

# Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health 2021

## Summary



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# Introduction



## Overview of the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA)

The Great Lakes are the largest group of freshwater lakes on Earth, containing 20 percent of the world's surface freshwater. They provide significant ecological goods and services that are important to the region's human, economic and environmental health.

The Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (COA) is an agreement between the Government of Canada and Province of Ontario (the Parties) to restore, protect and conserve Great Lakes water quality and ecosystem health. The Parties signed their first Agreement in 1971. Since then, the Great Lakes community has collaborated to implement eight subsequent agreements. Based on shared understanding and commitment, the achievements include significant reductions in persistent toxic substances and excess phosphorus, and the return of native species such as the Bald Eagle.

In 2021, Canada and Ontario celebrate the 50<sup>th</sup> anniversary of the first COA signing and the signing of the ninth Agreement. The impacts of a changing climate and invasive species make this COA more relevant than ever. Continued collaboration will sustain the progress made together over the past half-century and protect the Great Lakes for generations to come.

Canada and Ontario work together through the Agreement to implement federal commitments under the Canada–United States [Great Lakes Water Quality Agreement \(GLWQA\)](#) and provincial commitments under the [Made-in-Ontario Environment Plan](#), [Ontario's Great Lakes Strategy](#) and [Great Lakes Protection Act, 2015](#).

To read the full Agreement, visit:  
[Canada-Ontario Great Lakes Agreement](#)

The Great Lakes community includes:

- First Nations and Métis
- municipal governments
- conservation authorities
- non-government organizations
- scientists
- the industrial, agricultural, recreational, tourism and other sectors
- the public








## Quick facts about the Great Lakes

- They contain approximately 20 percent of the world's surface freshwater.
- They are ecologically important and support significant biological diversity.
- They supply drinking water for the majority of Ontarians.
- The region plays a vital role in the physical, social and economic life of Canada.
- They support sectors including manufacturing and agriculture production, recreation and tourism.

## Key components of the 2021 Agreement

The Agreement strives to achieve the shared vision of a healthy, prosperous and sustainable region for present and future generations. It includes guiding principles, priority areas, and 13 Annexes (areas of focus) that outline how the Parties respond to existing or emerging priorities over the five-year span of the Agreement. Each Annex identifies specific results to achieve and commitments for Canada and Ontario.

Figure 1: Annexes of the 2021 Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health

				
Protecting Waters	Improving Coastal Areas	Protecting Habitat and Species	Enhancing Understanding and Adaptation	Engaging Communities - From Awareness to Action
Nutrients	Areas of Concern	Aquatic Invasive Species	Groundwater Quality	From Awareness to Action
Harmful Pollutants	Lakewide Management	Habitat and Species	Climate Change Impacts and Resilience	Métis and the Great Lakes
Wastewater and Stormwater				First Nations and the Great Lakes
Discharges from Vessels				

Science-based management is a guiding principle of the Agreement. Priorities, policies and programs are established and adapted based on the best available science, research and knowledge, including traditional ecological knowledge.

## Implementation of the Agreement

The COA Executive Committee oversees the coordination and implementation of the Agreement. Environment and Climate Change Canada and the Ontario Ministry of the Environment, Conservation and Parks co-chair the Committee and members consist of federal and provincial senior officials that contribute to COA implementation. New to the 2021 COA, First Nations and Métis representatives are invited to participate in COA Executive Committee meetings in addition to meeting annually with COA Executive Committee co-chairs to discuss priorities and actions to achieve the purpose of the Agreement.

The COA Executive Committee's responsibilities include reviewing priorities, undertaking evaluations and assessments of the Agreement, recommending amendments and/or actions, and facilitating discussions and collaboration with the Great Lakes community and government partners.

Federal and provincial Annex leads oversee Annex-specific activities. This includes coordinating projects to achieve the commitments, undertaking annual progress assessments, and ensuring opportunities for engagement, participation and coordinated action with the Great Lakes community and partners, including First Nations and Métis.

Progress reporting is an important part of the Agreement. Canada reports progress through the [Great Lakes Water Quality Agreement](#), and Ontario reports progress under the [Great Lakes Protection Act, 2015](#). The Parties also report on progress jointly under COA.

Seven federal departments and three provincial ministries are signatories to the 2021 COA:

### Departments:

- Environment and Climate Change
- Agriculture and Agri-Food
- Fisheries and Oceans
- Health
- Natural Resources
- Transport
- Parks

### Ministries:

- Environment, Conservation and Parks
- Natural Resources and Forestry
- Agriculture, Food and Rural Affairs

# Priority: Protecting Waters



## Annex 1: Nutrients

Since the mid-1990s, there has been a resurgence of algae blooms in Lake Erie, Lake Huron and Lake Ontario, and algae blooms are beginning to appear in Lake Superior. Annex 1 addresses excess nutrients and aims to reduce harmful and nuisance algae blooms and low oxygen zones (hypoxia).

