



LEVELnews

Great Lakes – St. Lawrence River Water Levels

Wet July results in late seasonal rise on Lakes Erie and Ontario

During July, the Great Lakes basin experienced a mixture of drier and wetter than average conditions, with the basin as a whole, receiving wetter than average conditions. Dry conditions persisted in the Lake Superior basin, while Lakes Michigan-Huron, Erie, and Ontario experienced wetter than average conditions. The much wetter than average conditions in the Lakes Erie and Ontario basins resulted in a late seasonal rise in lake levels. Lake Ontario recorded its largest rise for July with an increase of 14 cm. Lake Erie experienced its second largest July rise on record of 10 cm.

The average level of Lake Superior in July was 4 cm above the long-term average, but 20 cm below the level of last July. As well, the lake experienced its eighth largest July level decline on record. The July water level of Lake Michigan-Huron was 40 cm above average and 46 cm lower than last year's record high. Lake Erie experienced its ninth highest July water level at 47 cm above average but 24 cm lower than the same time last year. The average July water level for Lake Ontario was 20 cm below the long-term July average and 37 cm lower than last year.

At this time of year, all the lakes except for Lake Superior have typically peaked and have started their seasonal decline. While it is generally expected for Lake Michigan-Huron to peak in July, Lakes Erie and Ontario have usually leveled off or have started declining by then. However, this year, neither Lake Erie nor Ontario reached their seasonal peaks until July and are only now starting their seasonal decline. Lake Superior usually peaks in late summer and starts its seasonal decline either in

Great Lakes Water Level Information				
Lake	July 2021 Monthly Mean Level		Beginning-of-August 2021 Level	
	Compared to Monthly Average (1918–2020)	Compared to July 2020	Compared to Beginning-of-Month Average (1918–2020)	Compared to August 2020
Superior	4 cm above	20 cm below	3 cm above	23 cm below
Michigan–Huron	40 cm above	46 cm below	43 cm above	42 cm below
St. Clair	51 cm above	30 cm below	56 cm above	28 cm below
Erie	47 cm above	24 cm below	52 cm above	17 cm below
Ontario	20 cm below	37 cm below	11 cm below	26 cm below

August or September. Lake Superior water levels are expected to stay above average under typical or wetter than average conditions, however, lake levels may fall below average in late summer if dry conditions occur. Lakes Michigan-Huron and Erie are expected to remain at or above average levels under any water supply condition. Despite the late rise in levels, Lake Ontario's water level is expected to remain below average if the basin experiences dry or average conditions, however, lake levels may surpass average levels in late summer or early fall if wetter than average conditions persist.

With water levels remaining above average on some lakes, low-lying areas are at risk from accelerated coastline erosion and flooding. As well, although Lake Ontario remains well above chart datum levels, boaters should take caution this summer. This year's below average water levels are much lower than recent years and could pose hazards not experienced for some time. For current information and forecasts, please refer to the sources listed below.

July monthly levels

Lake Superior's monthly mean level was 183.56 m (IGLD85¹), 4 cm above average and 20 cm below last year's level.

Lake Michigan-Huron had an average monthly water level of 177.00 m (IGLD85). This was 40 cm above its July monthly mean water level and 46 cm lower than its record high level last July.

Lake Erie's monthly mean level in July was 174.81 m (IGLD85), 47 cm above average and 24 cm below last year's level. This is Lake Erie's ninth highest July water level on record.

July Precipitation over the Great Lakes^{1,2}

Great Lakes Basin	126%	Erie	145%
Superior	64%	(including Lake St. Clair)	
Michigan-Huron	144%	Ontario	176%

July Outflows from the Great Lakes¹

Superior	103%	Erie	118%
Michigan-Huron	112%	Ontario	105%

¹ As a percentage of the long-term average.

² US Army Corps of Engineers (<https://re-wm.usace.army.mil/reports/GreatLakes/GLP-LastMonth.pdf>).

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.

Lake Ontario's July monthly-mean level was 74.81 m (IGLD85), 20 cm below average and 37 cm lower than the level from last July.

Lake level changes

Lake Superior declined by 1 cm in July, when it typically rises by 5 cm. This is the eighth largest July decline during the period-of-record (1918-2020).

Lake Michigan-Huron rose by 4 cm, more than its average July rise of 1 cm. This was its tenth largest July rise on record.

Lake Erie rose by 10 cm, when it typically declines by 4 cm, its second largest July rise on record.

