Great Lakes HABs Collaborative
NEWSLETTER
LINKING SCIENCE AND MANAGEMENT TO REDUCE HARMFUL ALGAL BLOOMS Fall 2021

What's happening with the HABs Collaborative?

HABs Collaborative Steering Committee member Max Herzog shares the following from his colleague at the Cleveland Water Alliance, Laura Rankin:

Erie Hack, the months-long innovative water-solutions competition that attracts the best and brightest from the Great Lakes region, has culminated with the naming of two winning teams and over $60,000 awarded during the finals on November 18.

Six finalist teams pitched innovations on everything from curb redesign to microfluidic chips for toxin detection. **RNA Power** won the $30,000 top prize for their innovative method to preserve and analyze RNA to aid in the detection of toxins in algae, and **Agri-Tech Ohio** was awarded $18,000 for their patented "Combined Remediation Biomass and Bio-Product Production Process" that involves planting a fast-growing variety of sorghum capable of extracting significant amounts of phosphorus and nitrogen from the soil and carbon dioxide from the air.

Erie Hack is the flagship competition of the **Cleveland Water Alliance (CWA)**, a nonprofit organization that is working to solidify Lake Erie's position as a critical player in the global water economy and a desirable operating space for sustainability-minded water entrepreneurs and scientists from around the globe.

"In 2017, we issued a challenge to 'Innovate The Lake,' and forward-thinkers from across our region answered the call," said Bryan Stubbs, President and Executive Director at CWA. "Now, in 2021, we are excited to have named the winners of the third iteration of Erie Hack. This year's competition activated some of the best innovations we've seen to date, and we're looking forward to collaborating with these teams as we continue to accelerate the economic impact and conserve the vitality of our freshwater ecosystems."

In addition to the first and second place grand prizes, four teams won Mini Challenges for their innovative products and solutions to specific water-related problems outlined by sponsoring organizations. The virtual event included opening remarks from Cleveland Mayor-elect Justin Bibb. Tony Brown, Play-by-Play Broadcaster for the Cleveland Monsters, moderated the competition.

Erie Hack is a program of CWA in partnership with local champions at **TechTown Detroit, Midstory, Blackstone LaunchPad at The University at Buffalo, and WEtech Alliance.** Erie Hack is presented by the **First Solar Community Giving Fund of the Greater Toledo Community Foundation** and the **Northeast Ohio Regional Sewer District.**

Joint Aquatic Sciences Meeting 2022

Members of the HABs Collaborative are hosting a session titled **"Collaborative Solutions in Response to Harmful Algal Blooms"** at the **Joint Aquatic Sciences Meeting** (JASM) in 2022. The session invites interdisciplinary applied research and collaborative management projects to improve the detection, forecasting, prevention, mitigation, and adaptation to freshwater and marine HABs. **The deadline to submit an abstract to JASM is January 10, 2022.**

JASM will bring together the nine organizations of the **Consortium of Aquatic Science Societies,** including the International Association for Great Lakes Research (IAGLR). Expected to attract 3,000-4,000 attendees, the JASM conference will be held **May 14-20 in Grand Rapids, Michigan,** and includes an extensive exhibitor hall and related sponsorship opportunities.

International Conference on Toxic Cyanobacteria

Registration is now open for the **12th International Conference on Cyanobacteria.** The conference will take place in Toledo, Ohio, from May 22-27. The deadline to submit an abstract is January 15, 2022, and the deadline for early registration is March 1, 2022.

To learn more, go to: http://www.bgsu.edu/ICTC

Great Lakes Commission Annual Meeting
Panel on Understanding Nearshore Nutrient Reductions

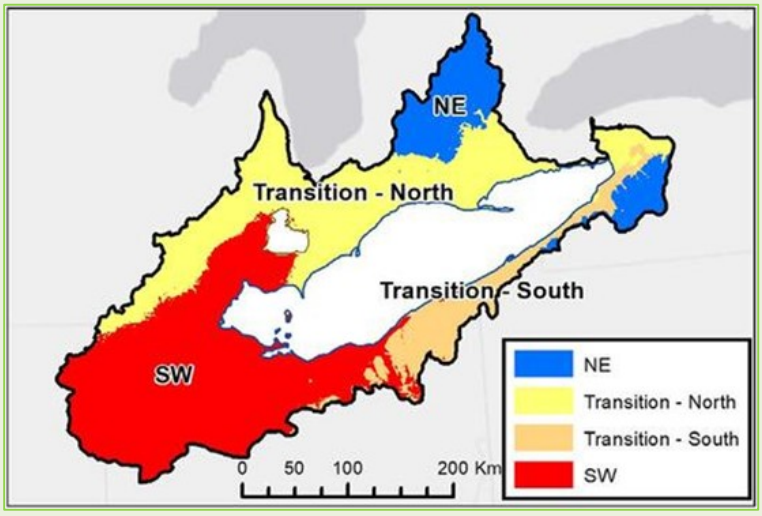
In October 2021, the Great Lakes Commission hosted a panel on understanding nearshore nutrient reductions at its annual meeting. The panel was moderated by **Chris Winslow of Ohio Sea Grant** and included remarks from **Matt Komiskey, USGS; Craig Stow, NOAA-GLERL; Ed Verhamme, LimnoTech; and Laura Johnson, National Center for Water Quality at Heidelberg University.** Panelists informed GLC Commissioners and attendees about the latest research and uncertainties related to how nutrients travel through agricultural fields, rivers, and lakes.

