IAGLR

LAKES Letter

Great Lakes Policy

Spring 2026, No. 29

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The Giigoonyig Enjintaawgiwaad hatchery on Walpole Island First Nation.

Aerial view of damage on eroding dune on Lake Michigan. *Photo by Sarah Rypma.*

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On the Cover. Duluth Harbor North Pier Light. *Photo by Colleen Pilat Images.*

LAKES *Letter*
Spring 2026, No. 29
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Editor
Paula McIntyre, IAGLR Communication Director & Strategy Advisor

Editorial Associates
Alex Duncan
Jessica Ives

Contributors
Vance Badawey, Janessa Esquible, Catherine Febria, Kristen Hychka, Gail Krantzberg, Dani Lindamood, Jérôme Marty, Jacob Orlandi, Gabrielle Parent-Doliner, Matthew Pawlowski, Rewa Phansalkar. Colleen Pilat, Trevor Pitcher, James Polidori, Monica Seidel, Scott Sowa, Ian Stone, and Helena Volzer.

Advertising
Direct inquiries to lakesletter@iaglr.org.

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Jérôme Marty

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EXECUTIVE DIRECTOR'S NOTE

Dear Friends and Members of IAGLR,

This year, the work of our community has continued with steady focus, even as the policy environment around the Great Lakes evolves. While the headlines often emphasize disruption, the reality on the ground is one of adaptation and resilience. Scientists, managers, and policymakers are navigating a complex landscape where federal priorities shift, but the fundamental need for robust, evidence-based stewardship remains unchanged.

This issue of *Lakes Letter* reflects that reality. Rather than focusing solely on the challenges, we highlight the mechanisms and strategies that are holding the system together. From the urgent need for transparency in data center water use to the long-term accumulation of road salt in our aquifers, the articles here present an assessment of the pressures facing the basin. Equally important are the pieces on governance: how binational frameworks like the Great Lakes–St. Lawrence River Basin Water Resources Compact are being tested, and how Indigenous knowledge systems are increasingly shaping the science-policy interface.

IAGLR has been actively engaged in these dialogues. In March, we joined partners in Washington, D.C., for Great Lakes Day, where we highlighted the importance of Great Lakes science in informing policies that protect the world's largest freshwater system. The dialogue included critical exchanges with regional leaders and members of Congress. Also in March, we collaborated with other nonprofit organizations to contribute to the development of Canada's first National Water Security Strategy.

Earlier this month, we joined other Great Lakes-St. Lawrence River organizations to host another Great Lakes Day on Parliament Hill. There, we collaborated to advance shared binational priorities.

In addition, this month we released our 2025 Annual Report, titled "Steadfast Science in Changing Times." I invite you to take a look at what we've accomplished and welcome your feedback.

Next week, from May 25–29, we gather in Winnipeg for our joint conference with the Society of Canadian Aquatic Sciences. This event is an opportunity to connect across borders and disciplines, to share findings, and to strengthen the networks that make our collective work possible. With close to 800 participants, we are looking forward for busy week.

Finally, I would like to take the opportunity to welcome Brianna Ellis to our staff. Brianna has been key to our conference over the last four years and will start in July as a full-time employee, supporting both our conference and policy programs.

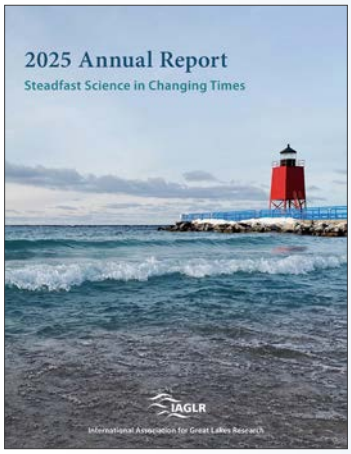
Thank you for your continued commitment to the Great Lakes. Your dedication to rigorous science and thoughtful advocacy is what ensures that, regardless of the political climate, our stewardship of these waters remains grounded in truth and effectiveness.

I look forward to welcoming you to Winnipeg.

Best regards,

Jérôme Marty

ASSOCIATION NEWS



IAGLR 2025 Annual Report released

We are pleased to share our 2025 Annual Report, titled "Steadfast Science in Changing Times." The year was defined by our collective response to unprecedented headwinds, proving that IAGLR is more than a professional society, it is a steadfast voice for large lake science. Highlights from the year include our 68th annual conference in Milwaukee, which brought together 600 scientists despite travel and funding barriers; the launch of the Student and Early Career Committee to support the next generation; and the receipt of a landmark $665,000 grant from the Fred and Barbara Erb Family Foundation. We also issued formal statements, commentary, and joint letters to protect the future of science and deepened our commitment to inclusion by securing new funding to support Indigenous and Black scholars. We invite you to read how our community stood firm in the face of policy shifts and funding uncertainties to ensure the flow of knowledge about the world's large lakes remained uninterrupted.

IAGLR participates in Canadian National Water Security Strategy planning

On World Water Day, March 22, Canada announced the launch of the country's first National Water Security Strategy and its plans to engage over the next several months with partners, stakeholders, and Canadians on water security challenges, opportunities, and priorities. IAGLR joined several nonprofit organizations on March 23 to contribute key points moving forward. For IAGLR, the NWSS would benefit from the following:

1. **Clear objectives**
   The strategy must establish a clear and actionable definition of "water security," explicitly identifying who it is intended to protect. This definition should be grounded in equity and must intrinsically include ecosystem health—ensuring that water quantity, flows, and biodiversity are recognized as core elements to be secured. It should also explicitly address water security for First Nations, supported by science and engineering, sustained investment in infrastructure, and dedicated funding for Indigenous training in water system operations and management.

