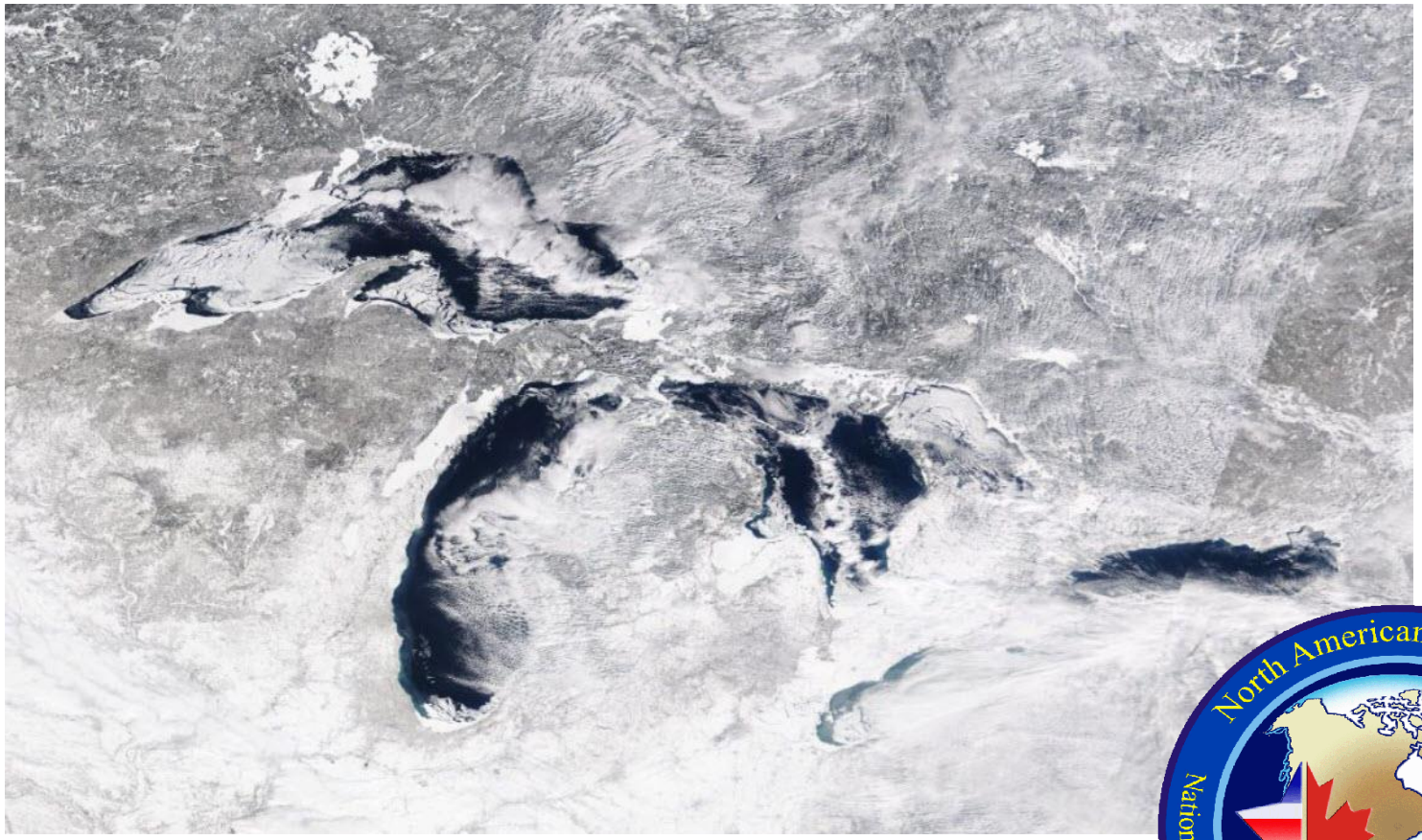
Pre-Season Outlook
Great Lakes Winter 2021-2022

October 27, 2021



Bradley Drummond (CIS)
Presenter: Jonathan Edwards-Opperman (USNIC)

North American Ice Service (NAIS) Great Lakes Products

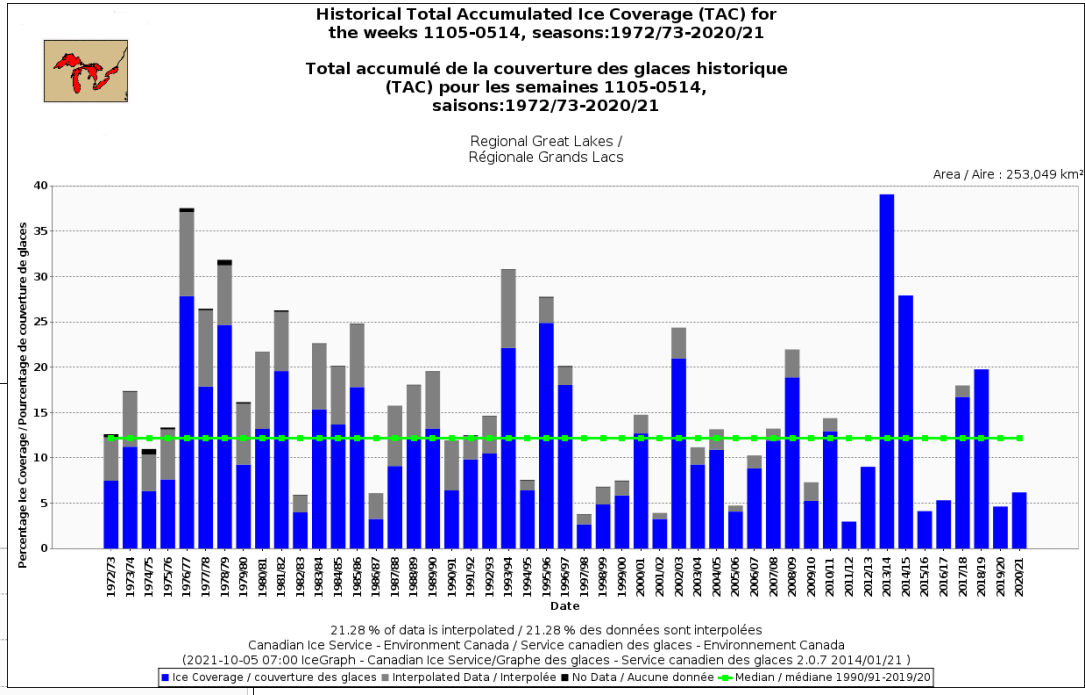
- **Daily ice analysis available for the Great Lakes**
- **15 & 30 day graphic and text Outlooks issued around the 1st and 15th of the month**
- **Joint Seasonal Outlook issued on December 1st by the NAIS**
- **NAVTEX (Ice-hazard) Bulletin issued daily at noon (EST/EDT) by CIS with input from USNIC for Lake Michigan**
- **Seasonal Summary will follow the 2021-22 winter season**
- **Canadian Ice Service (CIS) will be producing an experimental Ice Pressure Outlook for the Great Lakes this season.**

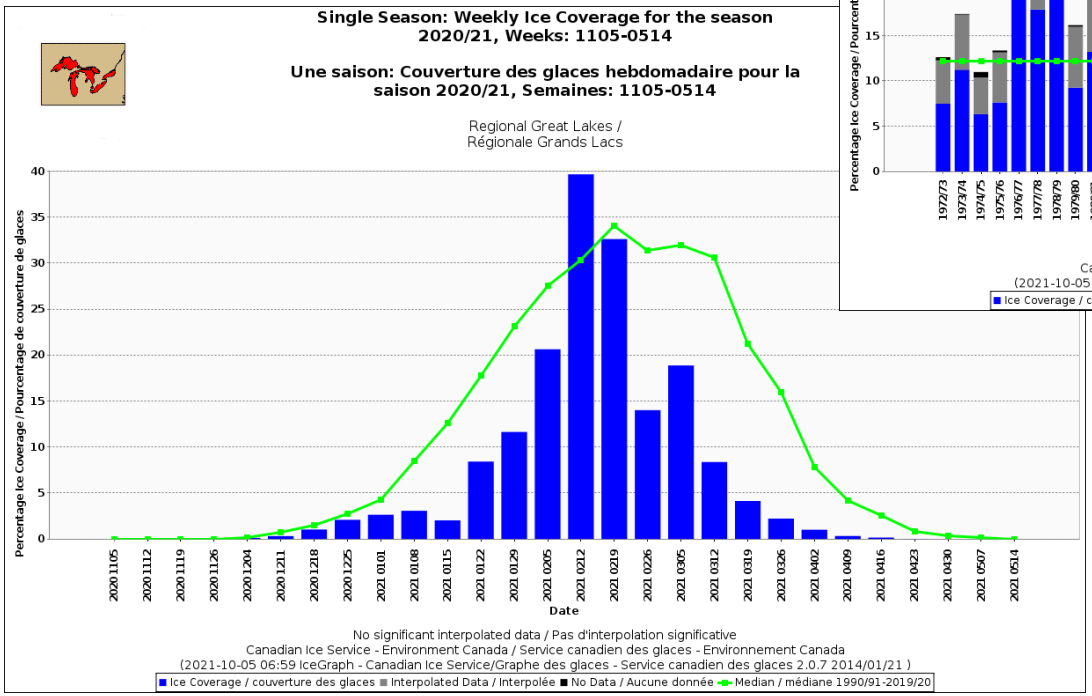
Great Lakes Ice Analysis

- **Joint effort from US National Ice Center (USNIC) and CIS**
- **Using variety of data sources including Radarsat Constellation, Sentinel 1A and 1B, MODIS, AVHRR, VIIRS, Aerial Reconnaissance, and Ship/Station Reports**
- **Daily procedure dictates that USNIC perform the analysis Tuesday – Thursday, and CIS analyze the conditions Friday – Monday**
- **Parameters analyzed include ice edge, total/partial ice concentrations, ice thickness and floe size**

