

Where is Chatham-Kent located?

- The Municipality of Chatham-Kent is a community located in southwestern Ontario that is naturally rich with fertile soil and abundant waterways.
- The shoreline areas of Chatham-Kent encompass approximately 130 km along Lake St. Clair and Lake Erie.
- As such, many of our communities exist beside or have natural waterways that feed into them.





Thames River

PHOSPHORUS REDUCTION COLLABORATIVE

<https://www.thamesriverprc.com/>

- Lake Erie provides an important local source of water for drinking, crop irrigation, fish and wildlife, recreation and tourism; providing several economic benefits to our community.
- For the third time over the past four years, a blue green algae bloom threatened our local lower Thames River area in the summer of 2020.
- With 20+% of all Ontario drains located in Chatham-Kent, we remain an integral partner of the Thames River Phosphorus Reduction Collaborative (PRC).



Algae bloom on the Thames River in August, 2020.

Two of the 8 PRC projects are currently located in Chatham-Kent:

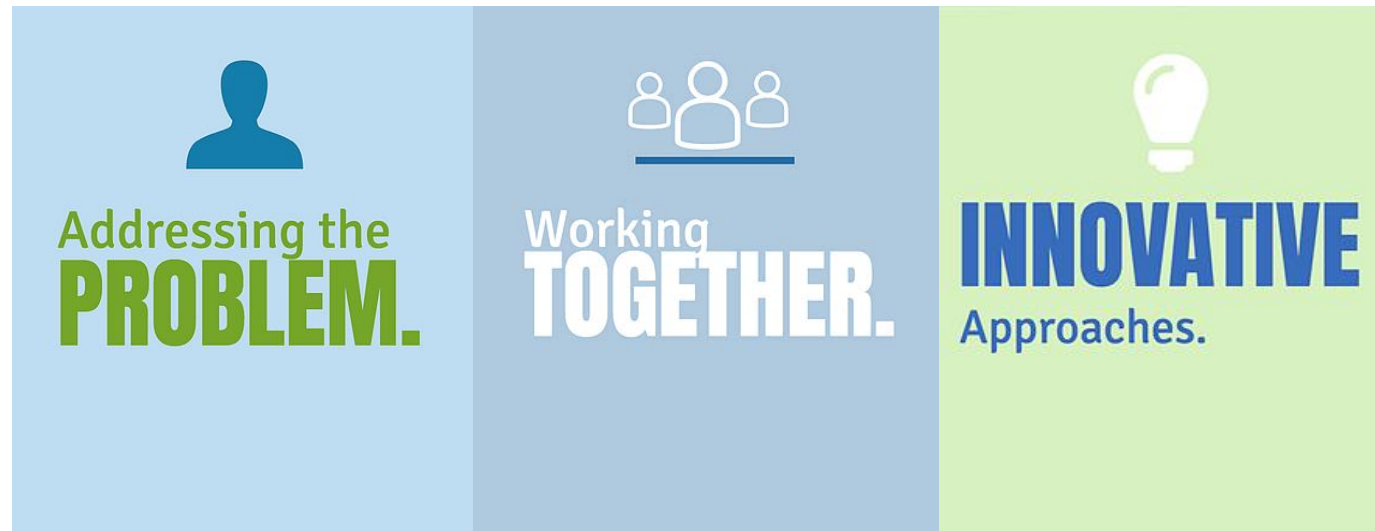
- The Boudreau Municipal Pump Station phosphorus removal and recovery system being tested in west Chatham-Kent, is showing promising results in extracting phosphorus from sewage wastewater.
- The Roesch Farm project, located in southeast Chatham-Kent, is proceeding with testing a second phosphorus sorptive material that intercepts and removes phosphorus from agricultural tile drain wastewater/run off.



Key Take Away

Meaningful public participation and engaged local leaders who assist to establish a compelling vision with measurable targets in practice of adaptive management, build partnerships that enable pursuit of collaborative financing that builds a record of success.

Municipalities **as** Integral Stakeholders **in** Local Water Management and Health
= Optimal Environmental, Social and Economic Sustainability



Status of Phosphorus/Hazardous Algae Blooms and Lessons from Canada

Mark Reusser

Vice President, Ontario Federation of Agriculture

November 19th, 2020

Farm Interest in the Great Lakes



The water in the Great Lakes is a shared resource and every user must do his/her share to sustain it and the ecosystem



Farmers are big users of nutrients including phosphorus to grow food on land that drains excess waters into the Great Lakes



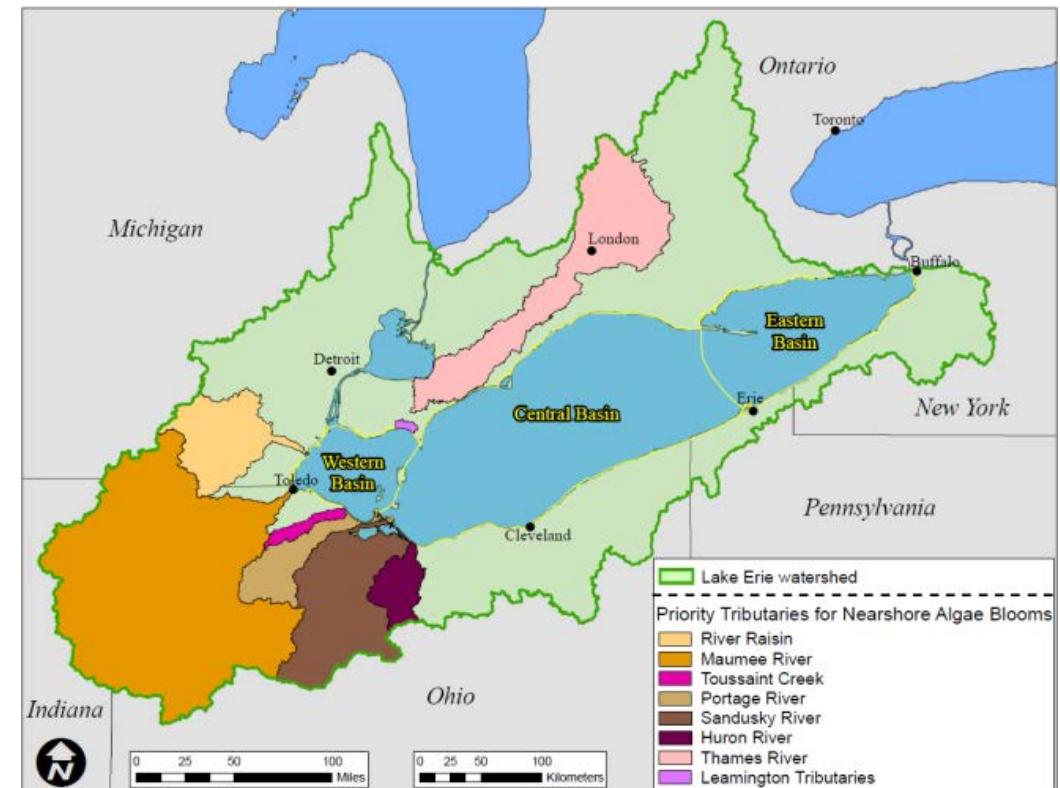
Understanding how phosphorus is lost, transport pathways and potential innovative solutions can result in tools for farmers to mitigate



Ultimately can we use technologies to mitigate small losses in the future? Is it feasible given very small losses per acre? Yes or No?

