LEVEL news

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Great Lakes – St. Lawrence River Water Levels

Lake Ontario experiences a wet August

During the month of August, the Great Lakes Basin experienced the following:

- The mean monthly water level of Lake Superior was below its average level, while lakes Michigan-Huron, Erie, and Ontario were above average.
- Lakes Superior, Michigan-Huron, and Erie experienced dry water supply conditions, while Lake Ontario experienced wet water supply conditions (a combination of the precipitation, evaporation, and runoff).
- Precipitation was generally average throughout the Great Lakes Basin in August.
- Lake Superior declined at a time of year when it typically rises. Lake Michigan-Huron experienced a greater than average decline, while lakes Erie and Ontario experienced a less-than-average monthly decline.

Great Lakes water level information:

August 2024 monthly mean levels

Lake	Level[1]	Compared to August monthly average (1918–2023)	Compared to August 2023	Compared to record high (1918-2023)	Notes
Superior	183.48 m	6 cm below	19 cm below	38 cm below	-
Michigan–Huron	176.68 m	10 cm above	2 cm below	74 cm below	-
St. Clair	175.48 m	29 cm above	4 cm below	49 cm below	-
Erie	174.56 m	27 cm above	3 cm below	46 cm below	-
Ontario	74.92 m	2 cm above	14 cm below	66 cm below	-

[1]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 where all the lakes have typically reached their annual peaks and started their seasonal declines, aside from Lake Superior that is typically nearing its seasonal peak.

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 at the end of this newsletter.

Plans are continuing to update the International Great Lakes Datum or IGLD, see below for further details.

Great Lakes water level information:

August 2024 lake level changes[1]

Lake	August lake level change	August monthly average change (1918-2023)	Compared to average August change (1918-2023)	Notes
Superior	2 cm decline	1 cm rise	decline instead of rise	-
Michigan–Huron	8 cm decline	4 cm decline	greater than average decline	-
St. Clair	6 cm decline	6 cm decline	average decline	-
Erie	7 cm decline	8 cm decline	less than average decline	-
Ontario	10 cm decline	14 cm decline	less than average decline	-

[1]Lake level changes are based on the differences in levels at the beginning of the month, not the monthly average levels.

Great Lakes water level information: Beginning-of-September 2024 level[1]					
Lake	Level[1,2]	Compared to September beginning-of-month average (1918–2023)	Compared to September 2023	Compared to record high (1918-2023)	Notes
Superior	183.48 m	7 cm below	17 cm below	38 cm below	-
Michigan–Huron	176.64 m	9 cm above	4 cm below	74 cm below	-
St. Clair	175.42 m	28 cm above	11 cm below	53 cm below	-
Erie	174.52 m	27 cm above	10 cm below	42 cm below	-
Ontario	74.87 m	4 cm above	12 cm below	64 cm below	-

[1] At the beginning of September, all of the Great Lakes were at least 28 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/

[2] 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 below its average level and is expected to remain below 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 above average under typical water supply conditions, while drier than average conditions would 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 the end of the year.

Lake Ontario water levels are expected to remain near average under typical water supply conditions. However, wetter than average water supply conditions may result in above average lake levels, whereas 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.

August 2024 basin statistics			
Lake	Precipitation-percentage of LTA (1981 – 2010) [1,2]	Net basin supply (probability of exceedance) [3,4]	Outflows (percentage of LTA)[1]
Superior	92%	82% (very dry)	96%
Michigan-Huron	83%	81% (very dry)	104%
Erie	119%	67% (dry)	105%
Ontario	109%	8% (very wet)	107%

[1] As a percentage of the long-term average (LTA).
[2] Environment and Climate Change Canada – Canadian Precipitation Analysis System. For more information, please visit: https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services/display-download/technical-documentation-regional-precipitation-analysis.html
[3] <5% extremely wet; <25% very wet; <45% wet; 45-55% average; >55% dry; >75% very dry; >95% extremely dry.
[4] 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 data contained in this report are provisional and is subject to change. Data are calculated from the best available observations at the time of posting.

IGLD update

Did you know that the land beneath our feet might not be as stable as you think? A 1 km thick ice sheet covered the Great Lakes 10,000 years ago pushing the land surface down. Although the ice sheet melted a long time ago, the land surface is still rebounding now that the weight of the ice is gone (in some places in the basin, the ground is rising more than 5 cm every decade). As a result, an update to the reference system is required approximately every 25 to 30 years to compensate for differential movement of the earth's crust in the Great Lakes region.

The elevation reference system for the Great Lakes is called the International Great Lakes Datum or IGLD. The current IGLD (called IGLD 1985) was implemented in January 1992 and replaced the previous system, IGLD 1955.

Planning is underway for the next update to the IGLD, with the current schedule the new reference level will be implemented in 2027.

To see a presentation with more details about the IGLD and the plans for the next update, see this page: https://www.greatlakescc.org/en/international-great-lakes-datum-update/

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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