

## Great Lakes – St. Lawrence River Water Levels

### 2023 begins with above average levels on Lakes Superior, Michigan/Huron, and Erie and near average levels on Lake Ontario

During December, the Great Lakes Basin experienced the following:

- The mean monthly water levels of all the Great Lakes were above average, except for Lake Ontario, which was below average.
- Lake Superior experienced average precipitation. Lakes Michigan-Huron and Erie received less than average precipitation, while Lake Ontario received higher than average precipitation.
- Lakes Superior, Michigan-Huron, and Erie experienced average water supply conditions, while Lake Ontario experienced very wet water supply conditions and an above average rise through December.
- Lakes Superior and Michigan-Huron experienced average December water level declines. Lake Erie declined at a time of year when it typically increases, while Lake Ontario experienced a much greater than average water level rise.

Great Lakes water level information: December 2022 monthly mean levels					
Lake	Level <sup>a</sup>	Compared to December monthly average (1918–2021)	Compared to December 2021	Compared to record high (1918-2021)	Notes
Superior	183.57 m	16 cm above	26 cm above	24 cm below	-
Michigan–Huron	176.47 m	11 cm above	22 cm below	79 cm below	-
St. Clair	175.12 m	18 cm above	30 cm below	68 cm below	-
Erie	174.20 m	18 cm above	38 cm below	69 cm below	-
Ontario	74.47 m	7 cm below	40 cm below	73 cm below	-

<sup>a</sup>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/>

**Get notified when a new edition of LEVELNews is available!**

Did you know that you can opt in to be notified whenever a new edition of LEVELNews is available?

Visit the LEVELnews subscription page to sign up for email notifications  
[\(https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence/subscribe.html\)](https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence/subscribe.html)

You can unsubscribe at any time.

This is the time of year when both Lakes Erie and Ontario have reached their lowest water levels of the season. From this point on, they are expected to hold steady and then start to rise over the next few months, although Lake Ontario appears to have already begun its seasonal rise this year. Typically, Lakes Superior and Michigan/Huron should continue their seasonal decline for a few more months before starting to rise again.

With water levels remaining above average in 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.

With 2022 in the books, we can look at the Great Lakes levels throughout the year. Read more about it below.

Great Lakes water level information:				
December lake level changes <sup>a</sup>				
Lake	December lake level change (1918–2021)	December monthly average change (1918-2021)	Compared to average December change (1918-2020)	Notes
Superior	8 cm decline	8 cm decline	average decline	-
Michigan–Huron	7 cm decline	5 cm decline	more than the average decline	-
St. Clair	21 cm rise	3 cm rise	more than the average rise	-
Erie	2 cm decline	1 cm rise	declined	-
Ontario	9 cm rise	1 cm rise	more than the average rise	-

<sup>a</sup> 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-January level <sup>a</sup>					
Lake	Level <sup>a,b</sup>	Compared to January beginning-of-month average (1918–2021)	Compared to January 2021	Compared to record high (1918-2021)	Notes
Superior	183.54 m	17 cm above	24 cm above	22 cm below	-
Michigan–Huron	176.43 m	10 cm above	23 cm below	83 cm below	-
St. Clair	175.28 m	36 cm above	17 cm below	59 cm below	-
Erie	174.18 m	16 cm above	44 cm below	71 cm below	-
Ontario	74.53 m	2 cm below	35 cm below	66 cm below	-

<sup>a</sup> At the beginning of January, all of the Great Lakes were at least 33 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/>

<sup>b</sup> 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 is currently above its average level and is expected to remain so under most water supply conditions.

Lake Michigan-Huron is expected to remain above average under most water supply conditions.

Lake Erie is expected to stay above average under most water supply scenarios.

Lake Ontario is near average and is expected to remain so under typical water supply conditions within the next few months. Water levels could move above average if wetter than average water supply conditions are experienced or move below average if drier than average conditions prevail.

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>.

December basin statistics			
Lake	Precipitation (percentage of LTA) <sup>a,b</sup>	Net basin supply (probability of exceedance) <sup>c,d</sup>	Outflows (percentage of LTA) <sup>a</sup>
Superior	104%	48% (average)	101%
Michigan-Huron	68%	55% (average)	110%
Erie (including Lake St. Clair)	68%	46% (average)	110%
Ontario	134%	26% (wet)	106%

<sup>a</sup> As a percentage of the long-term average (LTA).  
<sup>b</sup> United States Army Corps of Engineers (<https://lre-wm.usace.army.mil/reports/greatLakes/greatLakesPrecipitationLastMonth/greatLakesPrecipitationLastMonth.html>)  
<sup>c</sup> <5% extremely wet; <25% very wet; <45% wet; 45-55% average; >55% dry; >75% very dry; >95% extremely dry.  
<sup>d</sup> 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.

## Review of 2022 Great Lakes water levels

2022 saw the Great Lake levels returning closer to average, following the high lake levels of 2019 to 2021.

Lake Superior started the year with below average levels, returning to above average levels in April that continued for the remainder of the year. Lakes Michigan-Huron and Erie remained above average for the entire year. Lake Ontario dipped to below average water levels in July, remaining below average for the rest of the year, but began an early and steady seasonal rise through November and December approaching average levels in late December.

