The Great Lakes Water Quality Agreement at Fifty

A Great Lakes Ecoregion Network Report

September 27, 2022

GREAT LAKES
ECOREGION NETWORK

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I. Introduction

2022 marks the 50th anniversary of the first Great Lakes Water Quality Agreement (GLWQA or, "the Agreement") between the United States and Canada. Late in 2021, individuals and organizations throughout the Great Lakes region, who have helped shape the Agreement and its implementation over the last five decades, came together to form a new network—the Great Lakes Ecoregion Network (GLEN)—to celebrate 50 years of GLWQA achievements, to critique its limitations, and consider actions needed in the next 50 years to safeguard this global treasure.

This report is designed to:

1. Provide succinct background about the state of the Agreement;

2. Highlight major accomplishments and identify limitations and disappointments of the last 50 years to identify lessons learned for future work;

3. Offer recommendations for future action, including needs and changes to future Agreements.

Shore pebbles, Pictured Rocks National Lakeshore, Jane Elder

II. Overview

When Lake Erie algal blooms worsened to a crisis in the 1960s, Canada and the United States shared the problem—but no mechanism to combat it jointly. Out of that gap came the binational Great Lakes Water Quality Agreement. Signed by Canadian Prime Minister Pierre Trudeau and U.S. President Richard Nixon in Ottawa on April 15, 1972, the pact embraced the reality that Great Lakes water flows across the international boundary and that only through joint effort can the lakes be restored and protected.

Has it worked? The answer: yes and no. Yes, the Great Lakes are better off than they would be without the Agreement. The two countries have coordinated efforts to clean up the lakes for decades, keeping the commitment they made 50 years ago to "restore and maintain the chemical, physical, and biological integrity of the Waters of the Great Lakes." These efforts have reduced, but not eliminated, both conventional and chemical forms of pollution. They have also broadened the perspectives of both governments and the public to grasp the importance of regarding the Lakes as part of interconnected ecosystems instead of a jumble of unrelated pieces.

However, the Agreement's 1972 goals are unfulfilled. For example, the Great Lakes are not "free from nutrients entering the waters as a result of human activity in concentrations that create nuisance growths of aquatic weeds and algae." After early successes in reducing the phosphorus pollution that spurred algal outbreaks, the two nations have witnessed a rebound in both nuisance and harmful algae in Lake Erie since the early 2000s. A toxic bloom forced Toledo Ohio officials to warn residents not to drink city water for two days in the summer of 2014. Algal blooms also occur in Lake Huron's Saginaw Bay and pockets of Lake Michigan and Lake Ontario. Lately, blooms have appeared in Lake Superior, the coldest and cleanest of the Great Lakes.

This is just one of several problems undermining the goals and aims of the Great Lakes Water Quality Agreement, which has been significantly altered three times, in 1978, 1987 and 2012.

There has been progress to restore and protect the Great Lakes, including the reduction of some toxic chemicals. There are still significant challenges, including new and old toxic chemicals, nutrients, invasive species, habitat loss, groundwater pollution, and climate change. Meanwhile, mistakes of the past continue to plague the lakes. After more than three decades of cleanup effort, 34 of an original 43 Areas of Concern (AOCs) remain (26 U.S., 12 Canadian and five shared). AOCs are bays, harbors, and rivers that are victims of chemical and conventional pollution requiring billions of taxpayer dollars to clean up. The toxic materials, such as PCBs, dioxins, and mercury, are persistent and have contaminated millions of cubic yards of underwater sediments.

There is growing awareness that a binational U.S.-Canada Great Lakes Water Quality Agreement excludes sovereign governments that should have an equal seat at the table: tribes, First Nations, and Métis, whose wisdom and scientific knowledge are essential to protecting the health of the Great Lakes. The 2012 version of the Agreement suggested Indigenous membership on the WQB; the SAB already had Indigenous representation. In 2019, the Canadian government appointed Henry Lickers as the first Indigenous IJC Commissioner.

The biggest threat to the Great Lakes is undoubtedly climate change. It will alter the lakes in many ways, some of them not foreseeable. Warming groundwater, changes in the aquatic food web, and increasing algal blooms are among them. The 2012 version of the Great Lakes Water Quality Agreement contains an annex devoted to climate change, but focuses solely on assessment, planning and research exchange.

While two nations embarked on an auspicious beginning when President Richard Nixon and Prime Minister Pierre Trudeau signed the first Agreement in Ottawa in April 1972, today we are still closer to the beginning than the end of Great Lakes restoration and protection, Great Lakes Water Quality Agreement notwithstanding.

