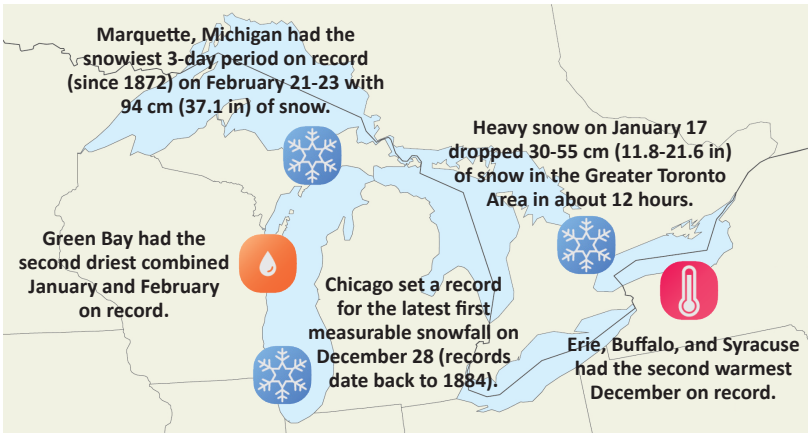
Quarterly Climate Impacts and Outlook

Great Lakes Region

March 2022

Great Lakes Significant Events – *December 2021 - February 2022*



December ranked among the top ten warmest for numerous cities across the southern portion of the basin. This near-record warmth contributed to a delayed first snowfall and reduced monthly snow totals. Erie had the fourth-least snowy December on record, with a 61 cm (24 in) deficit.

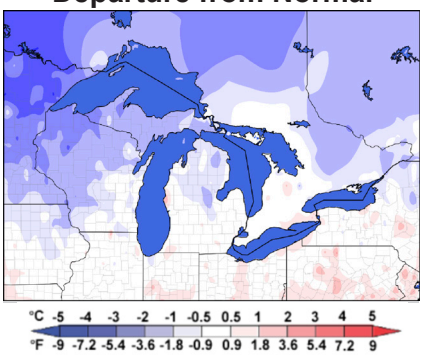
On December 10-11, a strong storm system brought near-record high temperatures and damaging wind gusts of 96-130 kph (60-80 mph) across the eastern basin. A seiche on Lake Erie caused water levels to rise by 3.2 meters (10.57 ft) at Buffalo, NY, the site's sixth-highest crest since at least 1975.

A significant winter storm January 16-17 blanketed the eastern basin with 25-61 cm (9.8 – 24 in) of snow, most falling rapidly. Buffalo, NY, had 11.7 cm (4.6 in) of snow in a single hour. Eastern Ontario had peak snowfall rates of 12 cm (4.7 in) per hour. Erie had the 2nd snowiest January day and wettest January day on record during that storm. Two of the three snowiest January days on record (since 1884) in Buffalo occurred this January.

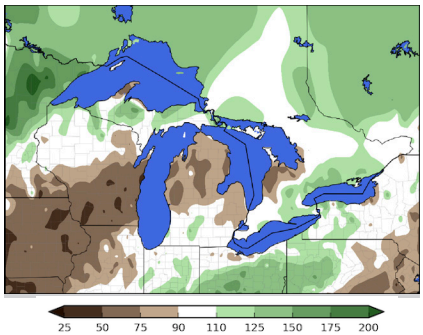
An above-normal number of fast-moving "clipper" systems throughout the winter affected the northwest portion of the basin. This led to higher-than-normal snowfall and much below-normal temperatures.

Regional Climate Overview – *December 2021 - February 2022*

Winter 2022 Temperature Departure from Normal



Winter 2022 Precipitation Percent of Normal



Precipitation normals based on 1991-2020. Temperature normals based on 1991-2020 (U.S.) and 1981-2010 (Canada).

Air Temperature and Precipitation

December was as much as 4°C (7°F) warmer-than-normal but January was as much as 5°C (9°F) colder-than-normal. February ranged from 6°C (11°F) colder-than-normal in the western Superior basin to 1°C (2°F) warmer-than-normal in the southern Erie and Ontario basins. Winter ranged from 4°C (11°F) colder-than-normal to 1°C (2°F) warmer-than-normal.

December precipitation was 97% of average for the overall basin, with all basins but Superior being near-or below-average. January was dry at 44% of average, with the Michigan-Huron basin having its driest January on record. February precipitation was 110% of average for the basin. Overall, winter precipitation was 82% of average for the basin.

