Cooperative Institute for Great Lakes Research

CIGLR

Great Lakes Science for Society

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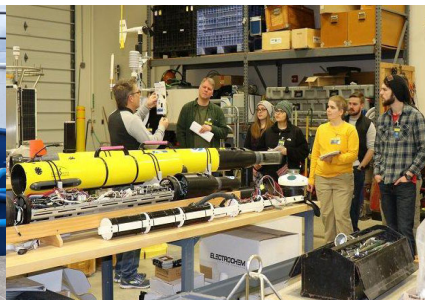
WHO WE ARE:

CIGLR conducts the scientific research needed to protect the Great Lakes, bringing the flexibility, nimbleness, and innovation of universities, non-governmental organizations (NGOs), and the private sector to support NOAA's mission to protect lives and property and strengthen the region's economy. Through these partnerships, CIGLR serves as a hub for research and collaboration focused on environmental, economic, and social sustainability, advancing science for society throughout the Great Lakes region.



ABOUT US:

CIGLR is made up of two main components:

Research Institute: A team of expert scientists working closely with NOAA's Great Lakes Environmental Research Laboratory (NOAA GLERL) to tackle key sustainability challenges in the region.

Regional Consortium: Expands our research reach and expertise across the Great Lakes, uniting 10 universities, 2 NGOs, and 3 businesses across both U.S. and Canadian waters.

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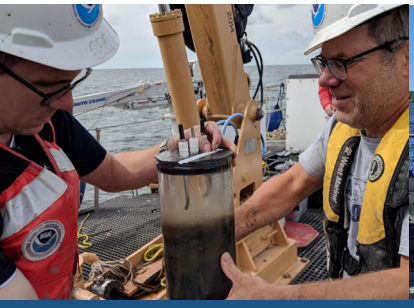
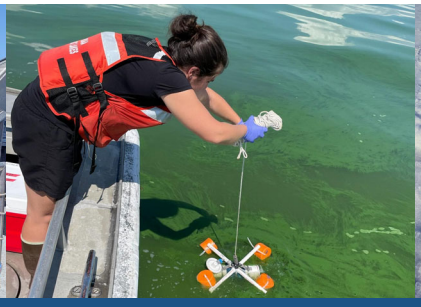
SCIENCE FOR SOCIETY:

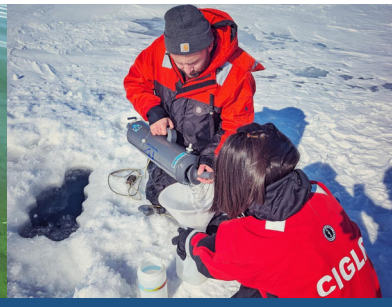
CIGLR turns Great Lakes research and knowledge into actionable science.

CIGLR's **Engagement, Career Training, and Outreach (ECO)** Program connects Great Lakes research with real-world decision-making. It provides hands-on training for students and postdocs and connects researchers with communities and stakeholders, such as water managers, anglers, public health professionals, and decision makers, to ensure research is relevant, accessible, and supports stewardship.

Learn more







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CIGLR RESEARCH: CIGLR's collaborative research encompasses the major environmental challenges and information needs that are critical for sustaining high quality ecosystems, economies, and human experiences in the Great Lakes. Our research is the foundation for providing Great Lakes *Science for Society*.

HARMFUL ALGAL BLOOMS & HYPOXIA threaten drinking water, recreation, and ecosystem health across the Great Lakes by producing toxins and low-oxygen conditions that harm people, fish, and water quality. CIGLR tracks these events using vessel sampling, satellites, buoys, autonomous vehicles, and genomic tools such as environmental DNA (eDNA). In Lake Erie, our research protects communities by supporting forecasts that warn water managers about algal bloom severity and hypoxic zones, while similar monitoring in embayments like Saginaw Bay, Lake Huron tracks seasonal changes and informs water management.
Contact: Casey Godwin, cgodwin@umich.edu

LAKE EFFECT SNOW & ICE create challenges for shipping, emergency response, and public safety across the Great Lakes, and at the same create economic activities through winter recreation. CIGLR develops advanced models to improve forecasts of lake effect snow, ice cover, precipitation, and visibility. Researchers use monitoring networks, satellite data, and the Great Lakes Earth System Model to provide daily updates, refine navigation tools, track trends, and simulate future ice conditions. These forecasts support commerce, transportation, recreation, and oil spill response in icy conditions.
Contact: Ayumi Fujisaki-Manome (ice), ayumif@umich.edu; Abby Hutson (lake effect snow), hutsona@umich.edu

WATER LEVELS & COASTAL FLOODING impact communities, infrastructure, and commerce across the Great Lakes, where changing levels disrupt shipping, damage property, impact tourism, and increase flooding and erosion. CIGLR studies water level variability and develops forecasts for navigation, emergency response, and water management. Researchers develop flooding models, expand buoy and sensor networks, monitor storm-driven events like seiches and meteotsunamis, and use AI and weather modeling to extend forecasts further into the future. This work helps communities build resilience and reduce risks to life and property.
Contact: David Cannon (flooding), djcannon@umich.edu; Yi Hong (water levels), yhon@umich.edu

OBSERVING SYSTEMS & AI are key tools CIGLR uses to monitor the Great Lakes and support public safety, navigation, and resource management. Our network of buoys, gliders, autonomous vehicles, drones, and satellites collects high-frequency data on water conditions, ecosystems, and weather. These data inform models, track harmful algal blooms and hypoxia, and provide real-time information for water managers, fishers, and recreational users. AI and machine learning optimize sensor placement and improve forecasts, making monitoring networks more efficient and better able to protect Great Lakes communities and ecosystems.
Contact: Dani Jones (AI), dannes@umich.edu; Russ Miller (observing systems), rusmil@umich.edu

INVASIVE SPECIES & ECOLOGY are closely linked in the Great Lakes, as non-native species like zebra and quagga mussels alter food webs, degrade habitat, and cause ecological and economic harm. CIGLR monitors these impacts through long-term studies, lab experiments, and genomic tools like eDNA and eRNA to detect species and track abundance. Research shows invasive mussels shift energy flow, reduce native species, and contribute to harmful algal blooms in Lake Erie and Saginaw Bay, Lake Huron. This work informs strategies to protect fisheries and maintain ecosystem health.
Contact: Casey Godwin, cgodwin@umich.edu

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