

# Spring Flood Outlook Spring 2021



**National Weather Service – Green Bay  
March 01, 2021**

# Flood Risk Factors

## Near Normal Risk for Spring Flooding in Northeast Wisconsin

### Increases Flood Risk

- Elevated Stream Levels
  - 75<sup>th</sup>-90<sup>th</sup> Percentile
- Additional Cold Snaps
  - Increases ice thickness and ice jam potential
- Lake Michigan Levels
  - Running near record
  - Some improvement from 2020

### Decreases Flood Risk

- Snow Depth
  - Remains Near to Below Normal
- Snow Water Equivalent
  - Below Normal (lowest 10<sup>th</sup> percentile for some locations)
- Frost Depth
  - Near normal for most locations
- Soil Moisture near to slightly above average

# What has changed?

## Near Normal Risk for Spring Flooding in Northeast Wisconsin

### Main Changes Since Last Outlook

- Frost Depths have increased closer to normal
  - Around a 12"-15" for most locations, some deeper frost depths observed (depends on siting)
  - NWS observation increased from 9" to 11"
  - Not expected to be a major issue
    - unless early season heavy rains occur
- Lengthy Cold Snap
  - Increased ice thickness and ice jam potential closer to a medium risk across northeast Wisconsin
    - One on the Menominee River near Pembine
- Slight increase in streamflow and soil moisture

# Greatest Threat of **Minor** Flooding

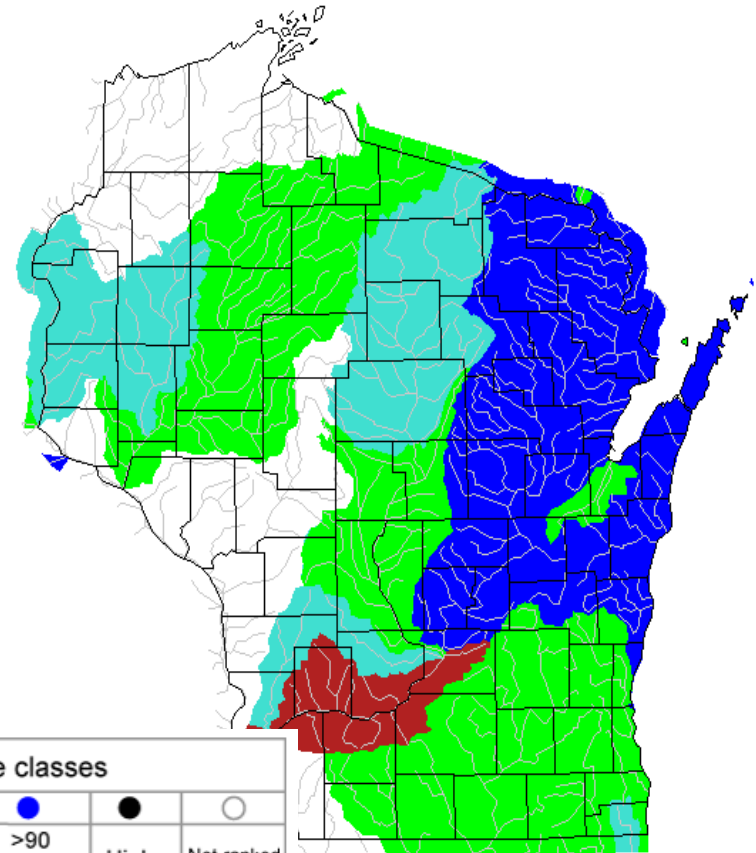
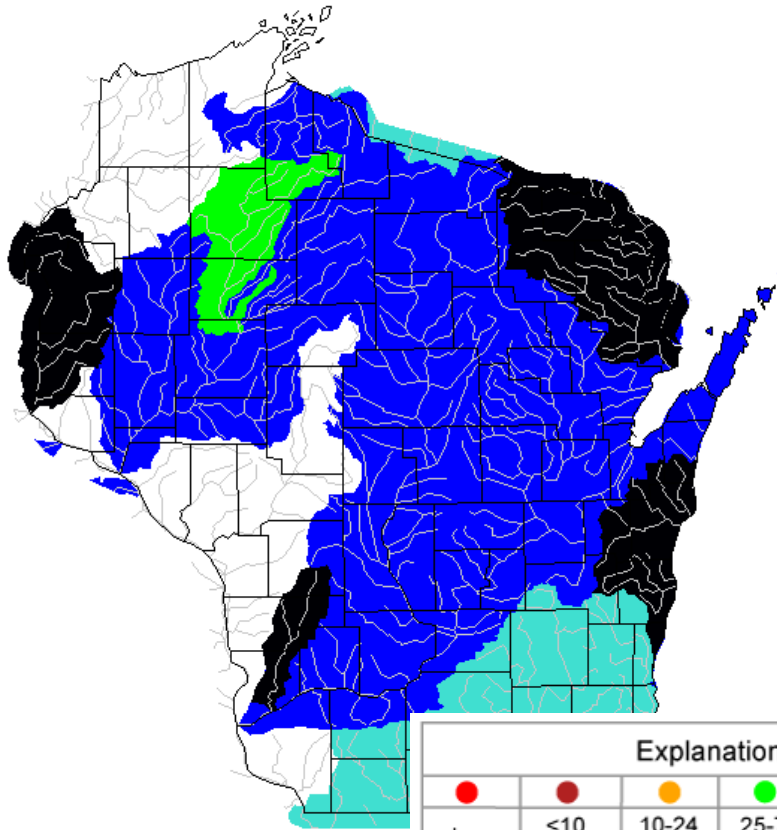
## Typical Flooding Expected at the Following Locations:

- **BBCW3** – Yellow River at Babcock
- **SHIW3** – Wolf River at Shiocton
- **NEWW3** – Wolf River at New London
- **Shoreline Flooding Likely** - East River, Fox River, Oconto River and Menominee River

