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LEVELnews

Great Lakes — St. Lawrence River Water Levels

All Great Lakes were near or above record-high levels through July

With near or above record high water levels on all the Great Lakes the risk continues for accelerated coastline erosion and flooding to low lying areas continues. For local sources of information on this, see the following sections of this edition of LEVELnews.

Water levels on Lake Ontario and Lake Erie slowly declined through July after reaching their annual peak levels in June, which were all time record highs on both lakes (based on the period of record 1918-2018). While declining, levels on both lakes are still above record levels for this time of year. Lake Michigan-Huron and Lake Superior rose slightly through July and remained near or above their record levels as they approach their annual peaks which typically occur later in the summer.

During July, all of the Great Lakes had well-above-average monthly-mean water levels with lakes Erie and Ontario coming in at over 10 cm more than their record-high values. Lake Superior was 4 cm above its record-high and Lake Michigan-Huron was just 3 cm below its record-high value.

At the beginning-of-August, lakes Superior, Erie and Ontario all had record high levels for that time of the year, while Lake Michigan–Huron's beginning-of-August level was just below its record high value. In particular, not only was Lake Superior's beginning-of-August level 35 cm above average, it was the highest beginning-of-month level for any month in the period of record.

Great Lakes Water Level Information

Lake	July 2019 Monthly Mean Level		Beginning-of-August 2019 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	35 cm above	21 cm above	35 cm above	22 cm above
Michigan–Huron	79 cm above	39 cm above	79 cm above	40 cm above
St. Clair	84 cm above	33 cm above	86 cm above	35 cm above
Erie	80 cm above	31 cm above	80 cm above	34 cm above
Ontario	79 cm above	74 cm above	74 cm above	72 cm above

Canada

If we experience average meteorological conditions, water levels in the Great Lakes basin are expected to demonstrate their typical seasonal decline over the next few months. How quickly they decline is dependent on the weather and how wet or dry it will be over the coming weeks and months. If conditions are average, the levels in Lake Erie and Lake Ontario would remain near record seasonal highs while Lakes Superior and Michigan-Huron levels would start to decline from these record high levels. If we see much wetter than average conditions more record breaking levels could be seen, however even with very dry conditions all the lakes are forecasted to remain above average into the fall.

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.

Local flood watches and flood warning information are issued in Ontario by Conservation Authorities at https://conservationontario.ca/conservation-authorities/find-a-conservation-authority/ or Ministry of Natural Resources and Forestry district office at https://www.ontario.ca/page/ministry-natural-resources-and-forestry-regional-and-district-offices.

Additional information can also be found at the International Lake Superior Board of Control web site, https://www.ijc.org/en/lsbc, and the International Lake Ontario–St. Lawrence River Board web site, https://ijc.org/en/loslrb.

More information is also provided in the "Water levels forecast" section at the end of this newsletter.

Information on current water levels and marine forecasts

With lake levels changing day-to-day the Government of Canada Great Lakes water levels and related data website at: https://www.canada.ca/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data.html provides a source for web sites on up-to-date Great Lakes water levels.

July Precipitation over the Great Lakes[1,2]

Great Lakes Basin	**81%**	**Lake Erie (including Lake St. Clair)**	**110%**
Lake Superior	**82%**		
Lake Michigan–Huron	**73%**	**Lake Ontario**	**85%**

July Outflows from the Great Lakes[1]

Lake Superior	**138%**	**Lake Erie**	**129%**
Lake Michigan–Huron	**128%**	**Lake Ontario**	**140%**

[1] As a percentage of the long-term July average.
[2] US Army Corps of Engineers
NOTE: These figures are preliminary.

Daily levels: Current daily lake wide average levels of all the Great Lakes are available on the Government of Canada Great Lakes Water Level Gauging Stations website 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 provides hourly water levels. 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 you are interested in. To view a text bulletin of recent wave height forecasts for all of the Great Lakes click on the "Wave height forecasts for the Great Lakes and St. Lawrence River" link.

July monthly levels

All the Great Lakes had well-above-average monthly-mean water levels in July and lakes Superior, Erie and Ontario had record-high values (1918–2018).

Lake Superior was 35 cm above its period-of-record (1918–2018) July monthly-mean water level and 21 cm above its level in July 2018. This set a record high value for the month, surpassing the previous July record set in 1950 by 4 cm, but is still 5 cm below the record-high monthly-mean level for any month set in October 1985.

Lake Michigan–Huron's monthly-mean level in July was 79 cm above average, 39 cm above last July's level, the 2nd highest July mean level on record and just 3 cm below the record set in 1986.

Lake Erie's monthly-mean level was 80 cm above average, 31 cm above it level the same time last year and 10 cm higher than the previous record set in 1986. This is now the highest mean-monthly level on record.

Lake Ontario's July monthly-mean level was 79 cm above average, 74 cm higher than a year ago, and 11 cm higher than the previous record set in June 2017.

Lake level changes

Lake Superior's levels rose 3 cm in July, slightly less than its average (1918–2018) rise of 4 cm.

Lake Michigan–Huron was unchanged between the beginning of July and August, which is what it does on average.

Lake Erie's level declined by 8 cm, more than its average fall of 5 cm.

Lake Ontario went down by 20 cm, more than double its average decline of 9 cm.

Beginning-of-August lake levels

At the beginning of August lakes Superior, Erie and Ontario all had record high levels for that time of the year. Lake Michigan–Huron's level was just below its record high value.

Lake Superior's beginning-of-August level was 35 cm above average (1918–2018) and 22 cm higher than August 2018. This beginning-of-August level is 2 cm higher than the previous record-high value set in 1950, and now the highest beginning-of-month level by 1 cm for any month from which was previously from October to December of 1985.

Lake Michigan–Huron's beginning-of-August level was 79 cm above average and 40 cm higher than its level at the same time last year. This was 6 cm below the Lake Michigan–Huron record high set in 1986.

Lake Erie was 80 cm above average at the beginning of August and 34 cm higher than the same time last year. This was 10 cm higher than the record high beginning-of-August level set in 1986.

Lake Ontario's level at the start of August was 74 cm above average and 72 cm higher than the water levels last year. This also set a new record by 1 cm over the beginning-of-August record set in 1947.

At the beginning of August, all of the lakes were at least 68 cm above their chart datum level.

Water levels forecast

Relative to their beginning-of-August levels and with average water supplies for this time of year, Lake Superior is expected to rise slightly over the month of August, while lakes Michigan-Huron, Erie and Ontario begin or continue their seasonal decline.

Based on beginning-of-August conditions, the forecast for Lake Superior indicates that if the lake receives average water supplies it will be near seasonal record levels for August, but will start its seasonal decline starting in September. With average water supplies, the level would remain well above average, but it would take

extremely wet conditions in order to approach record values for the rest of the year.

Lake Michigan-Huron is expected to start its seasonal decline in September if we experience average water supplies, coming down from the recent near-record values. With these average water supplies the levels will continue to be well above average for the rest of the summer and into the fall. Only under very extremely wet conditions would levels return to their near-record values.

Although Lake Erie has peaked for the year, it will most likely continue to experience above record levels for the next few months even if we see drier than average water supplies. Going into the fall season, only extremely wet conditions will see near record high levels while average to dry water supplies will continue to keep the levels well above average.
Lake Ontario is also likely to remain near record levels throughout August and after that, only wet water supply conditions will keep the levels near the record highs. For the rest of the year average water supplies would keep the levels above average with only extreme dry conditions bringing the Lake Ontario level close to average.

For more information on the probable range of water levels consult 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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