Great Lakes HABs Collaborative
NEWSLETTER
LINKING SCIENCE AND MANAGEMENT TO REDUCE HARMFUL ALGAL BLOOMS FALL 2025

What's happening with the HABs Collaborative?

HABs Grab 2025

The purpose of the Great Lakes HABs Collaborative is to facilitate communication and collaboration leading to more strategic research, informed policy decisions, and effective management of HABs in the Great Lakes basin. As 2025 started, the future of Great Lakes HABs research was uncertain as the status of budgets and agency positions were suddenly at risk. Through the uncertainty, one thing became clear: members of the Great Lakes HABs Collaborative wanted to help. During steering committee meetings in February 2025, concerns with the state of federal funding led into discussions of past research successes, such as the coordination of the 2019 sampling snapshot of the western basin of Lake Erie. This initial **HABs Grab** allowed more than 11 agencies to collect data at 172 locations on the same day to produce a HABs-focused data-set which is still being used today. Though the HABs Collaborative lacked the federal funding which had initiated the 2019 effort, members indicated that if someone could coordinate an event, many of them would collect water from locations across the Great Lakes voluntarily to create a similar output. With this spark of inspiration and infusion of energy, the HABs Collaborative began planning for a 2025 HABs Grab effort.

Water Guardians of Caldwell First Nation, Steve Simpson Sr. and Shelley Birch, work with University of Windsor Great Lakes Institute for Environmental Research staff to collect samples in Lake St. Clair.

Great Lakes Commission (GLC) staff designed a GIS-based survey and tapped into the HABs Collaborative network to generate a pool of partners for the 2025 Grab. These partners were able to volunteer to collect and process water samples from known HABs-prone areas across the basin. They ranged from university-based academics and state agency representatives to federal researchers and nonprofit scientists, spanning all five of the Great Lakes. In total, 17 partner organizations participated in the effort. Shipping and supply costs were provided by Michigan Sea Grant and the GLC and the analysis effort was coordinated by **Dr. Trista Vick-Majors** of Michigan Tehcnological University (MTU) with assistance and facilitation by Connor Roessler of the GLC and Connor O'Loughlin of MTU.

The research team with NEW Water collect samples from Green Bay.

Matt Hudson with the Burke Center for Ecosystem Research collects samples from the Wisconsin shoreline of Lake Superior in the Apostle Islands National Lakeshore.

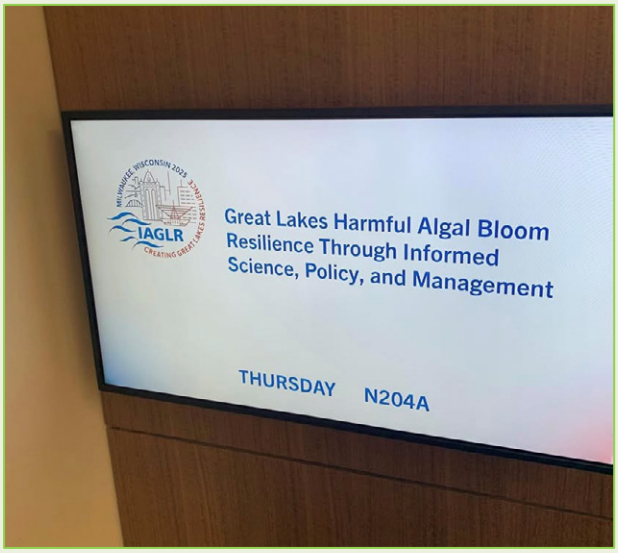
Participants collected samples from all five Great Lakes during the week of August 11-15 using the same methodology and protocol. The collected samples are being analyzed to create a unified dataset which researchers across the basin can utilize. The information from the dataset can help to determine information about algal blooms in the Great Lakes including their extent and severity, the presence and concentration of toxins, or other factors like nutrient levels. Having this information on harmful algal bloom dynamics and toxins is crucial for protecting human health and safeguarding the Great Lakes ecosystem with more informed management.

The HABs Collaborative at IAGLR 2025

The **International Association for Great Lakes Research** (IAGLR) hosted its 68th annual conference in Milwaukee, Wisconsin, this June. The conference brought energy and connection to the research community with hundreds of presentations and posters under the theme of **Creating Great Lakes Resilience**.