The causes of algae blooms are complex. The introduction of invasive species, agricultural production system changes, increased urbanization and climate change contribute to algae blooms. Working with the Great Lakes community, this Annex strives to attain the sustainable use of nutrients for the continued health and productivity of the Great Lakes ecosystem. Emphasis continues to be on Lake Erie and working with partners to implement the Canada-Ontario Lake Erie Action Plan. Specific commitments include:

- enhancing the scientific understanding of sources of nutrients, nutrient dynamics and transport, and the role nutrients play in the development of algae blooms
- developing phosphorus concentration and loading targets, including for priority tributaries, nearshore, and offshore waters of Lakes Erie and Ontario
- developing action plans and approaches to work towards achieving targets
- increasing the efficiency of nutrients used in agriculture to support a healthy Great Lakes ecosystem and economy



**A cyanobacteria algae bloom in the Thames River, a priority Lake Erie tributary**

## Annex 2: Harmful Pollutants

Harmful Pollutants are chemicals or pathogens (disease-causing organisms) that harm human or ecological health, including, but not restricted to, Chemicals of Concern or substances of emerging concern. Industries, institutions, agricultural operations and residences are sources of chemicals in our waters. Canada and Ontario have been working to reduce or eliminate the release of harmful pollutants into the Great Lakes basin. Many accomplishments have been made, including significant reductions in Canadian releases of mercury, dioxins and furans. However, more work is needed to understand the potential sources of chemicals and to further manage risks these chemicals pose to the environment and/or human health.

Annex 2 guides actions to reduce or eliminate releases of harmful pollutants into the Great Lakes basin. It contains commitments to cooperate on specific research, monitoring, surveillance and risk management actions related to Chemicals of Concern – a list of chemicals that Canada and Ontario agree are of concern to human health or the environment. This Annex includes actions to reduce the risks and impacts of plastic waste and microplastics. This includes supporting plastic pollution capture and clean-up projects, supporting efforts under the Canada-wide Strategy and Action Plan on Zero Plastic Waste, advancing research, surveillance and monitoring on plastic and microplastic pollution, and enhancing awareness and education.



**Small plastic pellets called “nurdles” accumulate on the shore of a Lake Nipigon beach in the Lake Superior basin**



## Annex 3: Wastewater and Stormwater (new)

Wastewater and stormwater carry nutrients and harmful pollutants such as salt, pathogens and contaminants into the Great Lakes. Management of wastewater and stormwater is critical to keeping the Great Lakes clean and protecting water quality, beaches and public health.

Improving wastewater and stormwater management requires significant investments, long-term planning and clear standards and policies. Many partners play a role, including federal, provincial and municipal governments. Specific commitments in this new Annex relate to:

- reducing excess nutrient and contaminant loadings from stormwater and wastewater collection and treatment systems
- conducting research and monitoring that advance understanding of contaminant concentrations
- promoting best management practices in road salt application, certification and alternatives

## Annex 4: Discharges from Vessels

In Canada, the federal government has exclusive jurisdiction over navigation and shipping. Existing laws, regulations, regulatory programs, inspection protocols and enforcement regimes are designed to address threats to the Great Lakes from vessel discharges.

Canada and the United States have committed to prevent and control discharges that are harmful to Great Lakes water quality. Discharges of polluting substances have been addressed under the [GLWQA](#), since 1972. Oil was originally the greatest concern. More recently, the introduction of aquatic invasive species (e.g., zebra mussels) into the Great Lakes has brought attention to discharges from ships' ballast water.

Annex 4 includes a commitment to limit and control vessel discharges that are harmful to water quality. It focuses on addressing discharges of harmful quantities of oil or hazardous pollutants, garbage, wastewater and sewage; taking measures to prevent the release of aquatic invasive species and pathogens due to biofouling and ballast water; and preventing harm from antifouling systems.



# Priority: Improving Coastal Areas



## Annex 5: Areas of Concern

Areas of Concern (AOCs) are geographic areas in the Great Lakes identified in the mid-1980s because human activities had severely degraded water quality and ecosystem health. Environmental degradation was mainly caused by past industrial activities, agriculture, urban and rural runoff and land use practices, and municipal wastewater effluent.

Following the 1987 Protocol to the [GLWQA](#), Canada and the United States formally recognized 43 locations as AOCs: 12 in Canada, 26 in the United States, and five binational AOCs.

