

The Impacts of Lake Erie's Harmful Algal Blooms on Great Lakes Businesses



GREAT LAKES
BUSINESS NETWORK

INTRODUCTION

The unique geography of the Great Lakes region, home to 20% of the world's fresh surface water, supports a robust economy of businesses that depend on clean fresh water. Threats like harmful algal blooms undermine the business sectors that rely on clean water in the region, prompting business leaders to join forces and advocate for the natural resources that sustain the regional identity, economy and way of life. Formed in 2017, the Great Lakes Business Network (GLBN) is made up of more than 170 businesses across the Great Lakes region which have come together to amplify their voices for the protection of the Great Lakes. One of the GLBN's focuses is supporting sound policy solutions to address harmful algal blooms (HABs). As businesses who rely on clean, safe water, a healthy Lake Erie is essential. Nutrient pollution in the Great Lakes jeopardizes the regional economy that depends on fresh water to thrive, and puts the cost burden of related impacts like harmful algal blooms on businesses that adhere to strict regulations in their own industries. Members of the Great Lakes Business Network appreciate Lake Erie for its intrinsic cultural and aesthetic value, as well as the economic value it provides — driving tourism, commerce, retail, fishing, outdoor recreation, and other industries.

Algal blooms occur when nutrients, warm water temperatures and adequate light create optimal growing conditions,

Nutrient pollution in the Great Lakes jeopardizes the regional economy that depends on fresh water to thrive, and puts the cost burden of related impacts like harmful algal blooms on businesses that adhere to strict regulations in their own industries.

causing algae to “bloom” and produce large visible colonies in ponds, lakes and other water bodies.¹ Some types of algal blooms, referred to as Harmful Algal Blooms (HABs) produce toxins that are harmful to human health and wildlife.

In the Western Basin of Lake Erie, blooms of blue green algae called cyanobacteria can produce toxins that can kill fish, mammals, birds, and can cause human illness. Even non-toxic algal blooms can negatively impact Lake Erie, and create challenges for communities and businesses that live, work and recreate on the water. Cladophora blooms in the Central and Eastern Basin of Lake Erie, often referred to as nuisance algae, do not produce toxins, but can create oxygen dead zones, clog the gills of fish and invertebrates, clog



A toxic *Microcystis* bloom washes up on the shore of Maumee Bay in western Lake Erie on August 29, 2011. Photo credit: S. Bihn, Western Lake Erie Waterkeeper

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Photo credit: Frank Szollosi

intake pipes for water treatment facilities, and produce an uninviting beach landscape that discourages contact with the water. Nutrient runoff flows into Lake Erie from non-point sources like agricultural fields and animal facilities and point sources like waste-water treatment plants, and fluctuates depending on the frequency and intensity of rainfall in the spring. As a result, harmful algal blooms vary in size each year with wet years resulting in larger blooms. Wind and water currents in the lake also affect the intensity of a bloom. As climate change increasingly impacts weather patterns and increases precipitation events in the Great Lakes region, HABs pose a growing and real threat to the businesses, communities and regional economy that are dependent on Lake Erie.

Toxic algal blooms generate significant losses when they contaminate drinking water or make the water unsafe for recreation. For example, in 2011, nearly \$71 million in economic benefits were lost because of the harmful algal bloom event in the western basin of Lake Erie which impacted cities like Toledo, Ohio. Again in 2014, a toxic algal outbreak in western Lake Erie led to a “do not drink” advisory for three days, impacting more than 400,000 people in the Toledo area alone. Research shows uncontrolled algal blooms could cost Canada \$5.3 billion over 30 years.² All water users, including municipalities that manage public water supplies, and in some cases, individual well owners,

bear the costs of water monitoring and treatment which have increased with increased frequency and intensity of harmful algal bloom events. The businesses and communities that rely on these freshwater resources cannot afford to take on the cost of harmful algal blooms, and inaction will only make the problem more costly.

To illustrate the unique financial, economic, and social impacts HABs are having on businesses within the Lake Erie basin, GLBN members who live and work in the Lake Erie watershed have come together to provide case studies which highlight their businesses, their relationship to Lake Erie, and the business impacts they have observed over the past several years from HABs. These testimonials are from employers whose livelihood and communities are bearing the brunt of HABs.

Through the GLBN, businesses have developed specific recommendations to move toward long term solutions for Lake Erie. This report features testimonials from businesses within the U.S. states of Michigan and Ohio, and the Canadian province of Ontario along with specific GLBN policy recommendations for each area.

In addition to the state and provincial recommendations that follow, the GLBN continues to call on the Governors of Michigan and Ohio, and the Premier of Ontario, to follow through on the priorities outlined in the Great Lakes Water Quality Agreement, and specifically, their commitment for Lake Erie of a 40% nutrient reduction by 2025. The GLBN calls on these decisionmakers to collaborate to implement a coordinated strategy which is needed to achieve this goal.