While several presentations throughout the week addressed harmful algal blooms, the Great Lakes HABs Collaborative hosted a session focused on the science and management of HABs called **Great Lakes Harmful Algal Bloom Resilience Through Informed Science, Policy, and Management**. The session was chaired by HABs Collaborative Steering Committee members **Jenan Kharbush** and **Ryan Sorichetti**, USGS representative **Mary Anne Evans**, and Great Lakes Commission program manager **Nicole Zacharda**. In total, 11 presenters shared their research findings during the session and eight researchers shared posters of their work.

GLC's Nicole Zacharda and Connor Roessler joined with the University of Michigan's Dr. Jenan Kharbush to lead this year's Great Lakes HABs Collaborative session.



The Great Lakes HABs Collaborative session at the IAGLR conference in Milwaukee, Wisconsin.

Presenters shared work from all five Laurentian Great Lakes and across a diversity of research topics. The audience was taken on a tour of the lakes as talks started with a synthesis of HABs knowledge in the Great Lakes basin, a multi-omics approach to HABs early warnings, and a system-wide overview of HABs driving factors beyond nutrients and high temperatures, before moving into lake-specific talks.

Talks about Lake Erie focused on modeling for the production rate of microcystin and the interaction between Maumee River sediments and nutrient loading. Moving north, several talks focused on Lake Superior and HABs in the St. Louis estuary plus implications and drivers of strains of *Dolichospermum* blooms in the lake.

A few presentations focused on HABs history, with a 20-year review of HABs monitoring on Lake Ontario and a re-constructive history of phytoplankton communities in Lake Huron. A Lake Michigan-focused talk also explored real-time camera modeling of bloom formations and examined the algal community makeup in the Green Bay watershed.

A final talk opened up the audience to discussion about recent bird mortality on a Lake Erie island and the potential connection to HAB toxins. The Great Lakes HABs Collaborative is grateful for the diversity of stimulating and thought-provoking presentations and the interest from those who attended. We hope the Great Lakes HABs community joins us at the next IAGLR conference in Winnipeg in May 2026.

Share your research project on the HABs Research Mapper!

HABs Collaborative Steering Committee members have worked with the **Great Lakes Commission** to develop an app that increases collaboration among researchers and water managers working to investigate and address HABs in the Great Lakes basin. **Visit www.glc.org/work/habs to learn more.** Please reach out to **Connor Roessler at croessler@glc.org**, if you have a research project to add to the mapper.

HABs Calendar

ASLO & SIL Joint Meeting

The **Association for the Sciences of Limnology and Oceanography** in partnership with **International Society of Limnology** will host a joint meeting from May 12-16, 2026, in Montreal, Québec. Registration information can be found at **this link.**

IAGLR & SCAS-SCSA Joint Conference

Save the date for the joint conference of the **International Association for Great Lakes Research and the Society of Canadian Aquatic Sciences** to be held in Winnipeg, Manitoba from May 25-29, 2026. More details can be found **here.**

13th US Symposium on Harmful Algae

Join the HABs Collaborative for the **13th US Symposium on Harmful Algae** to be held in Cedar Rapids, Iowa, from October 25-29, 2026. More information and event details can be found **here.**

Lake Superior Collaborative Symposium

The annual **Lake Superior Collaborative Symposium** will be held at the Northern Great Lakes Visitor Center in Ashland, Wisconsin, from January 26-27, 2026. More information can be found **here.**

The 16th St. Louis River Summit

Save the date for the **16th St. Louis River Summit** to be held on the UW-Superior campus from March 3-5, 2026. More information can be found **here.**

Harmful Algal Blooms, Hypoxia, and Nutrients Research Webinar Series

Hosted by U.S. EPA's Offices of Water and Research and Development in coordination with regional offices, this free webinar series is focused on communicating the latest, cutting-edge research related to nutrients and the priority impacts of nutrient pollution: harmful algal blooms (HABs) and hypoxia. Webinars are typically held bimonthly from 2 to 3 p.m. Eastern on the last Wednesday of the month. Find more information and a schedule of webinars **here.**

10 YEARS

Great Lakes HABs Collaborative

Linking Science and Management to Reduce Harmful Algal Blooms Since 2015

Looking Back: The Great Lakes HABs Collaborative's Tenth Anniversary

In December 2015, the Great Lakes HABs Collaborative, called the HABs Collaboratory at the time, had its first meeting. As the collaborative looks back on the past decade, partners shared their perspectives on the impact of the network:

Which products have benefitted your work?