Julian Bay, Apostle Islands National Lakeshore, Jane Elder

III. What *is* the Great Lakes Water Quality Agreement?

The Great Lakes Water Quality Agreement is a diplomatic agreement between the federal governments of the United States and Canada, signed by the President and Prime Minister (or their designee), and implemented under the leadership of the U.S. Environmental Protection Agency (US EPA) and Environment and Climate Change Canada (ECCC), respectively. Its purpose is to provide a framework for cooperation and coordination between the two nations to set priorities and implement actions that protect or improve water quality in the Great Lakes. The original Agreement was signed by Richard Nixon and Pierre Trudeau in 1972, and it has been substantively modified since then in 1978, 1987 and 2012.

How is the Agreement administered?

The Agreement was established under the authority of the Boundary Waters Treaty—a 1909 treaty between the United States and Canada to resolve disputes related to any of the shared waters along the U.S.-Canada boundary, which includes the waters of the Great Lakes.

The two federal governments are referred to as "the Parties" in the Agreement. The federal governments have authority to act to implement the Agreement within the limits of their domestic legal and regulatory frameworks. The Parties assign much of the responsibility for implementing the Agreement to federal, provincial or state regulatory agencies (such as delegating state water quality permits under the Clean Water Act). In turn, states and provinces pass on some of this responsibility to local governments. It is important to note that there are no penalties under the Agreement if one or both Parties fail to achieve Agreement objectives (treaties typically have greater latitude in establishing enforceable objectives, but the Agreement is *not* a treaty.)

The Boundary Waters Treaty established the International Joint Commission (IJC), comprised of three Canadian representatives and three U.S. representatives, to provide oversight and advice to the two federal governments on how to best resolve disputes. Since 1972, the IJC has also provided oversight and advice on the Great Lakes Water Quality Agreement. It is important to note that the IJC is not a regulatory body and does not have regulatory authority in terms of the GLWQA. The IJC is served by several volunteer advisory boards. For Great Lakes water quality, the most relevant boards include the Great Lakes Water Quality Board, the Science Advisory Board, and the Health Professionals Advisory Board. The IJC has offices in both national capitols as well as the Great Lakes Regional Office in Windsor, ON. Staff provide support to the Commission and its advisory boards, including coordinating meetings, research, and developing reports.

The most recent Agreement (2012) has annexes focused on Areas of Concern, lakewide management, chemicals of mutual concern, nutrients, discharges from vessels, aquatic invasive species, habitat and species, groundwater, climate change impacts, and science.

IV. Major focal areas and changes over the years

➔**The 1972 Agreement** focused on addressing pollution causing massive algal blooms in Lake Erie, Saginaw Bay and other waters, and alewife die-offs on Lake Michigan shores. This led to phosphorus bans in household detergents in both nations (28 U.S. states and all Canadian provinces) and improved municipal sewage treatment, resulting in improvements in water quality. It established the Water Quality and the Research Advisory Boards (renamed the Science Advisory Board in the 1978 Agreement).

➔**The 1978 Agreement** established the chemical, physical and biological integrity framework or "ecosystem approach," elevated efforts to assess the impact and reduce levels of toxic chemicals in the waters and sediments of the Great Lakes, including the concept of virtual elimination of toxic pollution. This shed new light on the role of persistent toxic chemicals and bioaccumulation in fish and wildlife in the Great Lakes food web and laid the groundwork for the Critical Pollutants list.

➔**The 1987 Agreement** (technically a "protocol" to the 1978 Agreement) called for Remedial Action Plans and identified impaired beneficial uses for the 43 toxic hotspots in Great Lakes harbors and major industrial sites named "Areas of Concern." It called for clean-up action to reduce human and wildlife exposure to toxic contaminants in sediment and soils. The 1987 Agreement also flagged airborne sources of toxic pollutants to the lakes, as well as 272 hazardous polluting substances that already posed some threat to water quality and 108 hazardous substances posing potential threats. The Agreement also specified maximum levels for 41 contaminants in Great Lakes waters. Annexes on Aquatic Invasive Species and Habitat added opportunity for biological focus. In the 1987 Agreement, the two federal governments restructured the relationship between the International Joint Commission (IJC) and the lead implementing agencies (Environment Canada and US EPA).

