



LEVELnews

Great Lakes – St. Lawrence River Water Levels

Above average lake levels expected through spring

The general trend of above average water supplies to all the Great Lakes continued in January leaving all of the Great Lakes levels well above average. Levels of all the lakes are forecasted to stay above average with average water supplies into early summer. Water levels in the Lower St. Lawrence River were also above average for the month of January due to above average outflows from Lake Ontario and Ottawa River. However daily levels at Montreal varied over

the month due to varying Lake Ontario outflows for ice management on the St. Lawrence River.

Be prepared for high water this spring and summer

Water levels in lakes Erie, Michigan–Huron and Superior have not been as high as they have been in the past year since the late 1980's. With levels well above average at the beginning of February, levels are predicted to remain above average into the summer

with average water supplies. Generally, above-average precipitation over the last few years has been the predominant contributor to the current above-average water levels. The natural hydrological processes, in particular precipitation and evaporation, are the predominant drivers of lake levels and there are no man-made structures that can fully control levels of the Great Lakes. Lake Michigan–Huron and Lake Erie outflow occurs naturally out of the St. Clair

Great Lakes Water Level Information				
Lake	January 2019 Monthly Mean Level		Beginning-of-February 2019 Level	
	Compared to Monthly Average (1918–2017)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918–2017)	Compared to One Year Ago
Superior	29 cm above	3 cm below	29 cm above	4 cm below
Michigan–Huron	51 cm above	8 cm above	52 cm above	6 cm above
St. Clair	57 cm above	17 cm above	40 cm above	17 cm below
Erie	63 cm above	25 cm above	60 cm above	20 cm above
Ontario	27 cm above	Same	29 cm above	3 cm below

River and Niagara River respectively. Outflows of Lake Superior and Lake Ontario are regulated, but this cannot override the high or low water levels that can occur from very wet or very dry water supplies due to natural fluctuations in the hydrological cycle.

Impacts of high water levels in the Great Lakes are varied, with some benefitting and some detrimental impacts possible. Some can gain benefit by having more water in the Great Lakes such as hydroelectric power, commercial shipping, agricultural, municipal drinking water, recreational boating, and commercial and sport fishing. High water periods within naturally fluctuating water levels can also have beneficial effects on the Great Lakes ecosystem. However, one of the key concerns to many associated with high Great Lakes water levels is the potential for increased shoreline erosion rates. Above-average water levels exposes coastline to wave action that in some cases has not been exposed in over 30 years, with the potential for an increased rate of erosion.

Shorelines especially susceptible to increased erosion rates include steep banks exposed to waves made up of silts, sands, gravels and cobbles. Shoreline erosion is a natural process that is important in providing sands, gravels and cobbles to

maintain beaches around the Great Lakes for swimming, natural protection of shorelines from waves during lower water levels, and coastline formations with ecological value such as barrier beaches and sand points for wetlands. However if wet conditions do continue, and water levels continue to rise, this could also put additional stress on existing shoreline protection structures as wave action works on areas that have not been tested for some time or could even reach levels above some shoreline protection, if levels get high enough. With levels well above average in late winter, and water levels likely to rise as we move into spring freshet conditions, all should be prepared for high water levels this spring and early summer.

Accurate predictions of Great Lakes water levels are not possible weeks in advance. To stay informed about what is going on in your area of the Great Lakes, local flood watches and flood warning information is issued by your local Conservation Authority, which can be found at <https://conservationontario.ca/conservation-authorities/find-a-conservation-authority/>.

Where there is no Conservation Authority, your local Ministry of Natural Resources and Forestry district office which can be found at <https://www.ontario.ca/page/>

[ministry-natural-resources-and-forestry-regional-and-district-offices](https://www.ontario.ca/ministry-natural-resources-and-forestry-regional-and-district-offices). Additional information on Great Lakes levels and flooding can be found at the Ontario flood forecasting and warning program web site at: <https://www.ontario.ca/law-and-safety/flood-forecasting-and-warning-program#section-2>, the International Lake Superior Board of Control web site at: <https://www.ijc.org/en/lisbc>, and the International Lake Ontario-St. Lawrence River Board at: <https://ijc.org/en/loslrb>. As well, the Water levels forecast section in this newsletter can also provide you with more information.