Great Lakes 2020-21

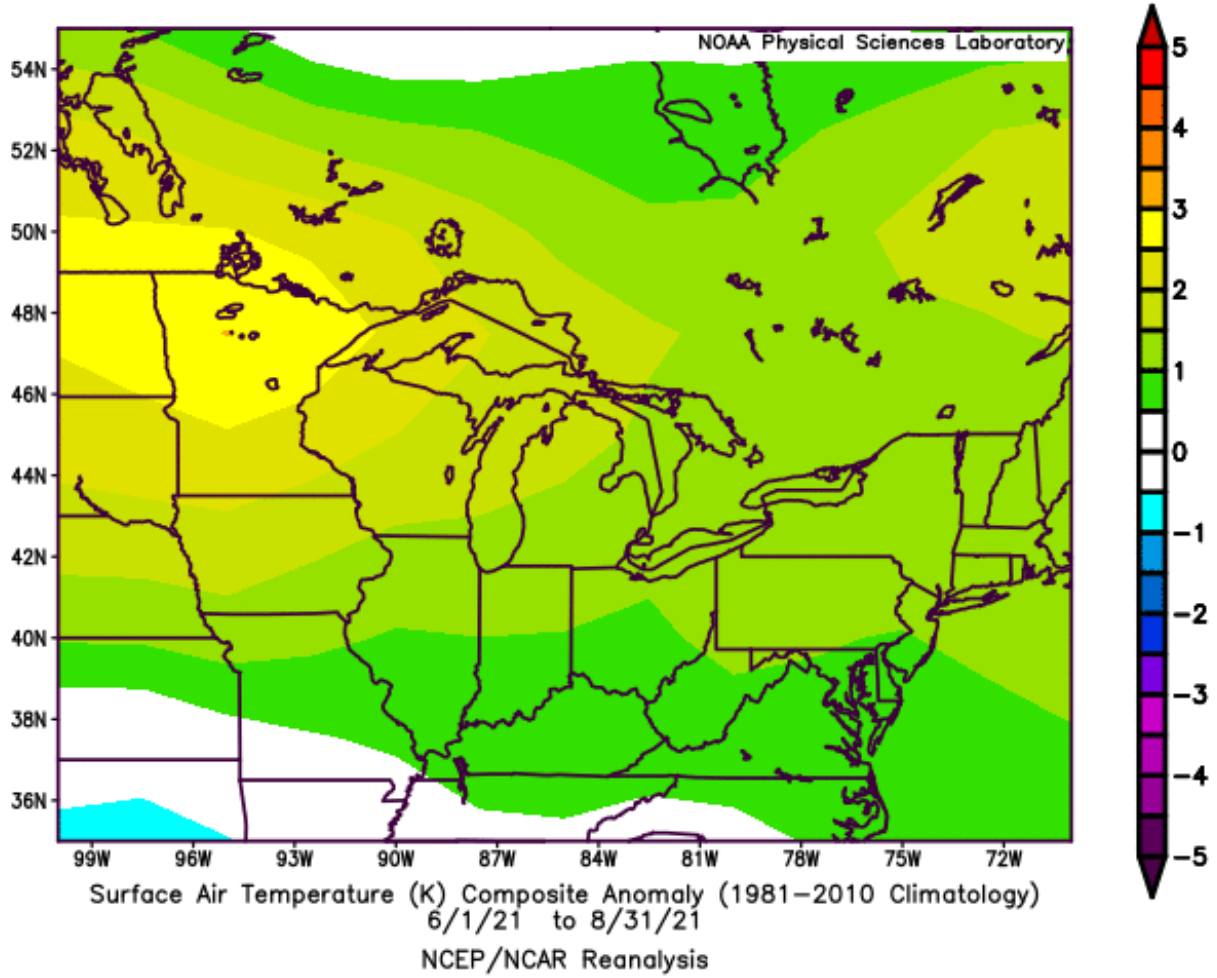
Right: Historical total accumulated ice cover, 1973-2021



