LEVEL news

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## Great Lakes – St. Lawrence River Water Levels

# Lakes Erie and Ontario Basins experience very wet conditions

During July, the Great Lakes Basin experienced the following:

- The mean monthly water levels of all the Great Lakes were above average.
- Lakes Superior and Michigan-Huron experienced drier than average water supply conditions, while Lakes Erie and Ontario experienced very wet water supply conditions (a combination of the precipitation, evaporation, and runoff).
- July precipitation amounts were below average for Lake Superior but higher than average for the remaining Great Lakes Basins.
- Lake Superior experienced its ninth largest July decline on record, while Lake Michigan-Huron's level rose slightly more than average. Lake Erie experienced its sixth largest rise on record, and Lake Ontario's level declined close to its average July amount.

**Great Lakes water level information:**

**July 2023 monthly mean levels**

| Lake | Level[a] | Compared to July monthly average (1918–2022) | Compared to July 2022 | Compared to record high (1918-2022) | Notes |
|---|---|---|---|---|---|
| Superior | 183.68 m | 16 cm above | 6 cm above | 18 cm below | - |
| Michigan–Huron | 176.70 m | 10 cm above | 11 cm below | 75 cm below | - |
| St. Clair | 175.50 m | 28 cm above | 3 cm below | 54 cm below | - |
| Erie | 174.60 m | 25 cm above | 1 cm below | 53 cm below | - |
| Ontario | 75.14 m | 13 cm above | 19 cm above | 66 cm below | - |

[a]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 at https://www.greatlakescc.org/en/international-great-lakes-datum-update/

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This is the time of year where all the lakes except for Lake Superior have typically peaked and have started their seasonal decline.

With water levels remaining above average in all lakes, and the possibility of large storms and winds, low-lying areas are at risk for accelerated coastline erosion and flooding. For current information and forecasts, please refer to the sources listed below.

Find out more about ways to keep updated on what is happening throughout the Great Lakes in this month's edition.

**Great Lakes water level information:**

**July lake level changes[a]**

| Lake | July lake level change | July monthly average change (1918-2022) | Compared to average July change (1918-2022) | Notes |
|---|---|---|---|---|
| Superior | 1 cm decline | 5 cm rise | less than average rise | ninth largest decline on record |
| Michigan–Huron | 1 cm rise | no change | more than average change | - |
| St. Clair | 4 cm rise | 2 cm decline | less than average decline | - |
| Erie | 3 cm rise | 5 cm decline | less than average decline | sixth largest rise on record |
| Ontario | 8 cm decline | 9 cm decline | slightly less than average decline | |

[a] Lake level changes are based on the differences in levels at the beginning of the months and not the monthly average levels.

| Great Lakes water level information: Beginning-of-August level[a] | | | | | |
|---|---|---|---|---|---|
| **Lake** | **Level[a,b]** | **Compared to August beginning-of-month average (1918–2022)** | **Compared to August 2022** | **Compared to record high (1918-2022)** | **Notes** |
| Superior | 183.68 m | 14 cm above | 4 cm above | 20 cm below | - |
| Michigan–Huron | 176.70 m | 11 cm above | 10 cm below | 74 cm below | - |
| St. Clair | 175.52 m | 33 cm above | 3 cm above | 51 cm below | - |
| Erie | 174.61 m | 29 cm above | 5 cm above | 49 cm below | - |
| Ontario | 75.12 m | 15 cm above | 26 cm above | 58 cm below | - |

[a] At the beginning of August, all of the Great Lakes were at least 48 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 Low Water Datum – Great Lakes Coordinating Committee at https://www.greatlakescc.org/en/international-great-lakes-datum-update/low-water-datum/

[b] 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 at https://www.greatlakescc.org/en/international-great-lakes-datum-update/

## Water levels forecast

Lake Superior is currently well above its average level and is expected to remain so under most water supply conditions. If there are very wet water supply conditions, lake levels could increase further in early fall, while very dry conditions could result in lake levels falling a bit below average.

Lake Michigan-Huron is expected to remain above average under most water supply conditions; it would take very dry conditions to bring the level below average by early fall.

Lake Erie is also expected to stay above average under most water supply scenarios.

Lake Ontario is above average but may approach an average level by mid-winter under typical water supply conditions. Wetter than average conditions may result in the level remaining above average, while drier than average water supply conditions would result in the level moving below average.

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 https://www.tides.gc.ca/en/monthly-water-level-bulletin-great-lakes-and-montreal-harbour.

| July basin statistics | | | |
|---|---|---|---|
| **Lake** | **Precipitation (percentage of LTA) [a,b]** | **Net basin supply (probability of exceedance) [c,d]** | **Outflows (percentage of LTA)[a]** |
| Superior | 71% | 83% (very dry) | 131% |
| Michigan-Huron | 135% | 58% (dry) | 103% |
| Erie (including Lake St. Clair) | 176% | 7% (very wet) | 109% |
| Ontario | 153% | 16% (very wet) | 115% |

[a] As a percentage of the long-term average (LTA).
[b] Environment and Climate Change Canada – Canadian Precipitation Analysis System
[c] <5% extremely wet; <25% very wet; <45% wet; 45-55% average; >55% dry; >75% very dry; >95% extremely dry.
[d] Please refer to the LEVELnews "What is net basin supply" (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 description of net basin supply.
**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.

## Other ways to keep up with what is happening in the Great Lakes

Remember that LEVELnews is just one way to keep up with what is happening in the Great Lakes. Of course we have links to flooding, level, and forecast information below, but there are other ways to stay in touch with Great Lakes information:

Tri-Board Tribune (https://ijc.org/en/tri-board-tribune) – a quarterly newsletter, designed by the Great Lakes Water Levels Boards of the International Joint Commission to share information and articles related to the entire Great Lakes – St. Lawrence River basin and provide regional updates presented by each Board.

Great Lakes Coordinating Committee Website (https://www.greatlakescc.org/en/home/) – provides binationally coordinated data for water levels, flows, and net basin supply throughout the Great Lakes Basin.

Great Lakes Water Quality Agreement (GLWQA) information (https://binational.net/).

Quarterly Climate Impacts and Outlook (https://binational.net/category/a9/qcio-btsc/) – archive of quarterly climate impacts and outlook documents that fulfill a commitment under the climate change impacts (Annex 9) of the GLWQA.

Great Lakes Daily News (https://www.glc.org/dailynews) – keep up-to-date on Great Lakes news with articles curated by the Great Lakes Commission Staff.

Great Lakes Connection (https://ijc.org/en/newsletter/great-lakes-connection) – A publication of the International Joint Commission focussing on the latest science, reader perspectives and opportunities to protect the health of the Great Lakes ecosystem.

International Lake Ontario-St. Lawrence River Board Weekly Summaries (https://ijc.us2.list-manage.com/subscribe?u=6f596332b572c1092ac6c20a3&id=15d567a8eb) - Sign-up to receive the International Lake Ontario-St. Lawrence River Board's weekly summaries on Lake Ontario outflows.

## Flood information

With water levels remaining high on some lakes, there is a high risk of flooding. Great Lakes water levels are difficult to predict weeks in advance due to natural variations in weather. To stay informed about 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 https://www.ijc.org/en/lsbc, and 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 at https://lre-wm.usace.army.mil/reports/greatLakes/greatLakesLevelsThisMonth/greatLakesLevelsThisMonth.html. 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 https://canada-preview.adobecqms.net/en/environment-climate-change/services/water-overview/quantity/great-lakes-levels-related-data.html. 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 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: LEVELnews-infoNIVEAU@ec.gc.ca

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