



LEVELnews

Great Lakes – St. Lawrence River Water Levels

High water levels on all the Great Lakes to start 2020

All the Great Lakes have declined since their annual high levels, however the December water level was either the second or third highest on all the lakes for the period of record (1918-2018). With very high levels on all of the lakes and the possibility of large storms and winds during winter months there is high risk for accelerated coastline erosion and flooding to occur in low lying areas. For current information and forecasts, please refer to local sources of information listed below.

We are now at the time of year when both Lakes Erie and Ontario have reached their seasonal minimum levels. From this point on, they would be expected to hold steady and then start to rise over the next few months. Typically Lakes Superior and Michigan/Huron should continue their seasonal decline for a few more months before starting to rise again.

Although all the lakes are below their record levels, they are all high enough that extremely wet conditions could result in more record highs in early 2020. As well, with Lakes Superior starting January at its second highest level on record and Michigan-Huron at its highest beginning of January level, even average conditions would lead to record high monthly-mean levels in the coming months for these lakes.

Included below is a summary of the very eventful year for Great Lakes water levels in 2019.

Great Lakes Water Level Information				
Lake	December 2019 Monthly Mean Level		Beginning-of-January 2020 Level	
	Compared to Monthly Average (1918–2018)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918–2018)	Compared to One Year Ago
Superior	33 cm above	7 cm above	37 cm above	9 cm above
Michigan–Huron	91 cm above	42 cm above	95 cm above	44 cm above
St. Clair	76 cm above	21 cm above	72 cm above	12 cm above
Erie	68 cm above	8 cm above	66 cm above	4 cm above
Ontario	47 cm above	29 cm above	48 cm above	24 cm above

December monthly levels

Although no records were set during the month of December, water levels were still very high with all of the lakes recording either their second or third highest monthly-mean level for December in the period-of-record (1918-2018).

Lake Superior was 33 cm above its December monthly-mean water level and 7 cm above last year's December level. This is the second highest December level on record, 7 cm below the highest level seen in 1985.

Lake Michigan–Huron's monthly-mean level in December was 91 cm above average, 42 cm above last December's level. This also puts it at the second highest December level, just 1 cm below the monthly record value of 1986.

Lake Erie's monthly-mean level was 68 cm above average, 8 cm above its December 2018 level. This was the third highest December lake level on record, 21 cm below the record high December value in 1986.

Lake Ontario's December monthly-mean level was 47 cm above average and 29 cm higher than a year ago. This was also the third highest on record, only 2 cm below the record high year of 1986.

Lake level changes

Lake Superior's levels went down by 4 cm in December, half of its typical decline of 8 cm between the beginning of December and January.

Lake Michigan–Huron was steady during the month of December, while it typically declines by 5 cm.

The level of Lake Erie declined by 3 cm from December to January, while it typically rises 1 cm at this time of year.

Lake Ontario went up by 2 cm, a little more than its average 1 cm rise from December to January.

Beginning-of-January lake levels

All the lakes started January well above average with Michigan-Huron setting a record high beginning-of-month level for any January in the period of record (1918–2018).

Lake Superior's beginning-of-January level was 37 cm above average and 9 cm higher than January 2019. This beginning-of-January level is the second highest in the period of record, only 2 cm less than the highest beginning-of-month recorded in 1986.

Lake Michigan–Huron's beginning-of-January level was 95 cm above average and 44 cm higher than its level at the same time last year. This is the highest in the period of record, with a level that is 4 cm higher than the previous beginning-of-month record for January set in 1987.

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

Great Lakes Basin	102%	Lake Erie	96%
Lake Superior	115%	(including Lake St. Clair)	
Lake Michigan–Huron	99%	Lake Ontario	102%

December Outflows from the Great Lakes¹

Lake Superior	123%	Lake Erie	125%
Lake Michigan–Huron	136%	Lake Ontario	132%

¹ As a percentage of the long-term average.

² US Army Corps of Engineers

NOTE: These figures are preliminary.

Lake Erie was 72 cm above average at the beginning of January and 12 cm higher than the same time last year. This level is the third highest on record and 23 cm lower than the beginning-of-January record set in 1987.

Lake Ontario's level at the start of January was 48 cm above average; 24 cm higher than the water levels last year and the third highest on record. The last time the level was this high at the start of January was back in 1946 when the level was 17 cm higher.

At the beginning of January, all of the Great Lakes were at least 54 cm above their chart datum level (Note: chart datum is a reference elevation for each lake in order to provide more

information on the depth of water for safe boat navigation on the lakes).

Water levels forecast

We are at the time of year when Lakes Superior and Michigan-Huron would typically still be declining under average water supplies, while Lake Erie and Ontario would hold steady or begin their seasonal rise in the coming months.

As mentioned above, the level of Lake Superior is expected to decline during the winter, however, Lake Superior starts out this year at a very high level. So high that even with average conditions, lake levels could match record levels and wet conditions would lead to record high levels for the next few months.