Agriculture's Approach

- Bi-national agreements focusing on Lake Erie and subsequent agreement between Canada and Ontario
 - 40% reduction in total phosphorus in western and central Lake Erie basin
 - 40% reduction in soluble phosphorus in priority watersheds such as the Thames River
 - Similar US actions
- Agriculture's approach
 - Livestock Nutrients: Timing Matters
 - BMPs
 - Cover crops
 - Less tillage
 - Crop rotation
 - 4R's Nutrient Stewardship
 - Drainage systems – Thames River PRC



Partnership for Action on Drainage Technologies

Cities Initiative & Cities of Chatham-Kent & London

Farm organizations – OFA & others

Drainage sector

Environmental and conservation groups

First Nation

Government Funding





Understanding Pathways

- Surface runoff to municipal drains (ditches)
- Surface to buried municipal drains on ag lands
- Field tile systems to municipal drains



Technologies and Products - Many Approaches Tested

- Technologies based on pumping and treatment
 - Electrolysis with biological treatment and recovery opportunity
 - Electrolysis of sorbent minerals to treat water under continuous flow
- Variety of materials
 - Iron based slag
 - Magnesium & calcium
 - Engineered products
 - Biochar
- Assessments underway and shared at Thames River PRC webinars
 - Next one in January 2021



Early Lessons Learned Since 2018



Agricultural P losses occur during winter and early spring



Total agricultural losses are less than 0.5 lbs per acre



P levels in our waters is very low (<0.5 ppm to 1 ppm)

Dissolved P levels are lower



Organizing non-point sources for treatment is costly



Promising technologies emerging



BMPs to manage ag waters & managing phosphorus

Regenerative agriculture

Future



Project expires in 2022



Decision on managing ag waters after it leaves the field? Yes/No?



Is it cost effective versus field BMPs?



BMPs will require more & consistent funding from society

THANK YOU & QUESTIONS?

For more information, please see project Website:

- www.thamesriverprc.com
- Twitter @thamesriverprc
- Sign up for Newsletter for regular updates

Interested in Continued Dialogue with Municipalities

- Charlie Lalonde at charles.lalonde73@gmail.com





FINDING SOLUTIONS

**INDUSTRY BEST
PRACTICES AND
INNOVATION**

**The Lawncare Industry Role in
Environmental Stewardship**

Summary

WE ALL HAVE A ROLE TO PLAY IN PROTECTING OUR ENVIRONMENT AND NO ONE SHOULD CONSIDER THEMSELVES EXEMPT

LAWNCARE INDUSTRY IS A SMALL CONTRIBUTOR TO NUTRIENT LOADING IN WATERWAYS YET SHOULD LEAD BY EXAMPLE

SOLUTIONS TO PHOSPHOROUS LOADS IN WATERWAYS MUST BE PROPORTIONAL TO THE CONTRIBUTION

PUBLIC EDUCATION AS TO WHY RESPONSIBLE USE MATTERS IS ESSENTIAL

CONTINUED EFFORTS AROUND TECHNOLOGICAL AND PRODUCT INNOVATION MUST AND WILL CONTINUE



Why healthy lawns and landscapes matter

Human health and Environmental Benefits

- Creates oxygen
- Helps sequester carbon
- Helps cool our communities
- Helps prevent soil erosion and sediment runoff
- Helps filter rainwater
- Helps trap harmful pollens and dust
- Helps reduce noise pollution
- Helps create calming effect for people and pets

Healthy turf
prevents
sediment
runoff!



Sediment
runoff will find
its way to our
waterways



Industry Best Practices

- Educated and trained specialists who apply according to label, annual training from new hire to most season vet, ride alongs with managers to ensure proper application technique
- Use of spreader guards/deflector shields on equipment when applying granular products (ring of responsibility practice)
- Help educate customers on proper mowing and watering, reuse of lawn clippings on lawn
- Liquid apps using wand no higher than 18" off ground or even lower with ride-on equipment (adherence to all state wind speed laws)
- No applications on hardscape surfaces, clean up, re-use or re-bag
- Product metrics measured daily as truck returns to branch – high degree of focus on product use due to product costs

Industry Best Practices

Re; phosphorous use along great lakes states, Ontario & Quebec:

- MN bans P other than (soil test, new turf) (TG removed 2007)
- IL & WI identical laws, bans P (TG led, w/ IL Sierra Club) (includes exemption for soil test, new turf)
- MI banned P in 2012 (TG led, w/ MI Environmental Council)
- NY restricted P use Jan 2012 (TG led, w/ NYDEC)
- IN, no laws banning but we stopped years ago
- OH, TrG stopped using P in granular years ago and only use in liquid apps. In liquid, just under one ounce or 2 tablespoons of P on a 1,500 square foot lawn
- PA no laws banning P but we have tried for years to advance a state standard with no success. TG stopped eastern half of state, western half we follow same approach as OH, no P in granular and limited amounts in our liquid apps
- Ontario & Quebec, Appear to be more regulated at local levels TrG stopped using P in fert apps years ago as there seems to be sufficient amount already in soil and would just do soil test samples occasionally to ensure

Innovation

TrG spray gun for more targeted applications

50% SRN fertilizer (slow release or controlled release)

- Granular fertilizer coated with a polymer that as it breaks down over time, releases a small amount of nutrients as it breaks down versus the more immediate release from traditional. Slow or controlled release helps prevent runoff of nutrient

Liquid apps for improved targeting and small amount of Phosphorous use

Collaboration with suppliers on enhanced fertilizer products that require fewer applications

- Additional work on organics including blends

Public-private partnerships

Public Education Campaign

- Proper mowing, watering, leaf and grass clipping disposal
- Best practice fertilizer applications
- Effective use of rain barrels and rain gardens
- Effective use of native vegetation and less “thirsty” plants

TruGreen Environmental Education Award



H2Ohio

H2.Ohio.gov

 [@H2Ohio](https://twitter.com/H2Ohio)





H2Ohio will be invested in targeted solutions to ensure safe and clean water across Ohio.

- Statewide initiative to address water challenges
- Designed to last 10 years



MIKE DEWINE
GOVERNOR OF OHIO



H2Ohio Fund will be invested in targeted solutions to ensure safe and clean water across Ohio.

- \$172 million appropriated for FY2020-2021

Ohio Environmental Protection Agency – Director Laurie Stevenson

- \$8 million in FY2020 to support infrastructure improvements, lead, water quality monitoring and technology R&D

Ohio Department of Agriculture – Director Dorothy Peland

- \$30 million in FY2020 to support best management practices for water quality

Ohio Department of Natural Resources – Director Mary Mertz

- \$46 million in FY2020 to restore and construct wetlands to capture and filter nutrients from runoff

Lake Erie Commission – Director Joy Mulinex



MIKE DEWINE
GOVERNOR OF OHIO

H2Ohio

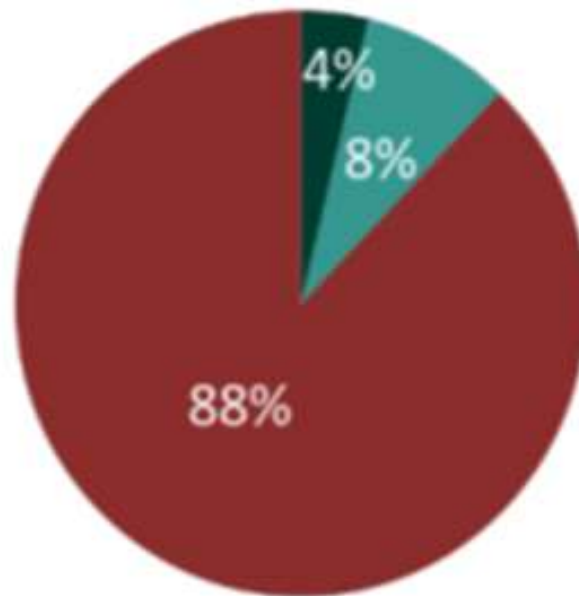
H2Ohio
Accomplishments
for Fiscal Year
2020



