LEVEL news

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Great Lakes – St. Lawrence River Water Levels

A slow start to the seasonal rise in all the Great Lakes

In March, the Great Lakes Basin experienced the following:

- The mean monthly water level of Lake Superior was slightly below average, while all the other lakes remained above average.
- Lake Superior experienced wetter than average (1918-2023) water supply conditions (a combination of the precipitation, evaporation, and runoff), while all the other lakes experienced very dry water supply conditions.
- March precipitation amounts were close to average (calculated from 1981-2010) for Lake Superior, slightly below average for Lakes Michigan-Huron and Erie, and far below average for Lake Ontario.
- Lake Superior experienced no monthly change in its water level but this is close to its average decline of 1 cm. Lake Michigan-Huron had a small decline at a time it usually rises, while the rises seen by lakes Erie and Ontario were both 10 cm less than their averages for March.

Great Lakes water level information:

March 2024 monthly mean levels

Lake	Level[a]	Compared to March monthly average (1918–2023)	Compared to March 2023	Compared to record high (1918-2023)	Notes
Superior	183.21 m	3 cm below	22 cm below	40 cm below	-
Michigan–Huron	176.39 m	7 cm above	4 cm below	83 cm below	-
St. Clair	175.20 m	26 cm above	10 cm below	63 cm below	-
Erie	174.42 m	31 cm above	12 cm below	53 cm below	-
Ontario	74.73 m	4 cm above	15 cm below	64 cm below	-

[a]Water levels are referenced to International Great Lakes (Vertical) Datum 1985 (IGLD85). For more information, please visit International Great Lakes Datum Update – Great Lakes Coordinating Committee at https://www.greatlakescc.org/en/international-great-lakes-datum-update/

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This is the time of year when all lakes except Lake Superior typically would be continuing their seasonal rise under average water supplies. Lake Superior historically has a later seasonal rise due to its northerly location and late freshet in comparison to the remainder of the lakes.

With water levels remaining above average on some lakes, and the possibility of large storms and winds, low-lying areas are at risk for accelerated coastline erosion and flooding. For current information and forecasts, please refer to the sources listed below.

Unseasonably warm temperatures throughout the 2023-2024 ice season resulted in the lowest ice cover on the Great Lakes since records began in 1972. A review of the ice conditions throughout this past winter is provided below.

Great Lakes water level information:

March lake level changes[a]

Lake	March lake level change	March monthly average change (1918-2023)	Compared to average March change (1918-2023)	Notes
Superior	no change	1 cm decline	less than average decline	-
Michigan–Huron	1 cm decline	5 cm rise	decline instead of rise	-
St. Clair	6 cm rise	17 cm rise	less than average rise	-
Erie	4 cm rise	14 cm rise	less than average rise	-
Ontario	4 cm rise	14 cm rise	less than average rise	-

[a] Lake level changes are based on the differences in levels at the beginning of the months and not the monthly average levels.

Great Lakes water level information: Beginning-of-April level[a]					
Lake	**Level[a,b]**	**Compared to April beginning-of-month average (1918–2023)**	**Compared to April 2023**	**Compared to record high (1918-2023)**	**Notes**
Superior	183.22 m	2 cm below	20 cm below	40 cm below	-
Michigan–Huron	176.38 m	3 cm above	7 cm below	89 cm below	-
St. Clair	175.22 m	22 cm above	16 cm below	74 cm below	-
Erie	174.44 m	26 cm above	14 cm below	62 cm below	-
Ontario	74.74 m	4 cm below	24 cm below	75 cm below	-

[a] At the beginning of April, all of the Great Lakes were at least 2 cm above their chart datum level. Chart datum is a reference elevation for each lake that provides more information on the depth of water for safe boat navigation on the lakes. For more information, please visit Low Water Datum – Great Lakes Coordinating Committee at https://www.greatlakescc.org/en/international-great-lakes-datum-update/low-water-datum/

[b] Water levels are referenced to International Great Lakes (Vertical) Datum 1985 (IGLD85). For more information, please visit International Great Lakes Datum Update – Great Lakes Coordinating Committee at https://www.greatlakescc.org/en/international-great-lakes-datum-update/

Water levels forecast

Lake Superior ended the month just below its average level and is expected to remain near average under typical water supply conditions. If there are very wet water supply conditions, lake levels could move above average, while very dry conditions would result in lake levels moving further below average.

