

International Great Lakes Datum



Moving from IGLD (1985) to IGLD (2020)



Bi-National System

8 States and 2 Provinces



230 Water Level Gauges

permanent structures



25-35 Year Update Cycle

to account for land movement

2027

Planned Release

for the next IGLD and updated LWD

WHAT IS IGLD?

The International Great Lakes Datum (IGLD) is a common vertical reference used throughout the Great Lakes - St. Lawrence River system to measure water levels. IGLD was first released in 1955 by the *Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data*, a bi-national committee dedicated to joint water resource management. IGLD (1955) was updated to IGLD (1985) in 1992. IGLD (1985) is expected to be replaced by IGLD (2020) in 2027. To maintain consistency with national datums, IGLD (2020) will align with the new geoid-based North American Geopotential Datum of 2022 that is expected to be adopted in the U.S. by 2025 and will be compatible with the Canadian Vertical Datum of 2013, which is already in use in Canada.

WHY IS IGLD UPDATED?

IGLD needs to be revised every 25-35 years to account for Glacial Isostatic Adjustment (GIA), or the ongoing “rebounding” of land brought on by the retreat of glaciers that covered the region during the last ice age 12,500 years ago. Over time, GIA tilting of the region led to changes in water levels relative to the rising or subsiding shorelines. IGLD (2020) will also utilize new advanced surveying technology to correct systematic leveling errors.

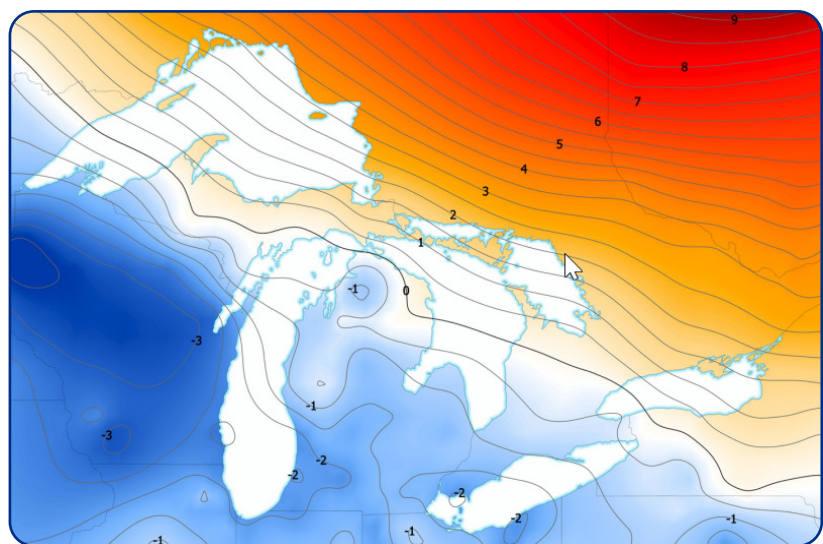
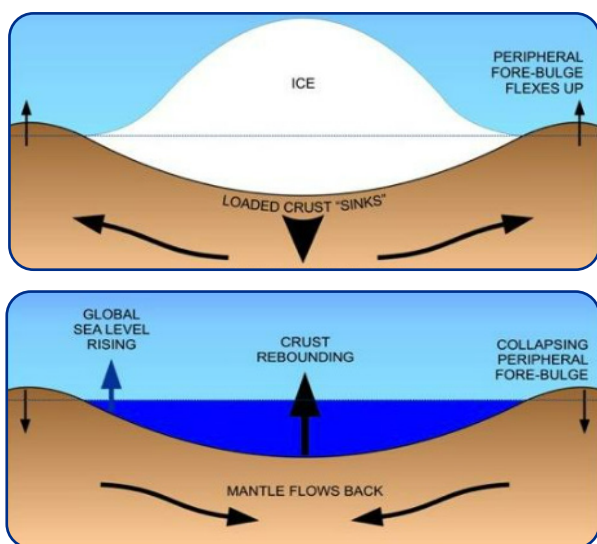


Fig. 1-3: Process of Glacial Isostatic Adjustment (left) and the resulting tilting of the entire Great Lakes region as determined by high accuracy GPS measurements in units of mm/year (right).

Changes

- Water level elevations for lakes and channels will be referenced to IGLD (2020) and assigned new values. These elevation values will change as much as 60 cm (2 ft), resulting from the elimination of systemic errors in IGLD (1985) and the alignment of IGLD (2020) with the new zero reference (Mean Sea Level) adopted for the North American Pacific Geopotential Datum of 2022.
- The traditional method of accessing a vertical datum, by leveling to known benchmarks, will be replaced by modern GNSS methods, which provide a direct and more accurate connection to the geoid-based IGLD (2020). Leveling will still be required between benchmarks at water level gauges.
- Low Water Datum (LWD), or Chart Datum, on the Great Lakes - St. Lawrence River system may also be revised. LWD sets authorized depths for navigational improvement projects. Changes will be communicated to stakeholders over the next 3-4 years.



Fig. 4-5: A Great Lakes water level station in Rochester, NY. Situated along Lake Ontario.

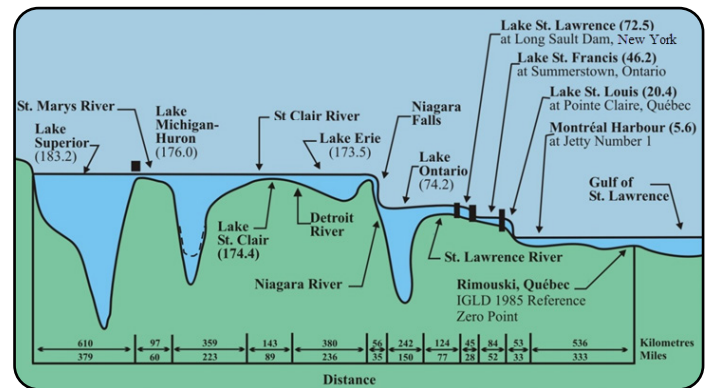


Fig. 6: IGLD (1985) Low Water Datum References for the Great Lakes.

Impacts



- Chart depth references and under keel clearance
- Low Water Datum: the elevation for water depths on nautical charts



- Height references for regulating outflow in the Great Lakes
- Flooding & erosion-control reference heights (*to consider in erosion/flood planning*)



- Dredging in harbors & navigational improvement projects
- Dam/lock operations & models/decision making tools (*e.g. NOAA Lake Level Viewer*)



- Permits issued by federal agencies (*e.g. U.S. Army Corps of Engineers (USACE)*)
- USACE Ordinary High Water Mark: Federal Navigation Servitude & Regulatory Permit Program
- Shoreline datums and permits issued by First Nations/Tribes, provinces/states



- Ecosystem restoration & management (*e.g. fish spawning habitat connectivity in wetlands*)
- Future surface water modeling & river management plans



- Planning for power generation
- Hazard Mapping & Planning (*for transportation and disaster planning agencies*)



- Geodetic leveling: augmented by Global Navigation Satellite Systems
- Updated transformation models and tools to convert between datums

Activities

Visit www.greatlakescc.org to follow IGLD (2020) progress, download technical reports, read FAQs, find events, and learn more!