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OHIO

Lake Erie is one of Ohio's most valuable natural resources, it is both ecologically significant and integral to the state's economic growth - contributing over 150,000 jobs and benefits to the Ohio economy related to shipping and commercial fishing³, providing endless outdoor recreational opportunities, and supplying drinking water to over three million Ohioans.

Known as the "Walleye Capital of the World", Ohio's Lake Erie shoreline supports a robust economic sector, generating billions of dollars each year through spending related to wildlife recreation and fishing. In 2015, commercial and recreational fishing for walleye, perch, and bass on Lake Erie attracted over 1 million anglers to Ohio, who spent over \$1 billion in fishing related expenses. The same year, recreational fishermen (who make up the dominant angling sector in the Ohio portion of the lake⁴) took over 600,000 trips on Lake Erie resulting in 5.3 million pounds of walleye, yellow perch, and other species harvested, while the commercial fishing industry harvested an additional 4.5 million pounds.

Not only does the Lake Erie shoreline attract recreational anglers and hunters from around the world, it also sustains over 30% of Ohio's total tourism related dollars, valued at \$15 billion annually.⁵ The tourism industry in Ohio's Lake Erie region supports over 100,000 Ohio tourism-related jobs and generates an additional \$750 million in state and local taxes.⁶

The Cost to Ohio Businesses

Businesses understand that clean water is essential to the tourism economy. Harmful algal bloom events can dissuade travel to Lake Erie, leading tourists to travel to other locations, which for some, increases the travel time and costs, ultimately reducing the number of trips they can take each season. Businesses in the Lake Erie region benefit from a clean Lake Erie that draws visitors to the coastal communities along the shore.

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Photo credit: iStockPhoto

HABs threaten the vital resource that Lake Erie provides to Ohio for drinking water, outdoor recreation, and wildlife habitat. In 2011 and 2013, large algal blooms on Lake Erie prevented residents from fishing, boating, and swimming in the lake during the summer months.⁷ In the 2014 HABs event described above, over 400,000 residents in Toledo, Ohio were unable to drink their tap water due to concentrations of toxins from algal blooms, leading to at least 60 hospitalizations.⁸ Beyond threats to health and safety, HABs have the potential to devastate the Lake Erie economy if they are not addressed, and are projected to cost Ohio utilities \$1.5 billion, not including impacts to tourism, recreation, and business attraction.⁹ When algal bloom conditions exceed the World Health Organization moderate advisory threshold, economic activity associated with angling in the state of Ohio on Lake Erie is expected to decrease by 10-13%, leading to a loss of approximately \$2 to \$5 million in fishing expenditures and permit revenue.¹⁰ Recurring HABs can also create additional costs for businesses and governments along the lakeshore who implement adaptation techniques to protect against this threat.

Main Contributions to HABs from Ohio

The primary driver of HABs along the Ohio coastline is nutrient pollution from fertilizers and animal manure. Storm water runoff from urban areas contributes to a lesser extent.¹¹ Urban and developed areas comprise 4% of land area in the Ohio Lake Erie Basin compared to the 72% that is dedicated to agricultural areas and open space.¹² Failing septic tanks and home sewage treatment systems contribute an estimated 6% of total phosphorous loading in Ohio.¹³

Taking Action to Protect Economic Vitality

Regardless of size, scale, industry and geographic location, all businesses are subject to rules and regulations with which they must comply to remain operating — measures that are designed to protect the health and safety of employees, customers and the greater environment. Businesses that pollute the Great Lakes, regardless of sector, should be held accountable, and subject to rules that protect our shared natural resources, and the Lake Erie businesses and communities that bear the burden of their pollution. The Great Lakes Business Network has identified key steps to reduce nutrient pollution in Ohio and to encourage businesses to assume responsibility for nutrients that are fueling harmful algal blooms.

It is clear that a better job must be done to understand and link water quality outcomes to practices on the land that will reduce nutrient pollution. Simple actions like increasing cover crops, amending manure and fertilizer into the soil, and preserving wetlands to help improve water quality are small steps that when implemented by many business owners, should have a significant impact on Lake Erie's water quality.

GLBN member businesses support these solutions and believe that Ohio has a critical role to play in implementing them in the region.