➔**The 2012 Agreement** included new content identifying climate change as a threat to Great Lakes water quality and called for research exchange. The negotiators stripped the lists of known and potential toxic chemicals from the 1987 Protocols and the list of specific objectives for such substances and replaced them with an annex intended to identify "chemicals of mutual concern." They also removed the airborne toxic substances annex, integrating these pollutants in a non-specific way into the annex on chemicals of mutual concern. The Parties committed to confer in cooperation and consultation with "State and Provincial Governments, Tribal Governments, First Nations, Métis, Municipal Governments, watershed management agencies, other local public agencies and the Public." It also restructured the Great Lakes Water Quality Board to include more diverse representation.

V. Major accomplishments driven by Agreement goals and objectives

Pollution Prevention and Reduction

- Drove reductions in direct discharges from industrial and municipal point sources, including successful phosphorus bans from household and commercial detergents following the 1972 Agreement.
- Identified 11 critical pollutants as threats to the Great Lakes that needed priority attention.
- Adopted an ecosystem approach to toxic chemicals (chemical, physical, biological; food web; cradle-to-grave).
- Identified hundreds of known and potential toxic and hazardous pollutants needing oversight to protect Great Lakes water quality (See Appendices in Annex 10 of 1987 Agreement.).
- Inspired Section 112 of the U.S. Clean Air Act "Great Waters" language flagging the need to study and regulate atmospheric transport of persistent toxic chemicals.
- Identified the 43 Areas of Concern and spurred remedial action in both nations.

Research and Science-based Strategies

- Drove the agenda (through Science Advisory Board leadership) for urgent investigations to address Great Lakes water quality threats through good science; encouraged cross-disciplinary research; engaged with the International Association for Great Lakes Research (IAGLR).
- Supported major advances in understanding the structure and activity of persistent toxic pollutants in aquatic food webs.
- Drove early work on the role of persistent organic pollutants (POPs) as endocrine disrupters.
- Connected scientific findings to policy and programs through consultation, citizen awareness, reports, testimony, and other avenues.
- Helped drive criteria for persistent toxic chemicals embedded in domestic law and regulatory systems.
- Inspired the Stockholm Convention on Persistent Organic Pollutants.

Constituency Building and Public Awareness

- Helped develop the basin-wide Great Lakes community—including citizen leadership, cross-border networks, agency collaboration, and common visions.
- Embraced the Great Lakes as a whole, connected system.
- Served as a key convenor for public dialogue: IJC biennial meetings were focal events for citizen engagement, media, scientists, and industry for nearly two decades.

VI. Limitations and disappointments related to the Agreement

Although the Agreement has made a substantial difference in many areas, the Parties failed to embrace preventive and precautionary approaches and many other Agreement principles as primary guidance for their strategies and actions. They have also failed to take bold and responsive action at critical moments to control invasive species or address chemicals of emerging concern. While we acknowledge incremental progress, we also recognize that incrementalism has failed to protect the Great Lakes and its food web.

Influence and Efficacy

- The GLWQA and its institutions have morphed from a framework that defined scientifically grounded goals to advance Great Lakes clean-up in its early versions, to one that has a decreasing role in substantive Great Lakes protection. The Agreement has sometimes been used as a political "show and tell" tool to provide evidence of activity but is no longer driving progress toward substantive targets or galvanizing public engagement to ensure the health and vitality of the lakes.
- Agreements prior to 2012 included objectives, targets, pollutant lists and other guidance that helped drive advances in federal, state and provincial Great Lakes programs. These also were critical factors in stimulating and strengthening public pressure on the governments to implement the Agreement. With one exception (Annex 4 on nutrients), these are absent from the 2012 Agreement.
- In previous Agreements, the Water Quality Board was charged with assessing and reporting on progress toward achieving Agreement objectives. It no longer appears to be playing that role, which is a loss to the oversight process, and to the Parties, the public and the lakes.
- The restructuring of roles and responsibilities between and among the Parties and the IJC (beginning in 1987) did not result in better policies or more effective controls on toxic substances, nutrients, and invasive species.

Pollution Prevention and Reduction

Lack of precautionary approach for toxic chemicals

- Focus has largely been on end-of-the-pipe pollution and what's already in the lakes or their tributaries. Source reduction and precautionary strategies, such as banning PFAS and certain flame retardants have had limited attention.
- Fading (and even lost) commitment to zero discharge and virtual elimination of toxic pollutants—this core concept has fallen off the agenda.