# Streamflow Data 2020 vs 2021

Tuesday, February 11, 2020

Wednesday, February 24, 2021



Explanation - Percentile classes

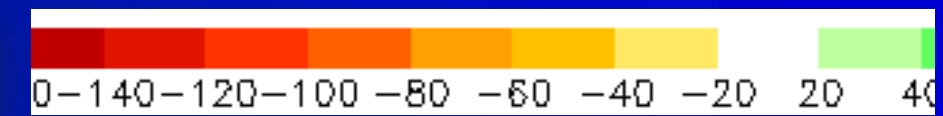
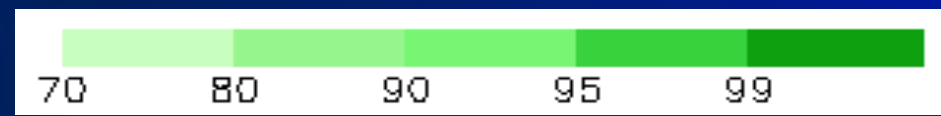
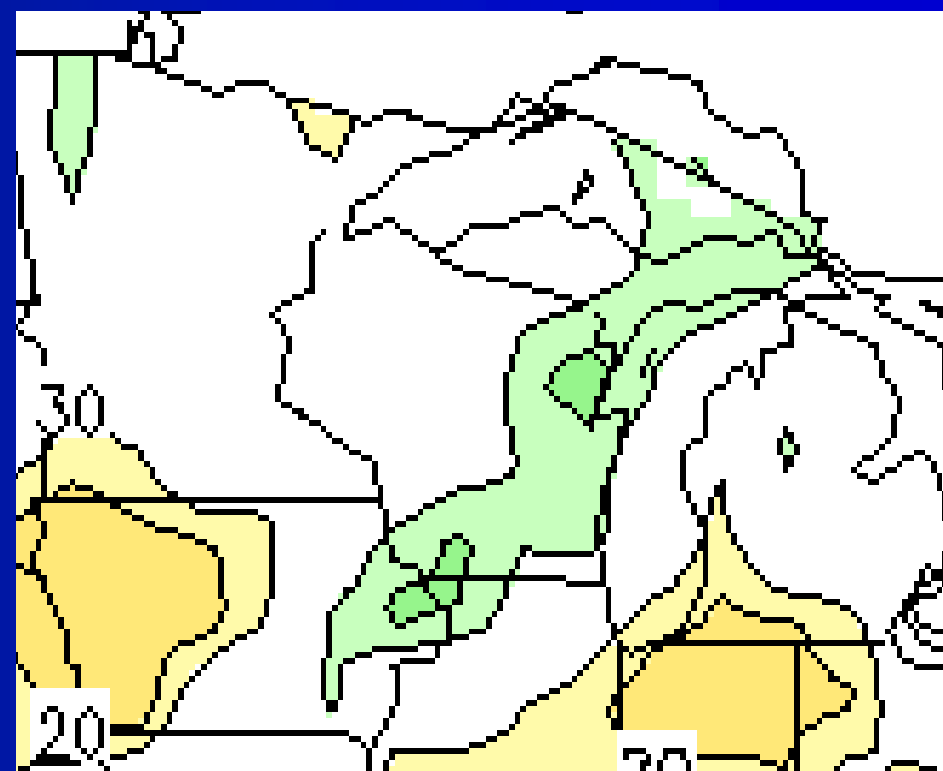
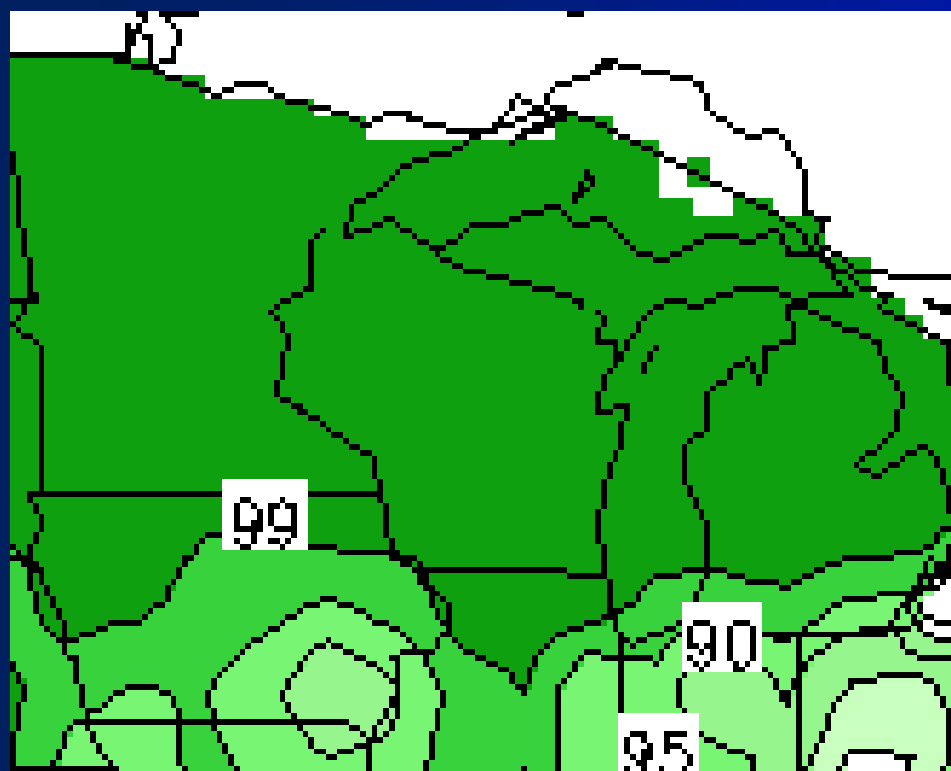
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked



- Streamflow is near to above normal, but has improved from last year.
- Higher river flow may still lead to quick rises to at least bankfull in some areas.

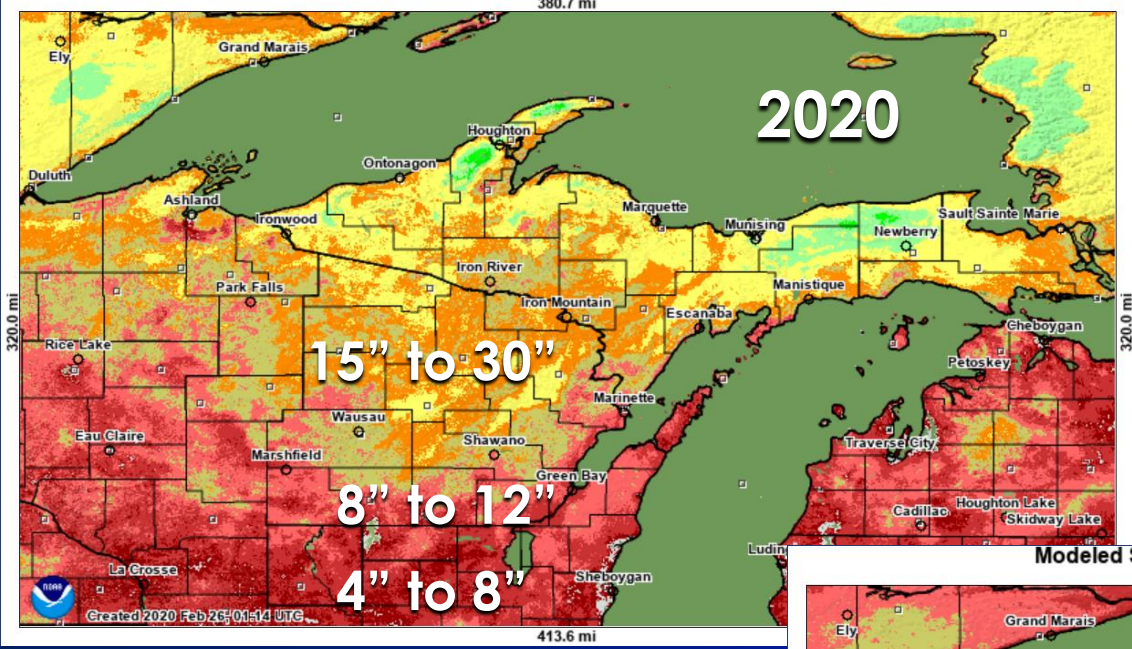
# Soil Moisture Content

February 11, 2020 vs. February 25, 2021

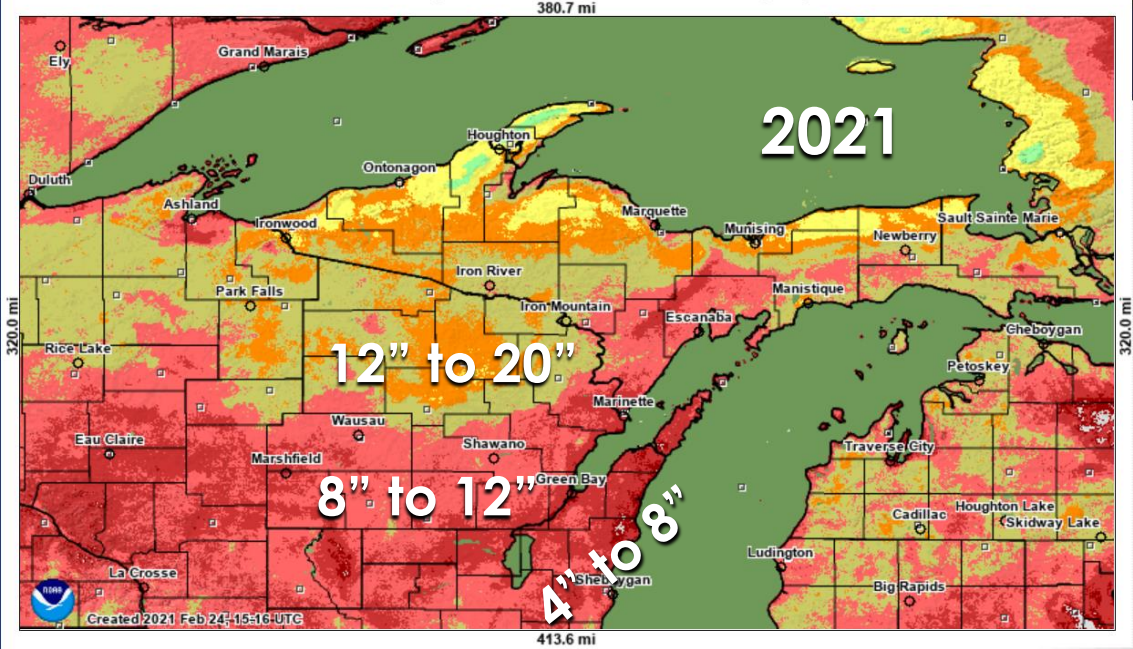


# Snow Depth 2020 vs 2021

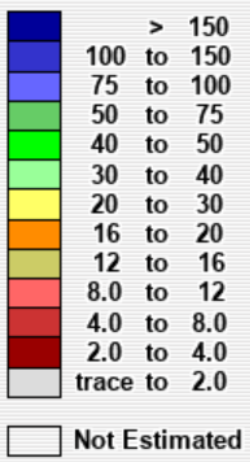
Modeled Snow Depth for 2020 February 25, 15:00 UTC