The Great Lakes Business Network calls on decisionmakers in Ohio to:

- **Support the Maumee Watershed Nutrient Total Maximum Daily Load (TMDL) project to quantify all local nutrient sources and secure local plans to meet nutrient reductions targets for the Maumee River Basin. The Maumee Watershed Nutrient TMDL is an important tool in the Ohio Domestic Action Plan, Ohio's plan intended to meet the Annex 4 phosphorus target for Lake Erie.**

Additional funding, data, and resources are needed to meet the water quality thresholds established within Annex 4. Therefore, the GLBN also calls on Ohio decisionmakers to:

- **Support funding for the H2Ohio Program, a statewide water quality program designed to reduce harmful algal blooms, improve wastewater infrastructure, and prevent lead contamination.**
- **Support initiatives that track soil test levels for fields utilizing livestock manure application to ensure that manure is applied only to fields with low soil test levels of phosphorous. To meet this objective, Ohio should also prioritize support for handling and transport of manure to fields with low phosphorous levels for application.**
- **Support projects that integrate implementation of agricultural best management practices with field to stream monitoring to better connect field practices with water quality outcomes.**



Photo credit: iStockPhoto

OHIO CASE STUDIES



BrewBoat Cleveland is a summer tourist attraction in downtown Cleveland, Ohio that operates cycle-boat and pontoon party cruises on the Cuyahoga River and Cleveland Harbor during the months of May through October. BrewBoat Cleveland employs 25 employees and is the setting for many important milestone celebrations in customers lives, from birthdays to bachelor parties. According to Captain Freddie Coffey, the business benefits from the fact that harmful algal blooms are less prevalent in the Eastern Basin. “If the top surface of the water was covered” he notes, “that would be bad news for a business like ours”.

BrewBoat Cleveland has endured effects of harmful algal blooms before though. Striving to operate as sustainably as possible, the business originally invested in electric motors rather than the traditional gas alternative. Throughout the season, algae and other debris in the water gummed up the inside of the motor, which has a lower horsepower than gas motors and is unable to shake off gunk to the same extent. When the motors become too clogged they must be replaced, leading this business to replace 4 motors in 5 years, enduring a cost of \$18,000 (\$4,500 per electric motor) that they otherwise would not have to spend.

Algae blooms also increase labor costs for end of season maintenance. As Captain Freddie recounts “When we pull the boats out of the water, they’re a mess”. To prevent lasting damage, the BrewBoat Cleveland team spends two days power washing the boats in the off season, an additional labor cost to the business.

Though the business has yet to experience what it would consider an “algae emergency” situation in the Cleveland Harbor, the regular presence of toxic blooms in the Western Basin is still a business consideration. Captain Freddie has considered expanding BrewBoat operations into the Maumee River in Toledo — an investment he would “have to think long and hard about” before taking that step.



Coe Vanna Charters, LLC
LAKE ERIE FISHING CHARTERS

Captain Dave Whitt has owned and operated Coe Vanna Charters as a full-time occupation for 38 years and serves as a board member for the Lake Erie Board of Charter Boat Captains. From May to September, Coe Vanna Charters offers two daily fishing excursions on each of their three vessels for walleye, smallmouth bass and perch near Port Clinton, Ohio. Located in the Western Basin of Lake Erie, Captain Dave has endured personal and financial losses due to harmful algal blooms and describes a big difference for his business before and after the regular blooms started occurring.

He emphasizes that the algae blooms on the Western Basin are toxic, subjecting him and other fishermen who sit above the blooms seven days a week to negative health impacts. During bad blooms, Captain Dave typically develops a cough, an impact which took time and conversations with other fishermen to associate with his exposure to harmful algal blooms. Captain Dave also lost his pet Border Collie three days after the dog was exposed to toxins from a bloom that was dying off and not visible to the eye. “If it kills dogs, it can harm other things, and my Captains are handling fish and lures exposed to the toxic algae”, he said.

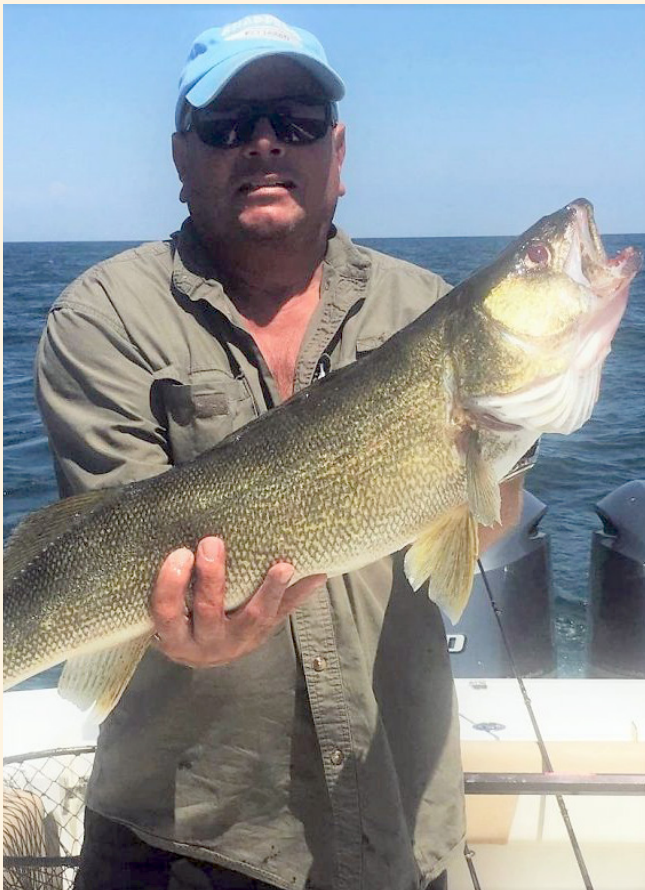
Historically, July was the best month for walleye charters, but now a successful catch is less certain, as spring runoff can run the fish out of the Western Basin. “I used to tell customers you’d be busy catching fish big enough to take home when they booked in July,” said Captain Dave, “but now July has a big question mark on it.”

