Harmful Algal Blooms (HABs) & Hypoxia

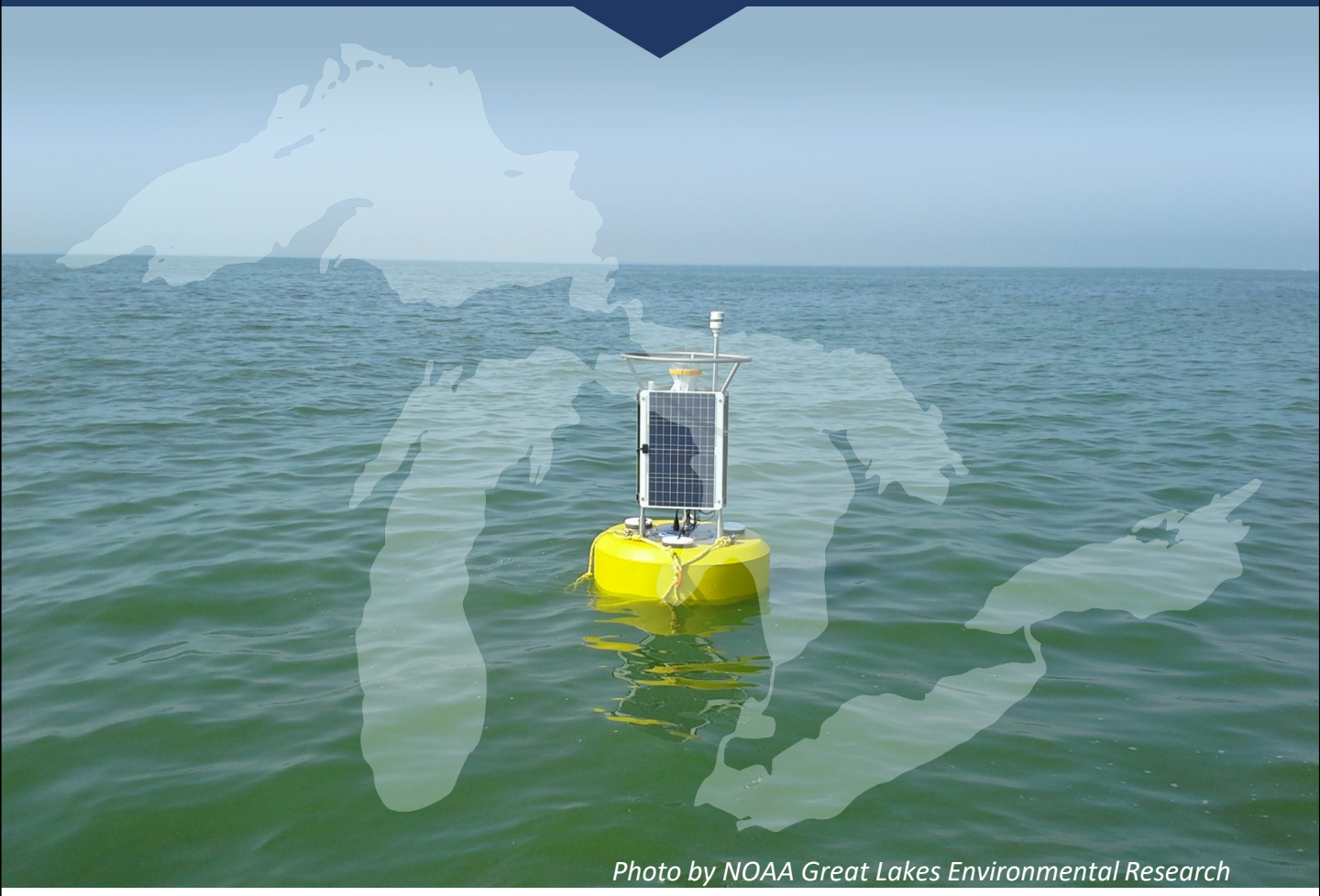
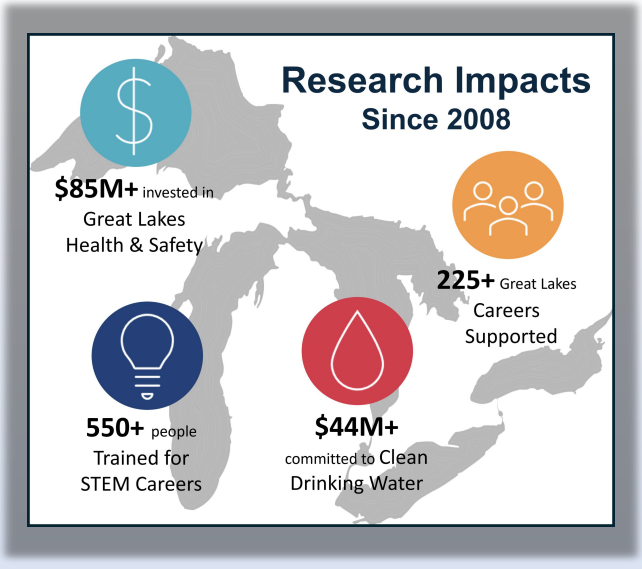


Photo by NOAA Great Lakes Environmental Research

Harmful algal blooms & hypoxia

threaten the drinking water quality for millions of residents around the Great Lakes. Excess nutrients in the water contribute to both of these issues. Harmful algal blooms can produce toxins that threaten human health. Hypoxia, or extremely low oxygen, can result in water becoming corrosive, discolored, and containing manganese, a heavy metal that is toxic to humans at high levels.