Modeled Snow Depth forecasted for 2021 February 25, 15:00 UTC

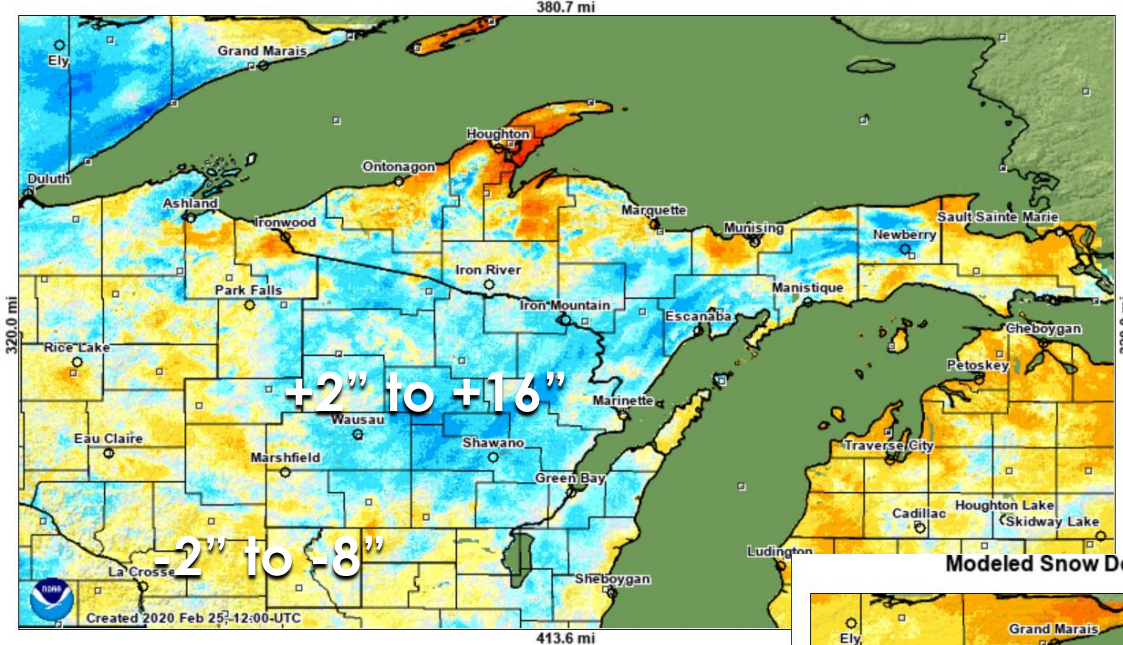


## Inches of depth

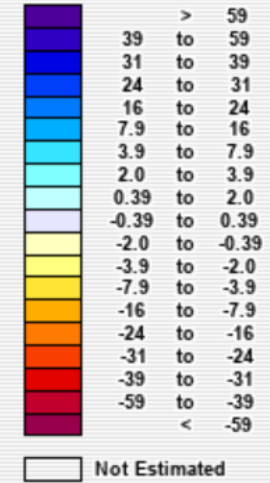


# Snow Depth and Departure from Average

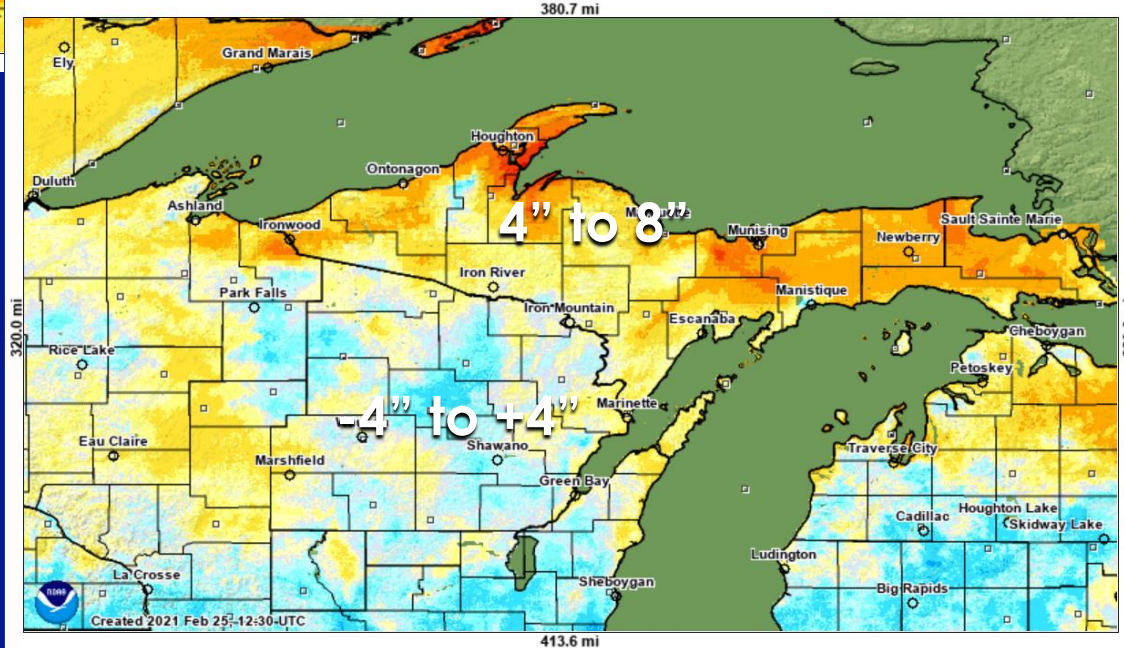
Modeled Snow Depth Departure from Normal (Daily) for 2020 February 25, 6:00 UTC



Inches of depth



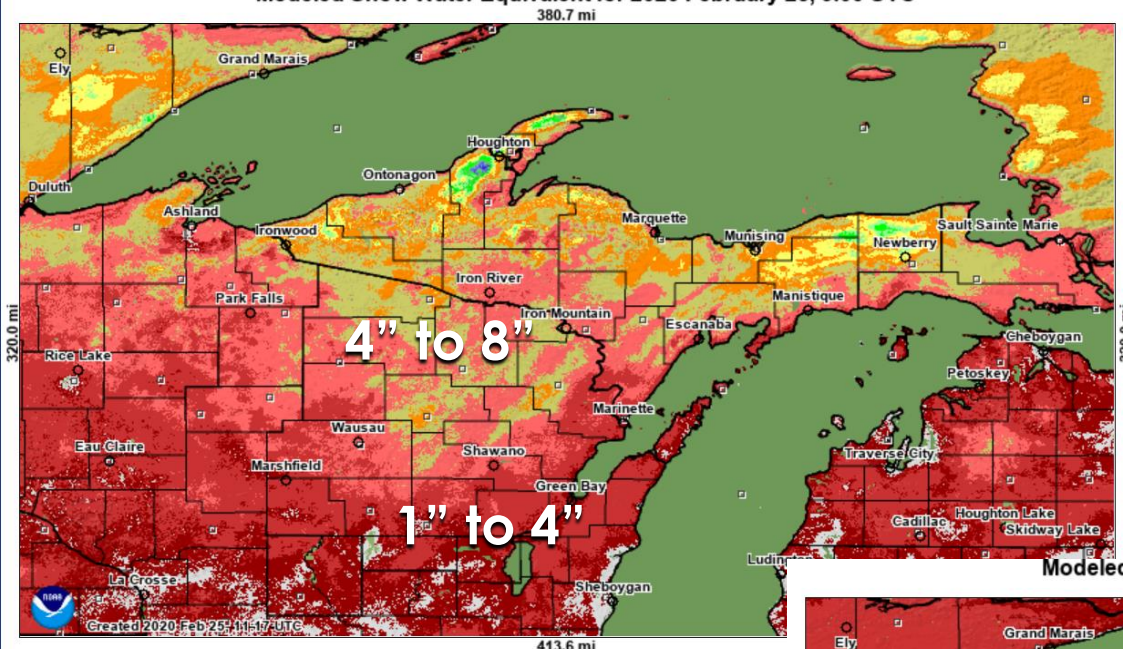
Modeled Snow Depth Departure from Normal (Daily) for 2021 February 25, 6:00 UTC