2. **Inclusive, knowledge-based foundation and effective governance**
   A national strategy must be grounded in robust science while integrating diverse knowledge systems, including meaningful engagement with local and Indigenous communities. Equally important, the effectiveness of the strategy will depend on the governance and decision-making structures established to implement and sustain it. Clear roles, accountability mechanisms, and inclusive governance models are essential to ensure that knowledge is translated into long-term, adaptive action.

3. **Ecosystem-based approach**
   The strategy should adopt a holistic, ecosystem-based perspective that recognizes humans as part of interconnected natural systems. This includes managing water resources in ways that sustain ecological integrity, resilience, and long-term environmental health across watersheds.

Left to right: Dominique Beauchamp (Aqua-Action), Meredith Brown (Canadian Geographic), Alain Pietroniro (University of Calgary), Marie-Paule Jeansonne (Gaspé Beaubien Foundation), Soula Chronopoulos (Aqua Action), Wade Grant (Parliamentary Secretary to the Minister of Environment and Climate Change Canada), Leanne Sexsmith (Real Estate Foundation of BC), Mark Fisher (Canada Water Agency), Terry DeGuid (Member of Parliament for Winnipeg South), Pauline Gerrard (IISD Experimental Lakes Area) and Jérôme Marty (IAGLR).

4. **Dedicated focus on shared and transboundary waters**
   Shared waters and transboundary basins require distinct and explicit consideration within a national strategy. This includes assessing risks associated with current and evolving United States policies and ensuring coordinated, transnational approaches to governance, monitoring, and response. Given their strategic, ecological, and political importance, these watersheds warrant focused attention from federal decision-makers.

Great Lakes Day in Washington and Ottawa

In addition to advancing aquatic science through research and conferences, we continue to engage with elected officials in both the United States and Canada to promote the importance of binational science to Great Lakes management.

IAGLR participated in Great Lakes Day in Washington, D.C., in March, joining partners from across the basin to meet with U.S. federal agencies and congressional representatives to highlight the importance of sustained investment in Great Lakes protection, restoration, and research.

Earlier this month, IAGLR also took part in meetings held in Ottawa with Canadian federal officials and partner organizations to discuss shared freshwater priorities, including ecosystem resilience, contaminants, climate change, and binational cooperation. These engagements reinforce IAGLR's commitment to highlight the value of science-informed decision-making and support the long-term stewardship of the Great Lakes at a time when scientists are facing budgetary cuts.

Pictured at Great Lakes Day in Ottawa earlier this month are (from left) Colin Cassin (Invasive Species Centre), Jérôme Marty, (IAGLR), Angela Coleman (Conservation Ontario) and Mark Fisher (Canada Water Agency).

HOST IAGLR 2028!

We're looking for a Canadian host for the IAGLR 2028 conference. Is that you?

We consider proposals from host institutions based on the following criteria:

- Proposed scientific program
- Conference facilities and logistics
- Location

If you're interested in hosting IAGLR 2028, or any future conference, please contact Conference Committee Co-Chair Noel Urban at confchair@iaglr.org.

MEMBER NEWS

Member Kudos

Our members are the driving force of the association, and their dedication and expertise make a lasting impact. From career milestones to distinguished honors, their successes showcase the strength and excellence of our community. We invite you to recognize and celebrate the accomplishments of members listed below.

Jean V. Adams (USGS Great Lakes Science Center and Great Lakes Fishery Commission, retired) for being elected to the Unified School Board of Antigo (Wisconsin).

Kaylynne Dennis (Grand Valley State University) for her Graduate School Citation for Outstanding Thesis. In Decembeer, she completed her Master of Science in biology with a focus in aquatic sciences. Her thesis focused on the drivers and rates of metabolism in Muskegon Lake, a recently delisted Area of Concern.

Joel Hoffman (University of Minnesota) for his new position as director of research at the university's Natural Resources Research Institute. As director, Hoffman provides strategic leadership for development of the NRRI research portfolio, guiding scientists and engineers to develop innovative solutions that address pressing challenges affecting communities, the environment, and the economy across Minnesota, the Laurentian Great Lakes region, and the United States. He is passionable about leading integrative research to support the development and implementation of sustainable, ecosystem-based management of natural resources. His research expertise includes ecosystem services, characterizing energy and contaminant flows through ecosystems, and developing biodiversity assessments, including biosurveillance of invasive species.

Rebecca Klaper (University of Wisconsin Milwaukee School of Freshwater Sciences Dean) for being named one of 16 Wisconsin Academy of Sciences, Arts & Letters Fellows this year. The award recognizes educators, researchers, mentors, artists, and civic or business leaders from across Wisconsin who have made significant accomplishments in their fields and substantial contributions to the cultural life and welfare of the state and its people.

Sullamithe Mercy Manduwa (University of Malawi) for receiving 10 DIYNAFLUOR fluorometer kits through a Track 2 microgrant from the eDNA Collaborative to support low-cost fluorometry capacity at the University of Malawi and other institutions. She was also awarded a £4,500 research grant by the Nyika Vwaza Trust to conduct the first eDNA-based fish biodiversity assessment of Lake Kazuni in the Vwaza Marsh Wildlife Reserve. Manduwa was also recently elected to the IAGLR Board of Directors as international student member for a two-year term.

Ali Shakoor (Wayne State University) for successfully defending his dissertation. Shakoor's Ph.D. research focused on the *Impacts of Microcystis Blooms on Walleye Reproduction, Amphibian Development, and Fish Community Distribution in Lake Erie.*

Ian Stone (University of Michigan) for his new position as a collaborative research specialist with the University of Michigan Graham Sustainability Institute's Water Center in Ann Arbor, Michigan. In his new role, he'll contribute to several projects focused on freshwater research, policy, and engagement across the Great Lakes region, including the future-oriented Great Lakes Horizon Scanning Initiative.