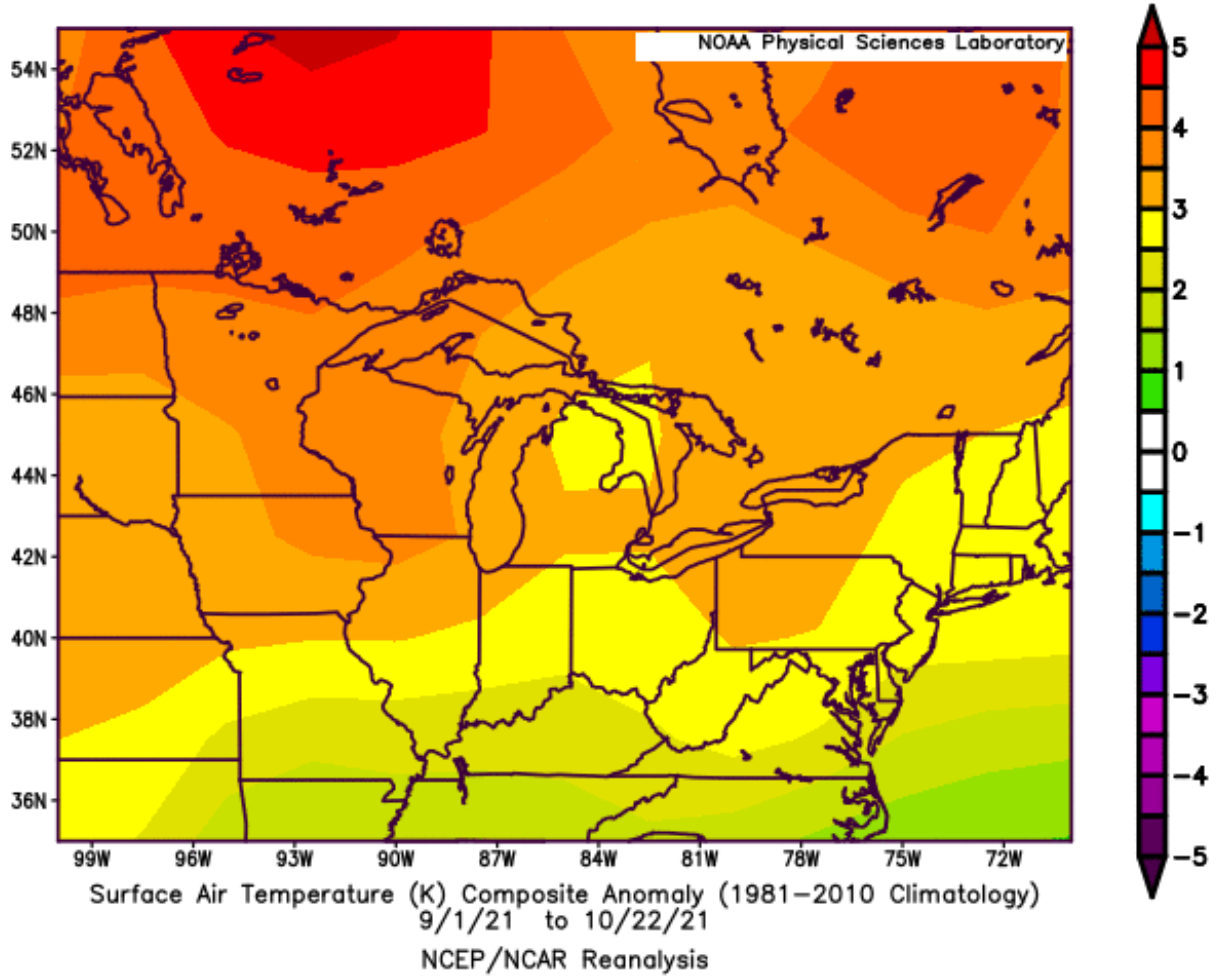


Left: Weekly ice cover for 2020-21

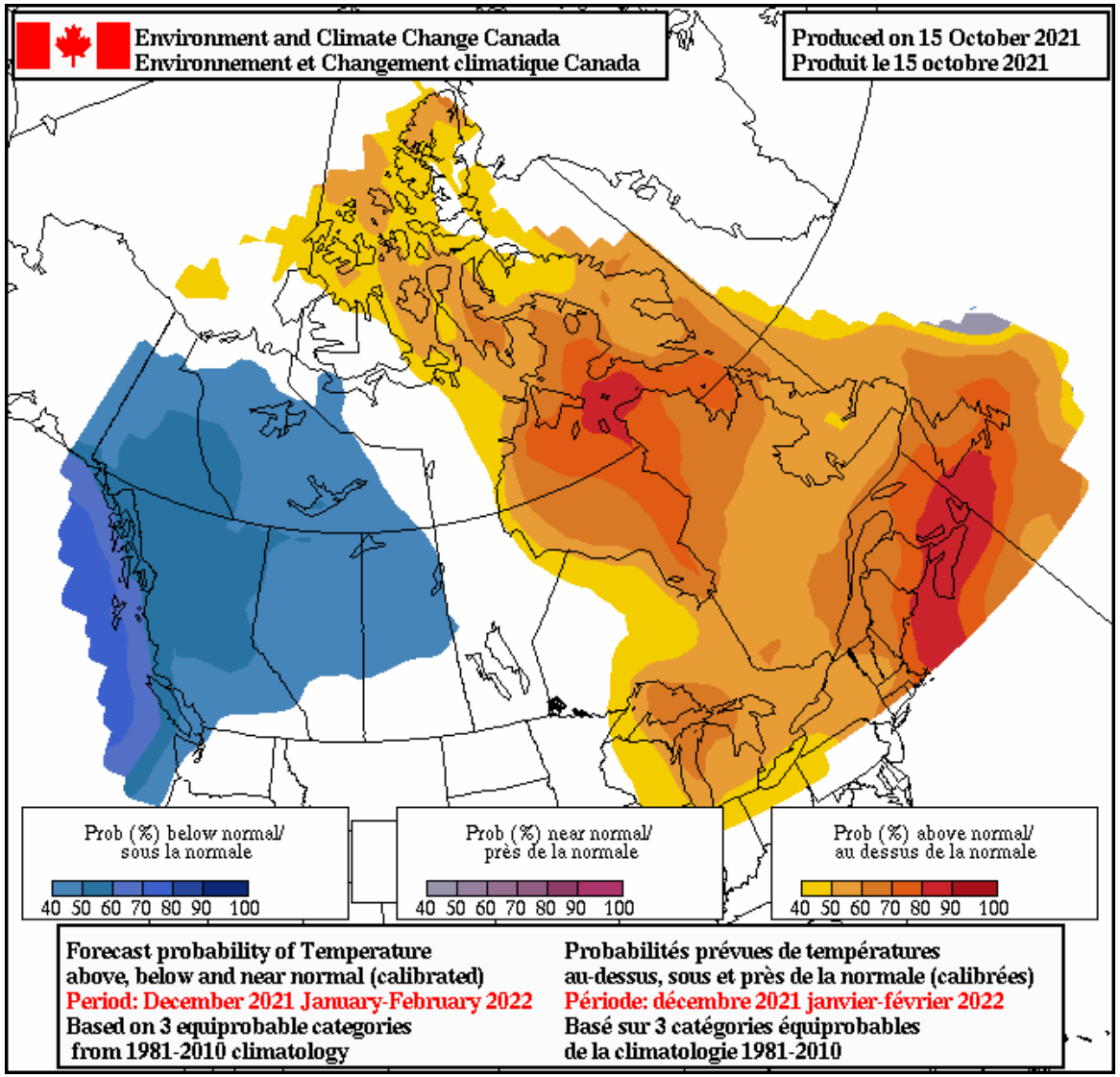
Summer 2021 Temperature Anomalies



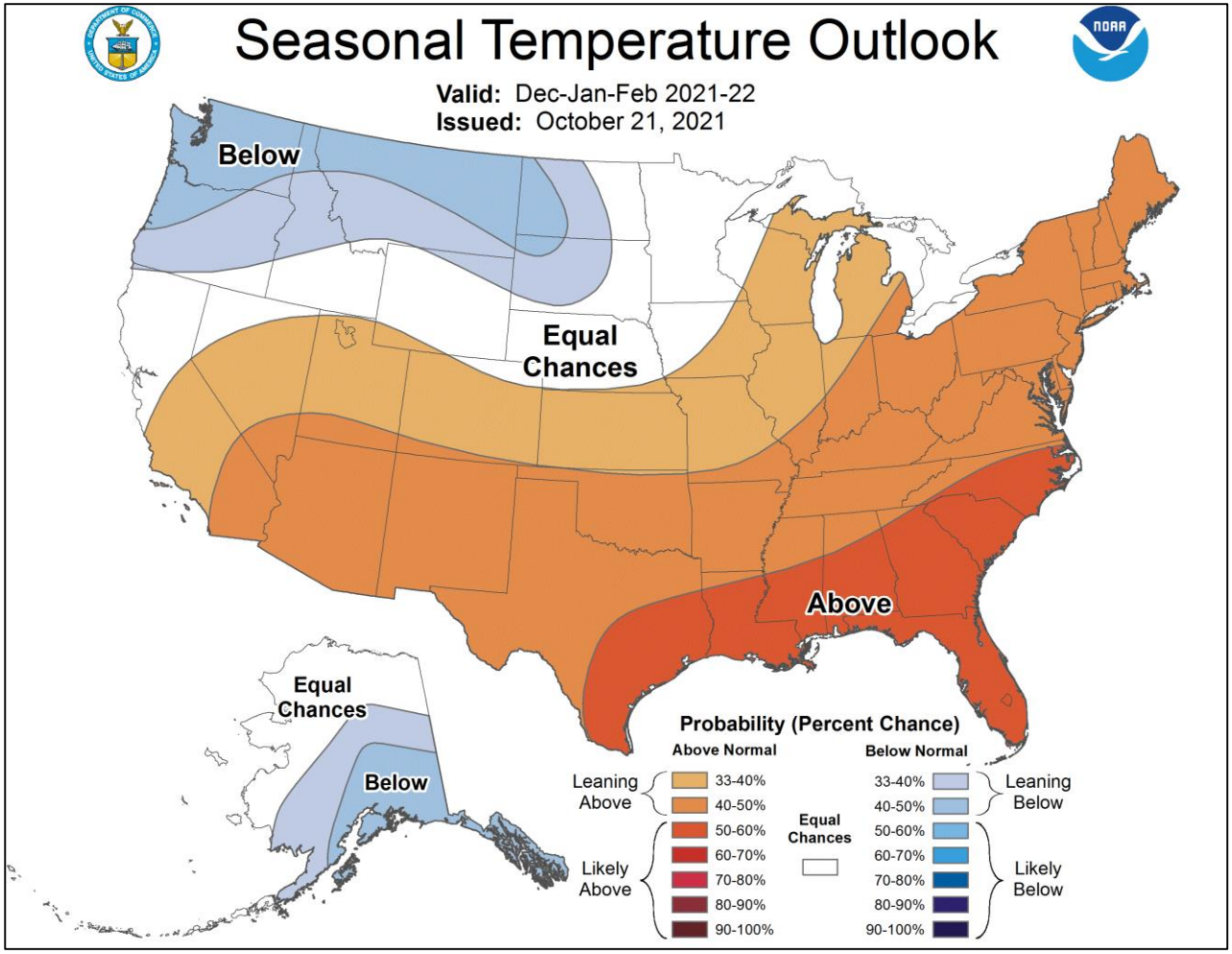
Fall 2021 Temperature Anomalies



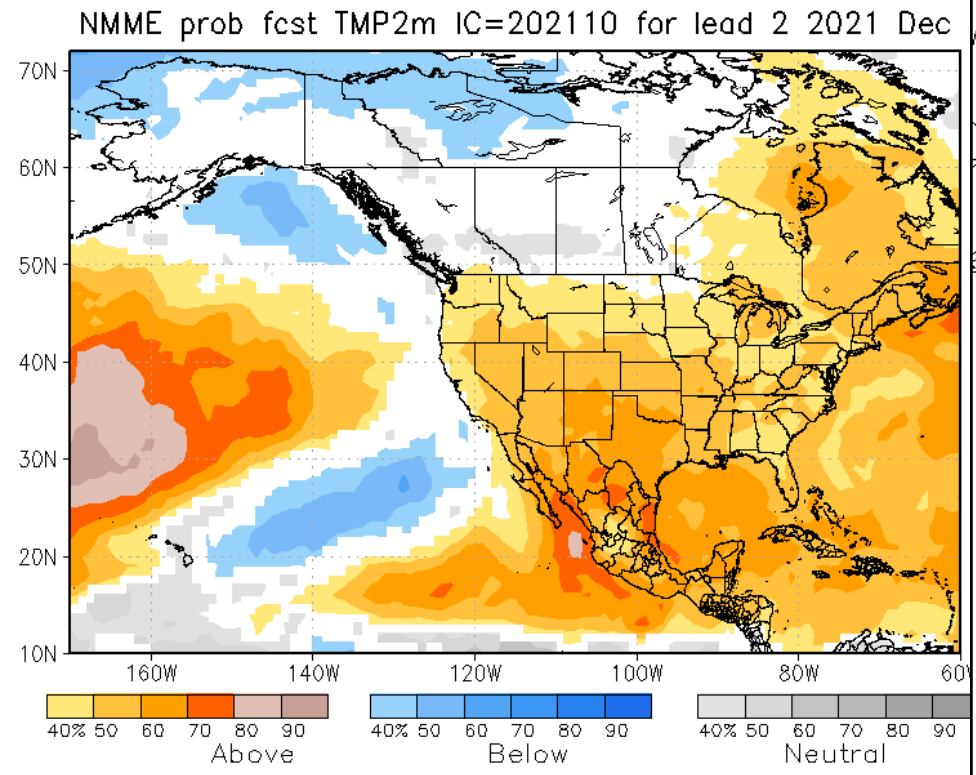
EC Seasonal Temperature Forecast