- Scrapping the previous toxics lists and benchmarks for progress when writing the 2012 Agreement was a significant loss; the new process on toxic pollutants (Chemicals of Mutual Concern) has been dismally slow and inadequate. So far only eight chemicals have been designated as chemicals of mutual concern since the 2012 Agreement.
- Across the lakes, many fish species remain unsafe for consumption by women of childbearing years, children, and other vulnerable people who rely on fish for sustenance. This particularly affects Indigenous communities and has become an environmental justice concern.
- Government practice has been reactive, not precautionary. Addressing toxic pollution after contaminants are widespread in the open environment is nearly impossible.

Remedial action limitations

- Objectives for the AOC delisting process align with "restoration of beneficial uses," which does not necessarily equate with ecological resilience.
- Restoration strategies for some AOCs have been driven more by opportunities for shoreline development and less by long-term ecological restoration and vitality.
- Remedial strategies for many AOCs include storing highly contaminated sediments in confined disposal facilities near or in the water, increasing risks for future generations.
- Current strategies are taking decades to achieve tangible progress: 34 of the 43 AOCs are still AOCs after 35 years.

Inadequate nutrient controls

- Strategies and domestic regulatory systems are completely inadequate to address nutrient pollution from agricultural sources, as the massive algal blooms and/or dead zones in Lake Erie and Green Bay clearly indicate. Intense climate-driven rain events overwhelm current runoff prevention strategies.

Other Concerns

- "Polluter pays" strategies are rarely used and have had little efficacy in domestic enforcement other than in post-pollution action to collect damages.
- Radionuclides are not addressed as a potential threat to Great Lakes water quality, even in an era where many nuclear facilities will be decommissioned, and highly radioactive materials will likely remain on site on the shores of the Great Lakes for decades to come.
- Fracking waste needs greater attention to prevent radionuclides and toxic substances in brine from entering the Great Lakes watershed.
- Independent scientific findings for needed actions are sometimes outweighed by corporate scientists, raising questions about scientific rigor in decision-making, and whether advice to the Parties may be poorly informed or lead to ineffective actions.

- Climate change has the potential to multiply the effects of existing toxic substances, but the Parties lack a coordinated climate strategy for the Great Lakes.

Accountability and Enforceability

- The Agreement's lofty principles are disconnected from specific strategies and implementation at the management level.
- Lack of enforceability has led to inadequate compliance with goals and objectives as noted above.
- Physical and biological integrity of the ecosystem have not received adequate attention, and both affect water quality and ecological health, e.g., the dredging and dumping of toxic materials can have negative impacts on lakes; the food web alterations in Lakes Michigan and Huron from invasive quagga and zebra mussels is substantial.
- There is no consolidated and consistent reporting framework across three key reports. The Progress Report of the Parties (the government's triennial report), the Triennial State of the Lakes Report and the IJC's Triennial Report are not well integrated and do not consistently identify priority actions. Similarly, LAMP updates and domestic action plans for watersheds for each lake (including watershed goals and objectives, including total maximum daily load [TMDL]) lack integration. This limits a comprehensive assessment of the health and trends of the larger ecosystem and muddies the waters for responsive action.

Constituency Building and Public Awareness

- Since 1987, IJC's role as an independent watchdog of compliance by the Parties has been intentionally diminished by the Parties.
- Domestic agencies often do not actively seek (or appear to want) public comment or involvement.
- Down-scaled biennial (now triennial) meetings for public input to the Parties limit forums for basin-wide collaboration.
- While they have taken early steps, the Parties need long-term strategies to ensure greater representation from and engagement with tribes, First Nations, the Métis, and communities disproportionately affected by pollution and other water quality issues.
- The Parties have reduced or eliminated funding that supports public consultation. For example, funding was eliminated for the Lake Superior Binational Forum and others. These, and other cuts, limit opportunities for growing public knowledge, relationships, and input that sustain public interest and investment in the Agreement, its goals, and its efficacy as a cross-border institution for cooperation and coordination to reach common goals. The overall effect is the loss of wisdom, experience, and ownership that authentic consultation can provide.

- Weakening institutions by reducing public "ownership" is a way to self-fulfill prophecies that institutions like the Agreement have limited value. It is also a way to ensure reduced cross-border cooperation, management, and even conversation.

VII. The next era of Great Lakes collaboration: Aspirations and Opportunities

As the people of the Great Lakes region look toward the next fifty years, Great Lakes Ecoregion Network urges the Great Lakes community to consider challenges that need cross-border cooperation, envision what a stronger management regime might look like, and identify what the next agreement needs. We have highlighted preliminary recommendations to start the conversation.