h2.ohio.gov



Maumee River



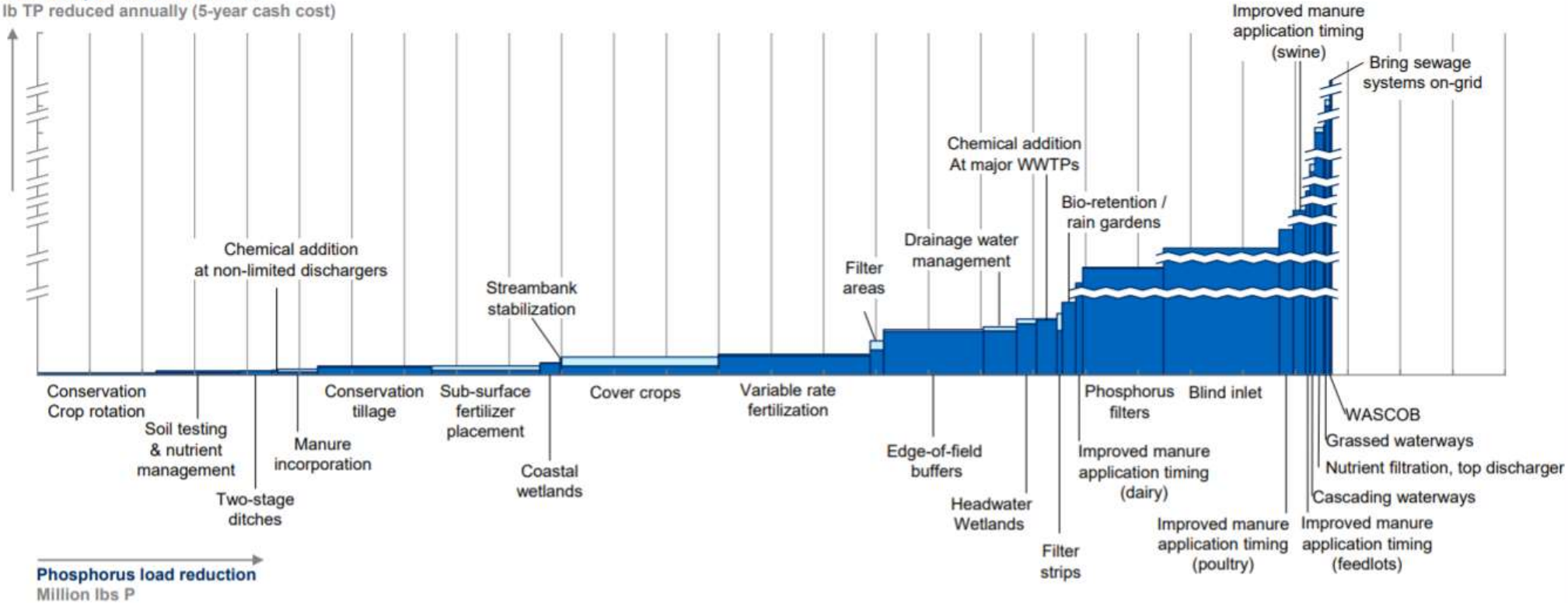
■ Nonpoint Source ■ HSTS ■ NPDES (Wastewater)

Estimated P load reduction through prioritized best practices

Using 2018 5-year trailing annual Spring TP in Maumee basin as baseline

Cost of Phosphorus load reduction

\$ / lb TP reduced annually (5-year cash cost)



10 conservation practices with a proven track record in Ohio and beyond



Nutrient Management

- 1 Soil Testing & Volunteer Nutrient Management Plans
- 2 Variable Rate Application
- 3 Subsurface Fertilizer Placement
- 4 Manure Incorporation

Erosion Management

- 5 Conservation Crop Rotation
- 6 Cover Crops

Water Management

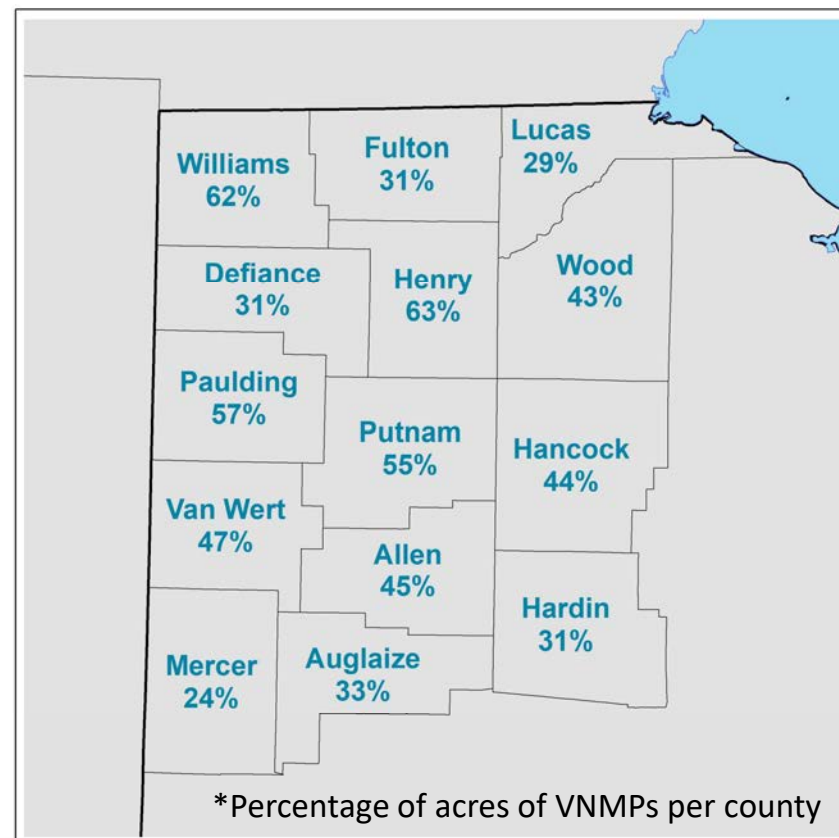
- 7 Drainage Water Management
- 8 Riparian Forest Buffers
- 9 Two-stage Ditch Construction
- 10 Headwater & Coastal Flow-through Wetlands

**First 7
practices
offered in
first program
year**

1.2 million acres of Voluntary Nutrient Management Plans

Program Interest

- Engaged Farmers at 8 rollout meetings
- Nearly 2,000 applications received from WLEB producers
- Applications include nearly 1.2 million acres of Voluntary Nutrient Management Plans (VNMPs)
- Represents approximately 43% of total cropland in the 14 counties