Working with community members and local governments, Canada and Ontario are implementing Remedial Action Plans (RAPs) to restore beneficial uses within the AOCs. Significant progress has been made to date. Three of the Canadian AOCs are remediated, and two are in recovery. Annex 5 aims to restore water quality and ecosystem health in the remaining AOCs with the long-term goal of delisting all AOCs and ensuring that environmental improvements are sustained. This Annex includes commitments to develop and implement a process to engage First Nations and Métis on remediation of AOCs and decision-making on delisting AOCs, considering traditional ecological knowledge when offered.

**Beneficial use impairment (BUI)** means environmental degradation as a result of a reduction in the chemical, physical or biological integrity of the Great Lakes. Canada and the U.S. have identified 14 BUIs. All BUIs must be addressed for the AOC to be restored and begin the delisting process.

1. Restrictions on Fish and Wildlife Consumption
2. Tainting of Fish and Wildlife Flavor
3. Degraded Fish and Wildlife Populations
4. Fish Tumors or Other Deformities
5. Bird or Animal Deformities or Reproduction Problems
6. Degradation of Benthos (organisms living at the bottom of bodies of water)
7. Restrictions on Dredging Activities
8. Eutrophication or Undesirable Algae
9. Restrictions on Drinking Water Consumption or Taste and Odor Problems
10. Beach Closings
11. Degradation of Aesthetics
12. Added Costs to Agriculture or Industry
13. Degradation of Phytoplankton and Zooplankton Populations
14. Loss of Fish and Wildlife Habitat

Figure 2: Map Illustrating Great Lakes Areas of Concern



Annex 5 specifies actions to achieve delisting criteria and restore beneficial uses in: Nipigon Bay; Peninsula Harbour, Niagara River, Port Hope Harbour, Bay of Quinte and St. Lawrence River. It also includes actions to continue improvements in: Thunder Bay, St. Marys River, St. Clair River, Detroit River, Hamilton Harbour and Toronto and Region AOCs. Restoration of beneficial uses in the AOCs in Recovery (Jackfish Bay and Spanish Harbour) continue to be monitored.



The osprey is a fish-hunting bird that can be found close to Great Lakes shores, including inland lakes and rivers in the Great Lakes basin

## Annex 6: Lakewide Management

It is important to consider Great Lakes' health on a local scale and a lakewide scale. Annex 6 focuses on restoring, protecting and conserving the Great Lakes on a lake-by-lake basis. It builds on and supports existing and new initiatives in priority geographies in each Great Lake to help achieve ecosystem objectives, including commitments outlined in the [GLWQA](#).

This Annex includes specific commitments related to:

- using science-based ecosystem indicators to assess and report on the status of each of the Great Lakes and addressing lakewide issues through Lakewide Action and Management Plans
- completing an assessment of the Canadian Great Lakes nearshore waters – the areas between the shore and deeper waters
- engaging the Great Lakes community in decision making and acting on lake-specific issues
- developing a process to engage with First Nations and Métis in decision-making and the application of traditional ecological knowledge, when offered, as it relates to assessing lake status, identifying priorities and taking action to address issues on a lakewide basis
- identifying and assessing potential risks to the Great Lakes as a safe drinking water source



**An aerial shot of the Randle Reef sediment remediation project in the Hamilton Harbour Area of Concern**



# Priority: Protecting Habitat and Species



## Annex 7: Aquatic Invasive Species

Aquatic invasive species are a significant environmental and economic threat to Great Lakes ecosystems and biodiversity. Aquatic invasive species have severely damaged the Great Lakes by outcompeting native species, altering food webs, degrading critical habitats for fish and wildlife populations and degrading water quality. Aquatic invasive species threaten the economy by affecting industries such as tourism, recreational and commercial fisheries, and disrupting water supply for municipal drinking water, power plants and industry.

Significant progress has been made to prevent the introduction and spread of harmful aquatic invasive species to the Great Lakes basin. However, continued efforts are needed across jurisdictions to reduce threats to water quality and ecosystem health.



**Biologists conducting early detection surveillance and response work to prevent Grass Carp from becoming established in the Great Lakes**



Annex 7 includes commitments to:

- implement ballast water regulations in Canada to protect the basin from the discharge of aquatic invasive species from ships
- assess the risks of potential new aquatic invasive species and pathways for introduction
- ensure regulations, policy and management actions prevent or reduce the spread of aquatic invasive species
- reduce sea lamprey populations to levels that support fish community objectives
- support coordinated early detection and response to new invasions
- improve the tools available for detection, control and management of established aquatic invasive species
- strengthen outreach to the Great Lakes community to prevent the introduction and spread of aquatic invasive species

## Annex 8: Habitat and Species

Thriving habitats and native fish and wildlife communities contribute to the social and economic vitality of the region. Unfortunately, many human activities put pressure on the ecosystem. This can result in habitat loss or degradation, fragmentation of natural systems, reductions in the health and abundance of native species, and threats from invasive species.