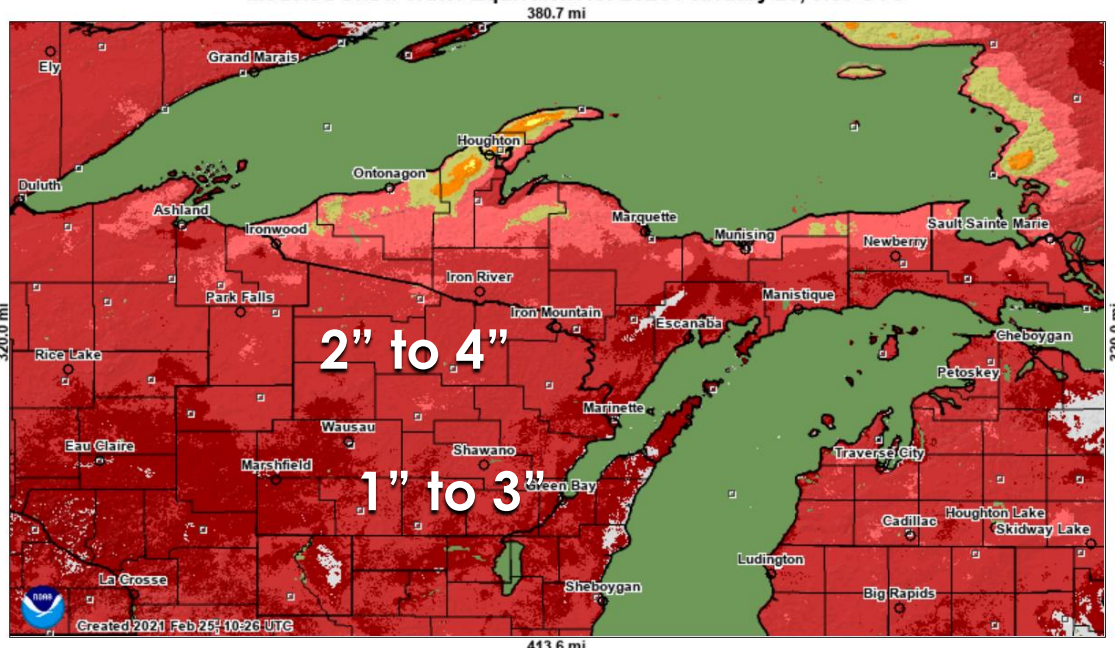


# Snow Water Equivalent 2020 vs 2021

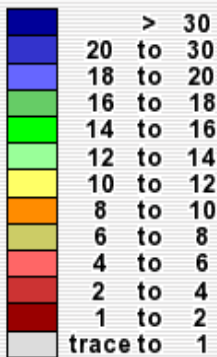
Modeled Snow Water Equivalent for 2020 February 25, 6:00 UTC