Click here to view a recording of the panel discussion.

Canadian Corner

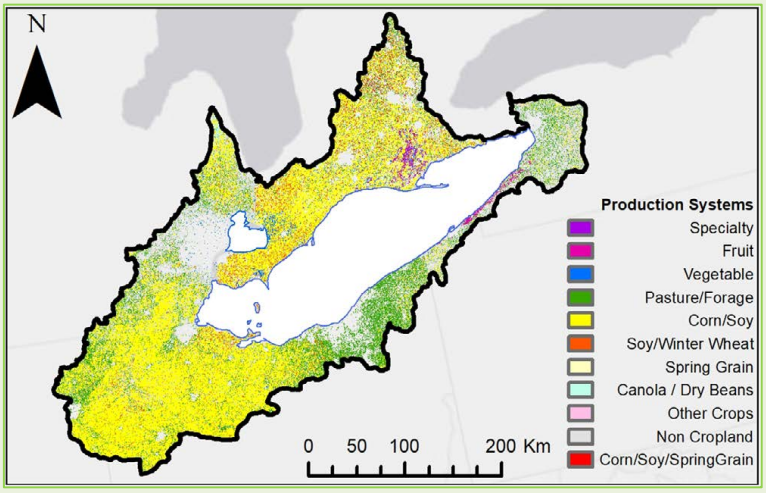
One size does not fit all: Toward regional conservation practice to reduce phosphorus loss in the Lake Erie watershed

Current estimates of the environmental efficacy and cost-effectiveness of conservation practices are developed based on a limited number of studies and involve a great deal of extrapolation rather than spatially distributed field trials. Consequently, we may not be applying the **"right practice" in the "right place"** to mitigate P loss from fields. A recent collaborative paper led by **Dr. Merrin Macrae of the University of Waterloo** sheds light on how subtle differences in microclimate, soils and topography should be considered when recommending appropriate conservation practices to reduce phosphorus loss from agricultural landscapes. The objective of the research was to develop a regional conservation practice suitability framework, using the Lake Erie watershed as a case study, that could be transferred to other watersheds that exhibit varying land characteristics and hydroclimates. A more in-depth look at this research can be found **here.**



Differing P management regions within the Lake Erie watershed.

The study examined patterns in climate, landscape characteristics and land drainage to define regional differences and identified four management regions within the Lake Erie watershed: Northeast, Transition North, Transition South and Southwest. A conceptual understanding and toolkit of how and why different conservation practices were appropriate within different regions was then developed based on a literature review and author experience. The "endpoints" in the northeast and southwest represent different P management regions based on the potential for P transport or retention on farm fields, whereas P management strategies in the two "transition" areas may be more complex.



Production systems within the Lake Erie watershed.

Macrae, M., Jarvie, H., Brouwer, R., Gunn, G., Reid, K., Joosse, P., King, K., Kleinman, P., Smith, D., Williams, M. & Zwonitzer, M. (2021). One size does not fit all: Toward regional conservation practice guidance to reduce phosphorus loss risk in the Lake Erie watershed. Journal of Environmental Quality, 50, 529-546. https://doi.org/10.1002/jeq2.20218

Member Spotlight

We know a lot of good work is happening around the Great Lakes basin thanks to many of our collaborative members. **Help us share that work by suggesting content for the "Member Spotlight" section of this quarterly newsletter.** Please share your ideas with Nicole Zacharda at **nzacharda@glc.org.**

Student Spotlight: Sarah Goodrich

Sarah received her bachelor's degree in biology and environmental science from Northern Kentucky University in 2019. She is now pursing her master's and eventually Ph.D. in the Department of Geography and GIS at the University of Cincinnati, working under Drs. Susanna Tong and Richard Beck. She is also currently employed at the U.S. EPA a Pathways Physical Scientist. Sarah enjoys being an interdisciplinary scientist and shows this in her thesis project work by combining remote sensing and aquatic toxicology techniques to understand more about HABs. She hopes that her thesis project will help provide more information on how climate change and warmer surface water temperatures can affect both the toxicity of *M. aeruginosa* blooms as well as algaecide efficacy. She is very passionate about water in general and wants to contribute to protect local recreational waterbodies by helping mitigate HABs and preserving aquatic ecosystems.