When the harmful algal blooms appear, Coe Vanna Charters has to pull boats out of their marina slips in Port Clinton and move them to Huron, Ohio before driving customers another mile east once they board the boats to drop their lines in cleaner water. This creates a huge inconvenience and additional expenses for the business, which then has to buy more docks - the biggest expense for the business, spend money on gas and transport, and essentially pick up and move the entire system of operations. It’s worth it, however, to salvage some of the season. Unable to fish in their normal locations, the crew identifies gaps in the satellite images to

position their boats where there is a hole of clean water in the lake. “We ultimately have to leave the dock and run through the slime to a spot where the water is not embarrassing”.

Captain Dave recalls times when the business has cancelled charters and when customers have cancelled due to harmful algal blooms, often after there is news coverage of the bloom. “What can you say — it’s a toxic bloom”. Coe Vanna charges \$690 for six passenger charters and \$940 for eight passenger charters. Operating two boats and two trips per day, when conditions force the business to cancel, they endure more than \$3,000 in losses per cancelled day. In addition, many customers take advantage of lodging at the marina. There are three guest rooms which Coe Vanna rents for \$180 each. This is an additional layer of loss, both on days with cancelled charters, but also when the boats relocate to Huron, which makes staying in the rentals less convenient.

After enduring the harmful algal blooms for more than a decade, Captain Dave is frustrated “We are being directly impacted, and perch and walleye are a major source of food for the nation — yet there has been absolutely zero progress made”.



The Cleveland Outpost is a gear exchange and outdoor retailer based on the shore of Lake Erie in Rocky River, Ohio outside of Cleveland. The primary goal of the business is to get people outside and on the water affordably, efficiently, and safely to enjoy Lake Erie. As an active kayaker himself and certified ACA kayak instructor, Josh Scott pays special attention to making sure people are getting out into the water safely. In addition to the typical kayaking hazards and safety protocols, Josh also has to pay special attention to the ecological conditions and impacts that he is seeing in the lake. Large algal blooms are not pretty, and that makes adventuring into the water less appealing and the lake less inspiring. More importantly, harmful algal blooms are detrimental to the very water resources that sustain outdoor recreation in northern Ohio and the Cleveland Outpost. As Josh says, “if it weren’t for Lake Erie we wouldn’t be the place that we are”.

Although the direct impacts from algal blooms are more difficult to quantify for an outdoor retailer, Josh says his business is impacted on a macro level. As the algal blooms continue to occur, the appeal and draw of the lake to outdoor enthusiasts and visitors declines, many of whom are the target customers for the Outpost. Bad bloom conditions mean less people recreating on the lake, which can translate into slower sales and interest in the Outpost with customers not able to safely get out on the water.

Although Cleveland hasn’t yet had a large algal bloom event with the same impacts as Toledo in recent years, that doesn’t mean it’s not in their future - Josh says. Education is key to solutions for Lake Erie, so Josh and his business work with local organizations to educate people about the ways humans are impacting our water resources. According to Josh, Cleveland has a large population of people who have never been in the lake because they are worried about the algal blooms or related toxins, but the Cleveland Outpost continues to do what it can to get them on the lake safely.

MICHIGAN

The state of Michigan borders four of the five Great Lakes, including Lake Erie in the Southeast. The Southeast region of Michigan is the most populous region in the state with more than 5 million residents and includes major metropolitan cities like Detroit, Flint, and Ann Arbor. Several watersheds in Southeastern Michigan empty into Lake Erie via the Detroit River, which contributes approximately 80% of the flow entering the lake¹⁴ and acts as a conduit for the majority of the water coming from the upper Great Lakes. Further upstream, Lake Huron contributes the majority of the phosphorus entering Lake Erie through the Detroit River.¹⁵ Additional flow from Michigan watersheds enters Lake Erie via the River Raisin, the Rouge River, the Black River and the Clinton River.¹⁶ While the Detroit River contributes the most nutrients overall, the flow is less concentrated than other tributaries due to the large volume of water traveling through the river. The River Raisin contributes nonpoint source nutrient pollution from upstream Michigan agricultural producers that creates nearshore algal blooms where the river empties into Lake Erie, catalyzed in part by the warm water temperatures created by the Monroe power plant. Nutrient pollution from the Maumee River is the main contributor to blooms in the Western Basin. Just as angling bolsters Ohio's outdoor economy, wildlife recreation contributes more than \$11 billion dollars to the Michigan economy each year. In comparison to all states in the US, Michigan ranks eleventh with respect to job creation