Modeled Snow Water Equivalent for 2021 February 25, 6:00 UTC

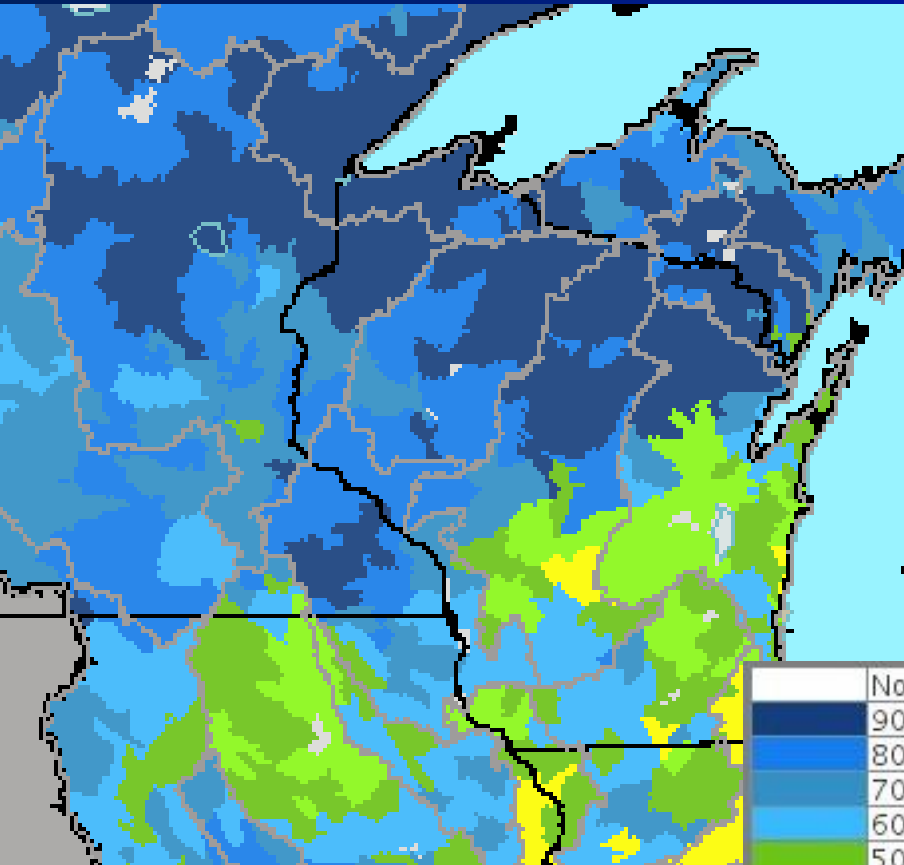


## Inches of water equivalent



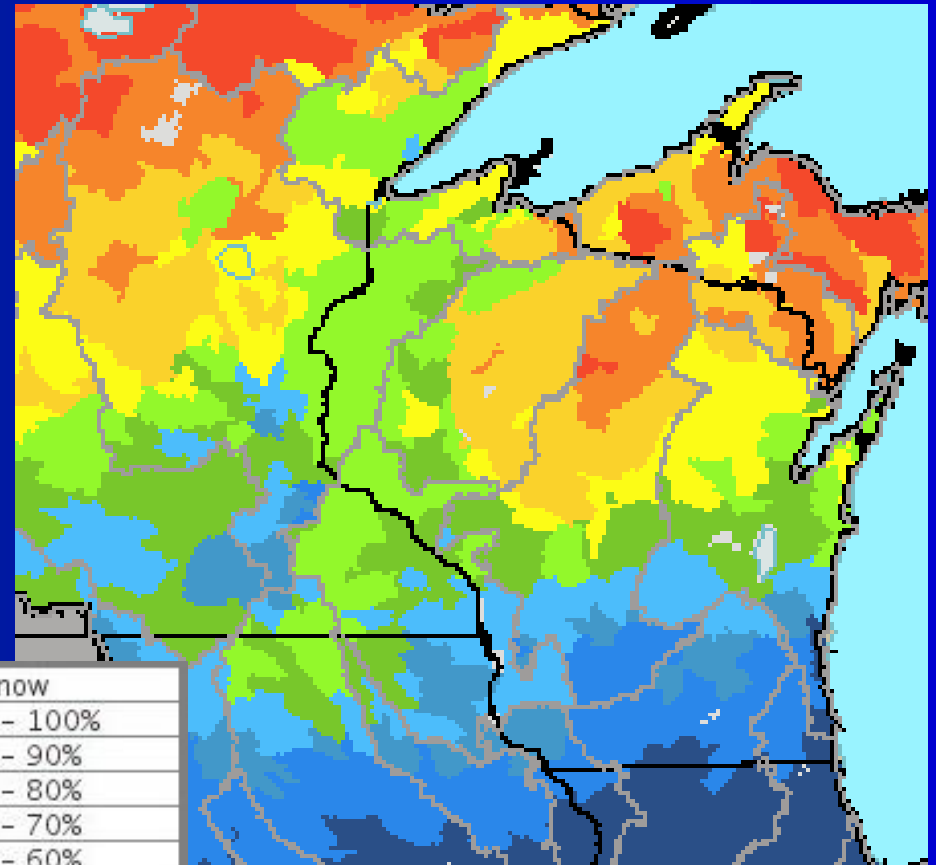
# Snow Water Equivalent Percentiles

Percentiles 2/12/2020



90-100 percentile in some  
Central/north-central

Percentiles 2/25/2021



Near lowest 10<sup>th</sup> percentile  
This year central/north-central



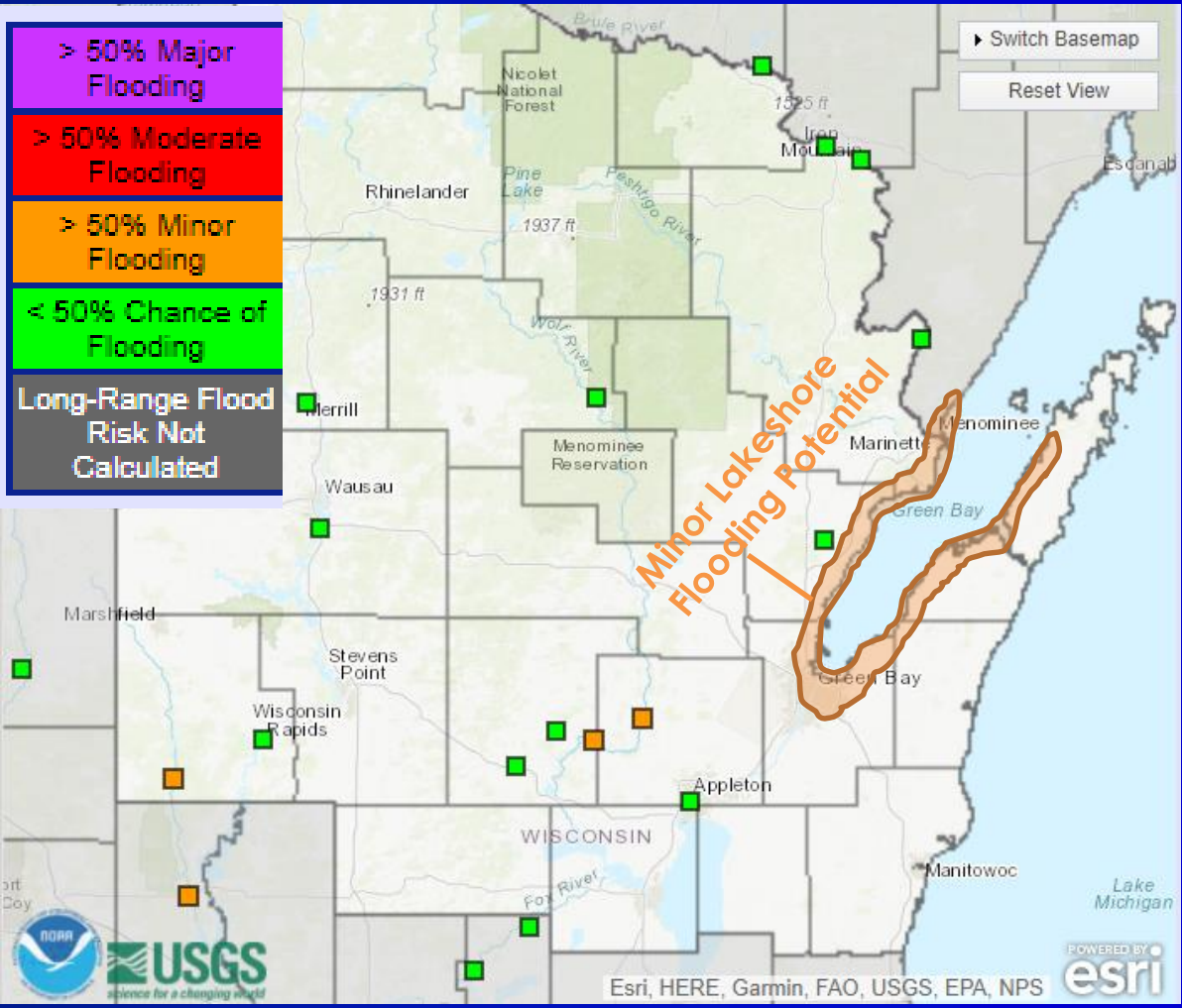
# River Flooding Probabilities

Minor flooding possible on a few Northeast Wisconsin rivers.

- Wolf River
- Yellow River

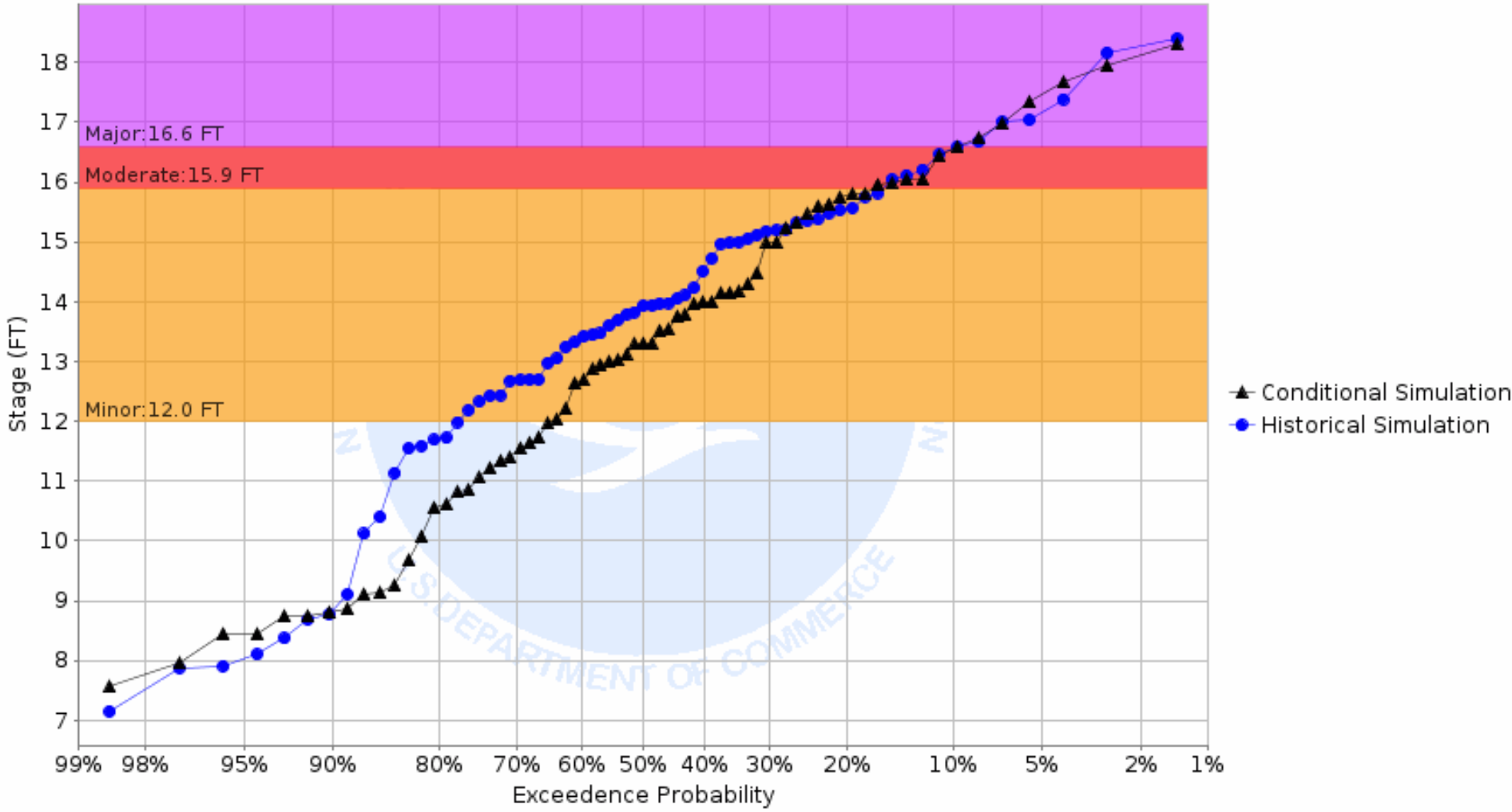
Minor Lakeshore flooding expected along the Bay