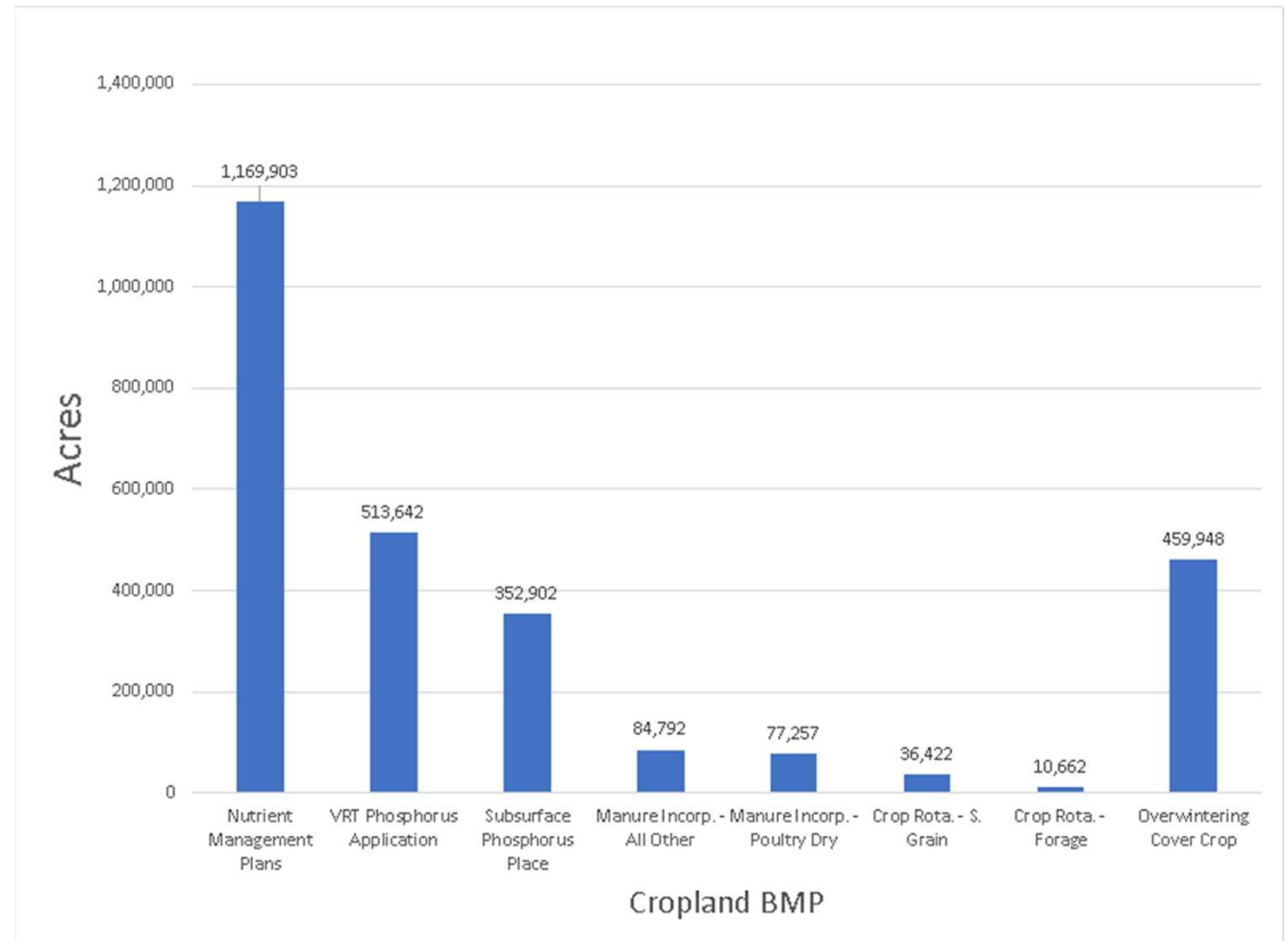




Implementation

- Practices will begin fall of 2020 continue to late summer 2021 with current funding

H2Ohio Best Management Practices – First Program Year





For Future Program Years

- Full funding needed for remaining program years to reach target of 40% phosphorus load reduction by 2025
- Expanding conservation practices to the entire Western Lake Erie Basin and beyond depending on funding availability





**OHIO DEPARTMENT OF
NATURAL RESOURCES**

An aerial photograph of a wetland area. A large body of water is on the left, with a narrow, rocky channel or dike extending from the shore into the water. To the right of the channel is a dense forest of trees. In the background, there are fields and a distant shoreline under a cloudy sky.

The Importance of Wetlands

One of the most effective and cost efficient long-term solutions to reducing excess nutrients in our waterways.

H2Ohio Statewide Projects



Lake Erie Basin Projects

1. Golden Park Wetland Restoration
2. Grassy Island Flow-through Wetland Restoration
3. Maumee Bay State Park Wetland Restoration
4. South Shore Wetland Restoration Project
5. Mackinac Creek Bay Wetland Restoration
7. Inner Bay Shoals & Islands Restoration
18. Inner Bay Coastal Wetlands Restoration
20. St. Joseph Confluence Wetland Restoration
21. St. Joseph River Restoration Project
22. Oak Openings Preserve Wetland Restoration
23. Little Portage Nuclear Radiation & Coastal Wetland Restoration
24. Rockwell Sand Preserve Wetland Restoration
25. Forder & Edge Floodplain Restoration
26. Oakwoods Nature Preserve Wetland Restoration Project
27. Truth Outdoor Center Wetland Restoration
28. Jendryak Wetland Restoration
29. Sandusky River Headwaters Preserve Wetland & Habitat Restoration
30. Van Order Wetland & Forest Restoration
31. Ravenna Marsh Wetland Restoration & Reconnection

Ohio River Basin Projects

- A. Raccoon/Licking/Kanawha Wetland Conservation Area
- B. Brooke Park Wetland Creation & Water Quality Initiative
- C. East Fork Lake Nuclear Radiation & Wetland Initiative

- Coastal Projects

- WLEB and Other Statewide Projects



A brief description of each ODNR H2Ohio project follows.



Project Monitoring



Lake Erie Aquatic Research Network



Ohio Department of Natural Resources

Providing Clean and Safe Water to Ohio



Wetland Creation, Restoration, and Enhancement

\$3.3 Million

allocated to establish an
independent project
monitoring program

26

wetland projects
in contract

90

number of Ohio
threatened or
endangered
species dependent
on wetlands; many
will benefit from
this additional
habitat

60,000

acres of watershed
filtered by wetland
projects

3,535

wetland acres to be
created, restored, or
enhanced

12

nonprofit
conservation
partners
engaged

\$28.9 Million

to support wetland project
implementation





**Ohio Environmental
Protection Agency**

Providing Clean and Safe Water to Ohio



\$4,210,000

For seven critical water and sewer projects



four drinking water projects in Columbiana, Coshocton, Noble, and Pike counties serving more than 4,000 people in rural Ohio.



three wastewater projects in Miami, Meigs, and Williams counties serving 600 people and 250 homes.

180



Home sewage treatment systems to be replaced

185

lead service lines to be replaced at daycares totalling \$725,000

**Increased
Monitoring and
Data Collection**



installing an additional 20 rain gages to improve weather forecasting and rainfall estimates in northwest Ohio.

\$1,750,000

Amount to go to seven local health districts for replacement of household sewage treatment systems

\$23 Million

In leveraged local, state, and federal funds



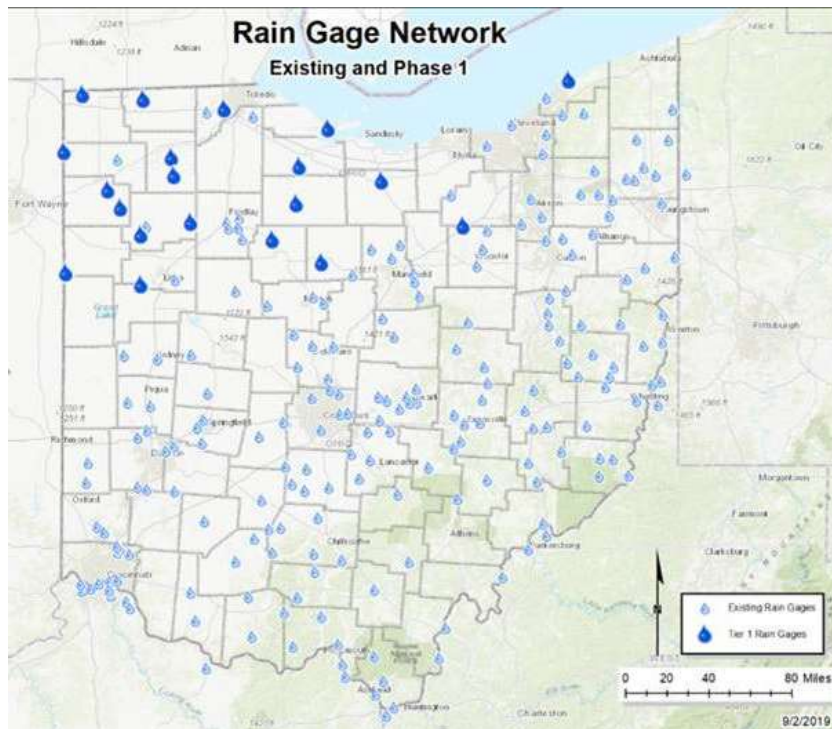
\$1.75M Household Sewage Treatment System (HSTS) Funding in Western Basin