Current Water Levels

End of February water levels were above-average on all lakes, except Lake Superior, which was below-average. Compared to last year's end of February levels,

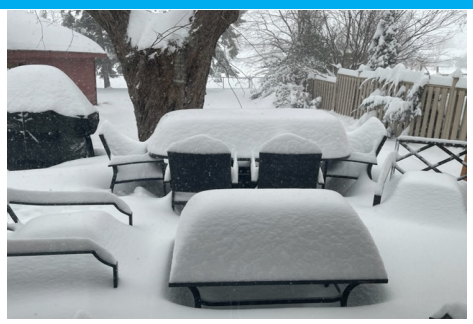
Lake	End of Feb. 2022 Level Compared to:		Change in Level from beg. of Dec. to end of Feb:	
	Average for Feb	Feb. 2021	2020-21 Change in Level	Average Change in Level
Sup.	-9 cm	-28 cm	-16 cm	-20 cm
Mich.-Huron	+23 cm	-43 cm	-18 cm	-8 cm
Erie	+45 cm	-5 cm	-9 cm	+3 cm
Ont.	+30 cm	+44 cm	+8 cm	+10 cm

all of the lakes were experiencing lower water levels, except for Lake Ontario. From the beginning of December to the end of February, water levels declined on Lakes Superior, Michigan-Huron, and Erie, while on Lake Ontario the water level rose 8 cm. Notably, Lake Michigan-Huron fell 10 cm more than it does on average, while Lake Erie declined 12 cm more than its average for this time period. On average, from December through February, Lakes Superior and Michigan-Huron typically decline, while Lakes Erie and Ontario typically experience a rise in lake level.

Contact: Melissa Widhalm (mwidhalm@purdue.edu)

Regional Impacts – *December 2021 - February 2022*

Ice floe on Lake Erie as seen from a Coast Guard helicopter (credit: United States Coast Guard)



Residential area in Toronto after January 17 snow storm (credit: Mark Schuster)

Ice moving downstream on the Vermillion River in Ohio (credit: NWS Cleveland)

Recreation: Several ice rescues across the Great Lakes and, unfortunately, one fatality on Lake Michigan resulted from highly variable and rapidly changing lake ice conditions in February. The largest rescue occurred on February 6 when the Coast Guard saved 18 people from an ice floe on Lake Erie. Additional rescues were reported on Lake Superior and Lake Huron. Below-average snowfall in central and southern Wisconsin reduced opportunities for snowmobiling, tubing, snowshoeing, and skiing. In Brown County (Green Bay area), all snowmobile trails remained closed through winter. West of Milwaukee, Lapham Peak increased artificial snow-making by over 20 percent.

Toronto Snow Storm: The January 17th event was among the most significant snow storms to affect the Greater Toronto Area in decades. Rapidly falling snow crippled communities across the Golden Horseshoe with major roadways shut down and vehicles stranded, schools canceled, and airports closed.

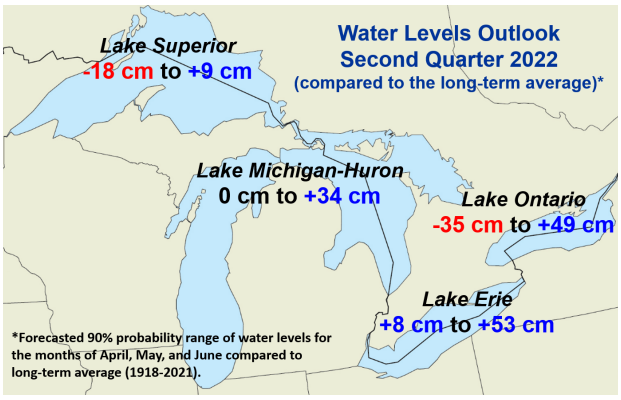
Ice Jams: Warm temperatures, heavy rainfall, and snowmelt led to ice jams and some flooding in mid- and late-February. In western New York, some residents were evacuated, and several roads were closed. Multiple swift-water rescues and road closures were reported on the Vermillion River in northeast Ohio. In Michigan, ice jams on the River Raisin caused street flooding in Monroe. About 100 homes were evacuated northwest of Toronto when an ice blockage caused flooding on the Credit River.

Regional Outlook – *April - June 2022*

Air Temperature and Precipitation

Canadian and American forecasters are predicting an increased chance of above-normal temperatures across the entire Great Lakes basin, with chances increasing southeastward across the region. Above-normal precipitation is expected for the southern portion of the basin, with equal chances of above-, near-, or below-normal precipitation in the north.

Great Lakes Water Levels



The March water level forecast indicates that in the second quarter, water levels will be in a period of seasonal rise, and some lakes will likely reach the seasonal peak. The amount of snowmelt and rainfall plays a significant role in rising lake levels during the spring. On Lake Superior, water levels are likely to remain below long-term average levels, while Lakes Michigan-Huron and Erie are forecast to stay above-average. Lake Ontario is forecast to be above the average levels at the beginning of the period but will likely transition to average levels by June.

Partners

- *Midwestern Regional Climate Center*
- *Environment and Climate Change Canada*
- *Agriculture and Agri-Food Canada*
- *Northeast Regional Climate Center*
- *Great Lakes Region State Climatologists*
- *NOAA*
  - *NCEI*
  - *GLERL*
  - *CoastWatch Great Lakes Node*
  - *Great Lakes Sea Grant Network*
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  - *North Central River Forecast Center*
  - *Ohio River Forecast Center*
  - *Climate Prediction Center*
  - *Office for Coastal Management*
- *GLISA*
- *US Army Corps of Engineers, Detroit District*
- *NIDIS*
- *USDA Midwest Climate Hub*

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