- East River
- Fox River
- Oconto River
- Menominee



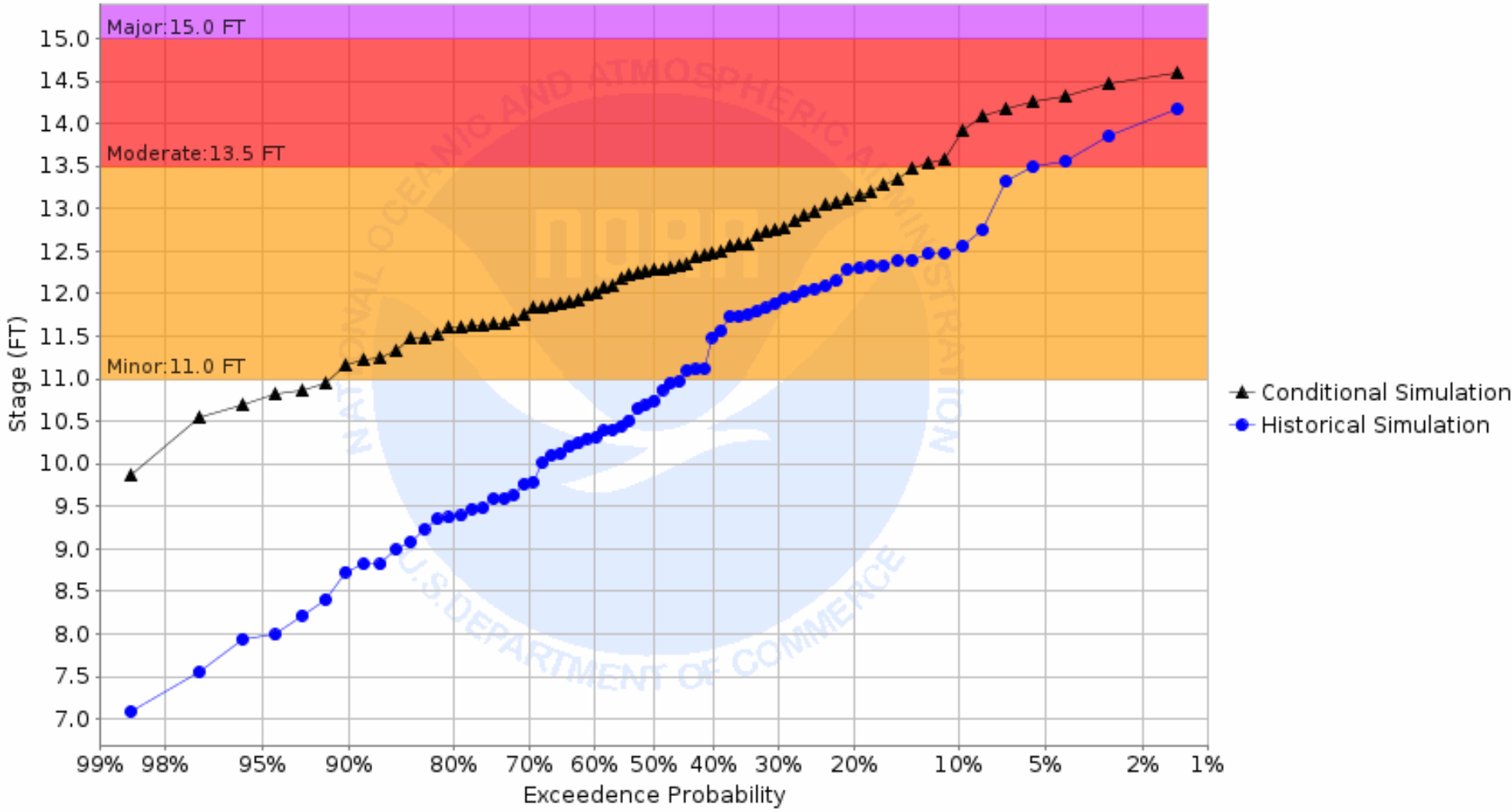
# Probability of Flooding Yellow River (BBCW3)

Chance of Exceeding River Stage at Yellow River at Babcock 1WNW (BBCW3)  
Forecast for the period 03/01/2021 - 05/30/2021  
This is a conditional simulation based on the conditions as of 02/22/2021



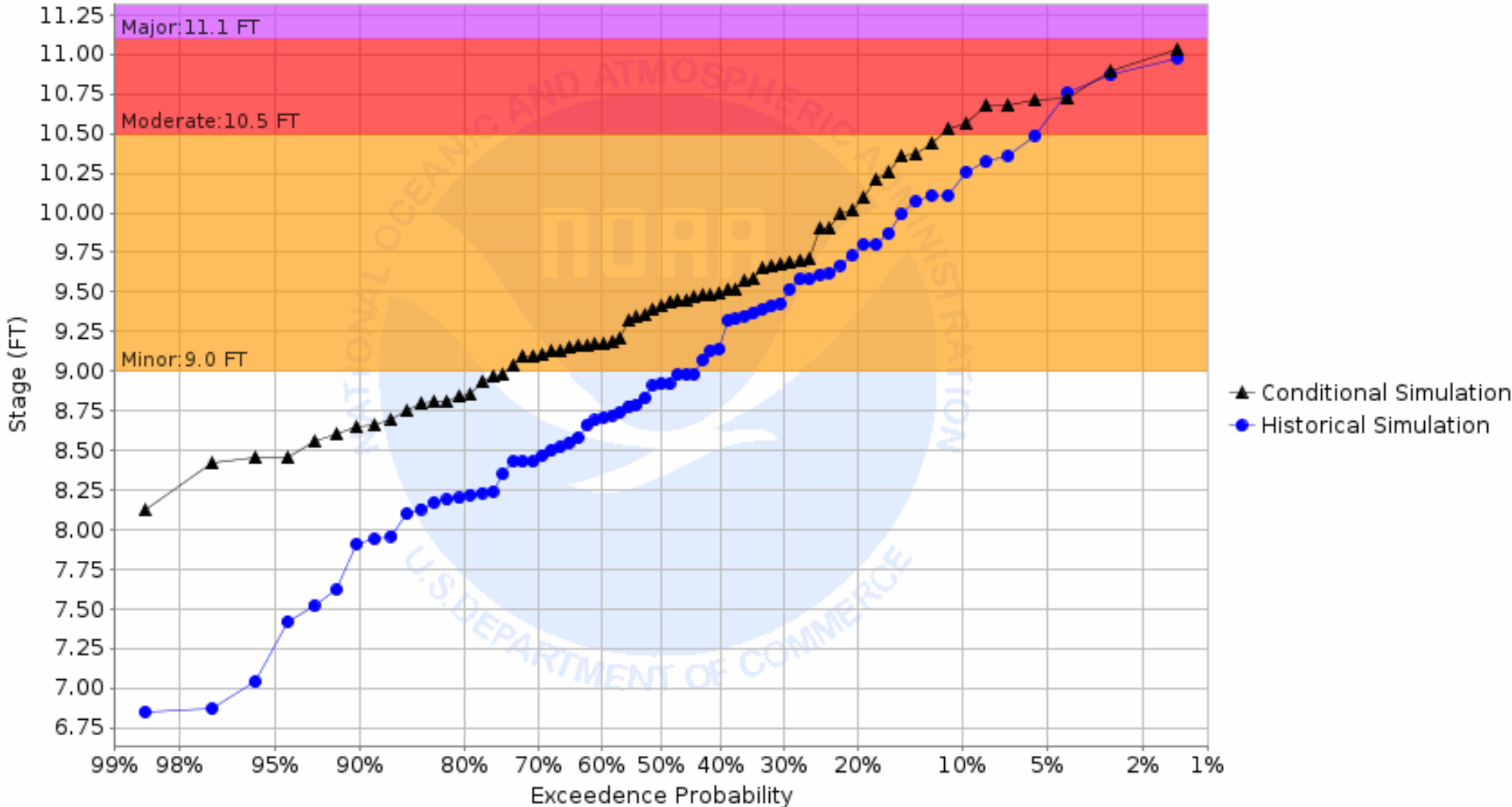
# Probability of Flooding Wolf River (SHIW3)

Chance of Exceeding River Stage at Wolf River at Shiocton (SHIW3)  
Forecast for the period 03/01/2021 - 05/30/2021  
This is a conditional simulation based on the conditions as of 02/22/2021



# Probability of Flooding Wolf River (NEWW3)

Chance of Exceeding River Stage at Wolf River at New London (NEWW3)  
Forecast for the period 03/01/2021 - 05/30/2021  
This is a conditional simulation based on the conditions as of 02/22/2021



