LEVEL news

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Great Lakes – St. Lawrence River Water Levels

All the Great Lakes water levels remain above average

During January, the Great Lakes Basin experienced the following:

- The mean monthly water levels of all the Great Lakes were above average.
- All the Great Lakes experienced water supply conditions (a combination of the precipitation, evaporation, and runoff), that were well above average, except for Lake Michigan-Huron, which was near average.
- All the lakes received above average precipitation with close to average runoff. The evaporation from the lakes was slightly above average.
- Lakes Superior and Michigan-Huron experienced close to average changes in their water levels during February. In contrast, both Lake Erie and Lake Ontario rose much more than usual.

Great Lakes water level information:

February 2023 monthly mean levels

Lake	Level[a]	Compared to February monthly average (1918–2021)	Compared to February 2022	Compared to record high (1918-2021)	Notes
Superior	183.47 m	19 cm above	30 cm above	17 cm below	-
Michigan–Huron	176.41 m	10 cm above	13 cm below	84 cm below	-
St. Clair	175.17 m	35 cm above	7 cm above	63 cm below	-
Erie	174.36 m	34 cm above	6 cm below	54 cm below	-
Ontario	74.76 m	15 cm above	12 cm below	51 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 typically only Lake Superior would still be declining under average water supplies, while all the other lakes are expected to be nearing or starting their seasonal rise in water levels.

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.

The Lake Erie – Niagara River ice boom recently saw the second earliest removal in its almost 60 year history. Read more about it below.

Great Lakes water level information:

February lake level changes[a]

Lake	February lake level change (1918–2021)	February monthly average change (1918-2021)	Compared to average February change (1918-2020)	Notes
Superior	3 cm decline	5 cm decline	less than average decline	-
Michigan–Huron	2 cm decline	no change	more than average decline	-
St. Clair	10 cm rise	3 cm rise	higher than average rise	-
Erie	13 cm rise	3 cm rise	much higher than average rise	-
Ontario	11 cm rise	3 cm rise	much higher 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-March level[a]					
Lake	**Level[a,b]**	**Compared to March beginning-of-month average (1918–2021)**	**Compared to March 2022**	**Compared to record high (1918-2021)**	**Notes**
Superior	183.46 m	21 cm above	30 cm above	16 cm below	-
Michigan–Huron	176.41 m	11 cm above	12 cm below	81 cm below	-
St. Clair	175.25 m	42 cm above	1 cm below	50 cm below	-
Erie	174.46 m	42 cm above	3 cm below	40 cm below	-
Ontario	74.83 m	19 cm above	11 cm below	34 cm below	-

[a] At the beginning of March, all of the Great Lakes were at least 29 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 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 above average and is expected to remain so under typical water supply conditions within the next few months. Water levels could move further 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.

February basin statistics			
Lake	**Precipitation (percentage of LTA) [a,b]**	**Net basin supply (probability of exceedance) [c,d]**	**Outflows (percentage of LTA)[a]**
Superior	138%	17% (very wet)	107%
Michigan-Huron	142%	43% (wet)	125%
Erie (including Lake St. Clair)	146%	18% (very wet)	119%
Ontario	105%	21% (very wet)	123%

[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.

Second earliest removal of the Lake Erie – Niagara River Ice Boom

Each winter since 1964, the Lake Erie-Niagara River Ice Boom has been installed near the outlet of Lake Erie to reduce the amount of ice entering the Niagara River. The ice boom accelerates the formation of the natural ice arch that forms most winters near the head of the Niagara River and also stabilizes the arch once it has formed.

A reduction of ice entering the river reduces the potential for ice jams, which can result in damage to shoreline property and significantly reduce water flow for hydro-electric power production.

Lake Erie's ice cover has remained minimal during the 2022-2023 winter season with less than one percent of ice cover on Lake Erie at the end of January. Due to the lack of ice cover on Lake Erie and the absence of ice in the Maid-of-the-Mist Pool below Niagara Falls, the removal of the Lake Erie – Niagara River Ice Boom started on March 2nd. In the history of the ice boom, it was only in 2012 that the ice boom was removed earlier than this year's date.

Get more information on the ice boom from the annual Operation of the Lake Erie – Niagara River Ice Boom Report that is available from the International Niagara Board of Control's website here: https://ijc.org/en/nbc/library/publications

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

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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