

LAKE LEVEL Trends & Projections

November 2020



Lake Michigan-Huron

Did you know that Lake Michigan-Huron is recognized as the largest lake in the world by surface area? Because Lake Huron and Lake Michigan are connected through the deep Straits of Mackinac, these two lakes are considered to function as one and therefore share the same water levels (1). Lake Michigan-Huron's inflow is only slightly regulated, and its outflow has no regulations (1). As a result, lake water levels are dependant predominantly on precipitation, runoff and evaporation (1).



Water Level Patterns

Annually, Lake Huron goes through seasonal fluctuations of high and low water levels. Highs typically occur in the late spring and early summer from spring runoff and increased rainfall (2). During the fall and winter months water levels usually decline as a result of cold dry air moving over the warm lakes, which cause high rates of evaporation (3). The larger the difference in temperature between the air and water, the greater the evaporation (3).

Current Water Level Trends

Table 1: Difference between Current Water Levels and Historical Water Levels on Lake Michigan-Huron

Historical Water Levels (m)		2020s Water Level Difference (m) * current level is 177.22 m
November Average	176.41	+ 0.81
November Monthly Record High	177.40	- 0.18
November 2019	177.30	- 0.08

Currently, Lake Huron water levels are continuing their seasonal decline (4). Although these levels are below the record monthly high for November, they are comparable to the high levels experienced November of 2019 (4). Earlier this year, Lake Huron surpassed monthly record highs from January through August 2020 (5). During the spring and summer of 2019, Lake Huron water levels were very close to record highs. Throughout the winter, this high water would typically go through its seasonal decline due to high rates of evaporation caused by cold temperatures (3). Conditions last winter, however, were warmer than usual which reduced evaporation (5). High amounts of precipitation also fell on the Lake Michigan side of the basin last fall and winter (5). In addition, National Oceanic and Atmospheric Administration (NOAA) scientists found that precipitation during the past 3 years has been about 25% higher than any 3-year period on record. These years of record high precipitation have resulted in water levels surpassing seasonal record highs in 2020.

Projections

It is projected that Lake Huron water levels will continue to decline throughout the winter, reaching its lowest point in February (5). More specifically, the lake is forecasted to be 15cm to 20cm below record highs, 5cm to 20cm below 2019 levels, but 71cm to 81cm above long-term averages for the next 6 months (5).

Because water levels on Lake Huron are dependant on weather (evaporation and precipitation), it is difficult to accurately predict water levels more than a few weeks ahead. Weather predictions change frequently throughout the week, therefore projecting these estimates months ahead results in a substantial range of uncertainty (6).

Landowners should be prepared for an increase in erosion issues along the shoreline into the fall and winter as a result of strong northwest wind storm systems.

References

(1) Briscoe. T. (2020, January 09). Homeowners near the Great Lakes face a 'very scary' challenge: How do you handle a generation's worth of water level changes in just a few years? Chicago Tribune. Retrieved from <https://www.chicagotribune.com/news/environment/great-lakes/ct-lake-huron-climate-change-water-levels-20200109-oiw7nunhoh3hm2vg5lrfimou-story.html>

(2) Government of Canada. (2019, August 02). Fluctuations in Lake Levels – types. Retrieved from <https://www.waterlevels.gc.ca/C&A/fluctuations-eng.html>

(3) Government of Canada. (2019, August 02). Natural Factors Affecting Lake Levels. Retrieved from <https://www.waterlevels.gc.ca/C&A/natural-factors-eng.html>

(4) US Army Corps of Engineers. (2020, November 06). Weekly Great Lakes Water Levels. Retrieved from <https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Water-Levels/Water-Level-Forecast/Weekly-Great-Lakes-Water-Levels/>

(5) US Army Corps of Engineers. (2020, October 20). October 2020 Great Lakes Water Level Summary. Retrieved from <https://www.lre.usace.army.mil/Portals/69/docs/GreatLakesInfo/docs/NewsAndInformation/OCT20summary.pdf?ver=Rdh3EHianuU9MsxkUFyE5g%3d%3d>

(6) US Army Corps of Engineers. (2020, November) Monthly Bulletin of Great Lakes Water Levels. Retrieved from http://lre-wm.usace.army.mil/ForecastData/BulletinGraphics/MBOGLWL-mich_hrn.pdf