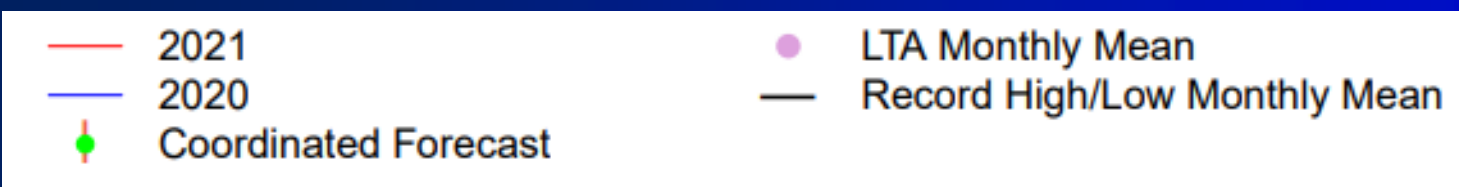
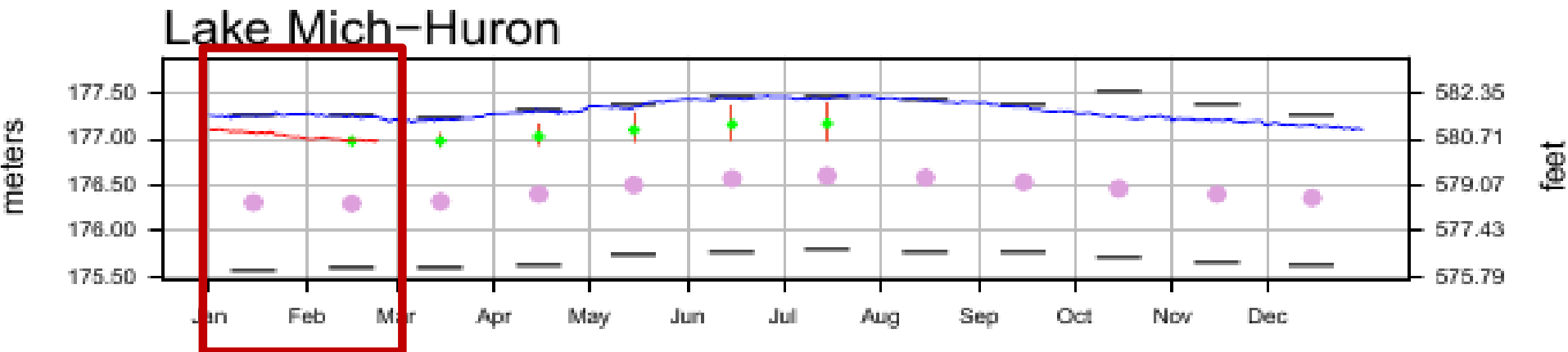
# **Lake Michigan Water Levels and Flooding Concerns**

# Shoreline Flooding and River Flooding

- Shoreline flooding potential remains elevated this year with Lake Michigan water levels running well above normal.
- The Great Lakes are subject to shoreline flooding as a result of strong storms.
  - (Especially with northeast winds)
  - Impacts the East River, Fox River, Oconto River and Menominee River
- Lakeshore flooding is primarily caused by storm surge and wave action.
- Can be cause from convection outflow.

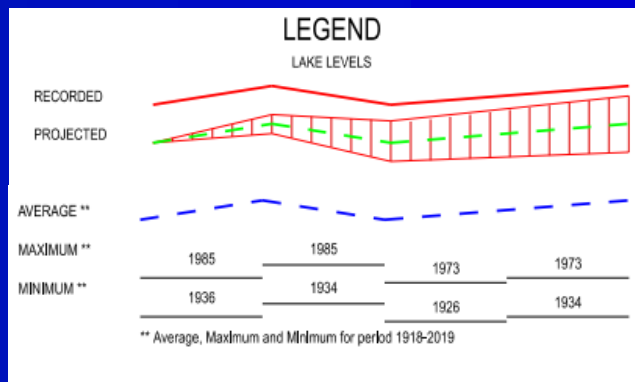
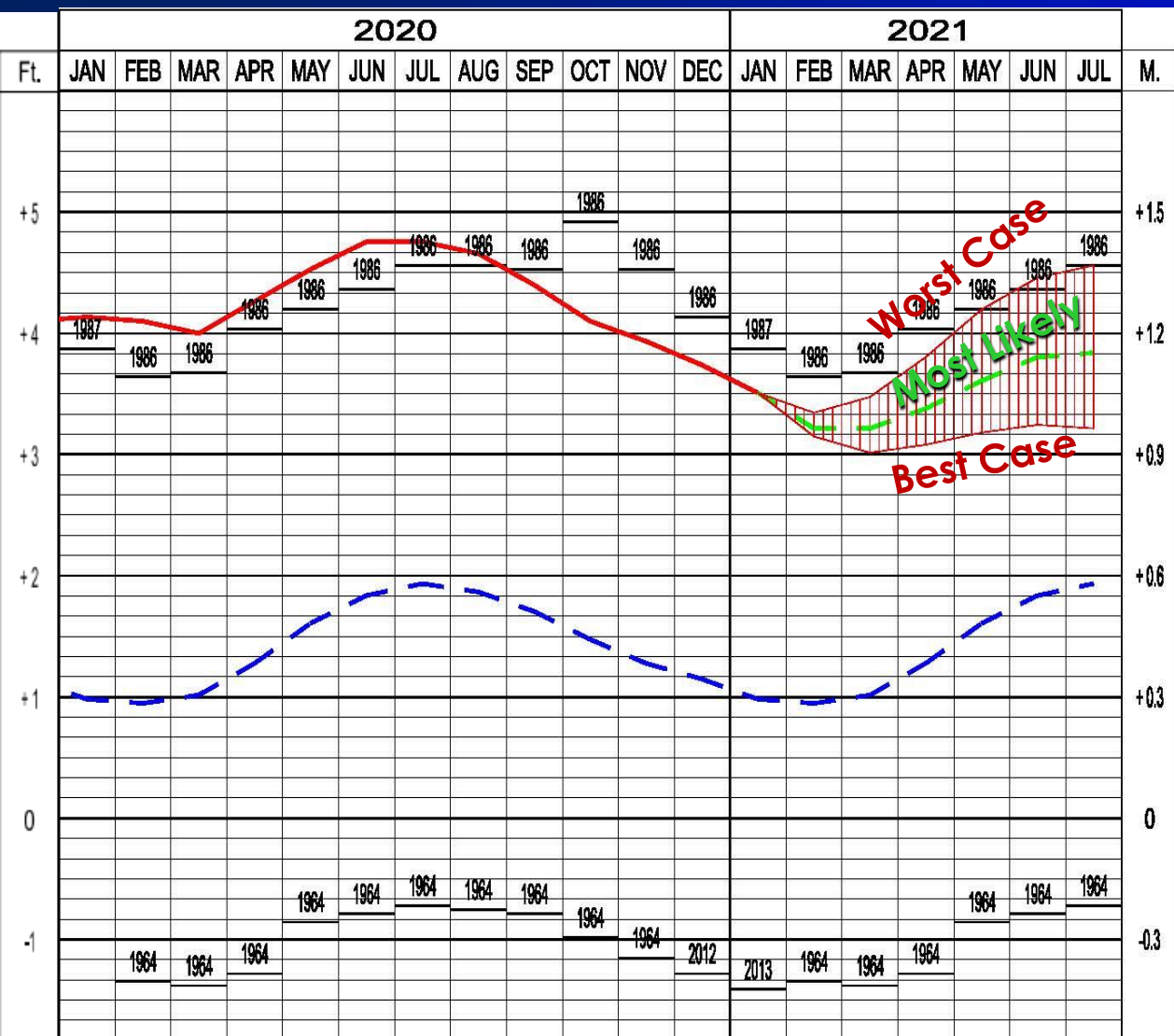


# Lake Michigan Water Levels 2020 vs 2021



Lake levels are around 10 inches lower than 2020, but still around 27 inches above the long-term average.

# Lake Michigan Forecast Water Levels

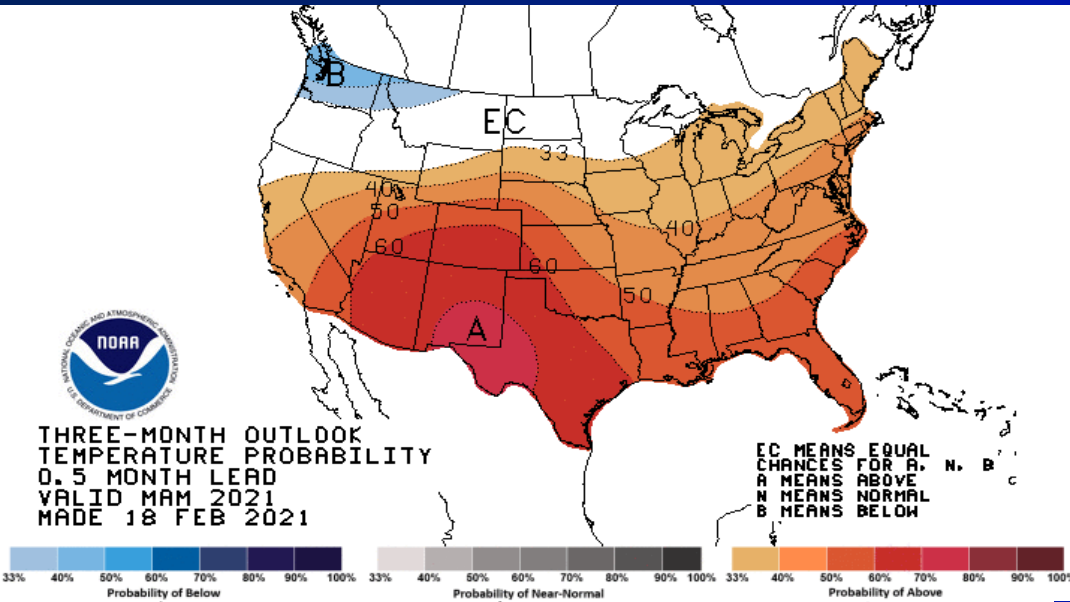


Lake levels are still running around 2-3 feet above the long-term average.