"I greatly appreciate numerous publications, including but not limited to (1) 'Great Lakes Harmful Algal Blooms: Current Knowledge Gaps", (2) 'Who Does What? A Guide to Agencies' Roles in HABs', and (3) 'Phosphorus (P) and HABs: Sources of P from the Maumee River'."

"It has been a great experience working with GLC's HABs Collaborative on webinar series highlighting the role of new technology in monitoring and mitigating HABs and nutrient pollution. The collaborative helped us educate managers, researchers, and residents across the Great Lakes about the cutting edge of water quality innovation, providing both an excellent educational experience and valuable exposure for startups working in a field that is often difficult to break into."

"I appreciate the collaborative fact sheets — I have used the fact sheets and images from them in several different presentations and linked on our website when talking about HABs. I also listen to webinars when my schedule allows to learn new aspects of HABs work and enhance my professional development."

What connections have you made through the Collaborative?

"The issue of HABs and progress towards solutions will require numerous partnerships and collaborations. The HABs Collaborative has played a critical role in getting minds and ideas around the table."

"Having people participate from beyond Michigan expands the reach of our work and leads to additional insights from webinar attendees."

What impact has the Collaborative had on the region?

"Thank you HABs Collaborative for your continued work within and for IAGLR."

"Building new relationships, supporting existing connections, and spread complex science information to non-academic and non-agency groups."

The State of HABs Mitigation Webinar Series 2025

Alyssa Guzman, Cleveland Water Alliance

"The State of HABs Mitigation" was a dynamic and essential series of interactive panel discussions, held in August and October 2025, that explored cutting-edge approaches to managing harmful algal blooms. Presented by the Cleveland Water Alliance and the Great Lakes HABs Collaborative, this series aimed to demystify complex issues surrounding HABs for a broad audience and equip managers with the knowledge to tackle this critical water quality challenge with 21st-century solutions.

The series launched with **"Innovations in HABs Mitigation,"** a discussion that highlighted the shift from traditional methods like algaecides to groundbreaking technologies leveraging everything from autonomous vehicles and AI to nature-based solutions. The event saw strong engagement with 124 attendees, demonstrating significant interest in this topic. Discussions covered the full range of HAB mitigation strategies, the current state and future of these technologies, and the barriers and opportunities for large-scale implementation. This session emphasized the crucial role innovation plays in revolutionizing our approach to water quality.

The second session in the series **"Innovations in Nutrient Mitigation,"** focused on one of the root causes of HABs: nutrient pollution. This event also saw strong engagement with 115 attendees, demonstrating significant interest in this ongoing series. Industry experts and research leaders examined how emerging technologies are transforming nutrient management, particularly in the context of large-scale agricultural systems. The session explored next-generation solutions, advancements in monitoring, and the ongoing challenges and opportunities for reducing nutrient loads that drive HAB formation.

This series went beyond just talking about the problem; it provided actionable insights and highlighted cutting-edge solutions. By bringing together a cross-section of experts—from academics and government officials to entrepreneurs and industry leaders—the panels fostered a collaborative environment where new ideas were shared and discussed. Participants learned about best practices, the limitations of current solutions, and the promising technologies helping combat water quality challenges. "The State of HABs Mitigation" series empowered stakeholders with the knowledge needed to drive positive, impactful change in the fight against harmful algal blooms.

Member Spotlight

Spotlight: Anjana Adhikari

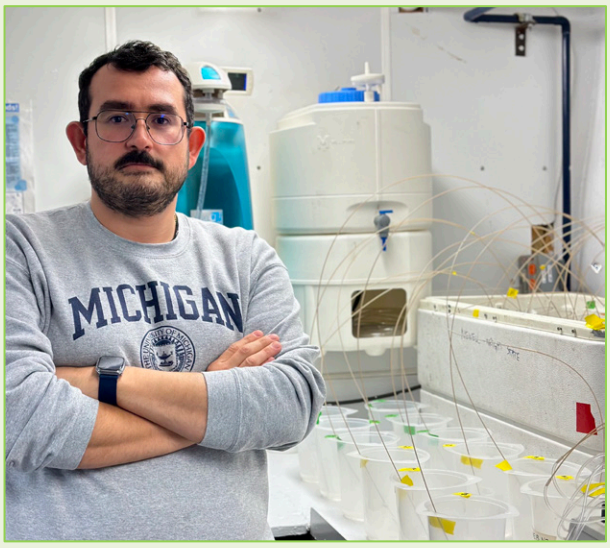
Anjana collecting samples by Bay Beach in Green Bay in Lake Michigan.