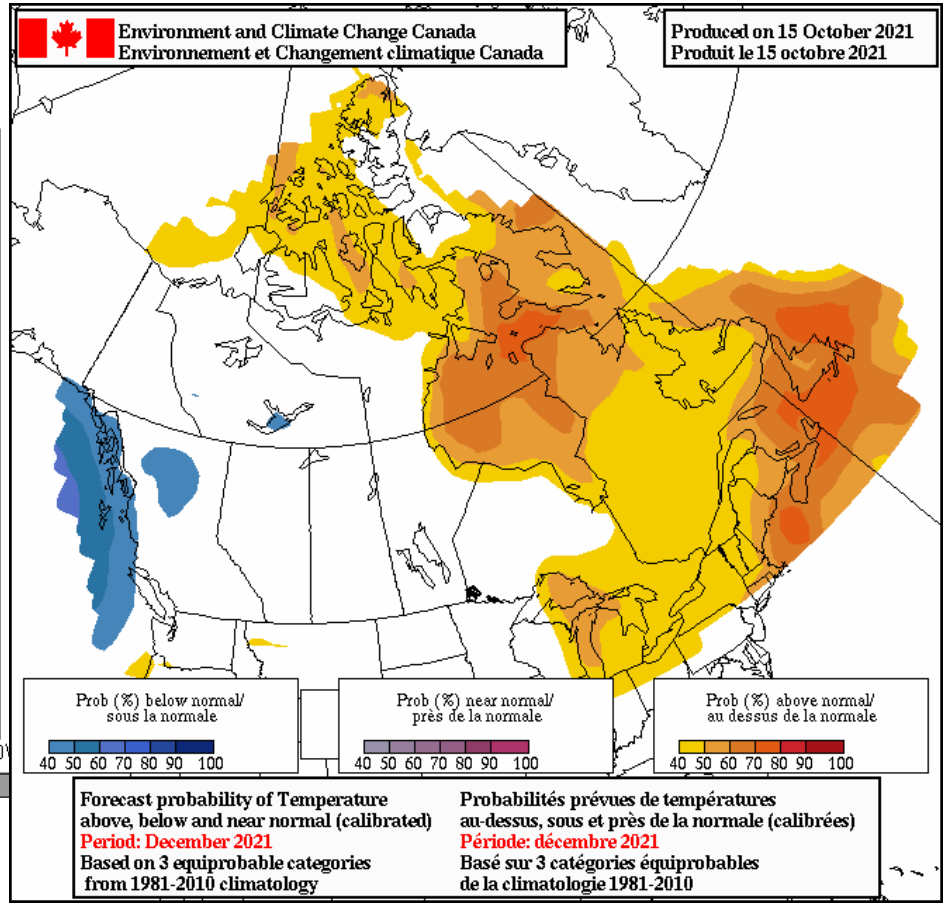


NOAA Seasonal Temperature Forecast

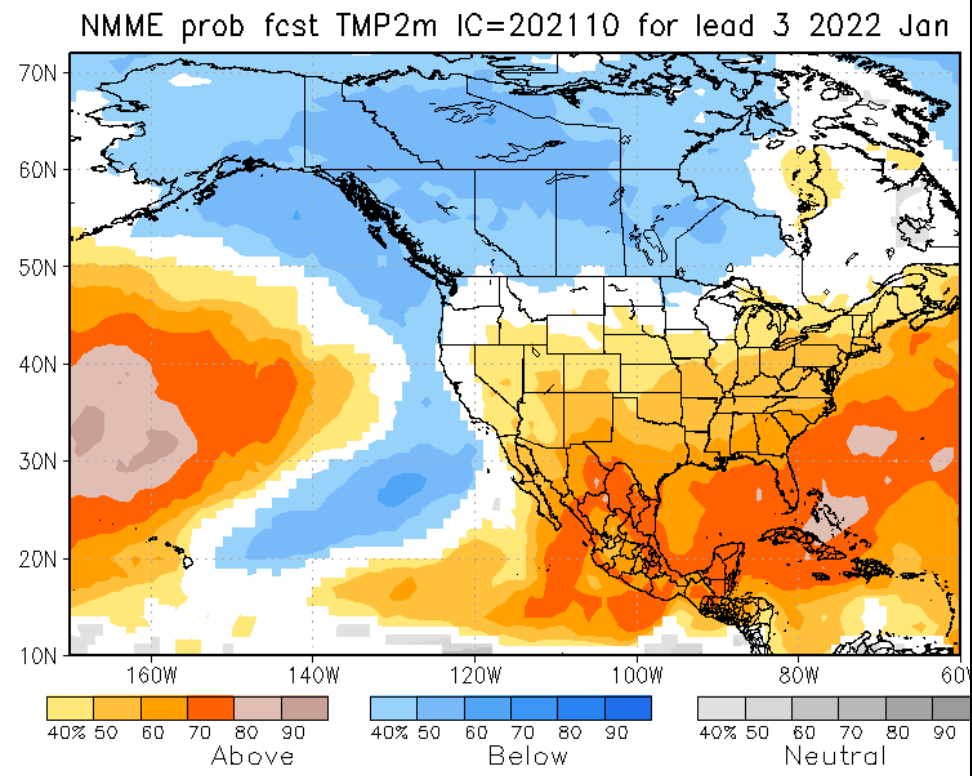


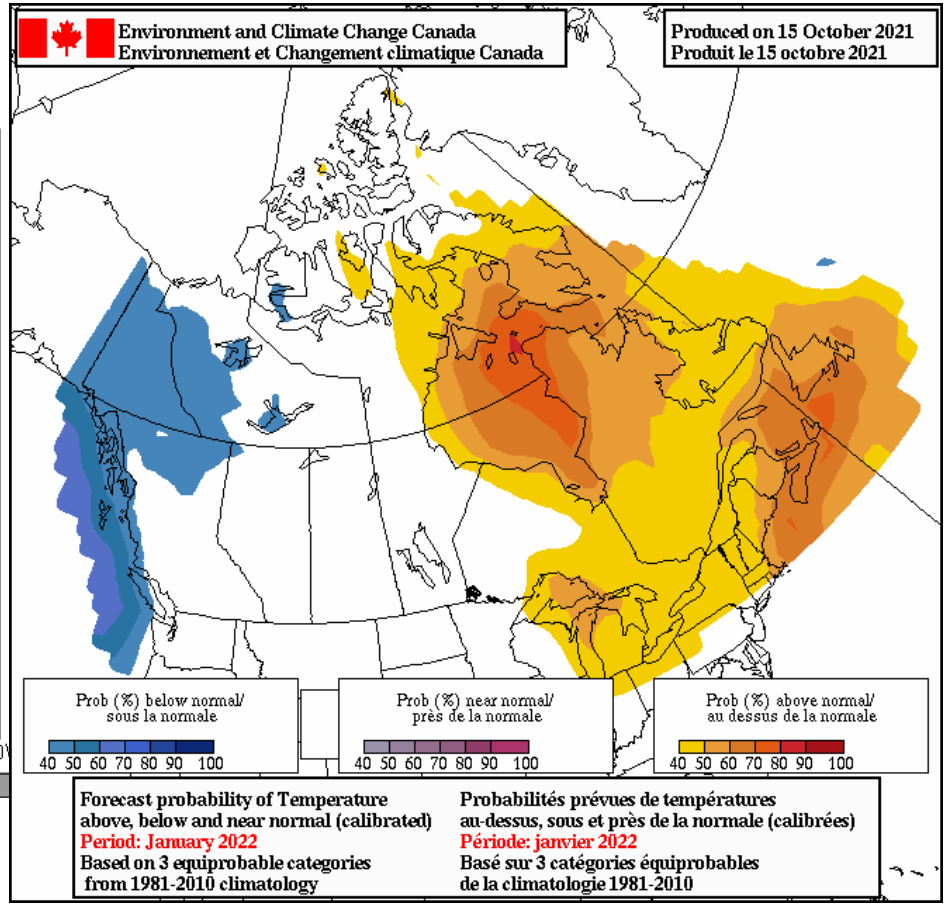
December Temperature Forecasts



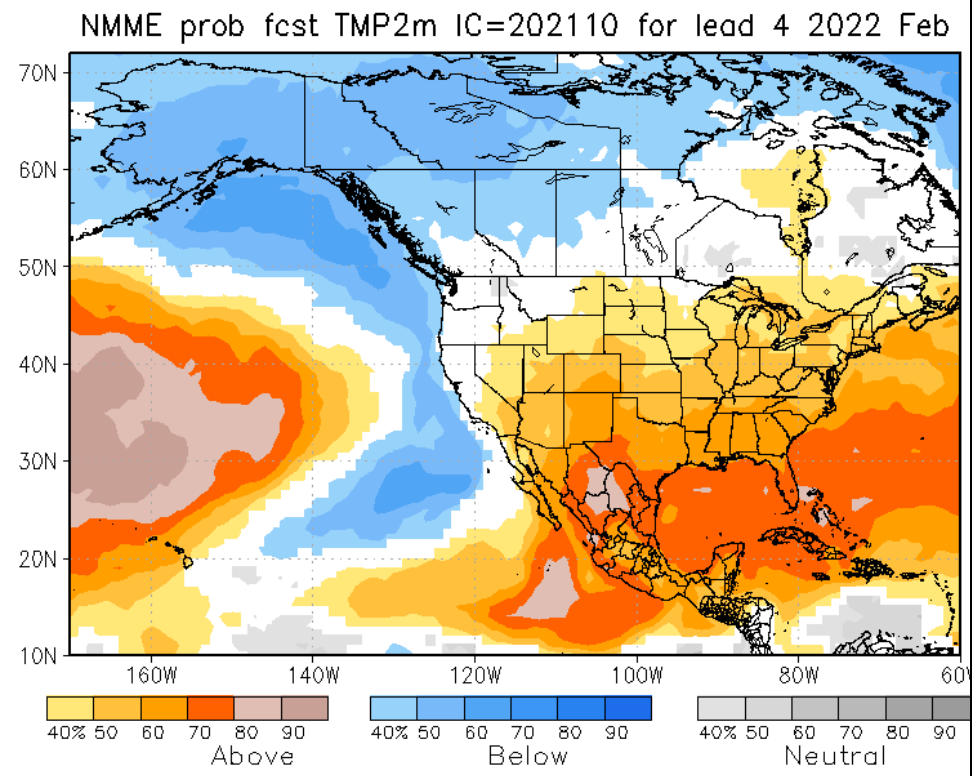


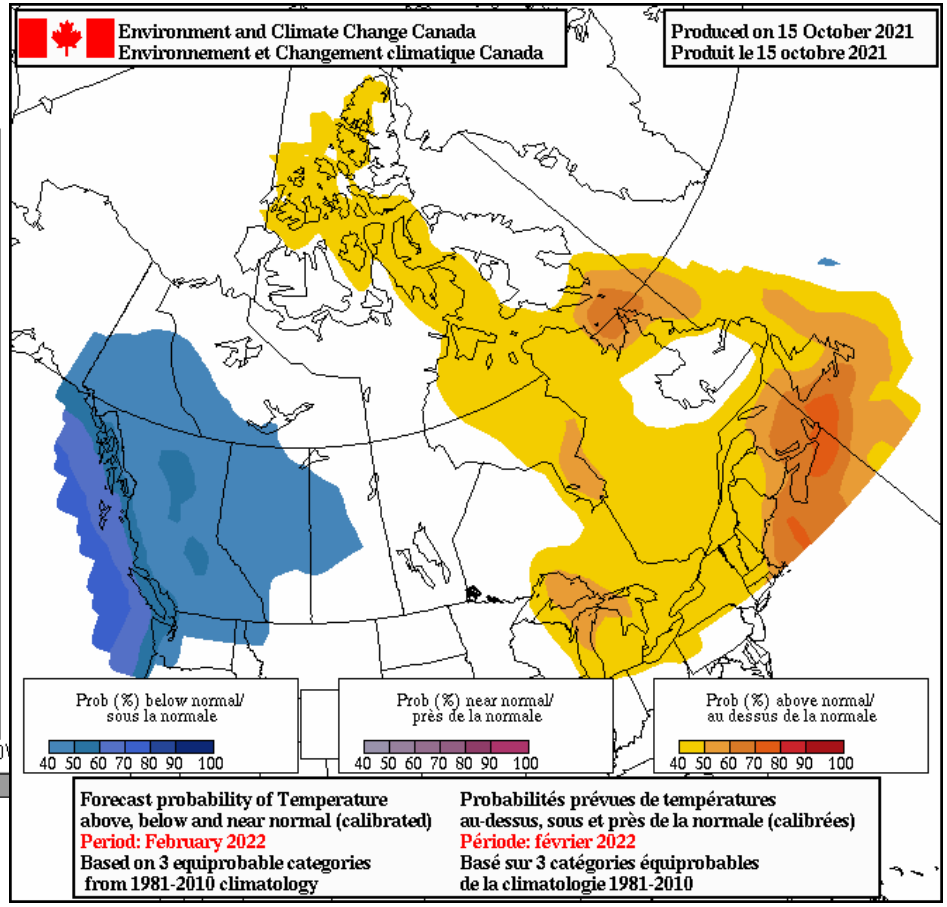
January Temperature Forecasts