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resulting from hunting and fishing expenditures by residents of the state. In Michigan's Lake Erie watershed, wildlife recreation creates over 55,000 jobs and adds more than \$2.4 billion to the regional economy. In 2016, hunting and fishing license sales in this region provided over \$1.4 million, generating the state's highest overall expenditures on fishing and hunting for both residents and non-residents of any region statewide.¹⁷

Main Contributions to HABs from Michigan

Michigan encompasses the northern portion of the Western Lake Erie Basin, making up around 20% of the Basin's total land base.¹⁸ Nutrient pollution from Michigan agriculture enters Lake Erie from the Detroit River, the River Raisin, near shore tributaries, and upstream land areas that drain into the Maumee River. The remaining nutrients originate from non-agricultural point source discharges, which are not considered in this report or recommendations. The River Raisin was identified as a priority watershed for load



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Photo credit: iStockPhoto

reductions in Michigan's Lake Erie Adaptive Management Plan along with the Detroit River and Maumee River watersheds.¹⁹

The Cost to Michigan Businesses

The impact of HABs in Michigan has the potential to cause disruption to the coastal landscape, affecting thousands of businesses, visitors, and homeowners in the state. Because sport fishing is so popular on Lake Erie in this region of Michigan, local sport fishermen and the businesses they rely on (bait and gear shops, marinas, motels and more) are increasingly impacted by HAB events when visitation and participation in angling decreases. When interviewed, charter boat captains reported spending extra gas and time driving farther away from shore to fish in algae free waters causing both them and their customers to bear the burden of nutrient pollution. Michigan businesses also emphasized the foul smell of decaying algae and unsightly conditions that deter locals and tourists from recreating along the shore and on the lake — impacts that motivate Lake Erie business leaders to advocate for solutions.

Taking Action to Protect Economic Vitality

While Michigan may be home to only a small portion of the Lake Erie watershed, practices on the land that are linked to positive water quality outcomes and which will reduce

nutrient pollution from agricultural runoff are just as important here as they are in Ohio and Ontario. Ensuring funding is available to put best management practices that reduce nutrient pollution in place while also giving priority to producers who are helping to meet nutrient reduction goals are two of many practices that can help Lake Erie. Additionally, just as businesses can learn from one another, Michigan and Ohio have the opportunity to learn from one another as they develop TMDL recommendations for watersheds that are contributing to nutrient loads in Lake Erie. Regional collaboration is needed to address tackle this complex problem effectively.

To implement these solutions, the Great Lakes Business Network calls on decisionmakers in Michigan to:

- **Support strengthening of the Michigan Agricultural Environmental Assessment Program (MAEAP) with improvements that link practices on the field to water quality outcomes**
- **Secure funding for agricultural best management practices that reduce nutrient runoff and ensure farmers adopt practices needed to move along a permanent continuum of the “ladder of conservation” including:**
 - **Prioritizing funding for best management practices in watersheds with approved TMDLs.**
 - **Determining the associated water quality outcomes, tracking the adoption of land management practices and monitoring how they impact downstream nutrient reductions to ensure targets are being met.**
- **Develop projections, benchmarks and thresholds in the Michigan Adaptive Management Plan to prompt evaluation of progress towards meeting nutrient reduction goals.**
- **Collaborate with Ohio in the development of the Maumee Watershed Nutrient TMDL for the Michigan portion of the Maumee River Basin and the River Raisin for a basin wide TMDL that quantifies all local nutrient sources and secures local plans to meet nutrient reductions. Apply the methodology being used for the Maumee Watershed TMDL to establish the total phosphorus TMDL for the River Raisin tributary.**
- **Ensure that the state is doing all it can to stop animal waste from polluting Michigan waters including banning all manure application on frozen, snow-covered or saturated ground.**

MICHIGAN CASE STUDIES



Luna Pier Harbour Club in Luna Pier, Michigan is dependent on Lake Erie. Hosting a marina, 25 campsites, a dock with over 400 boat slips, and a party store, Mike Briskey has been catering his business to the needs of the many sport fishermen in the area for over 35 years. The Western Basin of Lake Erie is one of the most productive sport fishing sites in the world due to its shallow waters and Mike and his business is heavily dependent on the conditions of the lake and its fish to support the needs of his customers. The same shallow and warm waters that support a robust fishery can also combine with the right weather conditions to create the perfect breeding ground for harmful algal blooms in the Western Basin of Lake Erie. The Marina is impacted by harmful algal blooms in many ways, both directly and indirectly, says Mike. He's specifically noticed that fishing quality for perch has been diminishing in recent years, which he believes are due to the effects that algal blooms are having on the lake food web and fish habitats. As algal blooms die and create oxygen dead zones in the lake, Mike believes they impact the normal diet for perch of primarily wigglers or minnows. Lately, fishermen at the Marina have been bringing back what perch they can and they have noticed a shift in the perch diet to primarily water fleas.