Michael McKay (University of Windsor), **Steve Wilhelm** (University of Tennessee), and **Brittany Zepernick** (University of North Carolina) for receiving The Daylight Award, an international biennial award from The Daylight Academy that honors and supports daylight research and daylight in architecture. They were recognized for their research into how daylight shapes aquatic ecosystems. Their work brings into focus the role of light in sustaining microscopic life, and in turn, the broader systems that support biodiversity, water quality, and planetary health. The Daylight Academy aims to promote interdisciplinary and transdisciplinary cooperation among scientists, architects, and other professionals active within daylight research or with a strong interest in daylight-related topics to impact daylight research and its application for the benefit of humanity and nature.

Submit a kudo

Members, do you have a recent achievement, award, or milestone you'd like to celebrate? Let us know! Submit a kudo to lakesletter@iaglr.org, and we'll share your accomplishment with the IAGLR community. Your success inspires us all!

Welcome new IAGLR members!

Please join us in welcoming the following members who joined the association between February and April 2026. We're glad to have you as part of the IAGLR community!

Armaghan Abed-Elmdoust
Salumu Alimasi Wilondja
Sara Ang
Isabella Badon
Baguma Balagizi
Lakshan Beligala
Thomas Binder
Margret Bintu
Dorcas Bolese Boendi
Bijan Boroumand
Connor Brooks
Jennifer Burfield
Salomon Bwirabuciza Luhinzo
Rachel Cable
Tyanna Carpenter
Karen Cederwall
Gillian Champoir
Karolina Charczynska
Emily Chase
Carolyn Chinguo
Carolyn Currie
Susan Debreceni
Tariq Deen
Trevor DeGroote
Leif DeVaney
Paul Draus
Ann Elizabeth Enova
Hassan Ezzeddine
K. Leora Gansworth
Caleb Geister
Rohini Gupta
Gillian Haig
Julia Hambleton
Mark Holland
Laura Horton
Jodie Houck
Xuhui Huang
Lydia Johnson
Carlos Jonasse
Don Jones
Jason Jones
Verena Kalter
Avneet Kaur
Robert Kayanda
Dianne Kendall
Myrna Kicknosway
Ella Kinart
Damaris Kisha
Matthew Klachefsky
Mary Klukow
Julia Kozak
Nathan Kroeze
Rodrick Kundu
Domitila Kyule
Jessica Lagroix
Edith Leoso
Charles Levkoe
Peter Limbu
Bo Liu
Bryan Loucks
Kristen Lowitt
Nicholas Maleski
Benjamin Maracle
Benjamin Marcy-Quay
Nevaeh Marshall
Joyce Mbewe
Kevin McCluney
Hayley McIlwraith
Brock Mihell
Fallon Moreau
Happiness Moshi
Eric Mudakikwa
Brant Muir
Archimède Mulega
Vianney Mulema
Andrew Mulligan
Nathan Nadeau
Gilbert Ndatimana
Ipaalo Ndhlovu
Adriana Nieto
Janvier Ntwali
Claudine Nyampinga
Madeline Nyblade
Elysee Nzohabonayo
Lorine Omondi
Melvin Ondiba
serene parenteu
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Leah Schleppenbach
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Samantha Sherry
Mahder Shumi
Robert Silber
Priscilla Simard
Nate Smith
Richard Smith
Conan Smith
Kevin Strychar
Allyza Tabirara
Jonathan Truscott
Zayd Walid
Alyssa Warrior
Brittany Welsh
Dorine Were
Patricia Wood
Kathleen Woodhouse
Hanqi Wu
Kate (Tianyi) Yang
Xuexing Yao
Dilber Yunus
Nathan Zeinstra

Calling all students and early-career researchers

You're invited to write for *Lakes Letter*

The August issue of *Lakes Letter* will be dedicated to the voices, discoveries, and perspectives of students and early-career researchers. This is your opportunity to share your work with a broad audience of scientists, policymakers, and lake enthusiasts. We are looking for compelling stories that go beyond the abstract and bring your research to life for our readership.

Pitch your idea by June 12 for consideration!

Content will be due July 27

Janessa Esquible

Great Lakes Indigenous Fisheries Postdoctoral Fellow
Great Lakes Fishery Commission

Describe your work.

I work with the Great Lakes Fishery Commission as a Great Lakes Indigenous fisheries postdoctoral fellow on a variety of projects and initiatives. These include the Ginebigomeg (sea lamprey) project focused on enhancing the collective understanding of Indigenous relationships with *Ginebigomeg* and their control. Begun in 2025 and funded by the commission, the project has a large interdisciplinary team led by Dr. Sue Chiblow of the University of Guelph and member of the Garden River First Nation. Another project is titled *Connecting Indigenous stewardship across continents: Identifying pathways for equitable fisheries governance in Canada and Uganda*. It brings together two First Nation communities along with three Indigenous communities in Uganda. This project was recently funded by the International Development Research Centre and led by the Cross-Cultural Foundation of Uganda. Lastly, I am working alongside Elders with Naugon Associates and other Indigenous leaders across the Great Lakes basin to advance the Inaaknigewin: Giigoonyag, Nibi ge Aki (Anishinaabe Law: Fish, Water and Earth) Initiative, focused on reaffirming and revitalizing Indigenous relationships with fish, water, and the land.

Prior to joining the commission, I lived in Alaska for 10 years, where I spent much of that time working for Tribes and Tribal consortia on various salmon and community-based projects. My dissertation research focused on documenting the breadth and depth of Alaska Native values, knowledge systems, and governance systems pertaining to salmon in order to achieve more equitable and inclusive salmon governance systems. I was able to bridge knowledge systems and perspectives through a case study that also included federal and state agency managers and researchers. My dissertation shed light on key mechanisms for improving salmon management and enhancing Alaska Native inclusion in current fisheries governance systems.

What inspired you to enter this work?