January monthly lake levels

All the Great Lakes had above average monthly mean water levels in January. Lake Erie was the highest above average while Lake Ontario was the closest to average for the month, but all lakes were well above their average value. Lake Superior was 29 cm above its period-of-record (1918–2017) January monthly mean water level, 3 cm below its value in January 2018 and tied for the 4th highest January level on record. Lake Michigan–Huron’s monthly mean level in January was 51 cm above average, 8 cm above last January’s level, the 10th highest January mean level on record and the highest it has been since 1987. Lake

Erie's monthly mean level was 63 cm above average, 25 cm above the level of last January, the 4th highest January mean level on record and the highest it has been for the month since 1987. Lake Ontario's January monthly mean level was 27 cm above average and the same as January 2018.

Lake level changes

Above average outflows and seasonal to above-seasonal evaporation rates for January cancelled the above average supplies to all the Great Lakes except for Lake Ontario. Both lakes Superior and Lake Michigan–Huron levels fell by their average amounts of 7 cm and 2 cm respectively. Lake Erie's level fell by 3 cm, slightly more than its average value of 1 cm, due to the combination of above average outflow and likely higher than average evaporation with the colder weather and limited ice cover. Lake Ontario rose 11 cm compared to its average 6 cm January rise.

Beginning-of-February lake levels

All the Great Lakes beginning-of-February levels were at least 29 cm above average however both lakes Superior and Ontario had levels below those seen at the beginning of February 2018. Lake Superior's beginning-of-February level was 29 cm above average (1918–2017), but 4 cm

below its level in February 2018. Higher beginning-of-February levels have been seen in only four other years on Lake Superior since 1918, but its beginning-of-month level was still 9 cm below the record set in 1986. Lake Michigan–Huron's beginning-of-February level was 52 cm above average, 6 cm higher than its level at the same time last year. Lake Michigan–Huron is the highest it has been since 1987 but is still 33 cm below its record high. Lake Erie was 60 cm above average at the beginning of February and 20 cm higher than the same time last year. Lake Erie has been higher in five years since 1918 and is the highest it has been since 1998 but is still 22 cm below its record high. Lake Ontario's level at the start of February was 29 cm above average and 3 cm lower than the water levels last year. At the beginning of February, all of the lakes were at least 38 cm above their chart datum level.

Water levels forecast

Looking ahead to spring and early summer water levels, it is likely that levels will continue to be well above average for lakes Superior, Michigan–Huron and Erie based on their beginning-of-February levels and past conditions on the lakes (1918–2018), even if very dry conditions occur. Relative to their beginning-of-February levels and with average water supply conditions, levels of lakes Superior, Erie and Ontario fall through the month of February while the levels of Lake Michigan–Huron remain stable. However as of February 19, all lake levels have remained stable or have risen from the beginning-of-February levels, giving February a wet start. The probable range of future lake levels looking forward to May for Lake Superior are between 12 cm and 35 cm above average, which are below record high values. The forecast based on beginning-of-February conditions indicates that

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

Great Lakes Basin	73%	Lake Erie	69%
Lake Superior	62%	(including Lake St. Clair)	
Lake Michigan–Huron	76%	Lake Ontario	85%

January Outflows from the Great Lakes¹

Lake Superior	115%	Lake Erie	126%
Lake Michigan–Huron	119%	Lake Ontario	116%

¹ As a percentage of the long-term January average.

² US Army Corps of Engineers

NOTE: These figures are preliminary.

most likely the levels of Lake Superior will not reach record high values in the next six months. There is a small possibility, if there are very wet conditions, that Lake Superior could reach record high values in June or July, however the forecast is less accurate this far in advance and will be updated in the coming months. The probable range of values to May for Lake Michigan–Huron are between 34 cm and 64 cm above average, and even with exceptionally wet conditions levels are forecasted to stay below record high values. The probable range of values for Lake Erie to the month of May is between 23 cm and

70 cm above average, which do not surpass record high values for the lake. Lake Ontario's levels are predicted to stay well below record high values, ranging between 22 cm below average with very dry conditions and 53 cm above average with very wet conditions. For more information on how the probable range of water levels is forecasted see the [July 2018 edition of LEVELnews](#). 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>.

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