As perch fishing begins to diminish in quality and quantity, it directly impacts the Marina through reduced occupancy and fewer sales. As Mike said, "if it impacts the perch, then it impacts me and my business".

It's not just fishing that brings people to Luna Pier Harbour Club and nearby waters, it's also a great place to sail your boat and lounge on the nearby beach. Many customers of the marina use the beach, but when a harmful algal bloom occurs and the winds are onshore, the beach and shallow waters become unusable and potentially toxic. When the beach is impacted by a bloom, it takes the enjoyment of out the area and away from the customers coming to Luna Pier Harbour Club.

Although it may hurt his business in the short term, Mike cautions his customers never to get too close to the algal blooms as they can contain toxins and are potentially dangerous. Instead, Mike hopes to protect his customers by

spreading awareness and caution about the algal blooms in the area as well as solutions that can be put into place by the everyday farmer such as using less fertilizer or not fertilizing on raining days. "Harmful algal blooms have become part of the everyday conversation in Monroe County, Michigan, which never used to be the case in the past" said Mike, pointing to a heightened awareness among the community.



Captain John Giszczak of Stray Cat Charter Fishing and Secretary of the Michigan Charter Boat Association has been working for 25 years running a licensed charter boat business in La Salle on Michigan's Lake Erie shoreline. Captain John is also a member of the Lake Erie/Lake St. Clair Citizens Fishery Advisory Committee. Spending most summers out on the water fishing on the lake, Captain John has been able to experience algal blooms first-hand and witness the impacts they can have on his business and way of life.

The southeastern portion of Michigan bordering Lake Erie maintains a close connection to the Lake, says Captain John, and the majority of businesses being negatively impacted by harmful algal blooms are related to recreational fishing, which brings many customers to the area to take advantage of Lake Erie's bounty. Although Michigan's Lake Erie shoreline is not heavily populated with tourist attractions, people in the area are acutely aware of harmful algal blooms and the damage they can have in the area, including turning the beaches and marinas into unsightly landscapes, with decomposing algae creating a smell similar to a sewage treatment plant.

To mitigate the impact of harmful algal blooms on their customers, Captain John and many other charter fishing companies take their clients out past the algal blooms into deeper waters. Because of this avoidance tactic, his business has not had to endure quantifiable losses from harmful algal blooms outside of the added cost of fuel needed to take customers to algae free locations in the Lake. However, Captain John worries that impacts to the Lake Erie fishery could have a lasting impact on his business. As soon as the fishing productivity and abundance in the area begins to be impacted by these harmful algal blooms, Captain John says there is sure to be an outcry from local fishermen and charter businesses alike.

ONTARIO

The province of Ontario occupies one third of the Lake Erie basin, a geography that is home to more than 2.6 million Canadians, supports a robust tourism, fishing, and outdoor recreation economy and provides drinking water to millions of Canadians.²⁰

Many Canadians travel to the North Shore of Lake Erie to take advantage of the warm water, scenic beaches, restaurants, and shopping boutiques in quaint coastal communities. Pristine natural resources and outdoor recreation opportunities draw additional visitors to this region. Wetlands along Lake Erie's North Shore support populations of at-risk turtles, snakes and toads which are increasingly threatened by human development.²¹ More than 300,000 people visit Point Pelee National Park each year, located 30 miles Southeast of Windsor on Lake Erie. The second smallest national park in Canada, Point Pelee is a well-known stopping point for migrating Monarch butterflies and songbirds, inspiring the "Festival of Birds" which takes place annually in May.

Home to more than 130 fish species, Lake Erie supports a robust sportfishing, commercial fishing and tourism economy on the Canadian portion of the Lake. According to the Ontario Commercial Fisheries' Association, commercial fishing and processing on Lake Erie generates \$244 million

in economic impact for Ontario, supporting more than 900 direct jobs, nearly 1,500 jobs overall, and an estimated tax revenue of more than \$20 million.²² By value, 80% of Ontario's commercial fishing industry is harvested from Lake Erie, further demonstrating the regional reliance on this economic driver.²³

More than 1.12 million recreational anglers in Ontario sustain a \$1.6 billion recreational fishing industry and 1,600 resource-based tourism businesses, largely based on walleye, perch and bass.²⁴ Additionally, recreational anglers drive demand for bait, and the province reports approximately 1,100 licenses sold to commercial bait fishing operations each year.