- Seven local health districts (LHDs)
- \$250,000 each
- Failing HSTS replacements/repairs
- Target low-income homeowners
- Provides opportunity to expand overall statewide efforts to address failing HSTS. To date, \$10.8 million in principal forgiveness awarded statewide for 73 counties.



Twenty New Rain Gages Installed Throughout Northwestern Ohio



- \$136,000 invested in rain gages filling a gap in Doppler weather radar network
- Improves flood forecasting as well as nutrient runoff modeling and the manure runoff risk tool



Technology Vetting Program

H2Ohio funding of \$500,000 to set up a third-party technology vetting process to evaluate emerging technologies that:

- Reduce or remove nutrient loading to streams and lakes;
- Reduce toxicity of algal blooms;
- Improve nutrient removal from wastewater; and
- Recover nutrients from manure.

Creating an avenue to move viable technologies from demonstration to implementation to improve water quality in Ohio.



Technology Vetting Program Schedule

- Ohio EPA selected a technical consulting firm that will evaluate technology proposals.
- We are also working on establishing pre-screening processes, program administration and partnership with external stakeholders that have valuable technical expertise.
- Ohio just issued an RFT for technologies to be vetted.

<https://epa.ohio.gov/Portals/33/documents/H2OhioTAP-RFT.pdf>.



Joy Mulinex

Ohio Lake Erie Commission

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MIKE DEWINE
GOVERNOR OF OHIO

The Great Lakes HABs Collaborative: connecting science and management

Great Lakes and St. Lawrence Cities Initiative

November 19, 2020

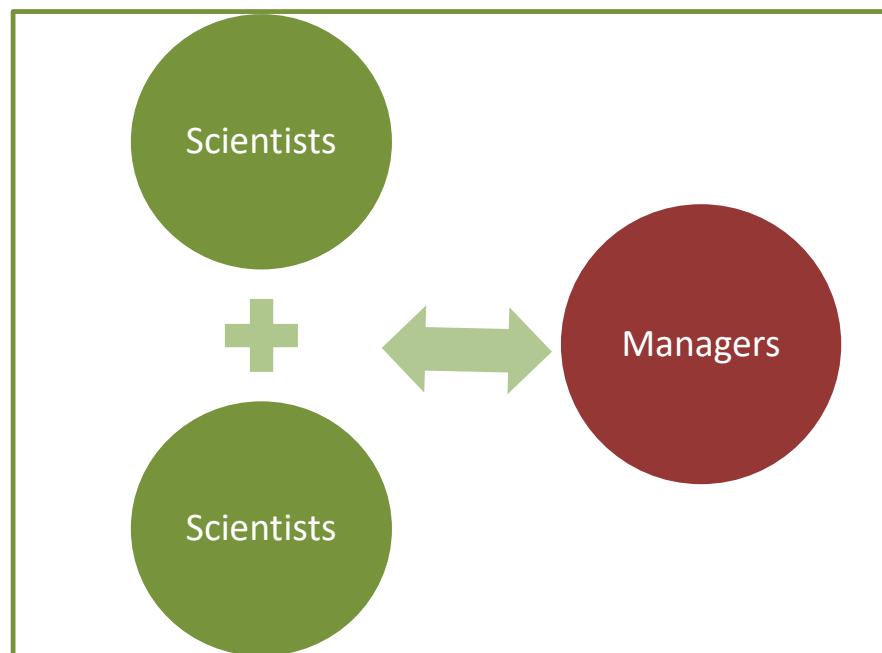
Presented by Co-Chair Dr. Katie Stammler, ERCA

What is the HABs Collaborative?

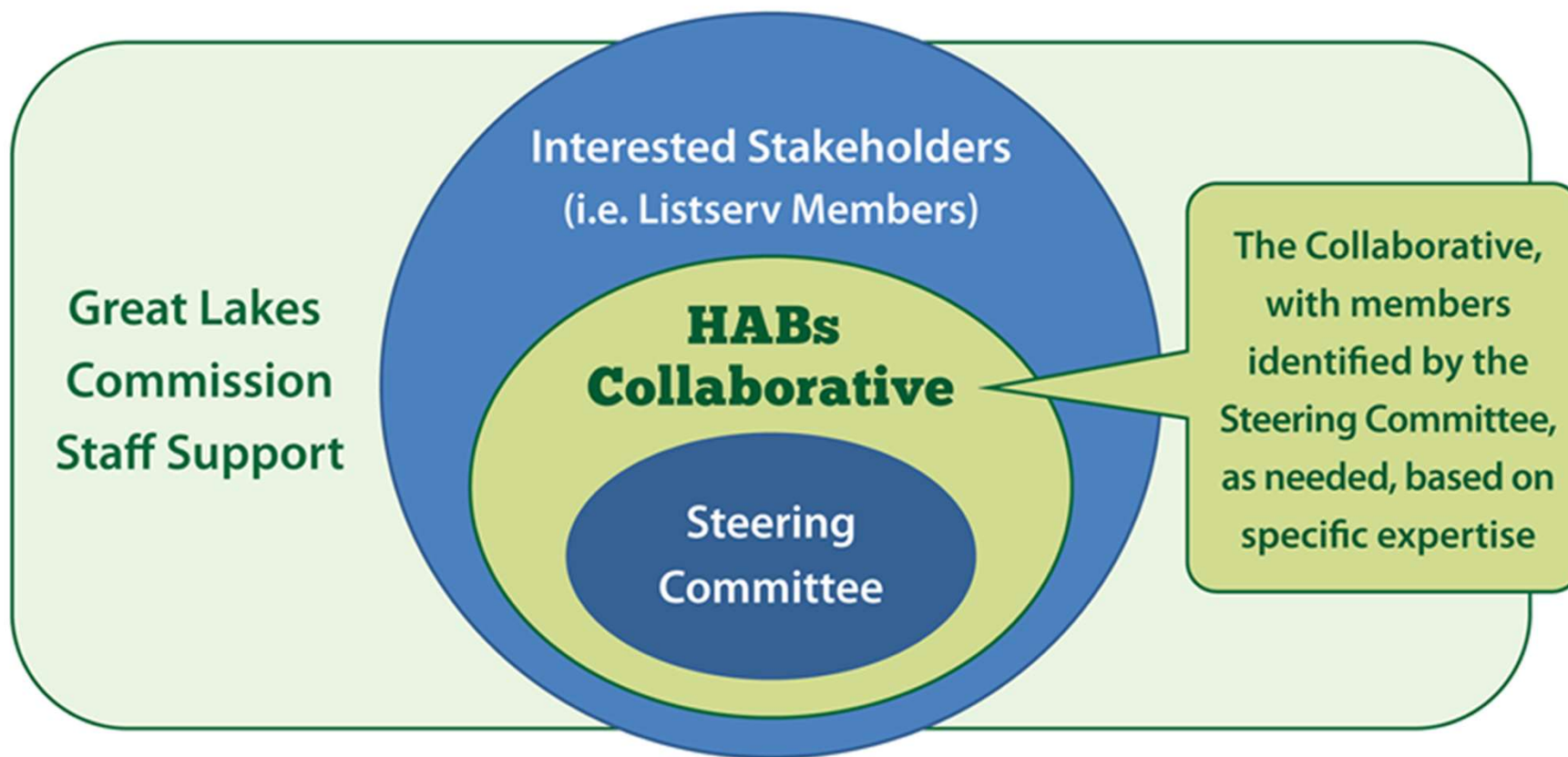
The Great Lakes HABs Collaborative seeks to improve communication among scientists, and between scientists and decision-makers, on issues related to Harmful Algal Blooms (HABs) in the Great Lakes.