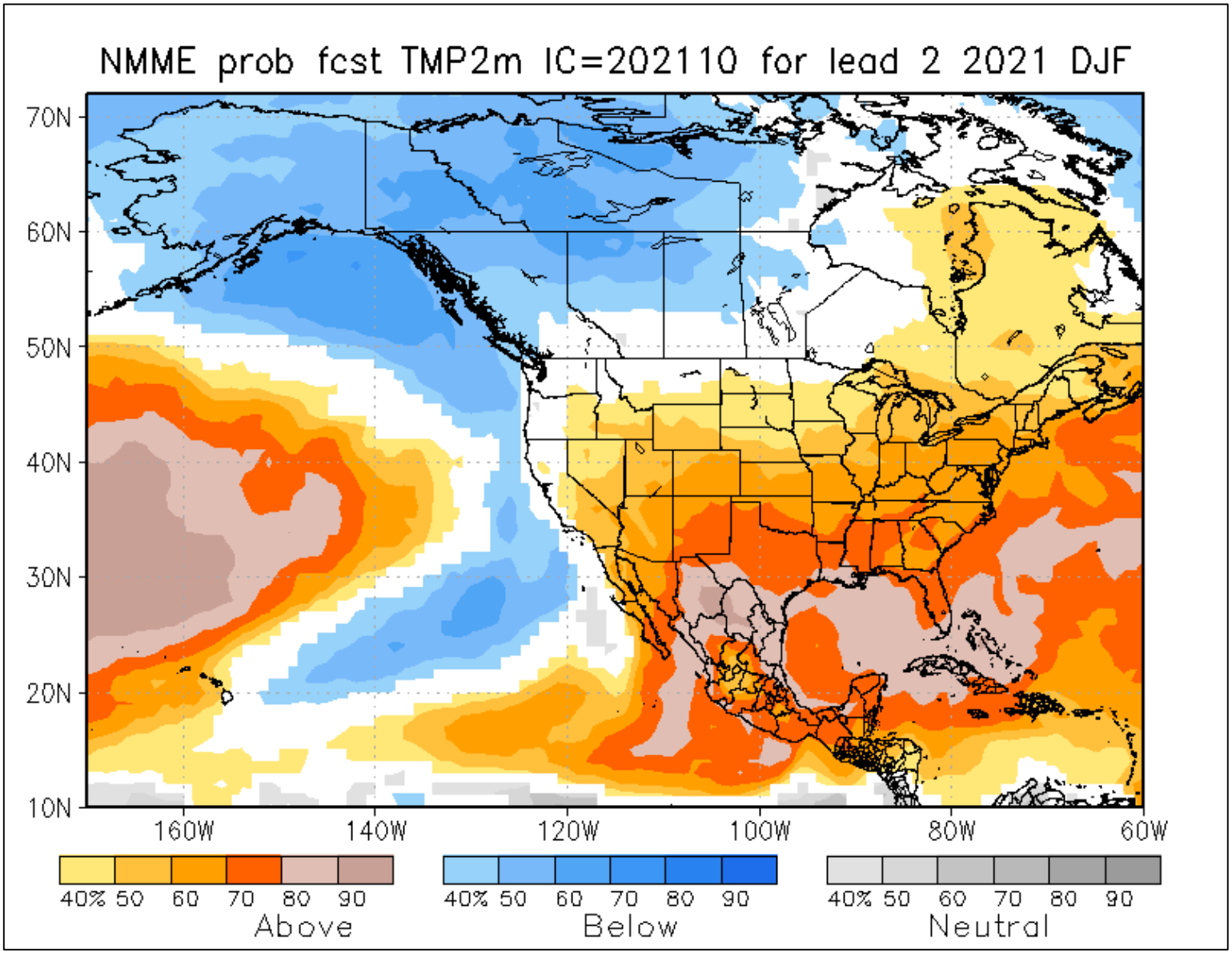


February Temperature Forecasts



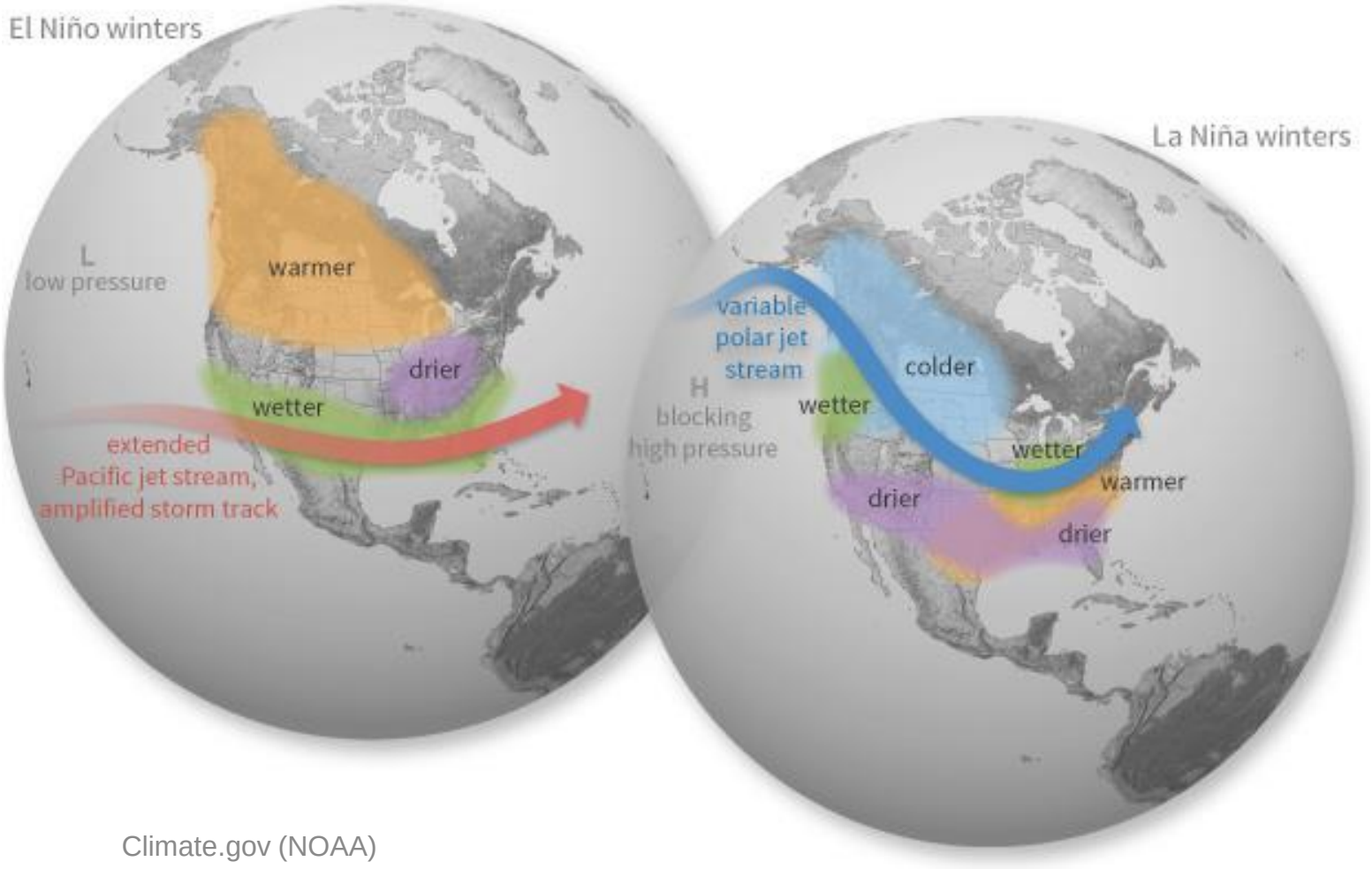


NMME multi-model Seasonal forecasts



https://www.cpc.ncep.noaa.gov/products/NMME/

Typical Wintertime Circulations During El Nino and La Nina



Climate.gov (NOAA)

