

Great Lakes – St. Lawrence River Water Levels

Lakes Superior, Michigan-Huron, and Erie Basins experience dry conditions

During June the Great Lakes Basin experienced the following:

- The mean monthly water levels of all the Great Lakes were above average. It is worth noting that Lake Superior experienced its eighth highest average water level for June even though it received very dry water supply conditions (a combination of the precipitation, evaporation, and runoff).
- In fact, the water supply conditions experienced by all the lakes, except Lake Ontario were either lower or much lower than average. Only Lake Ontario’s water supplies were close to average.
- June precipitation amounts were much less than average for Lakes Superior and Michigan-Huron. Lakes Erie and Ontario experienced closer to average precipitation amounts.
- Due to the generally dry conditions in the basin, all the lakes either rose less or declined more than their averages. Lake Superior experienced its fourth smallest rise on record while Lake Michigan-Huron experienced its ninth smallest change on record.

Great Lakes water level information:					
June 2023 monthly mean levels					
Lake	Level ^a	Compared to June monthly average (1918–2022)	Compared to June 2022	Compared to record high (1918–2022)	Notes
Superior	183.68 m	23 cm above	11 cm above	16 cm below	eighth highest on record
Michigan–Huron	176.68 m	11 cm above	13 cm below	76 cm below	-
St. Clair	175.46 m	26 cm above	9 cm below	56 cm below	-
Erie	174.60 m	23 cm above	8 cm below	54 cm below	-
Ontario	75.24 m	18 cm above	11 cm above	67 cm below	-

^aWater 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 all lakes typically continue their seasonal rise into 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:				
June lake level changes ^a				
Lake	June lake level change	June monthly average change (1918-2022)	Compared to average June change (1918-2022)	Notes
Superior	1 cm rise	7 cm rise	less than average rise	fourth smallest rise on record
Michigan–Huron	no change	5 cm rise	less than average rise	ninth smallest change on record
St. Clair	4 cm rise	4 cm rise	less than average rise	-
Erie	4 cm decline	2 cm rise	less than average rise	-
Ontario	10 cm decline	1 cm decline	Much more than average decline	

^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-July level ^a					
Lake	Level ^{a,b}	Compared to July beginning-of-month average (1918–2022)	Compared to July 2022	Compared to record high (1918-2022)	Notes
Superior	183.69 m	20 cm above	9 cm above	17 cm below	-
Michigan–Huron	176.69 m	10 cm above	13 cm below	77 cm below	-
St. Clair	175.48 m	27 cm above	6 cm below	58 cm below	-
Erie	174.58 m	21 cm above	6 cm below	60 cm below	-
Ontario	75.20 m	14 cm above	16 cm above	71 cm below	-

^a At the beginning of July, all of the Great Lakes were at least 49 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 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 increase further 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 but may approach average by late summer under typical water supply conditions. Wetter than average 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>.

June basin statistics			
Lake	Precipitation (percentage of LTA) ^{a,b}	Net basin supply (probability of exceedance) ^{c,d}	Outflows (percentage of LTA) ^a
Superior	64%	88% (very dry)	134%
Michigan-Huron	56%	96% (extremely dry)	107%
Erie (including Lake St. Clair)	82%	84% (very dry)	109%
Ontario	99%	51% (average)	117%

^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.

Be aware of rip currents when swimming on the lakes

Rip currents can occur in the Great Lakes whenever waves push water toward the shore. Breaking waves create a buildup of water along the shoreline that at some point needs to flow back toward the lake. Rip currents can develop where there is a low point in the lake bottom just off shore, such as a sand bar or rock reef, which funnels the water back toward the lake. Rip currents can be dangerous as they can pull even strong swimmers out into deep water; however, contrary to common belief, rip currents do not have an undertow and will not pull swimmers underwater.

Understanding rip currents and the conditions that cause them to form can help make it possible to avoid them altogether or for strong swimmers to safely exit them. To help make your summer activities around the Great Lakes safe and enjoyable please look for further information on Great Lakes rip currents here: <https://www.canada.ca/en/environment-climate-change/services/hurricane-forecasts-facts/learn/hazards-impacts.html#curr>

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/lsrc>, 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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