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LEVELnews

Great Lakes — St. Lawrence River Water Levels

Dry Conditions Persist Throughout the Great Lakes Basin

Persistent dry conditions have resulted in lower than average seasonal rise in water levels for all the Great Lakes. Although the lakes have seen lower than average increases, Lakes Michigan-Huron and Erie remain well above average. Lake Superior is now approaching average levels, while Lake Ontario levels remain below average.

During May, Lake Superior's average level was 14 cm above average but 13 cm below last year's level. Lake Michigan-Huron experienced water levels 45 cm above average and 43 cm lower than last year's record high. Lake Erie's levels were 35 cm above average but 40 cm lower than this time last year, when the lake was at record high levels. Lake Ontario water levels were 31 cm below average and 64 cm lower than last year.

We are now at a time of year when all lakes typically continue their seasonal rise into summer. Lakes Michigan-Huron and Erie are expected to remain at above average levels under typical or dry water supply conditions. Lake Ontario levels are expected to remain below average through the summer, however, wetter than average conditions over the coming months could result in levels rising above average into the fall. Lake Superior's level remains above average but may fall below average if the basin experiences drier than average conditions moving forward.

Great Lakes Water Level Information

Lake	May 2021 Monthly Mean Level		Beginning-of-June 2021 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	14 cm above	13 cm below	10 cm above	15 cm below
Michigan–Huron	45 cm above	43 cm below	41 cm above	50 cm below
St. Clair	42 cm above	41 cm below	44 cm above	40 cm below
Erie	35 cm above	40 cm below	33 cm above	45 cm below
Ontario	31 cm below	64 cm below	37 cm below	64 cm below

Canada

With water levels remaining above average on some of the lakes, there remains a risk for accelerated coastline erosion and flooding to occur in low-lying areas. As well, although Lake Ontario remains above chart datum levels, boaters should take caution this summer with below average water levels that are very different from recent years and could expose hazards not experienced for some time. For current information and forecasts, please refer to the local sources of information listed below.

May monthly levels

Lake Superior had an average monthly water level of 183.37 m (IGLD85[1]). This was 14 cm above its May monthly-mean water level and 13 cm lower than its level last year.

Lake Michigan-Huron's monthly-mean level in May was 176.50 m (IGLD85), 45 cm above average and 43 cm below last May, during which time the lake was experiencing a record high.

Lake Erie's monthly-mean level was 174.33 m (IGLD85), 35 cm above average and 40 cm below its record high May level this time last year.

Lake Ontario's May monthly-mean level was 75.03 m (IGLD85), 31 cm below average and 64 cm lower than the level from a year ago. This is the lowest May level since 2010.

Lake level changes

The level of Lake Superior experienced no change in level in May, at a time where it usually rises by 10 cm. This is the third time in the period of record (1918-2021) where water levels did not increase during May, which also occurred in 1952 and 1986.

Lake Michigan-Huron's level also did not change over the month of May, whereas it typically rises by 8 cm. This is the fourth time since 1918, when record keeping began that the level has not changed between May and June in the period of record. The level has declined during May on three different occasions, the most recent one having occurred in 1977.

The level of Lake Erie rose by 4 cm during the month, which is close to its typical 6 cm rise.

Lake Ontario increased by 2 cm in May, less than a quarter of its 9 cm average increase.

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

May Precipitation over the Great Lakes[1,2]

Great Lakes Basin	**62%**	**Erie (including Lake St. Clair)**	**72%**
Superior	**73%**		
Michigan–Huron	**58%**	**Ontario**	**44%**

May Outflows from the Great Lakes[1]

Superior	**112%**	**Erie**	**112%**
Michigan–Huron	**120%**	**Ontario**	**108%**

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

Beginning-of-June lake levels

Lake Superior's beginning-of-June level was 10 cm above average, which is 15 cm lower than last year.

[1]Water 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/

[1]Water 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 (greatlakescc.org).

Lake Michigan–Huron's beginning-of-June level was 41 cm above average and 50 cm lower than it was during its record beginning-of-June level this time last year.

Lake Erie was 33 cm above average at the beginning of May and 45 cm lower than the record high last year at this time.

Lake Ontario's level at the start of June was 37 cm below average and 64 cm lower than the water level from last year.

At the beginning of June, all of the Great Lakes were at least 32 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

The level of Lake Superior is expected to rise during the next month if it receives average or above average supplies. Very dry conditions would result in lake levels approaching average values during the summer months or falling below average moving into the fall.

