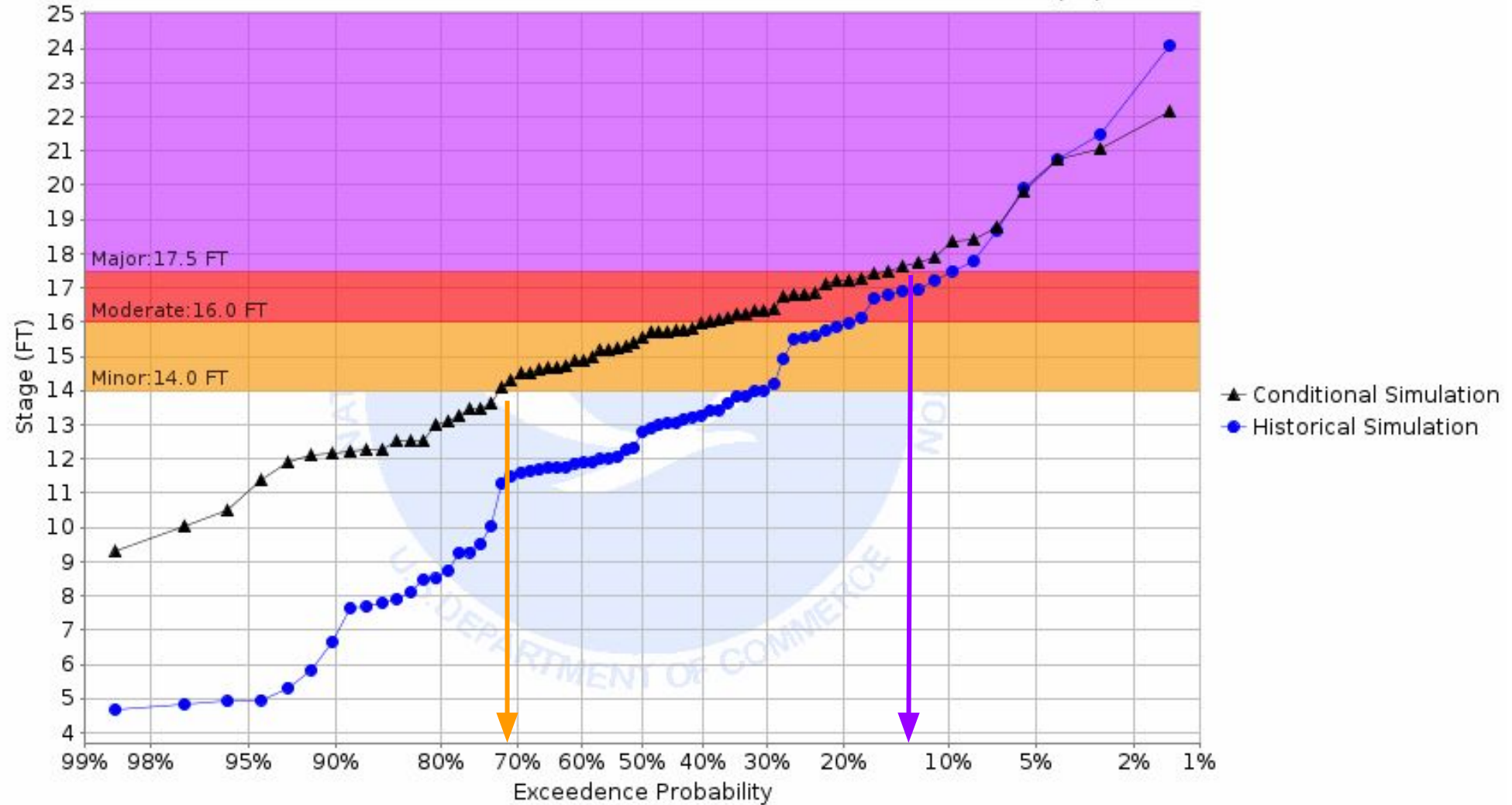
Long Range Forecast Probability Graphic

How about a higher threat location, such as the Minnesota River at Montevideo.

The black line intersects Minor Flood Stage just above 70 percent, meaning there is about a 70 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 13 percent probability, close to the normal of about 10 percent.

Chance of Exceeding River Stage at Minnesota River at Montevideo (MVOM5)
Forecast for the period 02/14/2022 - 05/15/2022
This is a conditional simulation based on the conditions as of 02/07/2022



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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Final Overview

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 through February into March as the weather pattern takes shape.

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
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Questions or need more info? Email us at nws.twincities@noaa.gov