VII. A. Major water quality and related issues on the horizon where cross-border cooperation will be essential

Pollution Reduction

- The Parties must take a proactive approach to prevent further devastating surprises from the use of toxic substances. This includes:
    - Developing a cross-border precautionary strategy for toxic chemicals, including radionuclides, in the Great Lakes focused on…
        - Embracing zero discharge strategies
        - Ensuring safe substitution processes for high-risk toxic chemicals and avoiding substitutions that may pose serious hazards.
- To achieve zero discharge, the Parties must adopt a zero-use strategy. This will include eliminating the use of toxic substances in products, addressing toxic substances by classes of chemicals instead of one-by-one, consideration of cumulative effects associated with the use of numerous toxic substances and mixtures, and putting special emphasis on protecting communities more highly subjected to toxic chemicals.
- The Parties must collaborate on addressing cumulative impacts from animal agriculture issues such as concentrated animal feeding operations (CAFOs).
- The Parties should expand cooperation to address climate change impacts on water quality (beyond information exchange).

- The Parties must collaborate on shared strategies for radionuclides, pollution from plastics and microplastics, pharmaceutical and cosmetic products, and new emerging toxic substances, including nanomaterials.

Physical and Biological Integrity

- The Parties must develop a strategy for physical and biological integrity to protect Great Lakes water quality, biodiversity, and physical integrity, which calls for:
    - Domestic land use regulations that protect water quality, habitat, and natural flows.
    - Finding alternatives to traditional large-scale water management practices like dredging, dumping, damming, and channelizing that loom even larger with climate change, such as resolving ever greater lake flooding problems with dredging deeper shorelines.
    - Renewed commitments to stem the loss of coastal wetland and shallows.
    - A guiding regime for
        - involvement of water scientists/fluvial geomorphologists who can directly link these lake trends to management practices,
        - increased local government involvement in developing policies and laws that support regeneration and resilience, and
        - involvement of economists who can spell out the links between poor policies and practices and unsustainable economies, building on current case studies.
- The Parties should develop a strategy to reduce climate-induced shoreline and lake level disruption and conserve coastal habitats and other ecological functions.
- The Parties should either establish a new agreement between the U.S./Canada and the region's Indigenous nations on Great Lakes biodiversity that addresses invasive species, habitat loss, and extinction, or expand the GLWQA to explicitly include the biological health of the Great Lakes ecoregion.
- The Parties should establish a new agreement between the U.S./Canada and the region's Indigenous nations to address climate resilience and adaptation strategies for the Great Lakes or expand the GLWQA to explicitly include climate response in the Great Lakes ecoregion.

Emerging issues

- The Parties should expand collaboration on additional toxic exposure pathways (products and foods).
- A new mining boom, including sulfate mining, threatens water pollution, smelting emissions, landscape destruction in Great Lakes tributaries and mining waste.
- Climate change impacts may increase recirculation of old toxic substances in the Great Lakes.

Research and Science-based Strategies

- The Parties must apply lessons from COVID: The recent human pandemic (Covid 19) should be a clarion call to implement extensive research on the threats posed by pathogens, including analyzing the potential roles of human wastewater systems (that are now required to discharge 'treated effluents' back to the lakes) and wildlife as potential means of new pathogen distributions or reservoirs, before there are future human or wildlife outbreaks.
- The Parties must review current scientific capacity to carry out essential functions such as research on human and wildlife health impacts, monitoring for known and suspected toxic chemicals, bacteria, and pathogens, as well as other Great Lakes biological and physical systems.
- The Parties must develop strategies to secure adequate and consistent long-term funding for essential research and monitoring to ensure public health and safety and environmental health and resilience, and report on funding in their Triennial Progress reports.

VII. B. What does a regenerative and resilient Great Lakes management regime look like?

A highly functional management regime will:

- Restore and embrace the chemical, physical and biological integrity framework for cooperation and collaboration.
- Establish an ecoregional advisory structure that engages citizen, environmental, municipal, and Indigenous representatives to give advice and recommendations to governments for actions. Each Lake would have an advisory committee and an overarching committee will serve the entire Great Lakes Basin.
- Create a Great Lakes zero-discharge and virtual elimination of toxic pollution strategy with specific actions that embrace precautionary approaches to the licensing and use of toxic chemicals in industrial processes and commerce, monitoring systems that track known persistent pollutants in the open lake environment as well as the health of fish, wildlife, and

humans. One goal will be to achieve and sustain water quality that removes the need for fish consumption advisories and protects drinking water sources.