ENSO Neutral

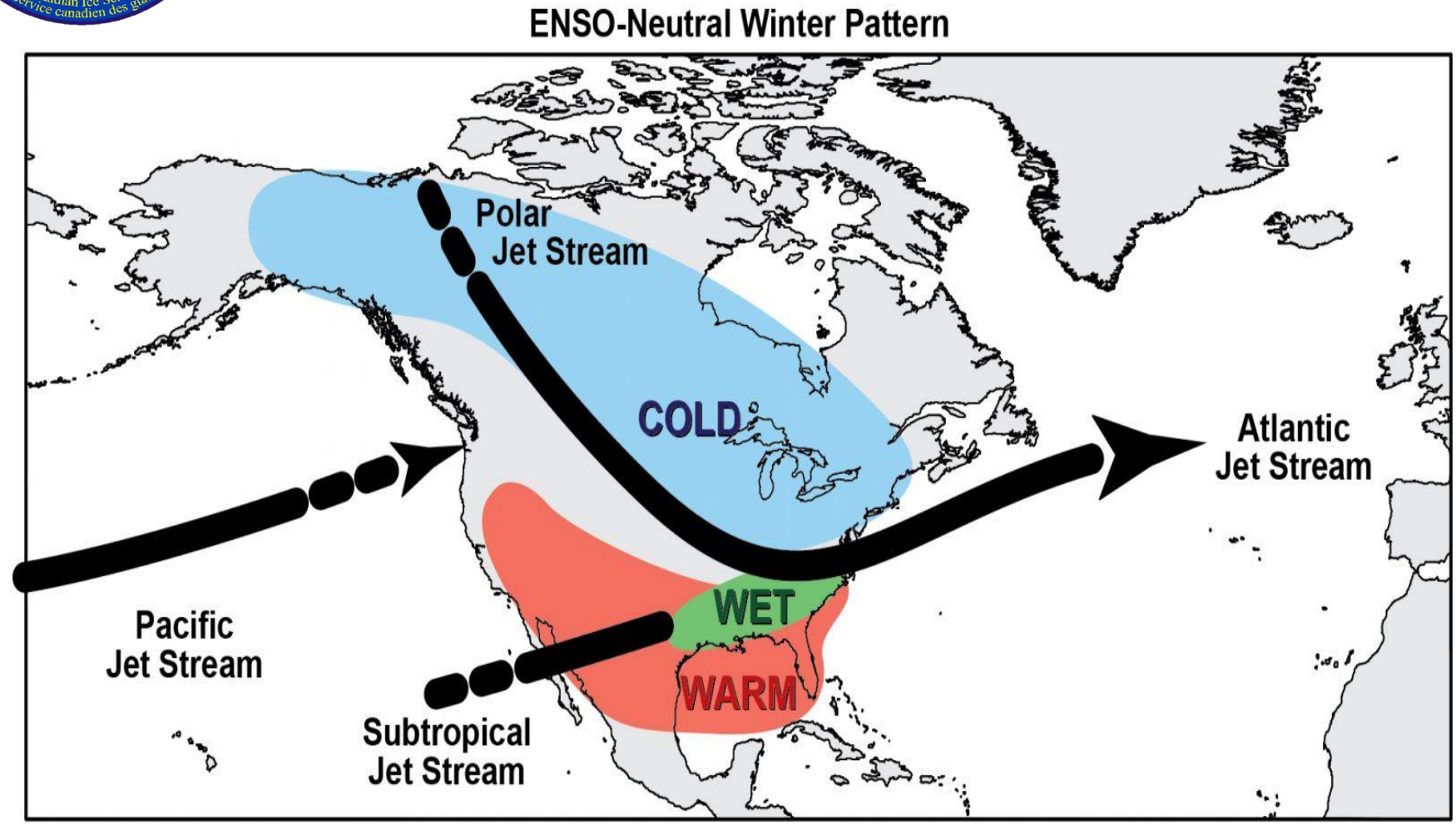
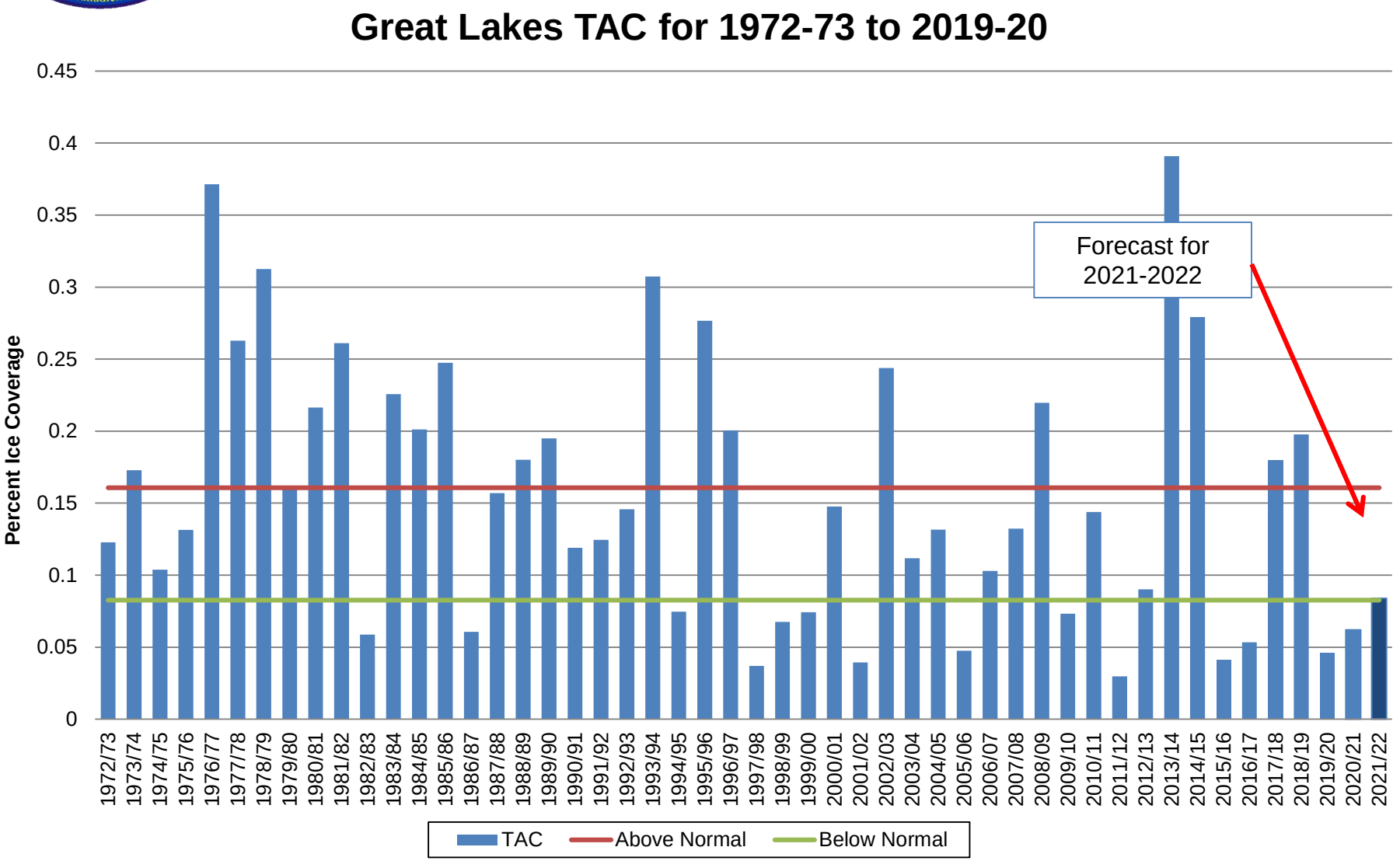


Image courtesy of Ray Wolf, National Weather Service.

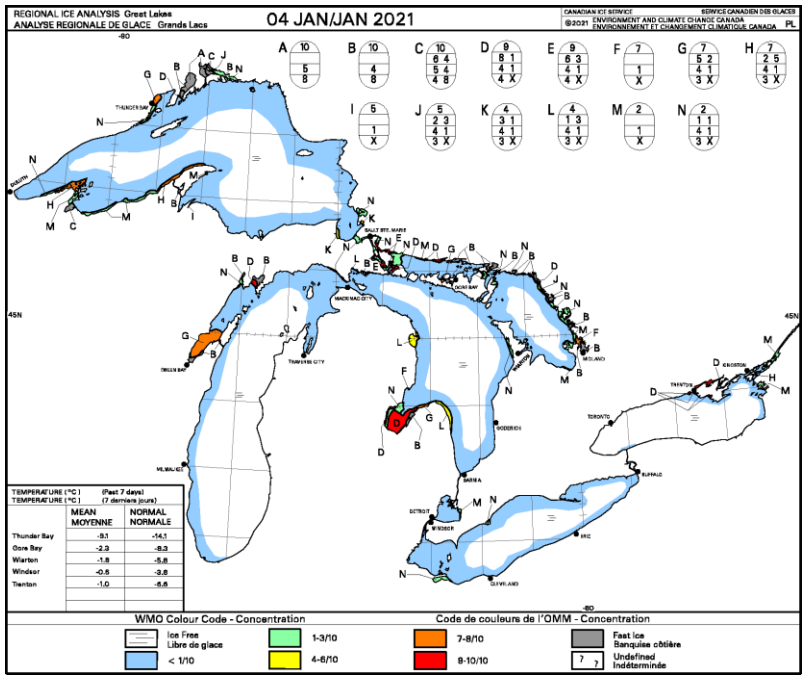
2021-22 Great Lakes Outlook

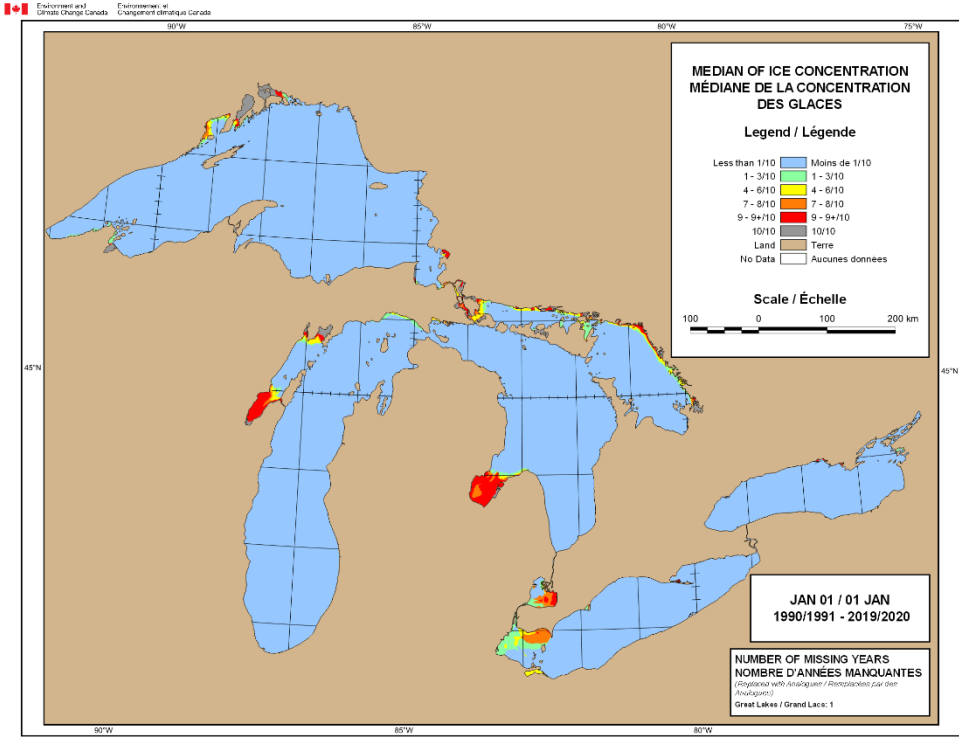
- ENSO is currently neutral and is expected to remain near the lower end of neutral or a weak La Nina through the winter, giving the potential for cold air outbreaks to predominantly effect the western lakes.
- Current guidance is leaning towards above normal air temperatures over the Great Lakes this winter, especially for the eastern lakes.
- All lakes have above normal surface water temperatures
- Ice Forecast: Below normal ice conditions

