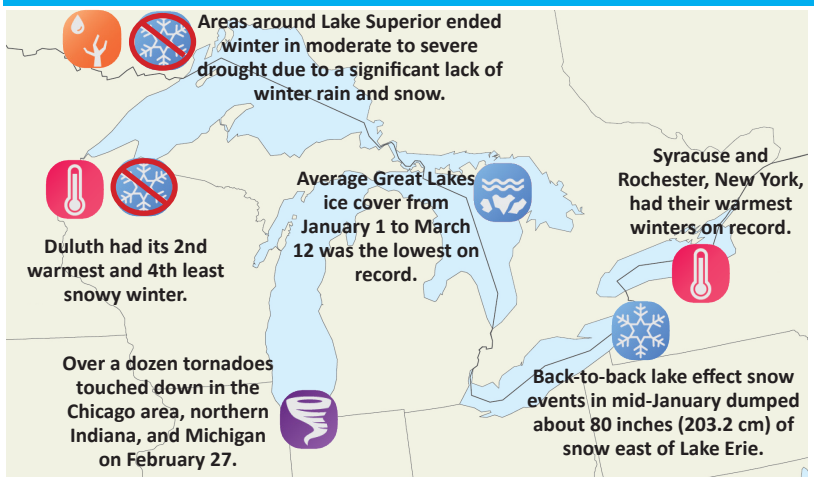
Quarterly Climate Impacts and Outlook

Great Lakes Region

March 2024

Great Lakes Significant Events – *December 2023 - February 2024*



Above-normal temperatures were widespread and persistent across the basin in December. Green Bay, Milwaukee, and Muskegon had their warmest December on record, with most other locations across the basin with a top five warmest December. Most precipitation fell as rain instead of snow.

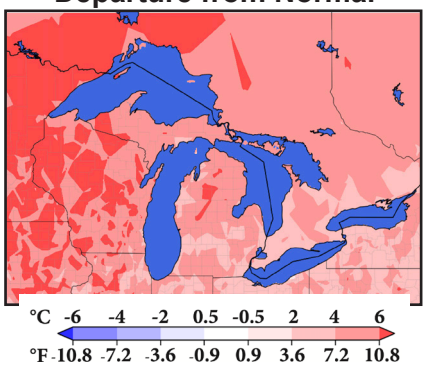
A brief blast of winter weather affected the basin in mid-January, fueling bitter wind chills in the west and isolated heavy snow in the east. Cold temperatures lingered for almost 2 weeks, allowing ice extent on the Great Lakes to reach a season-high of 18 percent on January 22 before quickly dropping back to historically low levels in February.

Unseasonable warmth returned basin-wide in February. On February 27, numerous locations across Michigan had their earliest 70°F (21.1°C) temperature on record.

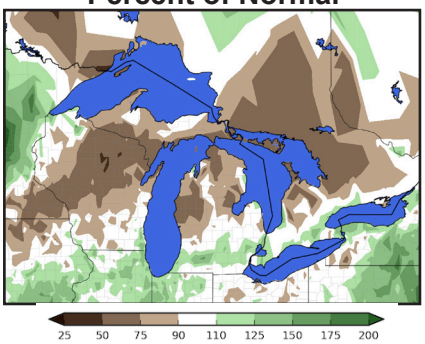
The Great Lakes basin had its warmest winter on record. Toronto, Sault-Ste Marie, Sudbury, Parry Sound, Green Bay, Lansing, and many other cities had their warmest winter on record. Around Lakes Superior and Erie, winter snowfall was 30-60 inches (76-152 cm) below average (or less than 50 percent of average).

Regional Climate Overview – *December 2023 - February 2024*

Winter Temperature Departure from Normal



Winter Precipitation Percent of Normal



Precipitation and temperature normals based on 1991-2020.

Air Temperature and Precipitation

December ranged from 3°C (5°F) above normal in the Ontario basin to more than 7°C (13°F) above normal in the Superior basin. January ranged from near normal in the southern Erie and Michigan basins to 6°C (11°F) above normal in the Superior basin. February ranged from 4°C (5°F) above normal in the eastern basins to more than 7°C (13°F) above normal in the western Superior basin. Winter was 2°C (4°F) to more than 6°C (11°F) above normal.

All basins but Ontario were dry in December, with the Great Lakes basin seeing 76% of average precipitation. All basins except Superior were wet in January, with the overall basin seeing 108% of average. All basins were dry in February, with Ontario being record dry and the overall basin seeing 46% of average. The basin saw 78% of average for winter, with all basins but Ontario being dry.

