

## Great Lakes – St. Lawrence River Water Levels

### Mild temperatures and high precipitation contribute to rising lake levels on lakes St. Clair, Erie, and Ontario

In January, the Great Lakes Basin experienced the following:

- The mean monthly water level of Lake Superior was below average, while lakes Michigan-Huron and Erie remained above average, and Lake Ontario’s water level moved above average.
- Lake Superior experienced drier than average water supply conditions, while lakes Michigan-Huron, Erie, and Ontario experienced wetter than average or very wet water supply conditions (a combination of the precipitation, evaporation, and runoff).
- December precipitation amounts were less than average for Lake Superior, average for Lake Michigan-Huron, and above average for lakes Erie and Ontario.
- Lakes Superior and Michigan-Huron experienced greater than average lake level declines, while Lake Erie rose at a time when it typically declines. Lake Ontario experienced a much greater than average lake level rise.

Great Lakes water level information: January 2024 monthly mean levels					
Lake	Level <sup>a</sup>	Compared to January monthly average (1918–2022)	Compared to January 2023	Compared to record high (1918-2022)	Notes
Superior	183.32 m	2 cm below	20 cm below	39 cm below	-
Michigan–Huron	176.42 m	10 cm above	2 cm below	84 cm below	-
St. Clair	175.26 m	39 cm above	11 cm above	54 cm below	-
Erie	174.31 m	28 cm above	3 cm above	55 cm below	-
Ontario	74.60 m	2 cm above	5 cm below	56 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/>



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Assuming we receive average water supplies, Lake Superior is expected to continue its seasonal decline into late winter, while the other lakes are expected to begin the transition from their seasonal decline to their seasonal rise in the coming months. It appears, however, that lakes St. Clair, Erie, and Ontario may have already begun their seasonal rise.

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.

See below for a review of water supplies and how their components contribute to our reported values.

<b>Great Lakes water level information:</b>				
<b>January lake level changes<sup>a</sup></b>				
<b>Lake</b>	<b>January lake level change</b>	<b>January monthly average change (1918-2022)</b>	<b>Compared to average January change (1918-2022)</b>	<b>Notes</b>
Superior	8 cm decline	7 cm decline	slightly greater than average decline	-
Michigan–Huron	3 cm decline	2 cm decline	slightly greater than average decline	-
St. Clair	18 cm rise	12 cm decline	large rise instead of a decline	third largest rise on record
Erie	14 cm rise	1 cm decline	large rise instead of a decline	-
Ontario	16 cm rise	5 cm rise	much 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-February level <sup>a</sup>					
Lake	Level <sup>a,b</sup>	Compared to February beginning-of-month average (1918–2022)	Compared to February 2023	Compared to record high (1918–2022)	Notes
Superior	183.28 m	2 cm below	21 cm below	40 cm below	-
Michigan–Huron	176.41 m	10 cm above	2 cm below	86 cm below	-
St. Clair	175.38 m	58 cm above	23 cm above	45 cm below	-
Erie	174.44 m	42 cm above	11 cm above	45 cm below	-
Ontario	74.70 m	9 cm above	2 cm below	49 cm below	-

<sup>a</sup> At the beginning of February, all of the Great Lakes were at least 16 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 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 could result in lake levels moving further below average.

Lake Michigan-Huron is expected to remain above average under either above average or average water supply conditions. Drier than average conditions could result in lake levels falling below average by early spring.

Lake Erie is also expected to stay above average under most water supply scenarios, although very dry water supply conditions could result in lake levels falling below average by late spring.

Lake Ontario water levels are just above average and are expected to remain near 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>.

January 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	79%	57% (dry)	106%
Michigan-Huron	103%	38% (wet)	117%
Erie	173%	11% (very wet)	115%
Ontario	131%	9% (very wet)	116%

<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.

## Review of water supplies in the Great Lakes Basin

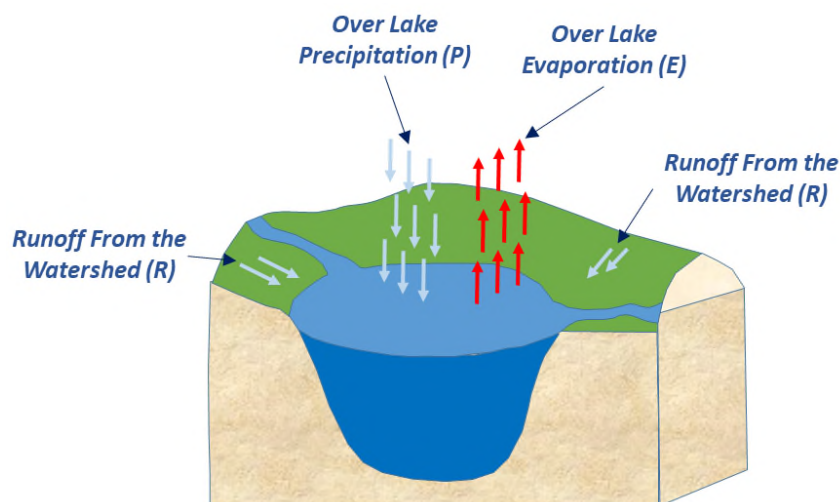
The primary driver of water levels across the Great Lakes-St. Lawrence River basin is the amount of water coming into the system, referred to as the *water supplies*. Net Basin Supply (NBS) (<https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence.html#projection>) is the total of the precipitation that falls directly on the lake surface and the runoff that enters the lake from the land surface, minus the evaporation that comes off the lake, which is shown in the image below. While it may be tempting to associate precipitation directly with water supplies in the Great Lakes Basin, the relationship can be obscured by the magnitude of runoff and over-lake evaporation.

Water supplies are a function of not only precipitation, but also runoff and evaporation; an increase or decrease in any of these components can affect the water balance. Changes to water supplies can be explained by focusing on individual components. Firstly, evaporation over the Great Lakes (<https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence/september-2021.html>), which is driven by the difference between the surface water temperatures and the air temperatures, peaks when surface water temperatures are high, air temperatures are cool, and relative humidity is low. A good example of this occurred in December 2023 when overall water supplies were high but precipitation was average. The increased water supplies were caused by a lack of cold air outbreaks, which resulted in lower than average over-lake evaporation. The magnitude of evaporation over the Laurentian Great Lakes is a substantial component of the water balance. To put it in perspective, if conditions were ideal, the rate of evaporation from the lakes could reach upwards of 1.3 cm per day. If this was applied over the total surface area, it would be close to 20 times the daily flow rate of Niagara Falls.

Additionally, the melting of the snow pack in the Great Lakes Basin can affect the timing of water supplies. For example, there might be a month where precipitation was low, but water supplies were

high due to warmer than average winter temperatures that resulted in increased melting and subsequent runoff into the lake.

LEVELnews references water supplies often because they are the best indicator of the amount of water in the basins. The interaction between these components can result in sometimes contradictory results between precipitation and water supply estimates. It is, however, important to consider that certain events or seasons can result in monthly reported values that may need somewhat more explanation for a complete understanding of the monthly reported water supply values.



## 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

**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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