Forecast TAC for 2020-2021



Early January



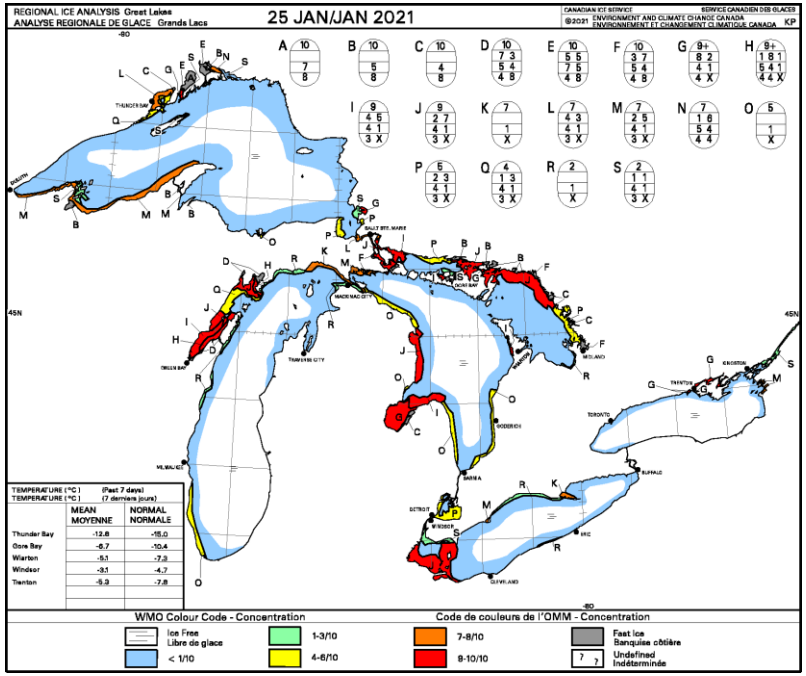


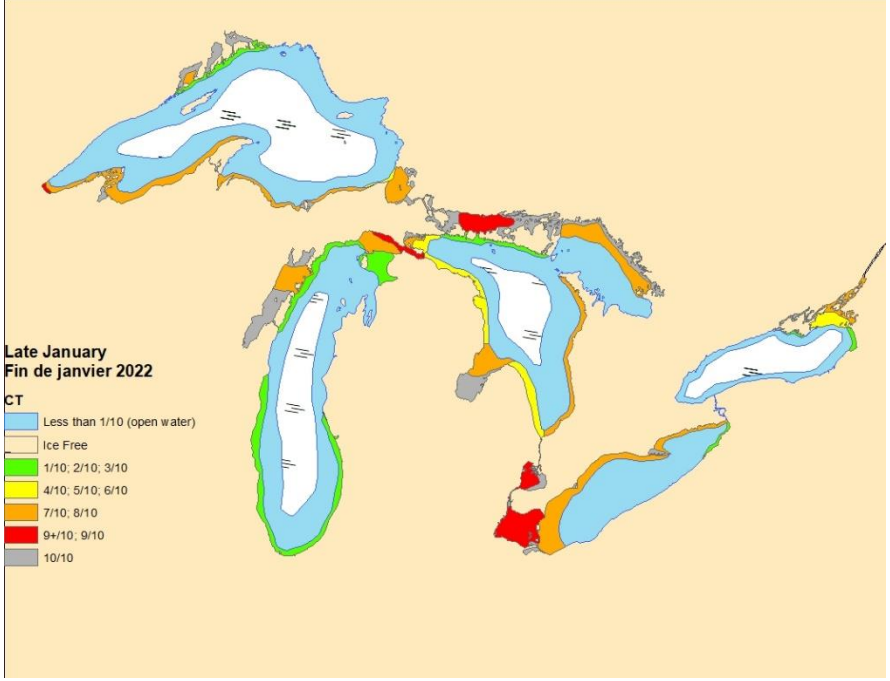
Above: 4 January 2021 conditions

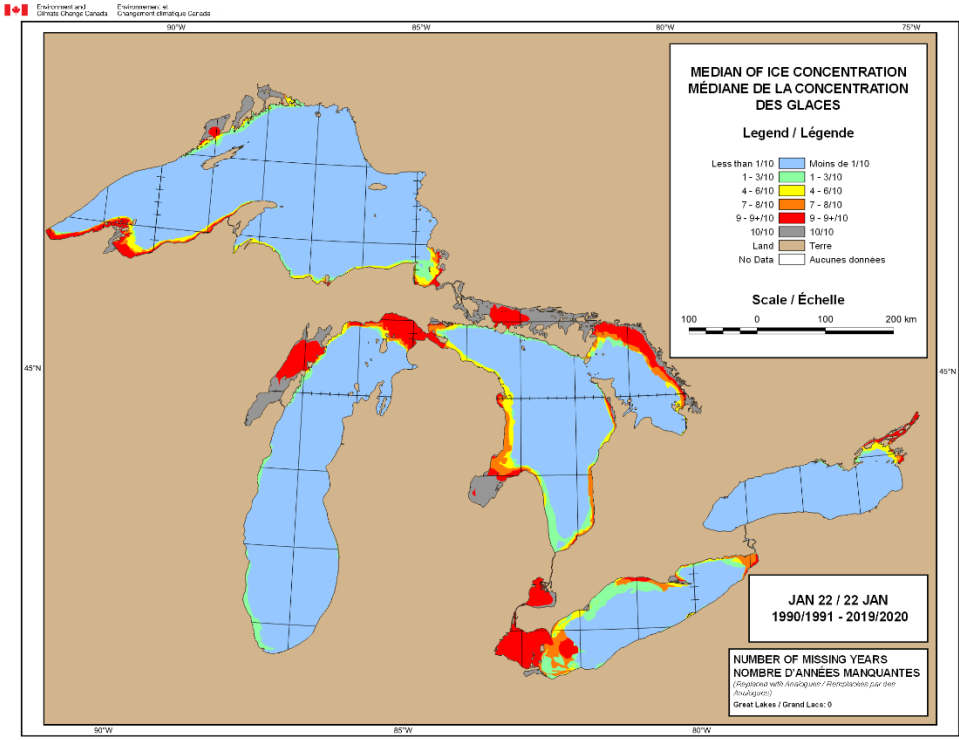
Top Right: early January 2022 Forecast

Bottom Right: Median ice concentration for 1 January 1990-2020

Late January





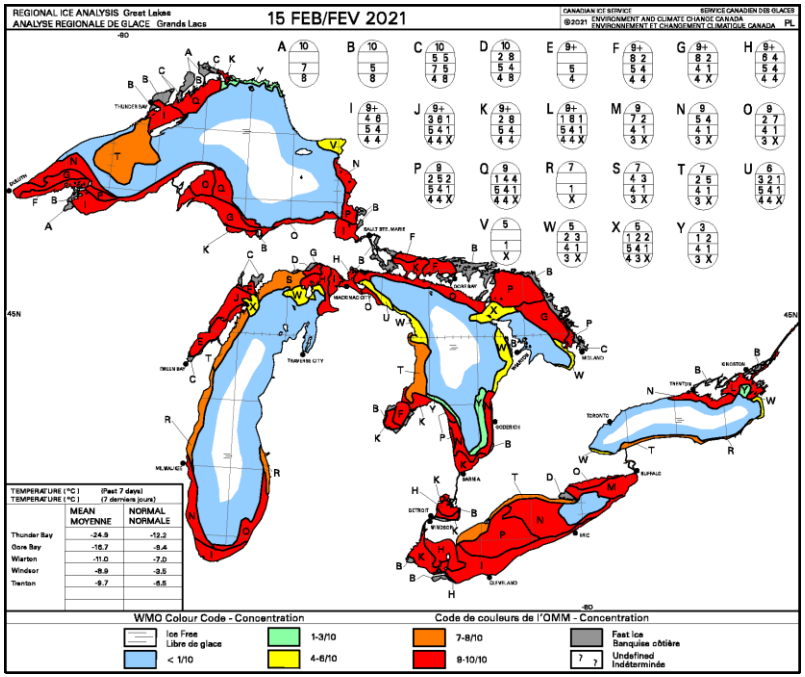


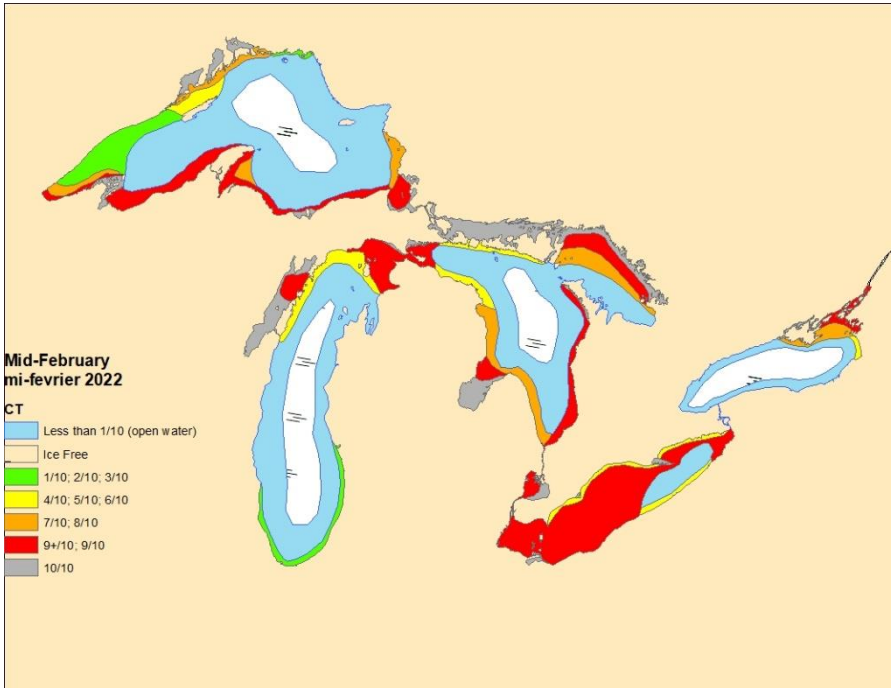
Above: 25 January 2021 conditions.