Sarah Goodrich

Stories from outside the basin: Des Moines Water Works source water protection efforts

Des Moines Water Works (DMWW) is an independent public drinking water utility that serves 500,000 central Iowans — one-sixth of Iowa's population. For decades, the utility has steadily expanded production capacity and built new treatment facilities to meet the demands of a growing metropolitan area. In addition to a growing customer base, the utility has experienced increased threats from nitrogen and phosphorus-laden source water.

Much of the land in the two watersheds that supply source water to DMWW, the **Raccoon and the Des Moines River Watersheds,** is heavily tilled in row crop, owned by non-operator landowners who may be reluctant to adopt to conservation adoption, and is thoroughly drained by agricultural tile systems. **Saylorville Reservoir,** a drinking

water supply that is plagued by HABs, sits just upstream of the utility on the Des Moines River. In 1992, DMWW built the world's largest nitrate removal facility to help address a portion of the thousands of tons of nitrogen that flow past the utility's intakes on the Raccoon River each year. The utility has added off-river storage, another treatment plant, and is planning a $30 million alluvial well project in hopes of avoiding the microcystin toxins produced by HABs found in the Des Moines River.

Despite investments in technology and capacity, agricultural nutrients in surface water have made it increasingly difficult for DMWW to meet regulatory requirements for safe drinking water. In 2015, after decades of supporting source water efforts with agricultural groups upstream with no water quality improvement, DMWW filed suit in federal court in an attempt to curb nitrate carried in agricultural tile drainage pipes. The suit was dismissed, but phosphorus, nitrogen, turbidity and ammonia continue to plague the rivers.

In 2020, newly appointed DMWW CEO, **Ted Corrigan,** tapped water policy specialist **Jennifer Terry** to manage the utility's watershed coalition-building efforts, government relations, and public affairs. Corrigan and Terry met with dozens of land, water, conservation, environmental and habitat groups and organizations to understand the various source water protection projects and approaches taking place in the Des Moines and the Raccoon River Watersheds.

As a result of those meetings, Corrigan and Terry **prioritized projects and partnerships.** Terry seeks out uncommon collaborators who share the utility's goal of **"growing clean water advocates."** An example of uncommon collaboration: a four-part **"Landowner Boot Camp"** webinar series that just wrapped up, which was sponsored by DMWW, a farmer's cooperative, a land management company, and Practical Farmers of Iowa. Attendees learned how conservation practices hundreds of miles away on farm ground make a big difference to drinking water sources downstream, as well as provide ROI for their property. The target audience for the series was customers who drink DMWW water, yet also own farm ground upstream.

DMWW is exploring the idea of promoting a scalable business model using public-private partnerships to boost cover crop adoption. DMWW, municipalities, an agricultural retailer, and agencies have been meeting to see if it's possible to purchase a $600,000 state-of-the-art cover crop

seeder and use the large piece of equipment to demonstrate cover crop application, which keeps soil and nutrients in place, in a small watershed just upstream from Des Moines as a pilot.

In recent months, Corrigan and Terry have gathered together a core group of drinking water leaders and have created the **Iowa Nutrient Collaborative for Public Water Supplies.** The collaborative has just adopted a charter, and its objective is to build a statewide community of education and advocacy for the dozens of public water systems in Iowa that struggle with nutrient pollution. The collaborative will provide a framework for training, networking, and communication tools about source water protection.

DMWW's goal is to be an industry leader in advocating for restoration and protection of surface water. As part of its "think downstream" campaign, the utility has launched a **Think Downstream Thursday** social media effort at **#dsmH2O** to underscore the importance of understanding that our actions have consequences on downstream users. Think Downstream Thursday posts have featured a salute to women in agriculture, elevated hard-working drinking water professionals, and encouraged wise water use during this summer's drought conditions.

The innovative projects and partnerships may not yield demonstrable improvements in the utility's source water in the next few years, but Terry believes such uncommon collaboration is an excellent example of thinking downstream. Building relationships in the watershed is important for future advocates of clean source water and safe drinking water.

Get involved and stay in touch!

Find us on Twitter

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

Join our Listserv

To join our Listserv and receive announcements about the Collaborative, please email Ken Gibbons at kgibbons@glc.org