With our partners at the NOAA Great Lakes Environmental Research Laboratory, CIGLR is committed to developing forecasting tools, answering critical questions, and engaging directly with communities to inform decisions that keep the public safe.



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Hosted by the University of Michigan, CIGLR is a partnership between the National Oceanic and Atmospheric Administration (NOAA), universities, NGOs, and businesses.

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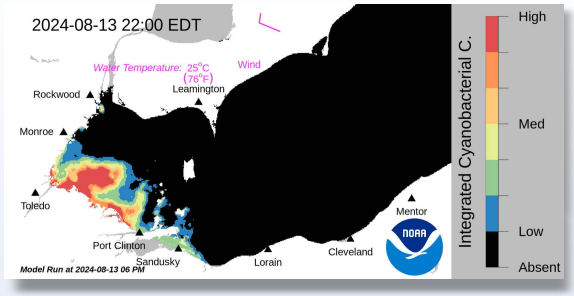
Quick Facts

- Harmful algal blooms (HABs) consist of cyanobacteria that are capable of producing toxins.
- HABs are promoted by nutrient pollution from agricultural runoff, wastewater discharge, and other sources.
- Hypoxia occurs when excess algae die and sink to the lake bottom, where decomposition consumes oxygen needed by animals.
- Hypoxic water can be corrosive, discolored, and contain the heavy metal manganese, which is toxic to humans at high levels.
- The hypoxic zone in Lake Erie can grow to approximately 4,000 square miles; hypoxia also occurs in some Great Lakes embayments, such as Saginaw Bay in Lake Huron and Green Bay in Lake Michigan.

Harmful algal blooms can produce toxins that threaten human and animal health. Great Lakes HABs most commonly produce a toxin called microcystin, which is a liver toxin and skin irritant. High levels of microcystin were responsible for the Toledo water crisis in 2014 that left 450,000 people without water for 3 days. The economic impact of this event was estimated at $65 million.

Photo by Haraz N. Ghanbari, Associated Press

Current Research & Outcomes

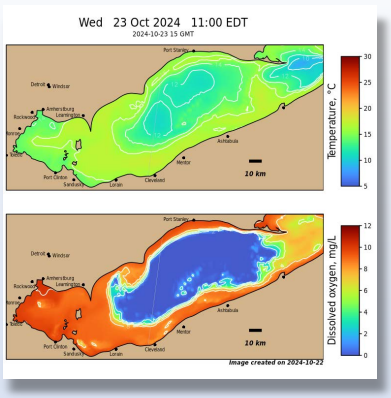


*CIGLR and NOAA scientists use water quality data along with satellite data, weather forecasts, and water movement forecasts to predict future HABs in western Lake Erie. They developed a specialized tool called the **Lake Erie HAB Forecast** that gives current bloom conditions and a 5-day forecast of algal bloom movement and size.*

- Monitoring buoys, autonomous sampling technologies, and weekly sampling events provide real-time data to managers and support forecast models in Lake Erie.
- Monitoring data are being used to evaluate Lake Erie's progress toward achieving bi-national phosphorus load reduction targets.
- Drinking water managers and other stakeholders in Lake Erie receive weekly algal toxin data to aid in decision making.
- The Lake Erie Hypoxia Forecast provides advance warning to drinking water plant managers, giving them time to adjust treatment processes and ensure the delivery of safe drinking water.
- Genomic technologies and autonomous vehicles improve monitoring efficiency, enabling early toxin detection and providing high-resolution data.

Research & Management Needs

- Research focused on understanding the challenges of achieving nutrient reduction targets to control HABs.
- Evaluation of the economic impacts of HABs and hypoxia, as well as conservation practices that improve water quality while providing habitat for wildlife and supporting recreation.
- Research to continue developing improved HAB and hypoxia forecasts that predict toxin levels, provide earlier warnings, and project further into the future.
- Research focused on what drives toxin production and its effects on human health and aquatic organisms.
- Federal investment in control technologies to prevent agricultural nutrients from polluting waterways.



*CIGLR and NOAA scientists use in-lake monitoring sensors to predict the movement of hypoxic water in Lake Erie's central basin. They developed the **Lake Erie Hypoxia Forecast** that provides early warnings of upwelling events, allowing drinking water managers to prepare for water quality changes and adjust treatment processes.*

Contact Us

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