Much of my work is inspired directly by the Indigenous communities I collaborate with. I ground my research in values including but not limited to respect, relationality, relevance, reciprocity, and responsibility. I have a responsibility as an Anishinaabekwe (Anishinaabe woman) not only to the water, but to all of my relations. Through my position at the commission, I am able to fulfill some of these responsibilities by centering relationality and focusing on fish and water with Indigenous leaders, communities, and others.

If you could brief policymakers on one Great Lakes issue that urgently needs attention, what would it be and why?

I would urge policymakers to take action and provide financial support to address the adikameg (whitefish) population declines—with an emphasis on Lake Michigan and Lake Huron—given their significance as a cultural keystone species and their economic importance to many communities across the Great Lakes basin. I would also urge policymakers to protect nibi, our shared waters, as they continue to face threats of diversion, extraction, and commodification that may have devastating impacts on all the life they support. Finally, I would urge policymakers to pursue opportunities to more equitably include Indigenous leadership in Great Lakes fisheries governance.

What is something about yourself that you'd like to share with other IAGLR members?

Upon returning home to the Great Lakes after being gone for several years, my son, husband, and I spend quite a bit of time with our relatives and outdoors in the woods, rivers, and lakes as often as we can. I enjoy outdoor walking and running, attending cultural gatherings, doing yoga, listening to music, dancing, and spending time with loved ones.

Ian Stone

Collaborative Research Specialist
University of Michigan Graham Sustainability Institute's Water Center

Describe your work.

There are several common threads between my current work at the University of Michigan Water Center and previous roles I held during graduate school and as a Great Lakes Fellow post-graduation. Convening experts, rightsholders, and stakeholders with the aim of planning for the future has been a constant: What issues are headed our way? What can be done to prepare for and safeguard the lakes in the long term? Specific projects have changed, but those overarching questions have steadily guided my work.

What inspired you to enter this work?

I was fortunate enough to have a small pond in the backyard of my childhood home. At the time I didn't know that it was the remnant of a great glaciation, nor did I know much about the critters that called it home. That information wasn't necessary to know that it was special. I spent endless hours pacing the banks, appreciating the daily, seasonal, and yearly changes to its structure and the life within. This guided me to an education in environmental science and eventually to the Annis Water Resources Institute at Grand Valley State University where I primarily studied algae on Muskegon Lake.

Witnessing the profound changes initiated by Muskegon Lake's designation as an Area of Concern motivated me to dive deeper into Great Lakes water policy. The policies of the past successfully transformed Muskegon Lake, ultimately resulting in its delisting in 2025. I felt in many ways that I had an obligation to make sure my generation does the same for those who follow, which led me to where I am now.

If you could brief policymakers on one Great Lakes issue that urgently needs attention, what would it be and why?

If I could brief policymakers on anything, it would be the urgency of maintaining strong relationships and multijurisdictional collaboration in Great Lakes management. A core tenet of Great Lakes management—much to the envy of other transboundary waters across the world—has been our ability to work together. Imperfect and clunky at times, to be sure, but always collaborative. At a moment in time when relationships across borders feel as strained as they have ever been in my lifetime, I think policymakers could use a reminder that the Great Lakes remain great not merely through multilateral coordination, but through truly multinational cooperation and collaboration. We need to ensure that cooperative spirit lives on, and if we truly want the Great Lakes to thrive for generations to come, this must extend to include all the sovereign nations of the region.

What is something about yourself that you'd like to share with other IAGLR members?

I am a ride-or-die Detroit sports fan. Perhaps my thinking is currently being influenced because as I am writing this, I am looking out at Comerica Park as the Detroit Tigers have just won on a walk-off home run! World Series here we come!

Although water is my career focus, I am an unabashed tree hugger. I credit my love

of trees to my father, who taught me their magic from a young age. I firmly believe we stand to learn a great deal from trees. My "favorite" tree changes like the breeze, but today I'm thinking about the lopsided, wind-torn white pines along the Lake Michigan coast, so for now, those are my favorites.

CONNECTED WATERS
Bridging Communities & Ideas

IAGLR & SCAS-SCSA Joint Conference

May 25-29, 2026
Winnipeg, Manitoba

The program features four keynotes and more than 650 presentations across 64 sessions. Presenters will share the latest research on a range of critical topics—from flood modeling, invasive species, and emerging contaminants, to Indigenous, community and western science collaborations.

LAST CHANCE TO REGISTER

Can't make it to Winnipeg? Our hybrid format ensures you won't miss a beat.

- **Full Access:** Stream all keynotes and live sessions in real time.
- **Post-Conference Library**: Enjoy unlimited access to the on-demand video archive long after the event ends. All presentations can be livestreamed and recordings will be available to registered attendees after the conference.

iaglr.org/iaglr-scas26

Speakers

TUESDAY

MYRLE BALLARD
University of Calgary

Understanding our relations: Why Three-Eyed Seeing is significant

WEDNESDAY

JOEY BERNHARDT
University of Guelph

STEVENSON LECTURESHIP AWARDEE

Towards a mechanistic science of global change: from cells to ecosystems and human well-being (Online)

IRENA CREED
University of Toronto Scarborough

FRANK RIGLER AWARDEE

Rewired watersheds and toxic blooms in northern lakes

THURSDAY

SCOTT HIGGINS
IISD Experimental Lakes Area

ALEXIS KANU
Lake Winnipeg Foundation

Eutrophication at the science-policy interface: Whole-ecosystem science, advocacy, and the challenge of translating knowledge into policy

IAGLR International Association for Great Lakes Research

Hosted by IISD Experimental Lakes Area

SCAS • SCSA Society of Canadian Aquatic Sciences / Société canadienne des sciences aquatiques

It's our turn

Stepping into Great Lakes governance

BY SCOTT SOWA

THOSE OF US WORKING in Great Lakes science, policy, and management are accustomed to complexity. But the current moment—marked by rapid federal policy shifts in the United States—presents both new challenges and new opportunities. This is not simply a matter of adapting to change; it is a test of whether the broader Great Lakes governance system is prepared to sustain environmental outcomes at scale while navigating evolving political dynamics.