Lake Michigan-Huron is expected to remain close to average under typical water supply conditions, although wetter than average conditions could result in a further increase above average. Drier than average conditions could result in lake levels falling below average within the next few months.

Lake Erie is expected to stay above average under most water supply scenarios. It would take very dry water supply conditions for lake levels to fall below average by early summer.

Lake Ontario water levels are expected to remain near or a bit below average under typical water supply conditions. Wetter than average water supply conditions may result in the level remaining above average, while drier than average water supply conditions would result in the level moving below average.

For more information on the probable range of water levels, consult https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence.html#projection.

For a graphical representation of recent and forecasted water levels on the Great Lakes, refer to https://www.tides.gc.ca/en/monthly-water-level-bulletin-great-lakes-and-montreal-harbour.

March basin statistics			
Lake	**Precipitation (percentage of LTA) [a,b]**	**Net basin supply (probability of exceedance) [c,d]**	**Outflows (percentage of LTA)[a]**
Superior	105%	33% (wet)	97%
Michigan-Huron	88%	76% (very dry)	114%
Erie	95%	90% (very dry)	113%
Ontario	48%	78% (very dry)	113%

[a] As a percentage of the long-term average (LTA).
[b] Environment and Climate Change Canada – Canadian Precipitation Analysis System
[c] <5% extremely wet; <25% very wet; <45% wet; 45-55% average; >55% dry; >75% very dry; >95% extremely dry.
[d] Please refer to the LEVELnews "What is net basin supply" (https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence.html#projection) for a description of net basin supply.
Note: The figures contained in this report are provisional and are subject to change. Data are calculated from the best available observations at the time of posting.