Data is from the US Army Corps of Engineers.

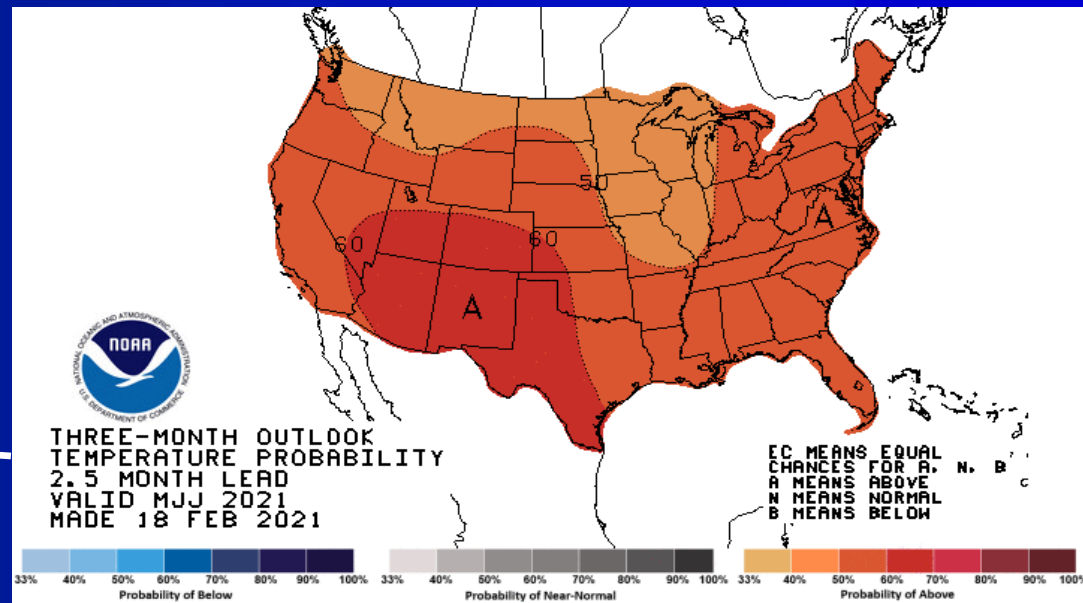


# Spring Temperature Outlook

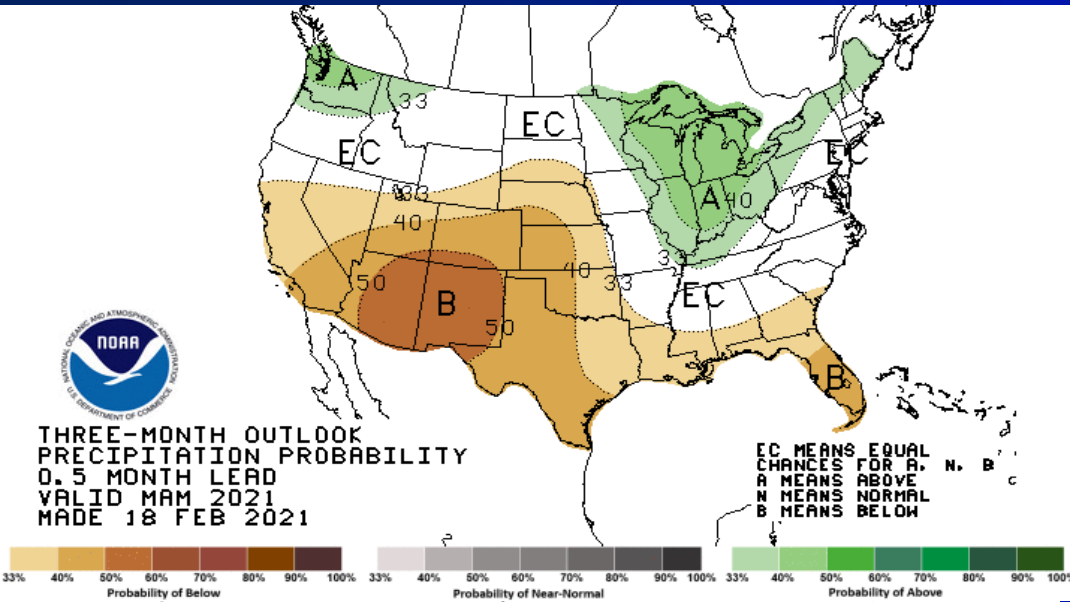


March through May

May through June

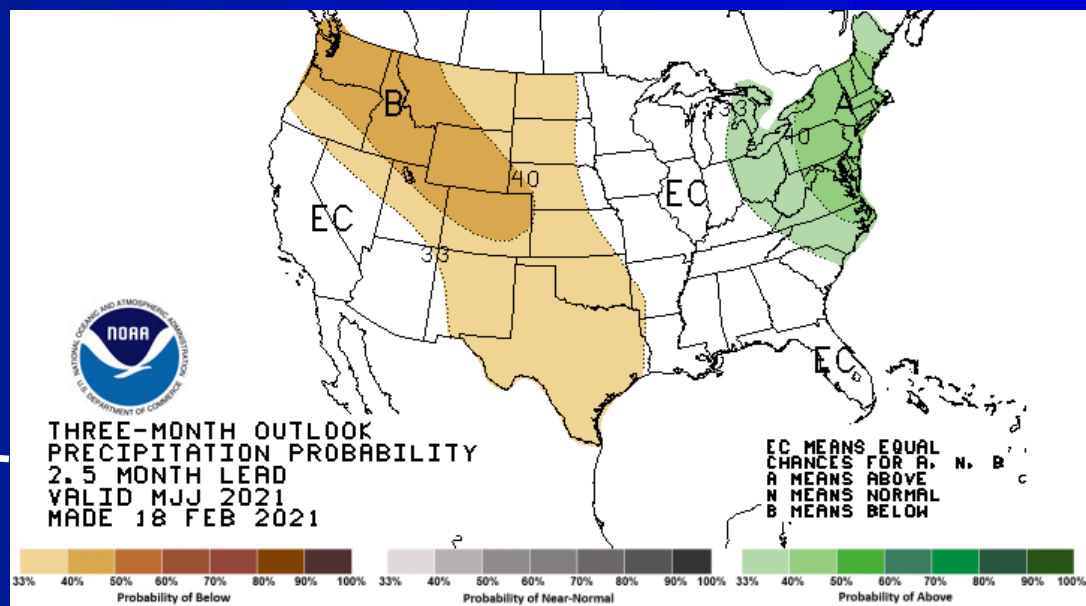


# Spring Precipitation Outlook



March through May

May through July



# Conclusions

- Near Normal Threat of Flooding in Northeast Wisconsin
- Yellow River and Wolf River Greatest Chance of Seeing Minor Flooding
- Elevated Lakeshore Flooding Potential Lingers This Year
- Final Flooding Threat will Depend On:
  - Any Heavy Precipitation Events
    - Especially heavy rain on frozen ground and snowpack
  - Nature of snowmelt
    - Quicker snowmelt increases the risk of flooding
    - Slow-steady snowmelt decrease the risk
  - Ice Jam formation (Low to medium risk)

# Questions or comments...

- [nws.greenbay@noaa.gov](mailto:nws.greenbay@noaa.gov)

## Useful Links

- Streamflow Data – [USGS WaterWatch](#)
- Soil Moisture Data – [CPC Soil Moisture](#)
- Seasonal Outlooks – [Climate Prediction Center](#)
- Snow Information – [NOHRSC](#)
- Frost Depth Data – [North-Central River Forecast Center](#)
- Great Lakes Water Levels – [US Army Corps of Engineers](#)