Recent U.S. federal changes affecting water, climate, and endangered species policy are being felt across the region. Staffing reductions at federal agencies have led to an unprecedented loss of institutional knowledge and capacity. These changes do not eliminate legal authority—states, Tribes, and local governments retain it—but they significantly diminish enforcement, monitoring, and program continuity. The risk is not regulatory collapse, but quiet erosion: delayed permits, fewer inspections, reduced data collection, and cumulative impacts that may go unaddressed or even unseen, making future responses more costly or irreversible.

While it is easy to feel pessimistic, we at The Nature Conservancy believe there is reason for cautious optimism. At binational forums across the region, I continue to see strong bipartisan and binational support for Great Lakes policies and programs. That commitment has been evident in the coordinated response by organizations mobilizing to oppose proposed cuts to key Great Lakes programs in the FY26 federal budget. I am deeply grateful to our Congressional champions who continue to support the Great Lakes Restoration Initiative and advance bipartisan legislation such as the Great Lakes Fisheries Reauthorization Act.

Importantly, the Great Lakes governance system was built for moments like this. Binational and interstate compacts, treaties, federal and state enabling laws, and the principles of cooperative federalism create a dense web of shared authority and institutional redundancy. The Great Lakes–St. Lawrence River Basin Water Resources Agreement and

This is not simply a matter of adapting to change; it is a test of whether the broader Great Lakes governance system is prepared to sustain environmental outcomes at scale while navigating evolving political dynamics.

Compact exemplify this resilience by establishing durable expectations for sustainable water management across jurisdictions. While a pullback by any partner—including one as significant as the U.S. federal government—is challenging, it is not unanticipated. The question before us is not whether authority exists, but whether we are prepared to fully exercise it.

In the near term, states are shouldering much of the burden, and I am encouraged by their response of prioritizing enforcement, strengthening cross-border coordination, and partnering more deeply with Tribes, universities, NGOs, and local governments. Multistate invasive species enforcement efforts, risk-based permitting, and cooperative science initiatives show how innovation and pooled capacity can partially offset federal reductions.

Over the longer term, I envision that collective efforts to diversify and stabilize public funding, complemented by filling national policy gaps and harnessing market mechanisms to drive conservation outcomes, will bring about exciting opportunities for collaboration and innovation. Thankfully, we are already seeing progress across these fronts. State-level funding initiatives such as Minnesota's Legacy Amendment, Ohio's H2Ohio program, and New York's Environmental Bond Act demonstrate how voter-backed and executive-led efforts can generate sustained investment in land and water conservation. These models underscore a growing reality: we must explore new public funding options beyond U.S. federal appropriations.

Additionally, Canada's continued investment in monitoring, science, and implementation helps maintain the integrity of binational agreements like the Boundary Waters Treaty and Great Lakes Water Quality Agreement. New investments—such as the establishment of the Canada Water Agency and Can$420 million for the Great Lakes Freshwater Ecosystem Initiative—demonstrate Canada's commitment to freshwater health in general and more specifically to the Great Lakes. Collectively, these actions show that Canada is not merely a partner, but a ballast that can help stabilize collaborative management of the system in periods of rapid U.S. political change and funding uncertainty.

Funding challenges are especially acute for local governments, particularly aging water infrastructure. Community-based systems have long relied on user fees, yet these models often proved insufficient to protect water resources. Major federal investments in the 1970s and 1980s helped address infrastructure backlogs, but many communities have struggled to keep up. New regional and state investments are essential not only to protect freshwater ecosystems, but also to ensure equitable access to safe and affordable water.

States and local governments are also stepping in to address regulatory gaps left by weakened federal protections. Illinois's efforts to establish new state-level wetland protections and Michigan communities experimenting with shoreline management ordinances reflect a broader trend: environmental leadership is increasingly emerging at subnational levels. This is where regional collaboration becomes indispensable. Interstate and basinwide organizations help align policies, share data, and present a unified voice—functions that become even more critical when federal policy ceilings or floors shift on issues like pollution, invasive species, and hydrology that ignore political boundaries.

Universities and professional societies such as the International Association for Great Lakes Research have a unique role to play by providing continuity. Stewarding long-term datasets, preserving institutional memory, convening cross-sector partnerships, and training the next generation of professionals are more important than ever. Just as critical is maintaining public trust by practicing transparency, acknowledging uncertainty, and grounding research in the needs of local communities and decision-makers. Place-based engagement that treats communities as partners, rather than research subjects, is essential in an era of skepticism toward science and government.

Ultimately, the Great Lakes governance framework remains legally robust. The challenge before us is not survival, but evolution. Previous generations stepped up when circumstances demanded it. Now, it is our turn. If states, provinces, Tribes, municipalities, businesses, universities, and NGOs step forward as coequal stewards—investing in capacity, coordination, and credibility—we can make the Great Lakes management system more resilient than ever. That is not a consolation prize; it is a responsibility—and a chance to lead.

Scott Sowa is the Juli Plant Grainger, Great Lakes Program Director at The Nature Conservancy.

Great Lakes region needs data center transparency

BY HELENA VOLZER

ACROSS THE GREAT LAKES REGION, a transformation is underway with data centers rapidly becoming part of the landscape to power our digital lives. But as their footprint grows, so do important questions about water, energy, community, and environmental impacts. The issue is whether and how data centers can be developed sustainably in a region defined by one of the world's most important freshwater systems.