The year started out wet throughout the Great Lakes Basin, which persisted throughout March, except for the Michigan-Huron Basin, which experienced a dry February and March. The summer months brought normal to dry conditions throughout the Great Lakes Basin. The northern part of the basin experienced wetter conditions overall than the south, with June and December experiencing much higher than average precipitation amounts. The southern portion of the basin experienced dry conditions in the fall, with a large snowfall in November, and wetter conditions throughout November and December.

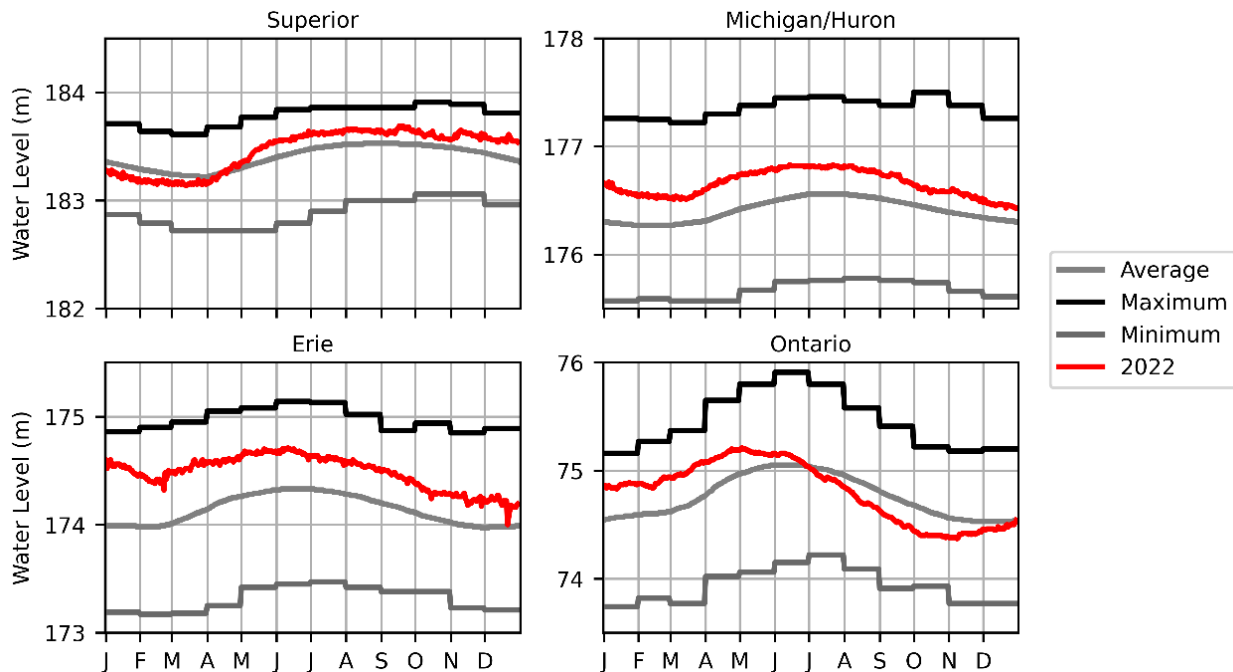
Lake Superior started 2022 with below average levels, which persisted until April. Lake Superior levels continued to decline from January to the end of March, very wet conditions in the spring led to above average lake levels. Lake levels followed typical yearly patterns throughout the remainder of the year, with a small increase in December due to well above average water supply conditions. Lake Superior experienced its yearly peak in September, which is close to the lake’s typical peak timing.

Lake Michigan-Huron experienced higher than average water levels for all of 2022. Levels followed a typical seasonal pattern for the year, experiencing its yearly peak.

Lake Erie started out the year at well above average levels. The lake showed typical seasonal behaviour for the year, aside from January and February, where lake levels decreased more than average due to dry water supply conditions. Lake levels appeared to briefly approach average in late December, but this was a result of a storm surge that temporarily decreased levels to record lows in the western end of the basin and not a reflection of the actual average lake level. Lake Erie’s yearly peak occurred in June, which is typical.

Lake Ontario started the year well above average, which continued through April, due to wetter than average water supply conditions. Lake levels began to decline in May and persisted until early November, due to drier than average water supply conditions in the basin. Lake Ontario’s yearly peak occurred in early May, which is earlier than its typical June peak. Lake Ontario levels began to rise through November and December due to wetter conditions and some heavy snowfalls over the basin and ended the year close to average.

The 2022 levels for all lakes can be seen in the graph below, along with the average and the maximum and minimum levels during the period of record (1918-2021).



## 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/labc>, and <https://ijc.org/en/loslrbc>.

## Information on current water levels and marine forecasts

**Daily levels:** Current daily lake-wide average levels of all the Great Lakes are available at <https://re-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:**

**Frank Seglenieks and Nicole O’Brien**

Boundary Water Issues

Meteorological Service Canada

Environment and Climate Change Canada

Burlington ON L7S 1A1

Email: [LEVELnews-infoNIVEAU@ec.gc.ca](mailto:LEVELnews-infoNIVEAU@ec.gc.ca)

**En162-1E-PDF**

**ISSN 1925-5713**

**EC22024**

**For information regarding reproduction rights, please contact Environment and Climate Change Canada’s Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-938-3860 or email to [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca).**

**Photos: © Environment and Climate Change Canada**

**© His Majesty the King in Right of Canada, as represented by the Minister of Environment and Climate Change Canada, 2023**

**Aussi disponible en français**