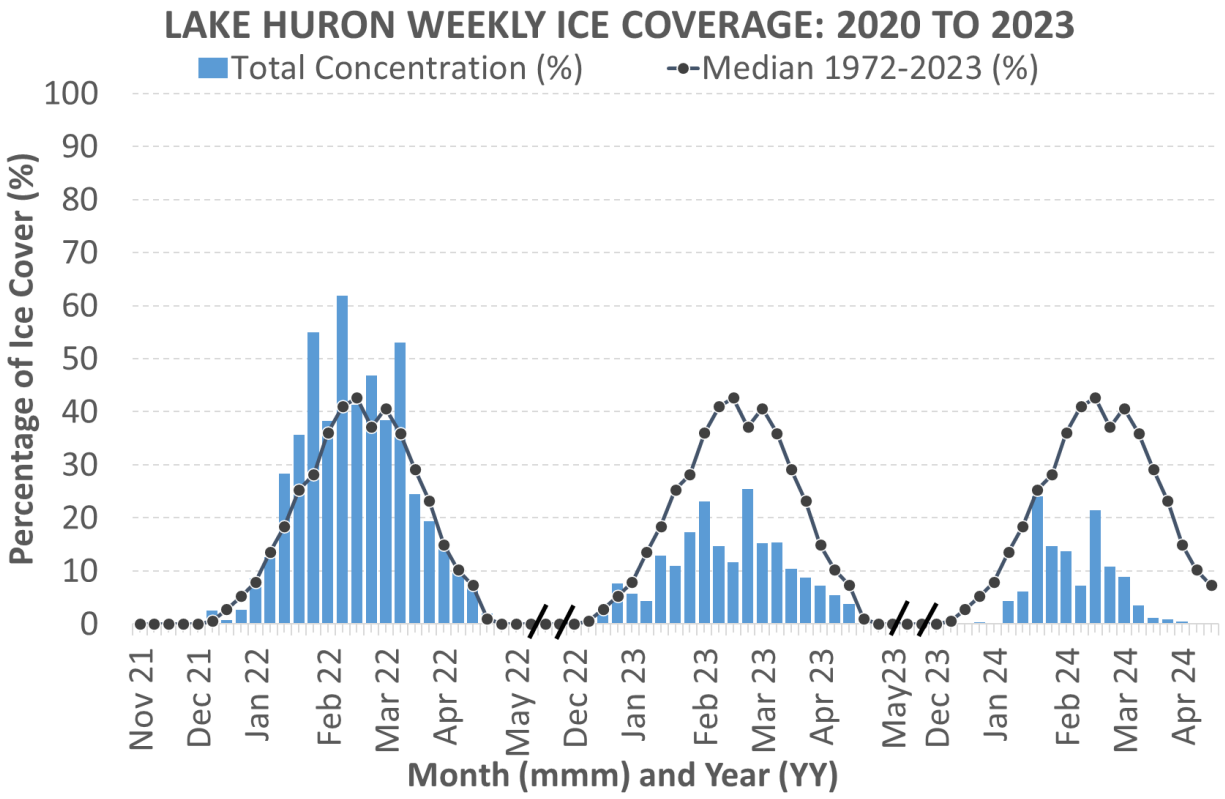
The 2023-2024 lake ice season

With the warmest winter season reported in some areas of the Great Lakes, it is not surprising that the ice content was the lowest on record. There were only a few cold air outbreaks during the winter and one extended cold period in mid-January. These cold temperatures were never sustained enough to create significant long-lasting ice cover on any of the lakes. For much of February and March, the overall ice coverage for all the Great Lakes was at its lowest level since records began in 1972.

Each of the Great Lakes is unique in its typical annual ice coverage. Lake Erie typically has the highest ice coverage due to its shallow depth and Lake Ontario generally has the lowest ice cover as it is very deep. Lake Ontario's depth allows the lake to retain more heat and resist ice formation throughout the winter months. Lake Superior is the deepest of all the Great Lakes but has a much greater average ice cover due to colder average water temperatures from its northerly location.

The accompanying figures show Lake Huron and Lake Ontario's ice cover over the past three years. They show how much less than average the ice coverage was this past season and how much earlier than average the lakes were ice-free. These figures use data from the Canadian Ice Service (https://iceweb1.cis.ec.gc.ca). Note that the double lines in the figure indicate a break in the data due to ice free conditions.

Around the Great Lakes, there were several environmental and economic effects of the low ice cover. With lower ice cover, recreational activities such as ice fishing and snowmobiling were impacted, as well as the businesses that rely on them.