Proximity to Lake Erie, Lake Michigan and Lake Ontario allows Ontario wine country to prosper along the shores, moderating climate extremes for the vineyards and protecting the grapes from deep freezes and extreme heat.²⁵ A growing wine region, Ontario draws nearly 5 million visitors to its scenic wine country each year.²⁶ The Lake Erie North Shore region boasts 13 wineries, seven spas and 220 restaurants.²⁷

Main Contributions to HABs from Ontario

Only seven percent of Canadian land is suitable for agricultural growing, creating pockets of highly concentrated agricultural



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operations where the geography allows.²⁸ By land area, Ontario ranks fourth among Canadian provinces suitable for agriculture, and contains over 50% of Canada's highly productive class 1 agricultural land, which is concentrated in Southern Ontario.²⁹ Three quarters of Canadian land in the Lake Erie basin is used for agriculture. This intensive agricultural use contributes to harmful algal blooms in Lake Erie when phosphorus runoff from commercial fertilizers and animal manure pollutes tributaries and ultimately the Great Lake, fueling blooms when the water temperature warms each summer.

The Cost to Ontario Businesses

Harmful algal blooms negatively impact wildlife and human health, generate unsightly conditions that stunt Lake Erie tourism and recreation, can increase costs for rate payers that rely on municipal water treatment facilities, and threaten the iconic Great Lakes identity that is essential to the Ontario Lake Erie economy. Many Canadian communities rely on Lake Erie for drinking water. As a result of the 2014 HABs event on Lake Erie, residents of Pelee Island were prohibited from drinking well water for several days due to elevated levels of microcystin contamination, which poses health risks to humans and pets.³⁰ To ensure drinking water sourced from Lake Erie is safe, municipalities in the Canadian Lake Erie basin have enhanced water treatment facilities to upgrade filtration and water treatment, which can create higher costs for ratepayers like households and businesses.

Studies estimate that in a business-as-usual scenario, Ontario could experience \$272 (Canadian) million losses annually over the next 30 years.³¹ The tourism industry is projected to endure the largest economic burden, an annual cost of \$110 million in the business as usual scenario, which decreases to \$28 million each year when policy interventions are applied. Studies also project notable losses for non-users — households within 100km of the Lake Erie shore, indicating that declining health of the Lake or degraded water quality have negative impacts across the basin. Property owners who are susceptible to decreased property values from declining water quality and environmental health comprise the third most affected impact category, and are projected to endure \$36 million annual losses in the 30-year business as usual category, which drops to an annual \$18 million when the policy intervention is applied.

Taking Action to Protect Economic Vitality

While these estimates are grim, the same studies show that with agricultural interventions like adjusting fertilizer application rate and timing, incorporating natural barriers to slow runoff, and urban interventions that improve stormwater infrastructure, optimize wastewater treatment plant

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Photo credit: iStockPhoto

operations and construct wetlands, the projected costs of harmful algal blooms decreases to an annual \$126 million in equivalent annual cost for the next 30 years.³²

Studies like these in Ontario illustrate that common-sense practices can help reduce nutrient pollution into Lake Erie while also benefiting the region economically.

To address this threat and reap the associated economic benefits, the Great Lakes Business Network calls on decisionmakers in Ontario to:

- **Develop and release the workplan for how the Canada-Ontario Action Plan for Lake Erie will be implemented to meet Canada and Ontario's commitments to a 40% reduction in phosphorus inputs to Lake Erie. The detailed workplan was promised for February 2019, and is now more than two years overdue. Without a clearly defined workplan with clear measurables, it is simply impossible to track progress and know if the necessary steps are being taken to meet Ontario's 40% reduction by 2025 commitment.**
- **Invest in financial and educational programs that assist Ontario farmers with implementing agricultural best management practices that mitigate nutrient losses, with additional components that track, monitor and report progress in the public realm to ensure the funds lead to positive results.**

ONTARIO CASE STUDIES



Pelee Island Winery, located on Lake Erie's largest island in Canada's warmest and Southernmost region, is the largest private estate winery in Canada. Pelee Island Winery cultivates more than 750 acres, where Lake Erie creates ideal growing conditions. Surrounded by water, Pelee Island Winery and Lake Erie are deeply interconnected which, in part, drives their "spirit of sustainability". Sue Rice, Public Relations Advisor to Pelee Island Winery described the relationship to Lake Erie, "The Lake literally flows all around us and if we ignore it, we are part of the problem. It may not be affecting our bottom line but the Lake is part of our community."