The Great Lakes hold 20% of the world's surface freshwater. This abundance can be misleading. Less than 1% is renewed each year, and many communities rely on groundwater and local aquifers that are more vulnerable to overuse. These finite and interconnected resources must be managed responsibly for today and tomorrow. The eight Great Lakes states and two Canadian provinces recognized this when they agreed to complementary frameworks: the Great Lakes-St. Lawrence River Basin Water Resources Compact and the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement. Together, these instruments

create a binational governance structure where proposals to divert Great Lakes water outside the basin are generally prohibited with minor exceptions. The Compact applies to U.S. states while the Agreement mandates similar restraint across the Canadian provinces of Ontario and Quebec. Any exceptions to the prohibition on diversions require water to be returned after use.

This is where data centers enter the conversation. The Great Lakes region is attractive to data centers because of its resources, relatively cool climates, infrastructure, and tax incentives. The U.S. side of the region now hosts nearly one-fifth of all U.S. data centers, with growth expected to exceed national averages through the end of the decade. But this growth can put pressure on local water systems, especially in small communities that were not designed for large and, at times, sudden withdrawals. For perspective, Illinois and Ohio each host around 200 data centers, ranking fourth and fifth nationally in total count, according to Data Center Map. While Canada overall hosts about 285 data centers, located primarily in the provinces of Ontario and Quebec, numbers are not indicative of scale and the localized impact on water resources that individual data centers may have.

Data centers generate enormous heat and must be cooled constantly. Many use water-based cooling systems that can use millions of gallons per day. However, not all the water returns to the system. In evaporative cooling, a significant portion is lost to the atmosphere, effectively removing it from the local watershed. Other ways of cooling data centers are highly energy intensive. The tradeoff is a water-energy nexus:

- **Water-based cooling** saves energy but consumes vast amounts of water
- **Air-based cooling** conserves water, but demands signficantly more electricity

Non-renewable energy production itself requires water, so cooling methods that reduce water use onsite may still increase water use offsite at power plants. For example, the Vantage data center in Port Washington, Wisconsin, will reportedly have power needs reaching 3.5 gigawatts. If non-renewable sources are used to meet those needs, its off-site water use could be more than twice the amount of water used by every home, business, and manufacturer in the City of Green Bay. Even before the data center boom, 70% of reported Great Lakes water use in 2024 was associated with generating electrical power, making it the largest Great Lakes water-using sector.

Perhaps the biggest gap we face is the lack of transparency around exactly how much water an individual data center uses. Most data centers connect to public water systems and therefore aren't required to report water use. While some companies release this information, it's often aggregated, doesn't address indirect or off-site water use (including for energy production), and lacks important details needed to assess an individual data center's water resource impact. This also makes it challenging to evaluate the cumulative effect of expansion across the region.

Each level of government has different roles to play when it comes to oversight. At the federal level, the U.S. administration is using executive power to try to fuel growth. The president has issued several executive orders facilitating this expansion—from keeping coal-fired power plants open to trying to restrict states

The issue is whether and how data centers can be developed sustainably in a region defined by one of the world's most important freshwater systems.

Perhaps the biggest gap we face is the lack of transparency around exactly how much water an individual data center uses. Most data centers connect to public water systems and therefore aren't required to report water use.

from regulating AI. Now is the time for Congress to step up, use its legislative power on behalf of communities, and enact meaningful regulations that mandate more transparency around water and energy use so that benchmarks for water conservation and efficiency can be established. In Canada, the federal government adopted its Sovereign AI Compute Strategy in 2024 to attract data centers above 100 megawatts. Expansion in Canadian provinces continues as tensions emerge over which level of government has authority to regulate this rapidly expanding industry. An announcement earlier this month of new data centers in British Columbia was met by accusations of a "build-first regulate-later model" and calls for a moratorium on new data centers until stronger regulation and environmental policies are enacted.

Locally, communities can negotiate data center proposals to ensure community benefits, such as green infrastructure and payment for infrastructure improvements. However, state and provincial level frameworks that ensure transparency and provide consistent rules for monitoring water use and preventing pollution are necessary to reduce the regulatory and legal burden on small and under-resourced local governments. Standardized regulations can assist local municipalities to plan for both the initial build out of data centers, as well as ongoing maintenance (including e-waste management), and future decommissioning.

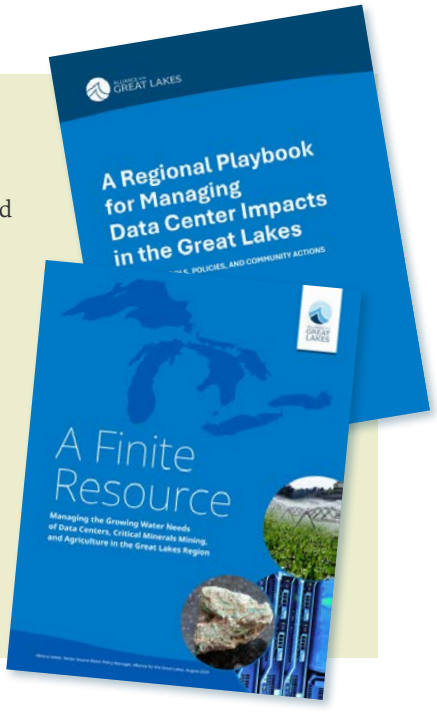
At the state, provincial, and Tribal levela, the most important role will therefore be ensuring sustainable water use and management. In the U.S., states are furiously considering legislation, including everything from energy- and water-use reporting requirements, bans on the use of non-disclosure agreements, study commissions, and repeals of tax incentives, to statewide moratoria. While Canadian provinces have primary responsibility for water management, they have thus far primarily pursued energy-specific proposals to regulate data center expansion. For example, British Columbia has limited data center expansion by limiting access to power altogether, whereas Québec enacted a higher rate for electricity for data center customers. Additionally, the Canadian government has a duty to consult First Nations on numerous activities, including regulatory project approvals. This engagement illustrates the vital role First Nations must play as regulations and future projects are considered. The role and ability of states and provinces to establish regulations that successfully balance rapidly evolving economic development with conservation and protection of water resources and provide for thoughtful planning will be critical in the years ahead.