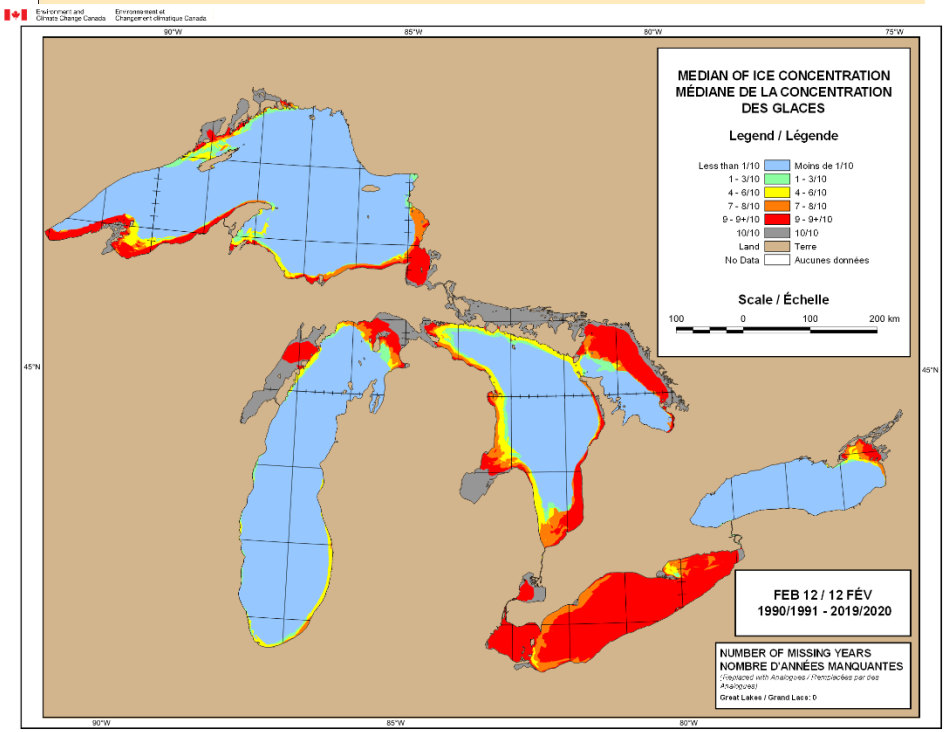
Top Right: late January 2022 Forecast

Bottom Right: Median ice concentration for 29 January 1990-2020

Mid-February





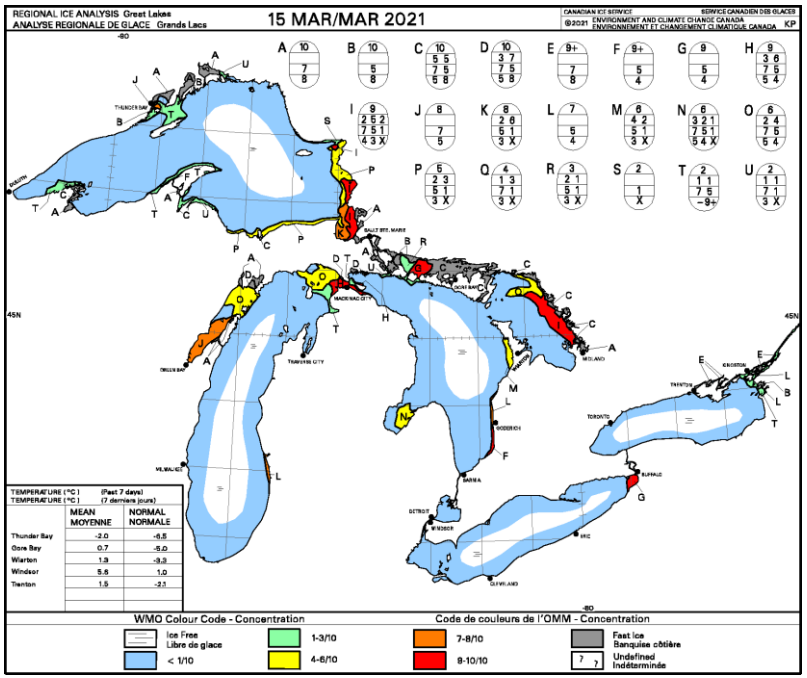


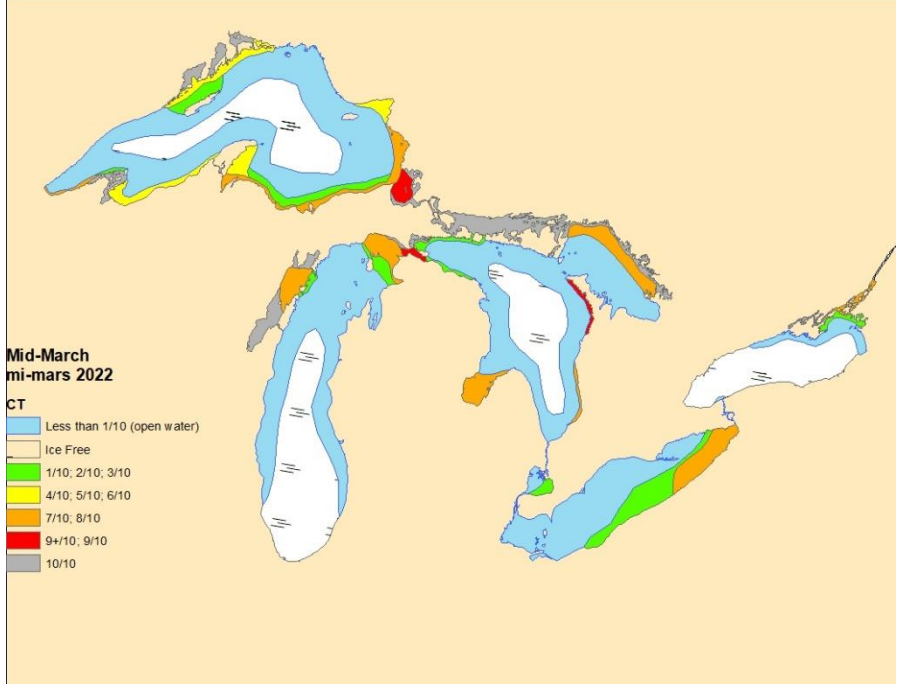
Above: 15 February 2021 conditions.

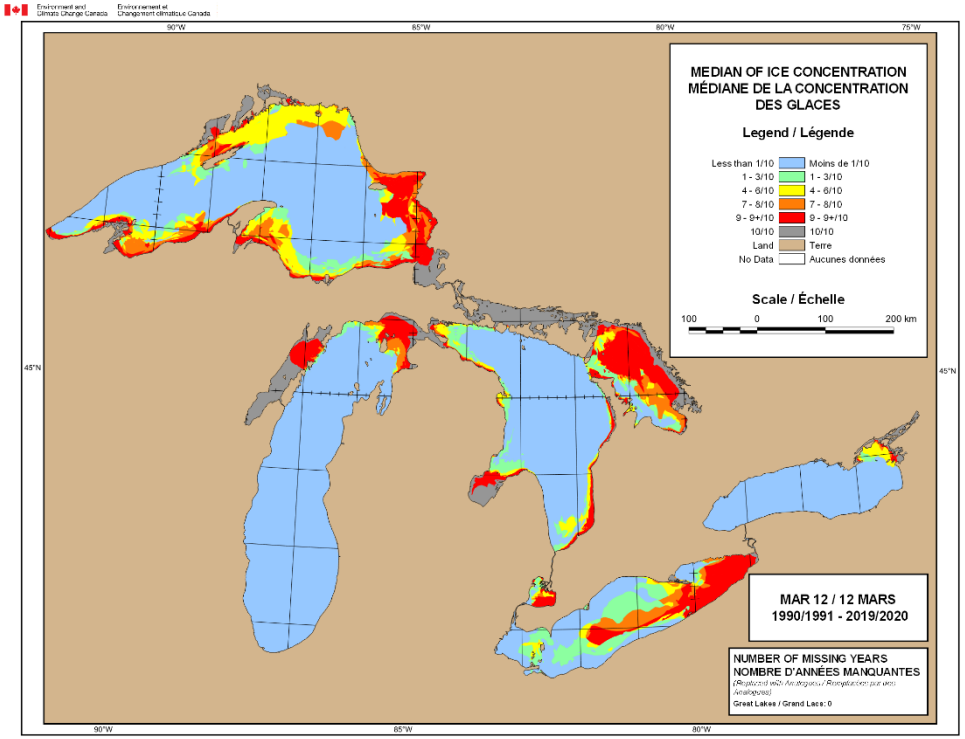
Top Right: mid-February 2022 Forecast

Bottom Right: Median ice concentration for 19 February 1990-2020

Mid-March







Above: 15 March 2021 conditions.

Top Right: mid-March 2022 Forecast

Bottom Right: Median ice concentration for 19 March 1990-2020

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https://www.canada.ca/en/environment-climate-change/services/ice-forecasts-observations/latest-conditions.html

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