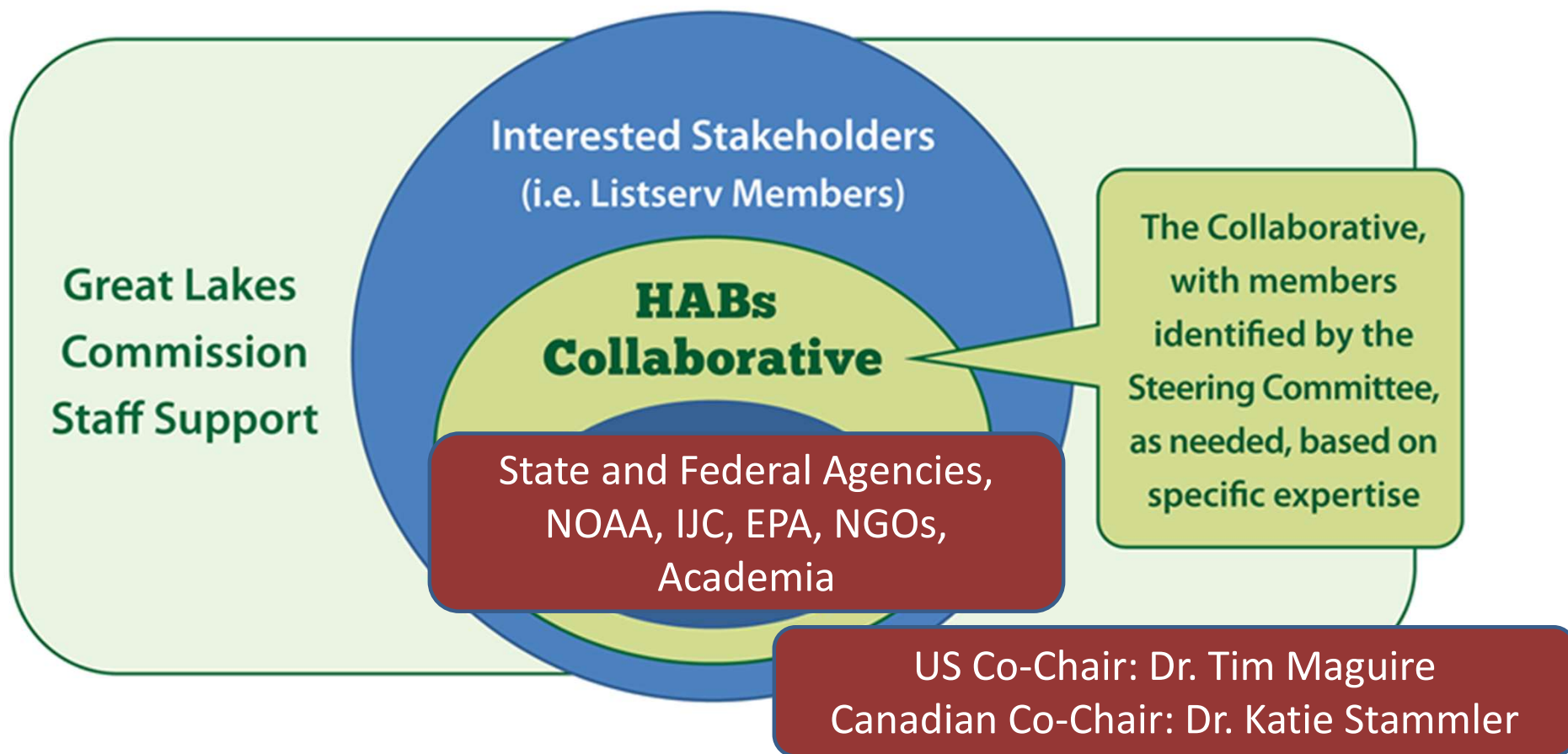
What is the HABs Collaborative?