Lake Michigan-Huron remains well above average and is expected to stay above average even in the event of drier than average conditions. In the event of wetter than average conditions, the lake levels are not expected to reach historic high levels.

Lake Erie levels are currently above average and are expected to remain so, even in the event of drier than average conditions. Wetter than average conditions would not results in Lake Erie reaching record high levels.

Lake Ontario remains below average and is expected to be below average even in the event of wetter than average conditions in the summer. If wetter than typical conditions persist into the fall, Lake Ontario levels may rise slightly above average. If drier than average conditions occur, Lake Ontario is not expected to reach record low levels.

For more information on the probable range of water levels consult the July 2018 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/july-2018.html

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

Overview of Recent Drought in the Great Lakes Basin

Net basin supply (NBS) is the amount of water coming into a lake basin from precipitation and runoff minus evaporation from the lake and is a measure of water availability in a basin. Dry conditions have been causing a lower than average NBS in the Great Lakes Basins. The result of the lower than average precipitation is illustrated in the figure provided below. It shows the cumulative NBS for the last three months (March to May), the average March to May cumulative NBS, and the historic low March to May NBS for all the lakes. Also included is a map indicating the extent of the dry conditions in the past three months.

Lake Superior has seen higher NBS values over the last three months than the other lakes. The NBS for the last three months is much higher than the historic low, which occurred in 2010, and is closer to the long-term March to May average.

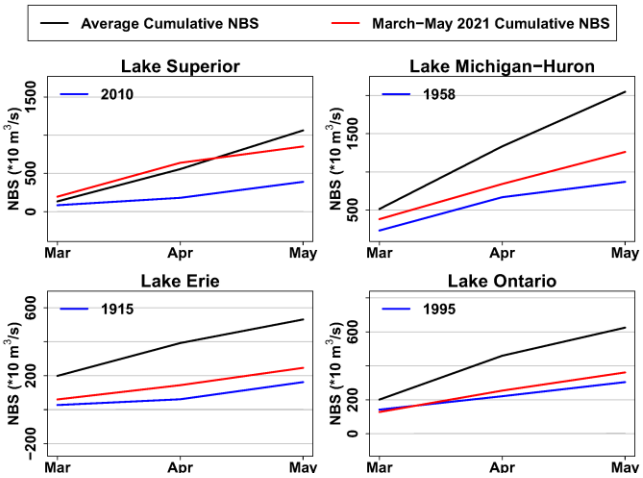
Lake Michigan-Huron has experienced lower than average March to May 2021 NBS, where the cumulative amount is the 6th lowest on record. The cumulative March to May NBS has not been this low since 2010. Dry conditions have persisted in the Lake Michigan-Huron basin over a longer period. The 6-month cumulative NBS was the 9th lowest on record.

Lake Erie has seen persistent dry conditions, resulting in lower than average NBS over the past 12 months. The 3-, 6-, and 12-month cumulative NBS were the fourth, fourth, and third lowest on record, respectively. The basin has not

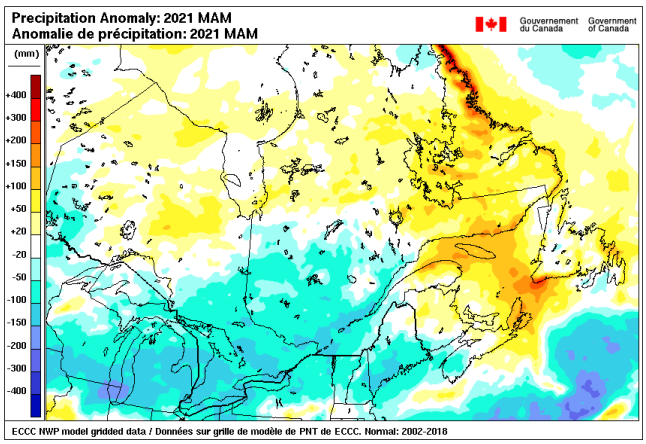
experienced 3-month conditions this dry since 2012.

Similar to Lake Erie, Lake Ontario's NBS has been historically low over the past 12 months. The basin's 3-, 6-, and 12-month cumulative NBS have been the third, sixth, and fourth lowest on record, respectively. The basin has not experienced similarly dry 3-month conditions since 1995.

With greater than average outflows from all the Great Lakes (mostly because of higher than average water levels), in addition to continued dryer than average weather, decreasing or constant lake levels have been observed at a time of year when lake levels are typically rising.



NBS for March, April, and May for each of the Great Lakes.



Precipitation anomaly for the March, April, and May 2021 time period for the Great Lakes.

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/lsbc, 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:

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