Current Water Levels

Lake	End of Feb 2024 Level Compared to:		Change in Level from beg. of Dec. to end of Feb:	
	Average for Feb	Feb 2023	2023-24 Change in Level	Average Change in Level
Sup.	-4 cm	-24 cm	-18 cm	-19 cm
Mich.-Huron	+9 cm	-2 cm	-7 cm	-8 cm
Erie	+35 cm	-5 cm	+16 cm	+4 cm
Ont.	+6 cm	-13 cm	+27 cm	+10 cm

All lakes had end of February water levels below their levels from last year. Also, all lakes, except Lake Superior, were above their average levels for the end of February. Lakes Superior and Michigan-Huron experienced a net decrease in water levels that was close to their average change from the beginning of December to the end of February. In contrast, Lakes Erie and Ontario experienced above-average rises in water levels over the same time horizon due to warm and wetter conditions in December and January.

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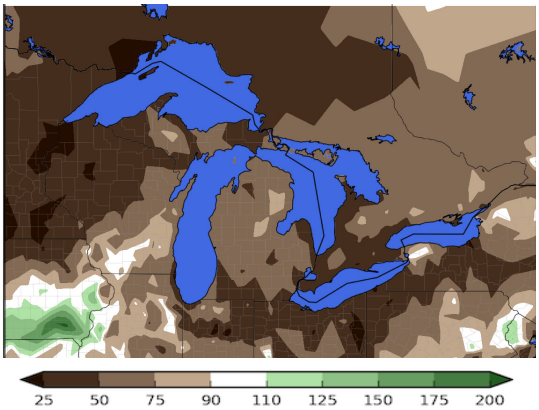
Regional Impacts – *December 2023 - February 2024*

Recreation: Below-normal snowfall, reduced snowpack, and limited lake ice had widespread impacts on recreation and tourism across the basin. Numerous dog sled races in Michigan and Minnesota were canceled due to poor trail conditions. In Michigan, the Black Lake sturgeon season was canceled due to marginal ice. Southern Ontario had its worst ice fishing season in decades, and local businesses in New York reported economic hardships due to low ice cover. Emergency loans were made available to Michigan businesses impacted by the lack of snowfall.

Agriculture and Ecosystems: Mild winter temperatures resulted in record to near-record early tapping of maple trees in Michigan, New York, Ontario, and Wisconsin. Plant phenology was ahead of schedule basin-wide, creating concerns about the potential for spring freeze damage if development stays ahead of schedule in early spring. Black bears emerged from hibernation early in Ontario, disrupting residents in their search for food.

Lake-Effect Snow Events: On January 13, wind gusts up to 68 mph downed trees and wires and produced a seiche on Lake Erie. An intense lake-effect snow event ensued through January 15, dumping up to 41 inches (104 cm) of snow east of Lake Erie and up to 22 inches (56 cm) east of Lake Ontario. Whiteout conditions led to a travel ban and the postponement of a National Football League game. Another storm, January 16-18, dropped 40-50 inches (102-127 cm) of snow downwind of Lakes Ontario and Erie. At least three storm-related deaths occurred. In Rochester, a plane slid off a taxiway amid snowy conditions.

Winter Snowfall
Percent of Normal



Lack of snow cover in Minnesota (photo credit: Minnesota State Climatology Office)

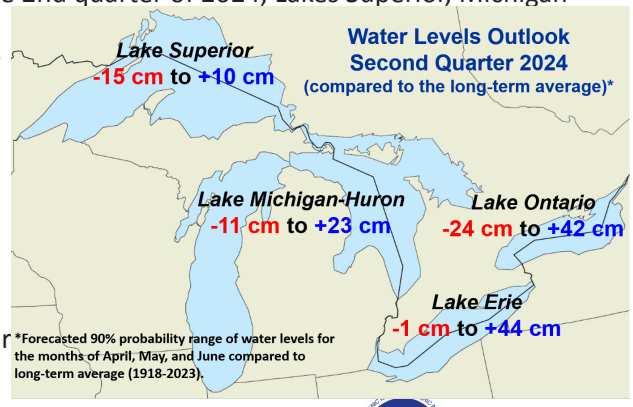
Regional Outlook – *April - June 2024*

Temperature and Precipitation

American and Canadian forecasts indicate above-normal temperatures for the entire Great Lakes basin. The American forecast shows equal chances of below-, above, and near-normal precipitation basin-wide. The Canadian forecast shows a slight chance of below-normal precipitation in the western portion of the basin.

Great Lakes Water Level Outlook

The March forecast indicates that second quarter (April, May, June) water levels on Lakes Superior and Michigan-Huron will be in their period of seasonal rise. Lakes Erie and Ontario are forecast to be in their seasonal rise and peak in May. Water levels typically rise during the spring months due to increased rainfall and snowmelt runoff. In the 2nd quarter of 2024, Lakes Superior, Michigan-Huron, and Ontario could have water levels above or below average, depending on conditions. If wetter (drier) conditions occur, above (below) average water levels are likely. For Lake Erie, above-average water levels will likely continue in the 2nd quarter under most scenarios.



Wildfire

The National Interagency Coordination Center (US) indicates an above-normal wildfire risk around Lake Superior and west of Lake Michigan in April. Canadian authorities indicate a near-normal wildfire risk.

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 and IL-IN Sea Grant Networks
  - 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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