LAKE HURON WEEKLY ICE COVERAGE: 2020 TO 2023
Total Concentration (%)
Median 1972-2023 (%)
Percentage of Ice Cover (%)
100
90
80
70
60
50
40
30
20
10
0
Nov 21
Dec 21
Jan 22
Feb 22
Mar 22
Apr 22
May 22
Dec 22
Jan 23
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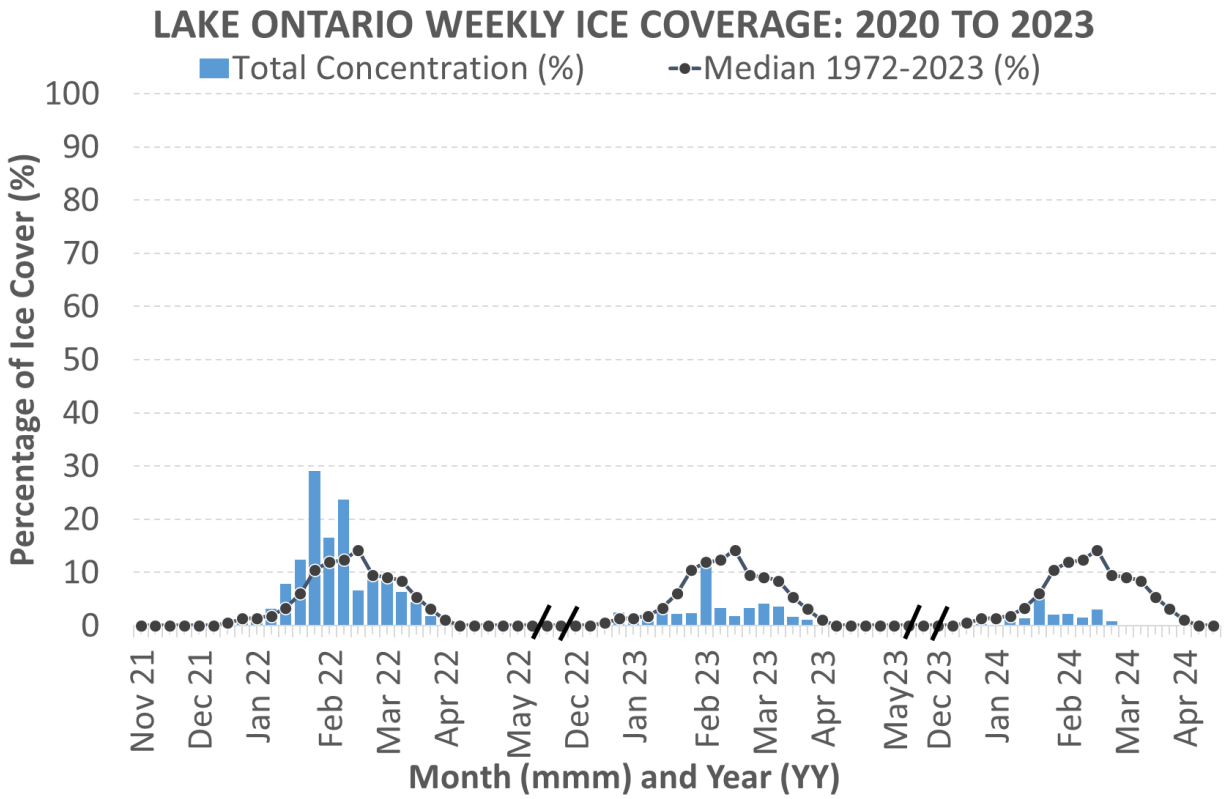
Month (mmm) and Year (YY)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May 22
Dec 22
Jan 23
Feb 23
Mar 23
Apr 23
May23
Dec 23
Jan 24
Feb 24
Mar 24
Apr 24
Month (mmm) and Year (YY)

Flood Information

With water levels remaining high on some lakes, there is a high risk of flooding. Great Lakes water levels are difficult to predict weeks in advance due to natural variations in weather. To stay informed about Great Lakes water levels and flooding, visit the Ontario flood forecasting and warning program website at https://www.ontario.ca/flooding.

Additional information can also be found at https://www.ijc.org/en/lsbc, and https://ijc.org/en/loslrb.

Information on current water levels and marine forecasts

Monthly levels: A monthly water level bulletin, produced by Fisheries and Oceans Canada, is available at https://www.tides.gc.ca/en/monthly-water-level-bulletin-great-lakes-and-montreal-harbour and click on the link "Full Monthly Water Level Bulletin for the Great Lakes and Montréal Harbour (PDF)". This publication is intended to complement the information provided by LEVELnews on a monthly basis.

Daily levels: Current daily lake-wide average levels of all the Great Lakes are available at https://lre-wm.usace.army.mil/reports/greatLakes/greatLakesLevelsThisMonth/greatLakesLevelsThisMonth.html. The daily average water level is an average taken from a number of gauges across each lake and is a good indicator of the overall lake level when it is changing relatively rapidly due to recent high precipitation.

Hourly levels: Hourly lake levels from individual gauge sites can be found at the Government of Canada Great Lakes Water Level Gauging Stations website at https://canada-preview.adobecqms.net/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data.html. These levels are useful for determining real-time water levels at a given site, however, it should be noted that they are subject to local, temporary effects on water levels such as wind and waves.

Marine forecasts: A link to current Government of Canada marine forecasts for wave heights for each of the Great Lakes can be found at https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data.html under the "Wave and wind data heading". Current marine forecasts for Lakes Superior, Huron, Erie and Ontario are available by clicking on the link of the lake in which you are interested. To view a text bulletin of recent wave height forecasts for all of the Great Lakes, click on the "Text bulletin wave height forecasts for the Great Lakes and St. Lawrence River" link.

FOR MORE INFORMATION:

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