

Great Lakes – St. Lawrence River Water Levels

All the Great Lakes continue their seasonal decline

During September, the Great Lakes Basin experienced the following:

- The mean monthly water levels of all the Great Lakes were above average, except Lake Ontario, which was below average.
- All the Great Lakes, except for Lake Superior, received lower than average precipitation.
- Lake Superior experienced wetter than average water supply conditions, whereas Lake Michigan-Huron and Ontario experienced drier than average conditions. Lake Erie experienced slightly drier than average water supply conditions.
- Lake Superior’s water level remained constant throughout September, but it is now past its seasonal peak and beginning its seasonal decline. Lake Michigan-Huron is past its seasonal peak and its levels decreased a bit more than average throughout September. Lake Erie and Lake Ontario levels are continuing their seasonal declines, with slightly higher-than-average monthly declines.

Great Lakes water level information: September 2022 monthly mean levels					
Lake	Level ^a	Compared to September monthly average (1918–2021)	Compared to September 2021	Compared to record high (1918-2021)	Notes
Superior	183.65 m	11 cm above	14 cm above	21 cm below	-
Michigan–Huron	176.72 m	19 cm above	21 cm below	66 cm below	-
St. Clair	175.41 m	29 cm above	23 cm below	47 cm below	-
Erie	174.46 m	27 cm above	21 cm below	41 cm below	-
Ontario	74.55 m	20 cm below	24 cm below	86 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/>

At this time of year, all the lakes are continuing their seasonal declines. Lake Superior water levels are expected to remain above average under typical and wetter than average water supply conditions, while drier than typical conditions may cause levels to drop to below average by late fall or early winter. The water levels of Lakes Michigan-Huron and Erie are expected to remain above or close to average under most water supply scenarios. Lake Ontario levels are below average, but would move to above average levels under wetter than average conditions. However, average or drier than average conditions could result in continued lower than average levels within the next few months.

With water levels remaining above average in some lakes and the possibility of large storms and winds, low-lying areas are at risk for accelerated coastline erosion and flooding. In addition, although Lake Ontario remains above chart datum levels, boaters should take caution this fall with below average water levels that are very different from recent years. These lower water levels could expose hazards not experienced for some time. For current information and forecasts, please refer to the sources listed below.

As all the Great Lakes have experienced their 2022 peak we can take a look at how their seasonal rises compared to the average levels. Read more about it below.

Great Lakes water level information:				
October lake level changes^a				
Lake	October lake level change (1918–2021)	Long-term October monthly average change (1918-2021)	Compared to average change (1918-2020)	Notes
Superior	same	2 cm decline	more than the average decline	-
Michigan–Huron	10 cm decline	6 cm decline	more than the average decline	-
St. Clair	6 cm decline	7 cm decline	less than the average decline	-
Erie	11 cm decline	9 cm decline	more than the average decline	-
Ontario	18 cm decline	15 cm decline	more than the 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-October level					
Lake	Level ^{a,b}	Compared to October monthly average (1918–2021)	Compared to October 2021	Compared to record high (1918-2021)	Notes
Superior	183.64 m	11 cm above	15 cm above	24 cm below	-
Michigan–Huron	176.66 m	17 cm above	22 cm below	83 cm below	-
St. Clair	175.39 m	33 cm above	23 cm below	57 cm below	-
Erie	174.41 m	26 cm above	23 cm below	48 cm below	-
Ontario	74.48 m	20 cm below	28 cm below	82 cm below	-

^aAt the beginning of October, 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/>

^bWater 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

At this time of year, all the lakes are continuing their seasonal decline.

Lake Superior is currently above its average level and is expected to remain so under average water supply conditions. Drier than average conditions could result in lake levels dropping below the long-term seasonal average, while wetter than average conditions would result in lake levels continuing to be above average.

Lake Michigan-Huron is expected to remain above average under most water supply conditions.

Lake Erie levels are expected to stay above average under most water supply scenarios.

Lake Ontario levels are below average and are expected to remain so under typical or drier than average water supply conditions within the next few months. Water levels could move above average if wetter than typical water supply conditions are experienced.

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>.

September basin statistics			
Lake	Precipitation (percentage of LTA) ^{a,b}	Net basin supply (probability of exceedance) ^c	Outflows (percentage of LTA) ^a
Great Lakes Basin	88%	-	-
Superior	103%	32% (very wet)	114%
Michigan-Huron	79%	81% (very dry)	111%
Erie (including Lake St. Clair)	83%	60% (dry)	109%
Ontario	89%	80% (very dry)	108%

^a As a percentage of the long-term average (LTA).

^b United States Army Corps of Engineers (<https://ire-wm.usace.army.mil/reports/greatLakes/greatLakesPrecipitationLastMonth/greatLakesPrecipitationLastMonth.html>)

^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.

Summary of the 2022 seasonal rise

The timing of the seasonal rise varies from lake to lake. Lake Superior typically experiences its peak in late summer or early fall, whereas, Lakes Michigan-Huron, Erie, and Ontario peak slightly earlier in mid-summer (June or July). Lake Superior has now likely seen its highest level of the season, with the other lakes continuing their yearly descent. We can look at how the seasonal rise in the lakes compared to their averages.

Lake Superior experienced close to double its typical rise this year, which was the fifth largest rise on record, surpassed only in 1944, 1950, 1968, and 2013. It started the year with below average levels but owing to very wet basin supply conditions in the winter and spring, lake levels moved above average in early spring and have remained as such. Lake Superior’s peak occurred in September this year, which is the typical timing of the yearly peak.

Lake Michigan-Huron saw an average seasonal rise and started the year above average, peaking in June. The lake levels have remained above average throughout 2022.

Lake Erie experienced close to its typical rise, and peaked in June. Lake Erie started the year with higher than average levels and remains above average.

The rise of Lake Ontario was almost half of its typical seasonal rise, and peaked about a month earlier than average. The lower than typical seasonal rise was mostly a result of dry basin supply conditions in the spring and summer.

Lake	Average seasonal rise (1918–2021)	2022 seasonal rise
Superior	33 cm	55 cm
Michigan–Huron	32 cm	32 cm
Erie	45 cm	39 cm
Ontario	62 cm	38 cm

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

Daily levels: Current daily lake-wide average levels of all the Great Lakes are available at <https://re-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.

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