Annex 8 focuses on restoring, protecting and conserving the diversity of habitats and species that make up the Great Lakes ecosystems while providing sustainable social, ecological and economic benefits. It includes commitments related to:

- identifying priority habitats to protect and restore
- identifying threats and protecting, enhancing or restoring habitat and native species
- understanding vulnerability to climate-related impacts and resilience of coastal wetlands
- engaging the Great Lakes community in habitat and species conservation

# Priority: Enhancing Understanding and Adaptation



## Annex 9: Groundwater Quality

Groundwater refers to the water under the Earth's surface found in cracks and spaces in the sand, soil and rock. Groundwater circulates as part of the water cycle and represents over 40 percent of the water entering the Great Lakes. The continued flow of good quality groundwater plays an important role in Great Lakes water quality and ecosystem health.

Annex 9 includes commitments to update a binational state of groundwater science report, identify future research priorities, and identify priority areas and sites for groundwater monitoring, management or remediation. Groundwater quality is linked to the successful delivery of commitments in other Annexes, including Areas of Concern, Lakewide Management, Harmful Pollutants, Nutrients and Habitat and Species.

## Annex 10: Climate Change Impacts and Resilience

Climate change affects physical, chemical and biological processes and aquatic ecosystems. It impacts people, public health, communities and infrastructure in the Great Lakes region. Warmer water, changing precipitation patterns, extreme variability in lake levels, decreased ice coverage, increased lake evaporation and extreme weather events are among the most evident impacts.

Federal and provincial programs that help Canadians adapt to climate change complement the efforts addressed in Annex 10. This Annex contains commitments that will:

- improve our understanding of climate change impacts on Great Lakes water quality and ecosystem health
- assess existing and future climate change vulnerabilities and risks
- advance the integration of climate change considerations into Great Lakes management strategies
- share climate change information with the Great Lakes community
- help communities build climate change resilience and adapt to climate change

# Priority: Engaging Communities – From Awareness to Action



## Annex 11: From Awareness to Action

The Great Lakes are an essential part of everyday life for 99 percent of Ontarians. They provide drinking water, food and electricity, and moderate climate. They provide recreation and tourism opportunities, and they are the economic backbone of Ontario. Their natural beauty nourishes our spirit, and they connect us with our heritage. Ensuring that the Great Lakes are healthy and that resources are managed sustainably is vital to the Lakes and the people who live and work here.

Despite the many benefits of living in the Great Lakes basin, many people are unaware of the connections between their activities and lake health. Providing more information, education and awareness of the Great Lakes will increase overall appreciation for the Lakes and motivate individuals to get involved. Annex 11 seeks to include a broad range of Canadians in dialogue, planning and priority setting. It encourages the Great Lakes community to build awareness, expand Great Lakes experiences and take action.



**Kayakers paddling over one of many historic shipwrecks in Lake Huron**

## Annex 12: Métis and the Great Lakes

Canada and Ontario work with Métis on a good governance basis on a wide range of environmental protection issues. The Agreement supports opportunities for Métis to participate in and contribute to Great Lakes initiatives. Annex 12 provides a framework for Canada and Ontario to build relationships, engage and collaborate with Métis on implementing actions and consider traditional ecological knowledge, when offered, in efforts to help restore, protect and conserve Great Lakes water quality and ecosystem health. This includes ensuring Métis are actively engaged in Great Lakes decision-making and have the capacity to act on Great Lakes issues. Finally, Canada and Ontario are committed to working with Métis to ensure their specific consumption habits are considered when developing fish consumption advisories.

### **Good Governance**

means to pursue a decision-making process based on public participation, transparency and accountability.

## Annex 13: First Nations and the Great Lakes

There are many First Nations communities within the Great Lakes basin. First Nations value their spiritual and cultural relationship to the Great Lakes. They contribute to protecting water quality and ecosystem health through the wise use and management of land and water in their communities. Annex 13 provides a framework for Canada and Ontario to build relationships and engage and collaborate with First Nations on a good governance basis. It supports engagement with First Nations in taking action, decision-making processes, considering traditional ecological knowledge, when offered, to restore, protect and conserve Great Lakes water quality and ecosystem health. This includes a commitment to working with First Nations to ensure their specific consumption habits are considered when developing fish consumption advisories.



# Looking to the Future: Collaborating for Success

Everyone has a role to play in protecting, restoring and conserving the Great Lakes. The COA 2021 gives momentum to broader efforts and helps facilitate collaborative arrangements and collective action among all people and organizations interested in protecting the Great Lakes.

Enhanced engagement of the Great Lakes community from all sectors will help to achieve shared Great Lakes outcomes.

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