Anjana Adhikari is a doctoral candidate in environmental health sciences at the Joseph J. Zilber College of Public Health at the **University of Wisconsin–Milwaukee**. Her main research is a collaborative effort in the Laurentian Great Lakes, encompassing three diverse lakes – Lake Michigan, Lake Superior, and Lake Erie. This work is a comparative study to help place diverse Great Lakes blooms on a continuum of environmental variability, rather than viewing them as a set of independent events. Understanding how communities respond to various nutrients across different temperatures and how cyanobacterial harmful algal blooms (cHABs) will react as climate change alters temperature and precipitation patterns is crucial, as these changes can lead to varying nutrient loads and N:P ratios in freshwater bodies. Her primary study site is Green Bay, Wisconsin, where, from May through September, her lab conducts field sampling twice a month to monitor nutrient levels, changes in microbial communities, and cyanotoxin concentrations. The two-year study focuses on examining the stoichiometry of nutrients and temperature, and how these factors affect the toxicity and proliferation of cHABs and the production of cyanotoxins in lower Green Bay, using both short-term and long-term bioassays. There are no literature mentions that bioassay experiments have been done before in Green Bay samples. The findings indicate that the dominant cyanotoxins detected across all three study sites include different congeners of Microcystin, cyanopeptolins, and anabaenopeptins, with variations in detection, toxin concentration, and congeners between months and times of the year. Her responsibilities include analyzing samples as the freshwater cyanotoxin analysis core for the three Great Lakes, part of a collaborative framework, using liquid chromatography-tandem mass spectrometry with a targeted peptide and alkaloid method following cell lysis and freeze-thaw procedures.

Outside of the Great Lakes project, she is a part of a Natural Hazard Center-funded project in the Tenmile Lakes Basin Partnership in Oregon, where she helps to analyze water samples for cyanotoxins collected from the lake and the households of the lakeside community that directly pump water from Tenmile Lake. She also assists in interpreting results and sharing them with the community and citizen scientists for this project. She also utilizes her knowledge of working with cyanotoxins in water matrices to understand freshwater cyanotoxins in fish tissues from samples collected during a NSF-funded research trip to Lake Victoria, Kenya, in 2023, as well as from a fish species in Green Bay.

Spotlight: Berk Durutürk

Berk Durutürk is a Ph.D. candidate in environment and sustainability at the **University of Michigan's School for Environment and Sustainability.** He is advised by Michigan Sea Grant director and University of Michigan professor Dr. Silvia Newell in the Aquatic Biogeochemistry Lab. His research mainly focuses on nitrogen transformations, harmful algal blooms, and hypoxic events in Lakes Erie and Superior. He aims to understand the relative roles of nitrogen cycling for cyanobacterial biomass in the water column and sediment-water interface on the development of HABs and hypoxia in Lake Erie, as well as testing whether nitrogen cycling is phosphorus limited in Lake Superior.



Berk Durutürk

Understanding nitrogen transformations in Lake Erie is critical and yet complicated to assess how nitrogen supports HAB growth and toxicity. While the western and central basins provide more of an ecosystem service in terms of nitrogen loss via denitrification, it is important to evaluate the role of sediment-water interface nitrogen dynamics in either exacerbating or mitigating harmful algae growth, and whether sediments provide a net ecosystem service through removal of excess of nitrogen. However, these are rarely quantified. Berk uses the continuous-flow, intact sediment core incubation system with nitrogen (15NO3-) tracer addition in all the research sites of both lakes and phosphorus (PO43-) tracer addition for Lake Superior. The sampling cruise trips were repeated for three years (2021-2023), 4 times annually across the ice-free season (in May, July, August, October). His sites on Lake Superior were determined based on previous observations of brief HABs occurrences near the Apostle Islands in comparison with the deeper central part of the lake, at a station that has been continuously monitored for decades. For Lake Erie, he follows the path where HABs originate in the western basin and hypoxia develops in the deeper central basin.

Berk completed his undergrad and masters in geological engineering at Hacettepe University in Türkiye. He has worked on various projects in Central Anatolia, the coastlines of the Aegean and Mediterranean seas and the East European Plain. He believes that joining Dr. Newell's lab has opened a new chapter of his career in Great Lakes research and enjoys being a part of this ambitious community. He especially loves all the time he spent on R/V Blue Heron and always welcomed the conversations with its amazing crew. Whether it's taking refuge in Marquette because of the 10-15-foot waves on Lake Superior or fending off black flies on a beautiful morning in Lake Erie, the Great Lakes have so much to offer everyone.