Helena Volzer is the senior source water policy manager at the Alliance for the Great Lakes.

RESOURCES

A Finite Resource
The Great Lakes region faces the prospect of water shortages, groundwater conflicts, and contaminated aquifers as demand sharply increases from large water users such as data centers, agriculture, and critical minerals mining. A new Alliance for the Great Lakes report details how access to water in the region will be undermined in the coming years if serious planning, policy, and regulatory actions are not taken

A Regional Playbook
Data center development is rapidly growing across the Great Lakes region. To help make sense of the impacts, the Alliance also released this guide for residents, concerned citizens, grassroots organizations, and local leaders seeking clear, accessible information. It describes how water is used in data centers and provides checklists to help communities understand potential impacts and ask the right questions at the right time.



Aerial view of damage on eroding dune on Lake Michigan. *Photo by Sarah Rypma.*

Incorporating climate risks in the management of Great Lakes water

BY GAIL KRANTZBERG

THE IMPACTS OF CLIMATE CHANGE on the Great Lakes are manifesting as intensified precipitation, heightened evaporation rates, diminished ice cover, and increased variability in water levels. These phenomena pose significant dangers to essential resources such as drinking water, groundwater recharge, shoreline integrity, coastal infrastructure, and the habitats that sustain fish and wildlife.

Recent occurrences of record-high lake levels have resulted in severe erosion, substantial property damage, and widespread flooding. Simultaneously, longer-term forecasts indicate increasing extremes in lake levels, oscillating between unprecedented highs and lows. The warming of winters is leading to a decline in ice cover, consequently leaving shorelines vulnerable to intensified wave action. In addition, heavier rainfall events contribute to increased nutrient and sediment runoff, which exacerbates harmful algal blooms and places additional strain on municipal water systems. Furthermore,

Existing policies rooted in historical hydrological data fall short of addressing these pressing challenges posed by climate change.

groundwater systems, which are hydrologically connected to the lakes, are at risk of altered recharge dynamics and contamination during flood events. Existing policies rooted in historical hydrological data fall short of addressing these pressing challenges posed by climate change.

Policy recommendations

Given the inadequacy of current policy frameworks, a new approach is needed—one that anticipates future conditions rather than reacting to past patterns. Four key strategies have emerged, each designed to strengthen the region's capacity to adapt to an increasingly volatile climate.

1. **Require climate-informed planning**
It is imperative to revise floodplain maps, shoreline zoning regulations, and infrastructure designs by incorporating climate projections and dynamic lake-level modeling. For example, the city of Rotterdam in the Netherlands has integrated climate projections into its urban water management strategy, using adaptive flood defenses, water plazas, and updated flood-risk maps to manage rising sea levels and extreme rainfall. Chicago integrates climate projections into coastal planning along Lake Michigan through its Climate Action Plan and shoreline management strategies, which guide the design of lakefront infrastructure, stormwater systems, and flood-resilient parks to address rising lake levels and extreme storm events.

2. **Enhance integrated water management**
Foster cooperation in the governance of both surface water and groundwater across state and provincial boundaries, leveraging transnational relationships to ensure comprehensive management. The Great Lakes region is still falling short in truly integrating groundwater and surface water management, especially regarding nutrient flows, emerging contaminants, and the ecological impacts of groundwater withdrawals. Addressing these gaps requires better monitoring of groundwater-lake interactions, stronger cross-border data sharing, and policies that explicitly link groundwater management with surface water protections.

A notable international success in transboundary integrated water management is the Mekong River Basin, where the Mekong River Commission (MRC) coordinates water allocation, ecosystem protection, and hydropower development across China, Laos, Thailand, Cambodia, and Vietnam. By jointly monitoring river flows and conducting basinwide environmental assessments, the MRC addresses both surface water and connected groundwater impacts, such as maintaining groundwater-dependent wetlands and managing sediment transport.

3. **Emphasize nature-based solutions**
Prioritize the restoration of wetlands, dunes, and floodplains to serve as buffers against storm surges, mitigate runoff, and bolster groundwater recharge.

For example, projects funded through the Great Lakes Restoration Initiative—such as the Shiawassee Flats Wetland Restoration in Michigan and the Fort Sheridan coastal habitat restoration along Lake Michigan—have restored marshes, ravines, and dune systems that naturally absorb floodwaters, filter runoff, and enhance coastal resilience.

4. **Commit to monitoring and equity**
Expand the sharing of basinwide data and allocate resilience funding specifically to vulnerable shoreline communities and Indigenous Nations to promote equity in resilience and adaptation.

For example, the Great Lakes Observing System provides real-time data on water levels, temperature, and water quality across the Great Lakes, while programs under the Great Lakes Restoration Initiative have directed funding to projects in historically underserved shoreline communities and support Indigenous Nations in Michigan, Wisconsin, and Ontario to enhance local resilience planning.

Neglecting to integrate anticipated climate impacts into the policy frameworks for Great Lakes water and coastal management represents a significant governance shortfall, as seen in municipalities along Lake Ontario, Lake Erie, and Lake Michigan where floodplain regulations and shoreline infrastructure designs still rely on historical water levels rather than projected climate-driven changes. Embedding advanced climate projections into these policies is crucial for safeguarding water security, sustaining ecosystems, and supporting coastal economies amidst an era characterized by increasing hydrological instability.

POLICY RECOMMENDATIONS

1. Require Climate-Informed Planning
2. Enhance Integrated Water Management
3. Emphasize Nature-Based Solutions
4. Commit to Monitoring and Equity

Gail Krantzberg is a professor emeritus at McMaster University in Hamilton, Ontario.