Pelee Island Winery grows 19 grape varietals including Chardonnay, Cabernet Franc, Pinot Noir and Vidal with sustainable and certified organic practices that promote biodiversity, water conservation, and soil health. Pelee Island is a leader in the Sustainable Winemaking Ontario program and has integrated innovative practices from the field to the bottle, including experimenting with more sustainable aluminum product packaging that can be recycled. The community ethic is strong at Pelee Island Winery, and according to Darryl MacMillan, Vice President Business Development, place, history and the character of their employees are key pillars of the company's success.



Darryl and other representatives from Pelee Island Winery described the impact HABs have for Lake Erie's reputation and their business. "There is a reputational damage to the area and the Lake due to the long term problems it has been facing. As a business at the epicenter of this, it has to be dealt with." Media coverage of harmful algal blooms exacerbate this challenge, often depicting Pelee Island in the center of the aerial footage of the Lake during bloom events. When people see headlines about HABs in Lake Erie they may make the decision not to visit the island. While Pelee Island Winery has not experienced any significant financial losses due to HABs thus far, drinking water is a concern for residents and the tourist community. When there is a bloom event, some are reluctant to trust drinking water, and monthly water testing is simply a way of life for Pelee Island residents. Health impacts from the blooms are top of mind for Pelee Island tourism businesses as well "When there is a bloom, don't put your ears in the lake. Don't go in or let the dog in."



Pelee Wings Nature Store located in Leamington, Ontario on the shores of Lake Erie sells an eclectic mix of retail offerings including birding optics, binoculars and scopes, outdoor clothing, canoes, kayaks and paddling gear. The store also offers guided outdoor recreation opportunities and watersports rentals. Located near Point Pelee National Park, a well-known birding destination, Pelee Wings offers birding tours and equipment that help visitors observe birds migrating across Lake Erie. Pelee Wings also relies directly on Lake Erie to sustain its watersports department. Jeff Dorrell, the watersports manager, oversees kayak, canoe and stand up paddle board rentals for customers to recreate on Lake Erie and Sturgeon Creek. Through his role at Pelee Wings, Jeff leads training sessions to help people become more comfortable and confident on the water and teaches skills that equip them to safely recreate on Lake Erie. In guided lessons, Jeff and the Pelee Wings watersports staff teach participants to paddle efficiently, manage rough 2-3-foot wave conditions, and how to fall out and get back into a capsized kayak in less than 5 minutes. Friday night sunset

paddles at Pelee Wings are a community favorite, and another way the business helps connect people to Lake Erie.

Harmful algal blooms impact Pelee Wings' ability to operate the watersport business, and customer's willingness to participate. The impact of harmful algal blooms on Lake Erie's reputation creates additional implications for Pelee Wings. According to Jeff, "water quality and water temperatures are a top concern for customers and it is a bummer when people think Lake Erie water quality isn't good enough to go kayaking".

In the past, Pelee Wings has endured serious algal blooms that turned the water bright green. When these algal bloom events occur, the business loses out on revenue from rentals and training courses, which can cost Pelee Wings \$1,000 per cancelled course and \$40-200 in rental fees per day. According to Jeff, customers react to the blooms in a variety of ways. Some people visit the rental shop only to cancel when they find out there is an algal bloom. Occasionally,

others who traveled a long way to recreate on Lake Erie will insist on renting despite a bloom event, which causes staff to worry about them falling in, and creates additional cleaning time to maintain the equipment. "When the boats come back in after paddling in an algal bloom, it looks like they are covered in green paint" said Jeff. This algal coating can double or triple the amount of time it takes to clean the boats – a job that typically takes 10-15 minutes.

In addition to cancelled lessons and labor costs for extra maintenance, harmful algal blooms can cause health impacts. Jeff uses the example of rolling a kayak to illustrate. "Certain water qualities like harmful algal blooms can cause sinus infections or what they call 'rollers nose'. When I see strands of algae in the water I am more hesitant to do a roll". For a business that thrives on providing many people's first experience on the water and helping customers feel confident on Lake Erie, it is important that steps are taken to keep Lake Erie's waters safe and clean.



Photo credit: iStockPhoto

CONCLUSION

Businesses want to be located along the shores of Lake Erie because the Lake provides immeasurable cultural and recreational value as well as tangible resources like clean, safe drinking water to their employees and customers. Lake Erie also serves as an economic engine in Ohio, Michigan and Ontario — contributing to the tourism, fishing, outdoor recreation, and agricultural industries and making the region a destination for travelers from around the world. In order to

protect the economic benefits each state and province receives from the Lake — decisionmakers in Michigan, Ohio and Ontario must take meaningful action now to put in place the common-sense practices on the land that will reduce nutrient pollution into Lake Erie.

A healthy Lake Erie is good for business — now is the time for decisionmakers to act.



Photo credit: iStockPhoto

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