Organizational Structure



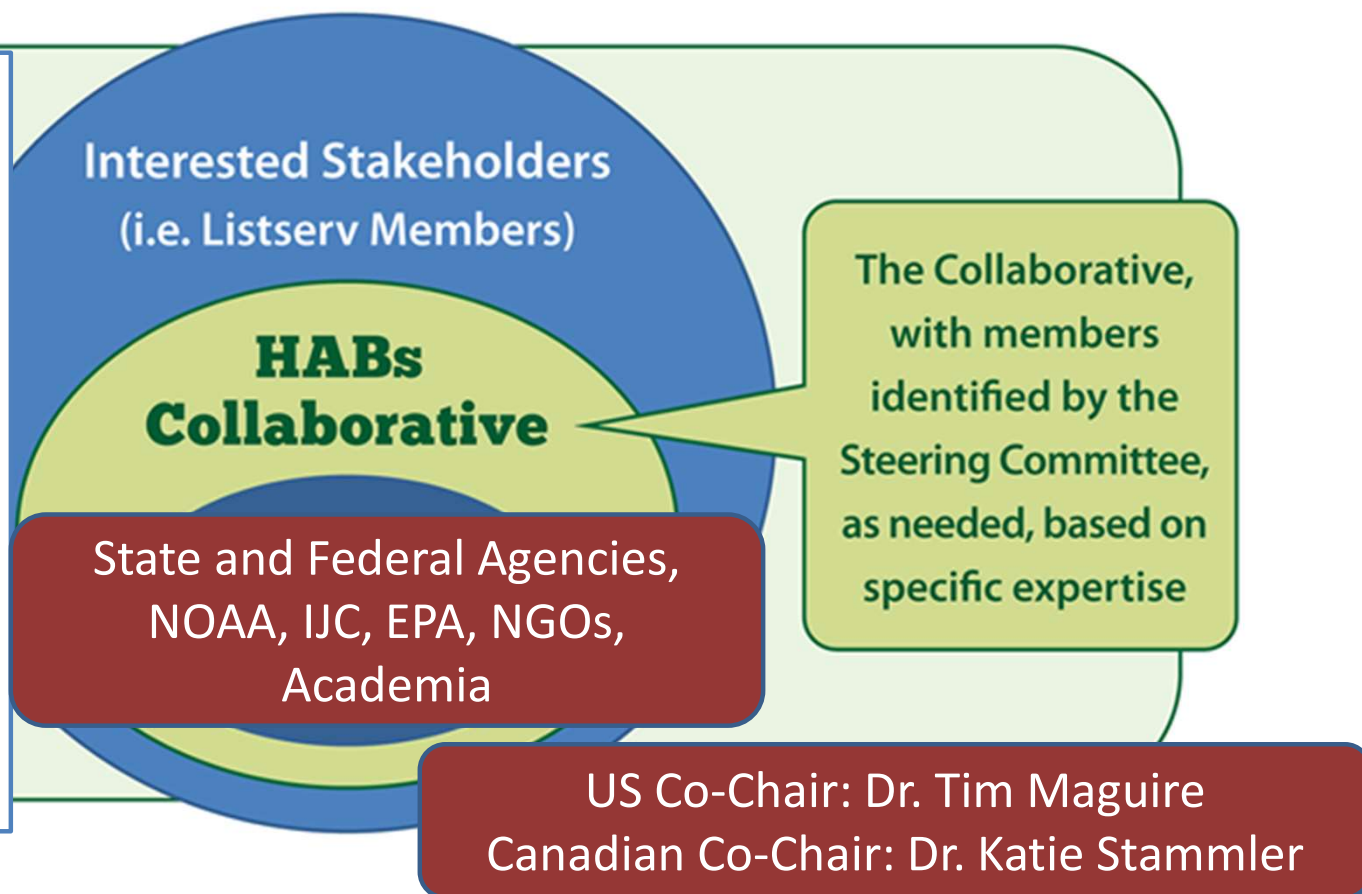
Organizational Structure



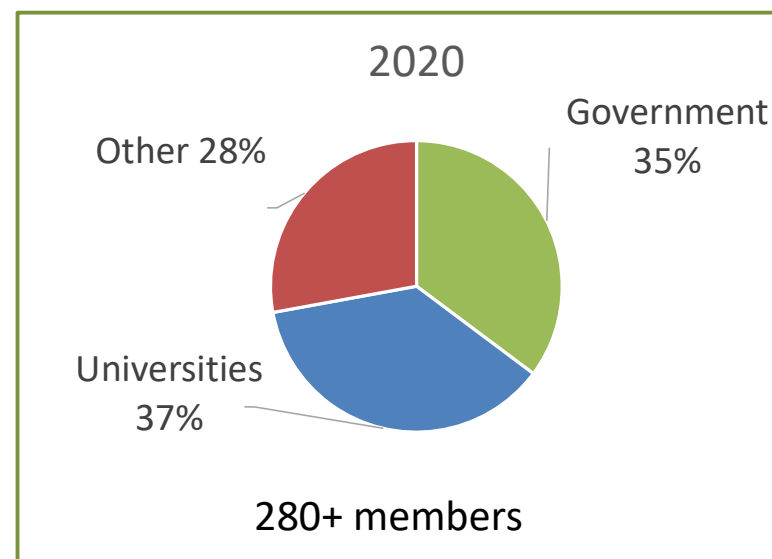
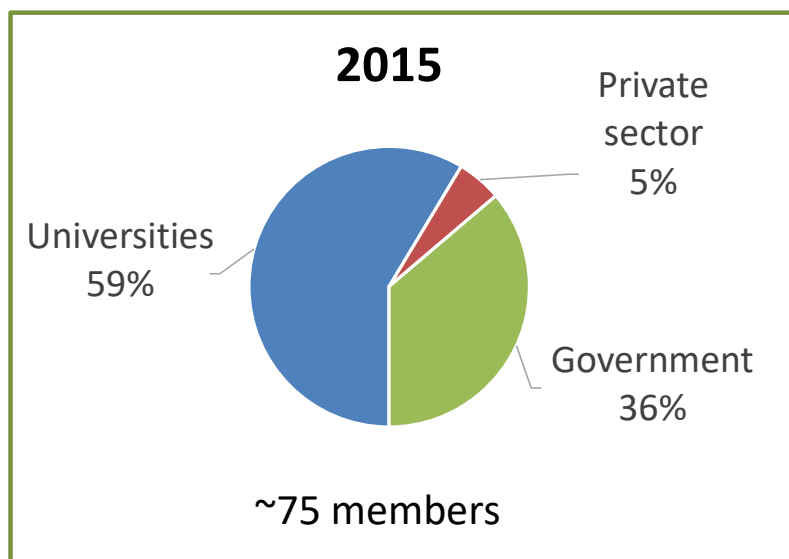
Organizational Structure

Currently we are missing representation from municipalities on the Steering Committee.

If you're interested in joining the Steering Committee, please contact GLC Program Manager Nicole Zacharda at [nzecharda@glc.org](mailto:nzacharda@glc.org)



Listserv Membership





HABs Collaborative

Linking Science and Management to Reduce Harmful Algal Blooms

[Home](#) / [Work](#) / [Water Quality](#) / [Great Lakes HABs Collaborative](#)

[Overview](#)[Steering Committee](#)[Meetings and Events](#)[Webinars](#)[Related Links](#)[HABs Collaborative Newsletter](#)

About the HABs Collaborative

The Great Lakes HABs Collaborative is a "collective laboratory" that seeks to improve communication among scientists, and between scientists and decision-makers, on issues related to Harmful Algal Blooms (HABs) in the Great Lakes. Established by the Great Lakes Commission (GLC), in partnership with U.S. Geological Survey – Great Lakes Science Center in 2015, the HABs Collaborative is helping to establish a common knowledge base of where science currently is on HABs, what future science needs may be, and how the region can work together to better prevent and manage HABs.

HABs in the Great Lakes have poisoned drinking water, threatened public health, and hurt the regional economy. Management is a complex, regional challenge that cannot be addressed by one state or by traditional management. The Great Lakes HABs Collaborative is part of the GLC's portfolio of collaborative projects that apply the collective impact framework to address complex problems facing the Great Lakes. The model for the Collaborative also builds on similar coordinative efforts by the GLC to address invasive Phragmites and invasive mussels in the Great Lakes.



A Collaborative Approach: Linking science and management to reduce harmful algal blooms



Copy link

Webinars

- Lakewide Management, the Great Lakes Water Quality Agreement, & HABs (*March 2020*)
- Smart Watersheds for Smart Lake Management (*Feb. 2020*)
- Great Lakes Observing System (*Jan. 2019*)
- Current and Emerging HABs-related Technology in the Great Lakes (*Nov. 2018*)
- Field Season Webinars (*Jul. 2017 and Dec. 2016*)
- Great Lakes HABs Modelling Webinar (*Mar. 2017*)
- HABs Collaboratory and Invasive Mussels Collaborative Joint Webinar (*Jan. 2017*)
- 2016 State of the Science Webinar Series
 - Data and modeling; Sources and movements (*Jun. 2016*)
 - HABs and safe drinking water; Detection, composition and effects; Public health (*Jul. 2016*)
 - Monitoring and forecasting; Sources and toxicity (*Aug. 2016*)
 - Educate & engage (*Sept. 2016*)





Great Lakes HABs Collaborative NEWSLETTER

LINKING SCIENCE AND MANAGEMENT TO REDUCE HARMFUL ALGAL BLOOMS Spring 2020

What's happening with the HABs Collaborative Steering Committee?

May 2020 Committee Meeting

The Steering Committee met in May to discuss the status of existing products being developed (HABs Knowledge Gaps Fact Sheet and a "Who Does What with Great Lakes HABs" Factsheet), proposed human health "mini-reviews," and Steering Committee governance.

Per the [Charter finalized in May 2018](#), our co-chairs, Silvia Newell of Wright State University and Michelle Selzer of Michigan's Department of Environment, Great Lakes, and Energy, served their two-year term and invited colleagues to take on this role on behalf of the Collaborative.

Katie Stammer of Essex Region Conservation Authority and **Tim Maguire** of the Cooperative Institute for Great Lakes Research volunteered to stand as co-chairs of the Collaborative's work. A current list of Steering Committee members can be found [here](#).

