

## Great Lakes – St. Lawrence River Water Levels

### Lake Superior experiences extremely wet April

During April, the Great Lakes Basin experienced the following:

- The mean monthly water levels of all the Great Lakes were above average. Of particular note, Lake Superior experienced its ninth highest average water levels for April and its fifth highest beginning of May water level.
- Lake Superior experienced its third highest April water supply conditions (a combination of the precipitation, evaporation, and runoff) on record, while Lake Michigan-Huron also experienced very wet conditions. Lake Erie experienced dry condition, whereas, Lake Ontario experienced wetter than average water supply conditions.
- April precipitation amounts over Lake Superior were one of its highest on record. Lake Michigan-Huron experienced higher than average precipitation, while, Lakes Erie and Ontario saw precipitation closer to average.
- Due to the very wet conditions in the basin, Lake Superior experienced its second highest April water level rise on record, while Lake Michigan-Huron's level rose more than average. Lake Erie experienced a less than average April rise, whereas, Lake Ontario's level rose approximately 40% above average for the month of April.

Great Lakes water level information:					
April 2023 monthly mean levels					
Lake	Level <sup>a</sup>	Compared to April monthly average (1918–2022)	Compared to April 2022	Compared to record high (1918–2022)	Notes
Superior	183.48 m	21 cm above	24 cm above	20 cm below	ninth highest on record
Michigan–Huron	176.56 m	15 cm above	11 cm below	73 cm below	-
St. Clair	175.42 m	35 cm above	2 cm above	49 cm below	-
Erie	174.64 m	39 cm above	5 cm below	41 cm below	-
Ontario	75.13 m	24 cm above	same	52 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 <a href="https://www.greatlakescc.org/en/international-great-lakes-datum-update/">https://www.greatlakescc.org/en/international-great-lakes-datum-update/</a>					

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Typically, all of the lakes continue their seasonal rise at this time of year as we head into the summer.

With water levels remaining above average in all 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.

Later in this issue, we summarize the seasonal Great Lakes level declines over this past season.

Great Lakes water level information:				
April lake level changes <sup>a</sup>				
Lake	April lake level change	April monthly average change (1918-2022)	Compared to average April change (1918-2022)	Notes
Superior	18 cm rise	8 cm rise	greater than average rise	second highest rise on record
Michigan–Huron	18 cm rise	10 cm rise	greater than average rise	-
St. Clair	6 cm rise	10 cm rise	less than average rise	-
Erie	5 cm rise	12 cm rise	less than average rise	-
Ontario	28 cm rise	20 cm rise	greater than 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-May level <sup>a</sup>					
Lake	Level <sup>a,b</sup>	Compared to May beginning-of-month average (1918–2022)	Compared to May 2022	Compared to record high (1918-2022)	Notes
Superior	183.60 m	28 cm above	28 cm above	14 cm below	fifth highest on record
Michigan–Huron	176.63 m	18 cm above	9 cm below	71 cm below	-
St. Clair	175.44 m	34 cm above	1 cm below	48 cm below	-
Erie	174.63 m	33 cm above	1 cm above	43 cm below	-
Ontario	75.26 m	28 cm above	7 cm above	45 cm below	-
<sup>a</sup> At the beginning of May, all of the Great Lakes were at least 40 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 <a href="https://www.greatlakescc.org/en/international-great-lakes-datum-update/low-water-datum/">https://www.greatlakescc.org/en/international-great-lakes-datum-update/low-water-datum/</a> <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 <a href="https://www.greatlakescc.org/en/international-great-lakes-datum-update/">https://www.greatlakescc.org/en/international-great-lakes-datum-update/</a>					

## Water levels forecast

Lake Superior is currently well above its average level and is expected to remain so under most water supply conditions. If there are very wet water supply conditions, lake levels could approach record highs in mid to late summer, while very dry conditions could result in lake levels approaching average.

Lake Michigan-Huron is expected to remain above average under most water supply conditions; it would take very dry conditions to bring the level below average by the end of the summer.

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

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

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>.

April 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	230%	3% (third highest on record)	112%
Michigan-Huron	142%	8% (very wet)	107%
Erie (including Lake St. Clair)	104%	70% (dry)	115%
Ontario	113%	43% (wet)	115%

<sup>a</sup> As a percentage of the long-term average (LTA).  
<sup>b</sup> Environment and Climate Change Canada – Canadian Precipitation Analysis System  
<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.

## Summary of the 2022/23 seasonal decline

By this time of year, all the lakes have typically completed their seasonal declines since last summer or fall. We can now compare these to their averages.

Lake	Average seasonal decline (1918–2022)	2022-23 seasonal decline
Superior	34 cm	22 cm
Michigan–Huron	33 cm	40 cm
Erie	46 cm	49 cm
Ontario	64 cm	81 cm

Lake Superior’s seasonal decline was less than average at 22 cm. Its record seasonal decline occurred in 1939, when it decreased by 58 cm. Lake Superior levels remain well above average with the end of the seasonal decline, resulting in levels much higher than last year but close to those in 2021.

Lake Michigan-Huron declined approximately one third more than its average. This greater than average seasonal decline saw lake levels reach their lowest level since 2014. The record seasonal decline for Lake Michigan-Huron was 79 cm, which occurred in 1977.

Lake Erie saw a slightly higher than average seasonal decline and finished the season with lake levels similar to this time last year. Lake Erie experienced its record decline in 1920, when lake levels decreased by 99 cm.

Lake Ontario experienced a seasonal decline about one third more than average, bringing levels to their lowest since 2013. The previous record high seasonal decline was 119 cm, back in 1998.

Even with greater than average seasonal declines for most lakes, all remain above or well above average. It is important to note that lake levels are always fluctuating and very often just pass through average levels on their way up or down, rather than staying at average levels for long periods of time.

## **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/loslrb>.

## **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://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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