Lake Ontario's level increased by 14 cm when it typically declines by 9 cm in July. This is the highest July lake level rise on record, three cm above the previous highest rise in 2006.

(Note that lake level changes are based on the levels at the beginning of the month and not the monthly average levels.)

¹Water 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 <http://www.greatlakescc.org/wp36/home/international-great-lakes-datum-update/>

Beginning-of-August lake levels

Lake Superior's beginning-of-August level was 3 cm above average, which is 23 cm lower than last year.

Lake Michigan-Huron's level was 43 cm above average at the beginning of August and 42 cm lower than at its record beginning-of-August level this time last year.

Lake Erie was 52 cm above average at the beginning of August and 17 cm lower than last year at this time.

Lake Ontario's level at the start of July was 11 cm below average and 26 cm lower than the level last year.

At the beginning of August, all of the Great Lakes were at least 37 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 <http://www.greatlakescc.org/wp36/home/international-great-lakes-datum-update/low-water-datum/>

Water levels forecast

At this time of year, all the lakes except for Lake Superior have typically peaked and have started their seasonal decline. Even under wetter than average conditions, none of the Great Lakes are expected to reach record high levels.

Lake Superior is currently above average and is expected to remain so under average or wetter than average conditions. Drier than average conditions could result in lake levels dipping below average in late summer.

The level of Lake Michigan-Huron is above average and is expected to decline throughout

August under all water supply conditions. However, it is expected to remain above average.

Lake Erie levels are currently above average and are expected to remain high, even in the event of drier than average conditions.

Lake Ontario remains below average. Under drier than average and average conditions, it would be expected to remain below average. Under wetter than average conditions, Lake Ontario could surpass average levels in late summer.

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 the Canadian Hydrographic Service's Monthly Water Levels Bulletin at:

<https://waterlevels.gc.ca/C&A/bulletin-eng.html>

A Note About Water Level Projections

Forecasting future lake levels is challenging but projections are beneficial for many who live around and enjoy the Great Lakes. In order to estimate future lake levels, water resources engineers look to measurements of the Great Lakes region made in the past. Changes to lake levels can be predicted for a range of potential wet and dry conditions assuming that the future weather and water supplies to the lakes are generally expected to fall within historically observed values and follow seasonal trends.

If you look at the water levels graphs in the Canadian Hydrographic Service's monthly water

Get notified when a new edition of LEVELNews is available!

Did you know that you can receive an email whenever the most recent edition of LEVELNews becomes available? All you have to do is enter your email on this website:

<https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence/subscribe.html>

You can unsubscribe at any time.

levels bulletin available at waterlevels.gc.ca, you will note a “Probable Range of Future Levels” depicted by dashed lines on the included figures. The red dashed line indicates predicted water levels if relatively wet conditions occur and lake levels are expected to be above these values 5% of the time. The blue dashed line is a prediction of lake levels if relatively dry conditions occur and lake levels are expected to be below these values 5% of the time. The levels between these two lines is the “Probable Range of Future Levels”, which is based on the recorded history of the lakes. We expect lake levels will be within this range 90% of the time. Actual water levels depend primarily on weather and water supplies, and during periods of extreme conditions, they may fall outside of the projected “most probable” range.

Information on flooding

With water levels remaining high on some of the lakes, the risk of flooding is also high. Great Lakes water levels are difficult to predict weeks in advance due to natural variations in weather. To stay informed on 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 the International Lake Superior Board of Control web site, <https://www.ijc.org/en/lisbc>, and the International Lake Ontario–St. Lawrence River Board web site, <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 on the Great Lakes water levels and related data at <https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data.html> and by clicking on “Daily water levels for the current month”. 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: <http://tides.gc.ca/eng/find/region/6>. 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 on the Great Lakes water level and related data web page 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:

Frank Seglenieks and Nicole O'Brien
Boundary Water Issues
Meteorological Service Canada
Environment and Climate Change Canada
Burlington ON L7S 1A1

Email: ec.LEVELnews-infoNIVEAU.ec@canada.ca

For information regarding reproduction rights, please contact Environment and Climate Change Canada's Public Inquiries Centre at 1-800-668-6767 (in Canada only) or 819-997-2800 or email to ec.enviroinfo.ec@canada.ca.

Photos: © Environment Canada – 2011

© Her Majesty the Queen in Right of Canada, represented by the Minister of Environment and Climate Change, 2021

ISSN 1925-5713

Aussi disponible en français