The likelihood of reaching record levels in the coming months is even higher for Lake Michigan-Huron. In fact, it would take drier than average water supplies to prevent a record high level for January. While even average conditions would result in record highs throughout the winter and spring.

For Lake Erie, although it is expected to start its seasonal rise in the next few months, it would take a few months of consistently wet conditions to once again see record high levels. Nevertheless, the lake will stay well above average throughout the winter and spring even with average or dry conditions.

Lake Ontario has typically hit its annual minimum at this time of the year and with average conditions, it would start to rise over the next few months. Average water supplies would keep Lake Ontario well above average while very wet conditions would once again put the lake level back towards record highs.

For more information on the probable range of water levels consult the January 2019 edition of LEVELnews at

<https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data/levelnews-great-lakes-st-lawrence/january-2019.html>

FOR MORE INFORMATION:

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>

Review of 2019 Great Lakes water levels

Looking back, 2019 was quite a memorable year for the lake levels in the Great Lakes. All the lakes started the year well above average and after a wet spring, the seasonal rise resulted in most of the lakes hitting either all time record highs or record highs for a particular month during the summer. The autumn saw all the lakes retreat from record highs, while still remaining much higher than average.

For the first few month of 2019, Lake Superior was just below record levels, so even though its seasonal rise was close to average, it still resulted in record high levels during May, June, and July. These levels remained high during the late summer and going into the fall resulting in record tying levels during August and September. Levels finally began their seasonal decline starting in late October, finishing the year still well above average.

Lakes Michigan/Huron started the year above average, but not really close to a record. Then a higher than average rise in the spring put the level just a few centimetres below the record high for July. Since then, wet conditions have persisted and the level has not gone down nearly as much as it would under a typical seasonal decline. This has resulted in a record high level at the end of the year and a very high possibility of record monthly highs being seen during the first months of next year.

Lake Erie started out the year well above average and had a much higher than average seasonal rise in the spring which resulted in record high values from May through to September. The level in June was the highest for any month in the period of record. In the second half of the year the levels declined a bit more than average resulting in the levels at the

end of 2019 being very close to where they were at the start the year.

Interestingly, the early part of the last three years have seen very similar levels on Lake Ontario, but, the differences in the spring have resulted in very different subsequent lake levels. For 2019, it was the highest lake level rise seen from March to June and this resulted in monthly records for June and July, with June being the highest level for any month in the period of record. Although the levels sharply declined from these highs through the end of the summer and early autumn due to somewhat drier conditions and high outflows, the level at the end the year was still higher than where it started the year.

The levels for all the lakes from 2019 can be seen in the graph below, the average, and the maximum and minimum levels during the period of record (1918 – 2018).

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](#) 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 change when it is changing relatively rapidly due to the high precipitation recently experienced.

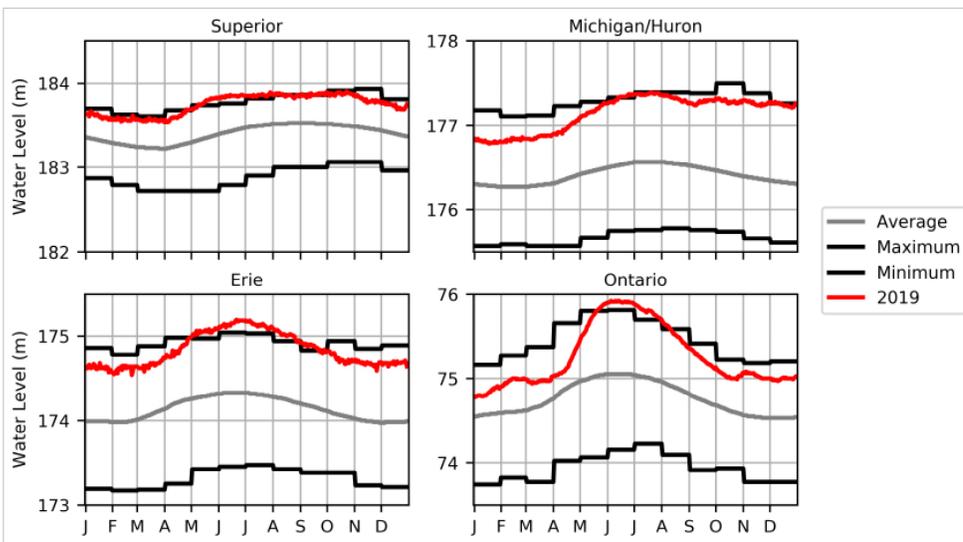
Hourly levels: Hourly lake levels from individual gauge sites can be found at the Government of Canada Great Lakes Water Level Gauging Stations website at:

<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](#) 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.



Information on flooding

Great Lakes water levels are hard 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 web site at <https://www.ontario.ca/flooding>.

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