Spotlight: Abby Reed

Abigail (Abby) Reed is a second year Ph.D. student and National Science Foundation (NSF) Graduate Research Fellow in the **University of Michigan's Earth and Environmental Sciences Department,** co-advised by Drs. Jenan Kharbush and Silvia Newell at the Aquatic Biogeochemistry Lab. She was born in Ohio but grew up in southwest Florida, where her interest in harmful algal blooms started early with middle school science fair projects focused on red tides composed of the brevetoxin-producing dinoflagellate, Karenia brevis. That interest in HABs brought her back to the Midwest for her Ph.D. to study the nitrogen cycle within Great Lakes eutrophic systems that are prone to cyanobacterial HABs. Abby hopes to one day work in the federal or state government managing water for reduction of harmful algal blooms.

Abby is currently researching if and how nitrogen cycling under ice may impact summer HABs as part of a newly funded project on Great Lakes winter nitrogen cycling, funded by NSF's Chemical and Biological Oceanography Programs. Specifically, she quantifies nitrogen cycling processes each month over the full annual cycle within Western Lake Erie and Saginaw Bay in Lake Huron, which are both locations prone to summer cyanobacterial HABs. She is measuring uptake rates of major nitrogen forms (ammonium, urea, nitrate), nitrification rates, and phytoplankton community structure in both systems. Nitrification transforms nitrogen from ammonium, the form of nitrogen that cyanobacteria prefer, to nitrate, the form of nitrogen that diatoms prefer. Nitrification has been observed under ice in other temperate lakes, favored by light limitation and reduced phytoplankton competition. This essential process provides nitrate to winter diatoms and prevents toxic ammonium buildup. We predict losses in ice might reduce nitrification, leaving ammonium available for harmful algae in the summer.

Abby Reed conducting under-ice research.

Past studies regarding the nitrogen cycle in the Great Lakes occurred mostly during the warmer months, with very little sampling in winter and shoulder seasons. Abby's project will fill in some of these gaps during the winter months to see how under-ice nitrification, or lack thereof, may influence nitrogen availability for seasonal phytoplankton communities. She also plans to investigate other approaches to studying winter conditions in Lake Erie, including using remote sensing products of ice and phytoplankton, interpreting historical records of ice conditions, and further documenting temporal phytoplankton community shifts. Her work will ultimately lead to a better understanding of the phenology of nitrogen cycling in eutrophic systems within the Great Lakes.

Spotlight: Colton Bragg

Colton Bragg is a master's student at the **University of Michigan Earth and Environmental Sciences Department** working with Dr. Jenan Kharbush in the Microbial Biogeochemistry Lab. He obtained his bachelor's degree in ecology and evolutionary biology from Saginaw Valley State University and started his master's program in 2024. His research focuses on how climate change will influence Western Lake Erie and Saginaw Bay cyanobacterial harmful algal bloom microbial communities.

Colton Bragg

Under climate change, the Great Lakes are expected to increase in temperature and dissolved CO2, both of which favor cyanobacteria over other phytoplankton. This is predicated to increase harmful algal bloom frequency and intensity. Using genomic and isotope tracer techniques in collaboration with the NOAA Great Lakes Ecological Research Laboratory, he studies how these conditions will alter natural bloom communities, including how bloom toxicity, composition, and nutrient uptake may change. He is also examining how the presence of different carbon concentrating mechanism genes (CCMs) in Microcystis aeruginosa will affect their success under climate change. Cyanobacteria use CCMs to scavenge inorganic carbon from their environments, and different CCMs may be more or less efficient under different climate change scenarios. Thus, studying these CCM dynamics could inform how blooms will behave in lakes in the future.

Having grown up in Michigan and around the Great Lakes, Colton is passionate about preserving our unique aquatic ecosystems and he hopes that his research will help contribute to maintaining these incredibly important lakes.

Get involved and stay in touch!

Find us on X (Twitter)

The collaborative is active on X (Twitter)! Follow us to get up-to-date information about our work and other HABs-related content. @GLHABsCollab

Join our email list

To join our email list and receive announcements about the Collaborative, please email Connor Roessler at croessler@glc.org