Silvia Newell and Michelle Selzer will stay on the Steering Committee for the next two years. A special thanks goes to both for their leadership during their term as co-chairs. Through their efforts, a Charter was instituted, the Collaborative was shifted to a Collaborative, and the Steering Committee was expanded. Their guidance was instrumental in continuing the Collaborative's work creating a community of practice across the water management and research sectors working to address HABs in the Great Lakes.

Quarterly Newsletter

- Updates on work of the Collaborative
- Member spotlight
 - Submitted by members of the Collaborative
 - Features work from across the Great Lakes
- Announcements for upcoming events
- Read past newsletters at: glc.org/work/habs/news

Publications

- Presented in an easily digestible format
- On topics of interest to the public, management community, and/or policy makers
- Available at:
glc.org/work/habs/publications

Phosphorus (P) and HABs: Sources of P from the Maumee River

- *Published on 9/12/2017*

How Does Nitrogen Affect Harmful Algal Blooms?

- *Published on 10/09/2017*

A Collaborative Approach: Linking science and management to reduce harmful algal blooms

- *Available at: <http://bit.ly/HABsCollabVideo>*

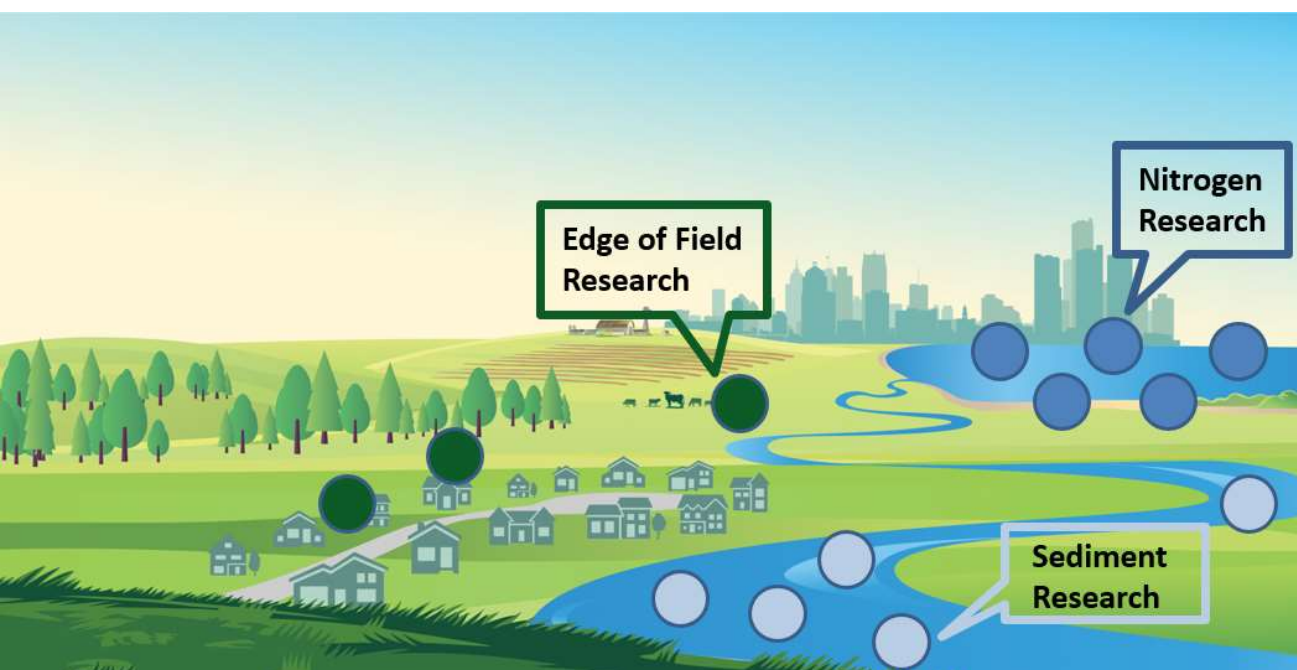
Who Does What? A Guide to Agencies' Roles in HABs

- *In Progress*

Great Lakes Harmful Algal Blooms: Current Knowledge Gaps

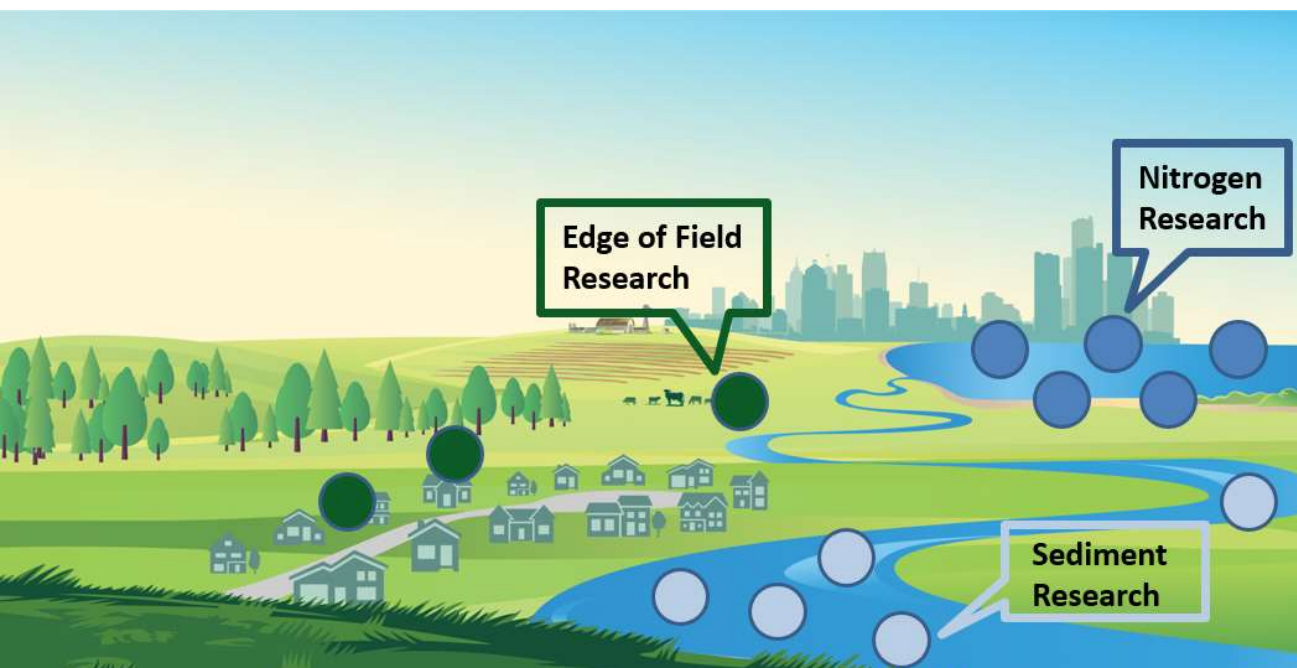
- *In Progress*

Future Work: Research Dashboard



- To be hosted on a new HABs Collaborative website
- Clickable dashboard to navigate different areas of research
- Will contain information on the various research efforts occurring throughout the Great Lakes basin
- Development will begin in January 2021

Future Work: Research Dashboard



Clickable interface to navigate Great Lakes research

Nitrogen Research Detail	Research Team	Name of Project/Link to More Info

Keeping in Touch



Website:

<https://www.glc.org/work/habs-collaboratory>

 @GLHABsCollab

Join the List-Serv:

habscollaboratory+subscribe@great-lakes.net



Great Lakes HABs Collaborative

Linking Science and Management
to Reduce Harmful Algal Blooms