



RESOLUTION

Adopted October 14, 2021

Addressing Nutrient-Driven Algal Blooms in the Great Lakes Basin

Whereas, the Great Lakes sustain a \$6 trillion economy, are approximately one-fifth of the world's fresh surface water supply, provide drinking water for more than 40 million people in the U.S. and Canada, and are home to more than 3,500 plant and animal species; and

Whereas, the Great Lakes tourism and recreational economy is highly dependent on the aesthetic quality of the Great Lakes and the basin's inland lakes, beaches and waterfront areas, and connecting streams, lakes and rivers; and

Whereas, harmful and nuisance algal blooms are impacting the resiliency of the Great Lakes basin, leading to negative environmental, economic, and health concerns and their frequency and extent in North America are increasing; and

Whereas, the Great Lakes basin has historically been subject to harmful and nuisance algal blooms fueled by excessive nutrients and these blooms are increasing, primarily due to land-based activities that contribute both point and nonpoint sources of nutrients, changing climate conditions, and impacts of invasive species; and

Whereas, legacy phosphorus within fields, ditches, streams, and lakebeds further contributes to harmful and nuisance algal blooms; and

Whereas, harmful and nuisance algal blooms in the Great Lakes basin are now more frequent in certain nearshore areas and annually persistent in some shallower bays and inland lakes, particularly the Lower Fox River and Green Bay (Lake Michigan), Saginaw River and Bay (Lake Huron), Maumee River and Bay (Lake Erie), embayments of Lake Ontario, including the Bay of Quinte and Hamilton Harbor, and inland lakes of the basin including New York's Finger Lakes, making these areas a bellwether for the Great Lakes basin overall, as nutrient pollution continues and the lakes increasingly warm due to changing climate conditions; and

Whereas, among the Great Lakes, harmful and nuisance algal blooms are most pervasive in Lake Erie due to high nutrient loads and because it is shallow, southernmost, and warms more quickly; and

Whereas, persistent summer algal blooms in Lake Erie's western basin foul shorelines, shallow bays, and rivers, becoming a public nuisance or toxic under certain conditions, are readily carried and distributed throughout the lake by winds and currents, and can lead to hypoxic (oxygen-depleted) "dead zones" in Lake Erie's central basin, when algae die and decompose; and

Whereas, extensive harmful and nuisance algal blooms can trigger an adverse "chain reaction" for the quality of drinking water sources by: (i) increasing the amount of organic matter in the water column; (ii) resulting in particulate turbidity that interferes with the effectiveness of drinking water disinfection; (iii) increasing the likelihood that organic matter will interact with disinfection chemicals and create EPA regulated "disinfection-by-products" that are likely to have a range of adverse human health effects; and (iv) creating low-oxygen or anaerobic conditions that

result in biological interactions that ultimately impair drinking water taste, odor, and color, as well as draw additional nutrients out of bottom sediments; and

Whereas, scientific studies have linked invasive shellfish such as quagga and zebra mussels to heightened levels of phosphorus, and the active avoidance during filter feeding of cyanobacteria in a manner that favors the life and propagation of harmful and nuisance algal bloom microbes; and

Whereas, climate shifts may increase the frequency and severity of spring storm events that increase phosphorus export from the land and elevate annual water and air temperatures, further promoting harmful and nuisance algal blooms; and

Whereas, recognition of the scale, scope and negative impacts of nutrient-driven harmful and nuisance algal blooms led to state, provincial, and federal commitments to address nutrient management, including:

- 2012 Great Lakes Water Quality Agreement (GLWQA) Annex 4 – Nutrients between the United States and Canada;
- Additional GLWQA commitments and plans specific to state, provincial, and federal actions to address phosphorus loads to Lake Erie;
- Great Lakes Restoration Initiative Action Plan III, Fiscal Year 2020-Fiscal Year 2024; and

Whereas, the United States and Canada adopted new phosphorus targets for the western and central basins of Lake Erie in 2016, with a commitment to reduce phosphorus input to these basins by 40 percent from the 2008 baseline; and

Whereas, states, provinces, and federal governments demonstrated the ability to work together toward comprehensive strategies to address phosphorus loads to Lake Erie in the [Lake Erie Binational Phosphorus Reduction Strategy, June 2019](#) with tracking of progress supported by the Great Lakes Commission's Blue Accounting; and

Whereas, improving agricultural practices and the protection, enhancement, and restoration of wetlands contribute to long-term solutions that reduce impacts of land-based activities and changing weather patterns that promote harmful and nuisance algal blooms; and

Whereas, improving wastewater treatment infrastructure will reduce point source nutrient pollution; additional investment in water treatment infrastructure will better secure public drinking water; and

Whereas, the Great Lakes Harmful Algal Blooms Collaborative was established in 2015 to improve communication among scientists, and between scientists and the region's decision-makers, and identify knowledge gaps and share potential solutions with respect to formation of harmful and nuisance algal blooms; and

Whereas, while the understanding of causes of harmful and nuisance algal blooms has greatly increased, there are still important knowledge gaps that need to be addressed as identified in the [Harmful Algal Blooms and Hypoxia Comprehensive Research Plan and Action Strategy: An Interagency Report](#), the [Great Lakes Harmful Algal Blooms: Current Knowledge Gaps summary](#), the [New York State Department of Environmental Conservation's HABs Research Guide](#), and reports by the International Joint Commission; and

Whereas, states and provinces recognize the magnitude and complexity of the problem, are committed to reducing nutrient loading to prevent harmful and nuisance algal blooms and concur that resolving the issue necessitates multiple approaches to mitigation technologies, improving our scientific knowledge, and adopting long-term regional solutions.

*Adopted at the 2021 Annual Meeting of the Great Lakes Commission, October 12-14, 2021, held online.
The resolution was passed unanimously.*

Therefore, Be It Resolved, that the Great Lakes Commission supports increased deployment of, and flexibility in, U.S. federal funding programs, including those funds administered by the U.S. Environmental Protection Agency through the Great Lakes Restoration Initiative (GLRI) to reduce point and nonpoint source nutrient discharges, improve agricultural practices, limit erosion by fostering naturalized stream-flood stability, install green infrastructure practices, and protect, enhance, and restore wetlands and flood plains; and

Be It Further Resolved, that the Great Lakes Commission urges continued and expanded support for the Great Lakes HABs Collaborative which works to transfer knowledge among state, provincial, federal, and university partners, summarizing the status of harmful and nuisance algal bloom issues, identifying research gaps and needs, and developing outreach materials; and

Be It Further Resolved, that the Great Lakes Commission supports funding of targeted research, development, and monitoring focused on the role of changing climate conditions on bloom dynamics and nutrient loading; formation and transport of bioavailable particulate and soluble phosphorus; the role of nitrogen in contributing to blooms and their toxicity; remote sensing and monitoring systems for prediction and early warning capability; human health impacts of HABs; emerging treatment technologies; the role of invasive zebra and quagga mussels in promoting growth of harmful and nuisance algal blooms; and the role of agricultural best management practices to reduce nutrient loss; and

Be It Finally Resolved, that the Great Lakes Commission recommends that the U.S. government expand its funding and technical support to implement existing commitments and agreements related to Lake Erie, and increase support across the Great Lakes basin to implement state-specific plans addressing the persistence of harmful and nuisance algal blooms and hypoxia occurring throughout the Great Lakes region.

*Adopted at the 2021 Annual Meeting of the Great Lakes Commission, October 12-14, 2021, held online.
The resolution was passed unanimously.*