LEVEL news

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Great Lakes – St. Lawrence River Water Levels

All the Great Lakes experienced dry water supply conditions in October

In October, the Great Lakes Basin experienced the following:

- The mean monthly water level of Lakes Superior, Michigan-Huron and Ontario were below average, while Lakes St. Clair and Erie were above average.
- All the Great Lakes experienced extremely dry to very dry water supply conditions (a combination of the precipitation, evaporation, and runoff).
- The Lake Superior and Lake Erie basins received approximately half of the average October precipitation. The Lake Ontario and Lake Michigan-Huron basins received precipitation amounts closer to, but still below, average.
- All the Great Lakes experienced greater than average monthly declines, including the largest decline in October for Lake St. Clair and the second largest decline for Lakes Michigan-Huron and Erie.

Great Lakes water level information:

October 2024 monthly mean levels

Lake	Level[1]	Compared to October monthly average (1918 to 2023)	Compared to October 2023	Compared to record high (1918 to 2023)	Remarks
Superior	183.34 m	18 cm below	21 cm below	57 cm below	-
Michigan–Huron	176.42 m	5 cm below	14 cm below	108 cm below	-
St. Clair	175.20 m	17 cm above	8 cm below	76 cm below	-
Erie	174.31 m	21 cm above	8 cm below	63 cm below	-
Ontario	74.58 m	4 cm below	8 cm below	64 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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At this time of year, all the lakes are continuing their seasonal declines.

Low-lying areas are at risk for accelerated coastline erosion and flooding with the increased possibility of large storms and stronger winds in the fall months. For current information and forecasts, please refer to the sources listed at the end of this newsletter.

Additional information on fall and winter storm safety is provided below.

Great Lakes water level information:

October 2024 lake level changes[1]

Lake	October lake level change	October monthly average change (1918 to 2023)	Compared to average October change (1918 to 2023)	Remarks
Superior	10 cm decline	4 cm decline	greater than average decline	Fifth largest decline on record
Michigan–Huron	17 cm decline	7 cm decline	greater than average decline	Second largest decline on record
St. Clair	30 cm decline	10 cm decline	greater than average decline	Largest decline on record
Erie	20 cm decline	9 cm decline	greater than average decline	Second largest decline on record
Ontario	23 cm decline	11 cm decline	greater than average decline	Fifth largest decline on record

[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-November 2024 level[1]					
Lake	Level[1,2]	Compared to November beginning-of-month average (1918 to 2023)	Compared to November 2023	Compared to record high (1918 to 2023)	Remarks
Superior	183.31 m	19 cm below	19 cm below	37 cm below	-
Michigan–Huron	176.35 m	7 cm below	21 cm below	91 cm below	-
St. Clair	175.04 m	8 cm above	20 cm below	66 cm below	-
Erie	174.21 m	15 cm above	13 cm below	56 cm below	-
Ontario	74.48 m	9 cm below	9 cm below	65 cm below	-

[1] At the beginning of November, all of the Great Lakes were at least 11 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 so under most water supply conditions.

Lake Michigan-Huron is expected to remain below average under typical and drier than average water supply conditions. However, wetter than average conditions would result in close to average water levels.

Lake Erie is expected to stay above average under most water supply scenarios. It would take 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 below average under typical water supply conditions. However, wetter than average water supply conditions may result in above average lake levels in the next few months.

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.

October 2024 basin statistics			
Lake	Precipitation-percentage of LTA (1981 to 2010) [1,2]	Net basin supply (probability of exceedance) [3,4]	Outflows (percentage of LTA)[1]
Superior	71%	96% (extremely dry)	90%
Michigan-Huron	48%	98% (extremely dry)	103%
Erie	67%	99% (extremely dry)	102%
Ontario	44%	95% (very dry)	104%

[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://canada-preview.adobecqms.net/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence.html#basin) for a description of net basin supply.
Note: The information contained in this report is provisional and is subject to change. Data are calculated from the best available observations at the time of posting.

Fall and winter storms

Fall and winter can bring higher waves and storm surges on the Great Lakes. Winds blowing across long open water sections, or fetch, can cause large waves and push water levels up on the downwind side of the lakes, creating a storm surge.

The largest waves occur on Lake Superior, where historically, wave heights have approached 9 m. The largest storm surge occurs on Lake Erie, with the largest recorded surge producing about a 2.5 m rise. Although waves and storm surges are usually well below these maximums, they can create rapid changes in water levels that should be considered when undertaking activities on the shores of the Great Lakes.

In the coming months, higher waves and storm surges could increase the potential for erosion of some shorelines, especially steep shoreline bluffs made up of silts, sands, gravels and cobbles that are exposed to waves. Although erosion around the Great Lakes can cause significant changes to the shoreline that can impact property and activities around the lakes, it is also a naturally occurring process that helps support shoreline dynamics such as beach building and the natural ecosystem of the Great Lakes.

Keep in mind that conditions can change quickly along the shores of the lakes, and this can lead to dangerous conditions, especially if you are not prepared. Check the local forecasts and always keep a safe distance from the shoreline edge.

Flood Information

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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