- Invest in science that supports long-term monitoring, including epidemiological studies for people and wildlife, and science-based decision-making on toxic chemical regulation and oversight, and chemical mechanisms and retention in the Great Lakes biosphere.
- Provide a consistent and integrated framework for measuring and reporting progress against established goals and benchmarks and timelines for the Great Lakes system and specific geographical and ecological targets.
- Include an independent evaluation of the oversight and implementation processes, outcomes, impacts, and influences—possibly by a joint Royal Society of Canada and the U.S. National Academy of Sciences study, or joint contract with a major U.S. and Canadian university.

VII.C. The next Agreement—needs, structure, topics, annexes

Pollution Reduction and Ecological Integrity

- Restore the chemical, physical, and biological integrity framework for cooperation.
- Align the Agreement with other agreements that affect the chemical, physical, and biological integrity of the Great Lakes. This includes:

    a. Canada/U.S. Convention on Great Lakes Fisheries (Great Lakes Fishery Commission)
    b. Agreement on Environmental Cooperation among the United States of America, United States of Mexico, and Canada (Commission for Environmental Cooperation (CEC), given the Great Lakes region's relevance to biological health of the North American continent
    c. The Stockholm Convention on Persistent Organic Pollutants (a.k.a. POPS treaty) for its relevance to toxic substances.

Accountability and Enforceability

- Conduct an independent analysis (possibly academic) to assess pros and cons of the Agreement becoming a treaty.
- As an alternative to a treaty, require that compliance with Agreement objectives be codified into domestic law.
- All annexes should have objectives and benchmarks.
- Each affected federal, state and provincial agency should develop a compliance plan outlining their steps to achieve Agreement objectives.
- Require that, following each Triennial Assessment of Progress Report by the IJC, each Party via Congress and Parliament hold oversight hearings on compliance and progress toward objectives, including opportunities for public statements.

- Require that the Water Quality Board report to the IJC, Parties and the public on progress toward compliance with Agreement objectives prior to the IJC's triennial reports.

Constituency Building and Public Awareness

- Public participation should be an essential role of the Parties, including administrative agencies as well as Congress and Parliament as the primary agents of implementation; IJC should welcome public involvement, but its primary role should be oversight, compliance, and early warning. The IJC should obtain public views in preparing its reports, but its consultation should not replace the responsibility of the Parties to directly hear from the public about their concerns and opinions.
- The Agreement should be expanded to Indigenous nations as Parties who are partners in developing and implementing the Agreement.
- The Agreement should be changed to improve and safeguard environmental quality of the St. Lawrence River downstream of the Akwesasne Mohawk Territory, Cornwall, Ontario, Massena, New York (beyond the current boundaries addressed by the GLWQA).

Cloud Shadows, Lake Michigan, Jane Elder

VIII. Summary

Over the last fifty years the Great Lake Water Quality Agreement has played an important role in setting the agenda for Great Lakes protection, but its continued success is on the shoulders of the Parties and their domestic agencies. In an era where democratic institutions are fragile, we cannot take the Agreement for granted. Its future requires forward-looking strategies, clear objectives, mechanisms to drive domestic compliance, and the support of the Parties in committing to and funding and implementing the actions that will safeguard the lakes and ecological integrity. If the Parties relegate the Agreement and the IJC to a symbolic and limited advisory role, it will continue to lose gravitas and import. We must strengthen the Agreement, or it will fade into history. The next Agreement will need to embrace precautionary and preventive strategies, regeneration, and resilience, and restore benchmarks for progress, and additional mechanisms for accountability and meaningful public involvement.

A strong and vital Agreement will help shape a healthier future for the Great Lakes. In a time of considerable uncertainty, we need to choose our future course wisely. We see these potential scenarios for the next 50 years of Great Lakes management:

- Incrementalism in both policy and practice, which normalizes degradation;
- Lack of foresight and action for climate change, which will drastically change the region ecologically, socially, and economically, while we will be trying to absorb climate refugees from other devastated areas;
  Or…
- Local watershed leadership and cross-basin coordination will rise up to provide innovative strategies in the absence of federal, state and provincial leadership;
- Transformative leadership and bold new strategies move us toward ecological health and resilience.

Aspects of each scenario are likely to surface and coincide in the coming decades. However, without a significant and rapid shift from the status quo represented in the first two bullets, the lakes and the life that depends on them are at risk. We will all play a role in shaping the future of the lakes, and we hope you will join us in considering how to best shape cross-border cooperation, collaborative Great Lakes management, and the Agreement to best safeguard the remarkable Great Lakes in the challenging decades to come.

Au Train Bay, Lake Superior, Jane Elder

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