ON THE ROAD TO DISASTER

How road salt policy gaps are threatening the Great Lakes

BY GABRIELLE PARENT-DOLINER, DANI LINDAMOOD, JÉRÔME MARTY & MONICA SEIDEL

EVERY WINTER, road crews, homeowners, and property managers across the Great Lakes basin reach for the same solution they have relied upon since the 1940s: salt. Cheap, effective, and familiar, salt—predominantly sodium chloride (NaCl)—has become the default tool for keeping roads and sidewalks passable through ice and snow. But what happens to all that salt once it washes off our streets and parking lots? It flows into our streams, lakes, soils, and groundwater, and it doesn't leave.

Salt pollution is now one of the most pervasive and underappreciated water quality threats facing the Great Lakes basin. Chloride, the toxic fraction of NaCl, is rising in freshwater systems across the region, and unlike many other pollutants, there is no natural process that removes it once it enters the water. The cumulative load of chloride from decades of winter road maintenance is reshaping the chemistry of the basin's freshwaters. For instance, from 1980 to 2020, chloride concentrations in Lake Michigan increased from 9 to 15 mg/L, an annual increase of about 0.125mg/L. More dramatically, Lake Simcoe in central Ontario is already at an average chloride level of 61 mg/L and is projected to see an increase of 0.7 mg/L chloride per year, reaching an average of 120 mg/L by the 2050s—the Canadian Council of Ministers of the Environment's (CCME) long-term exposure threshold. Many watersheds are experiencing spikes in chloride that exceed seawater levels (19,400 mg/L). Notably, Newmarket's Western Creek registered a reading of 26,000 mg/L in February 2025, and Ottawa Riverkeeper's monitoring of Green's Creek registered above 20,000 mg/L.

The CCME's chronic guideline was not designed to protect soft-water ecosystems like those on the Canadian Shield. Research shows that at the low water hardness typical of Muskoka's lakes, protective chloride thresholds should be as low as 64 mg/L. Some Shield lake species begin showing reproductive failure and increased mortality at

concentrations as low as 5 mg/L, well below the CCME's 120 mg/L limit. Most Muskoka lakes haven't yet reached the CCME's chronic threshold, but that's cold comfort when the science shows damage occurring at a fraction of that level. Both the guideline and the pollution are problems.

The threat is even more direct for groundwater. Waterloo, Ontario, for instance, draws most of its drinking water from aquifers in the Paris and Waterloo moraines, and those aquifers are showing elevated chloride from decades of road salt application on the surfaces above. Unlike surface water contamination, groundwater cannot be flushed or filtered by natural processes. What goes in stays in. This also applies to lakes: natural removal in Lake Erie would take about seven to nine years, 25 years in Lake Ontario, and 500 to 600 years in Lake Superior.

The alternatives market offers little relief. While products like potassium chloride, magnesium chloride, and calcium chloride are marketed as substitutes, research shows they can be even more toxic to aquatic organisms than sodium chloride. Similarly, "natural" products have proven just as harmful. Physical alternatives like sand disrupt aquatic habitat and damage terrestrial ecosystems through extraction. The most promising reductions come not from substitution but from doing things differently: optimized plow timing, anti-icing techniques, adjusted speed limits, and snow tire requirements (that are still not mandatory in Ontario).

None of that matters much without policy that creates real incentives to change, and that's exactly what we don't have. In 2001, the Canadian federal government concluded that road salts met the criteria for toxic substances under the Canadian Environmental Protection Act, then opted for a voluntary code of practice rather than regulation. More than 20 years later, salt use has not stopped growing.

At the provincial level, Ontario has water quality objectives and guidelines but no enforceable targets for groundwater quality or water availability. The province's Safe Drinking Water Act applies only to treated drinking water and not to the protection of the surface or groundwater sources that feed it. Between 2003 and 2019, 24% of monitored groundwater wells showed increasing chloride trends, with no binding framework to respond.

This regulatory gap is not unique to Canada. Across the border, the United States applies over 24.5 million tons of road salt annually, according to the Cary Institute of Ecosystem Studies in New York, with Great Lakes states being the heaviest users.

Moreover, the U.S. EPA's chloride criteria are less strict than Canada's: 230 mg/L for chronic and 860 mg/L for acute. The thresholds are not legally enforceable rules, because the criteria only become regulatory once a state adopts them into its own water quality standards under Section 303 of the Clean Water Act.

Some action has happened at the state level, where a handful of states have taken meaningful steps. Minnesota has built out one of the most comprehensive approaches, including a statewide chloride strategy, a Twin Cities metro total maximum daily load (TMDL) study, and chloride management requirements built into municipal separate storm sewer system (MS4) permits. Wisconsin also has developed its own TMDLs and variance programs. The state's MS4 permit framework requires communities discharging to chloride-impaired waters to include chloride reduction measures in their stormwater management programs, but typically focuses on winter road maintenance rather than removing the chloride during treatment.

Many Great Lakes states look to New Hampshire's RS 489-C as a single change that could move the needle on private road salt application. New Hampshire passed a law limiting liability for certified applicators from the Green SnowPro Program, recognizing that private contractors over-apply salt because they're afraid of slip-and-fall lawsuits. Yet outside New Hampshire, most jurisdictions lack comparable policy tools to regulate salt use on private property, and the economic logic of over-salting prevails on both sides of the border. When the cost of a lawsuit far outweighs the cost of extra salt, applying more is the rational choice, leaving the Great Lakes' freshwater reserves increasingly compromised.

Municipalities throughout the basin are left holding a problem they can't fully address. On public roads, crews face reputational and legal risk for under-salting; on private property, contractor liability drives over-application. Meanwhile the long-term costs of chloride pollution fall on no one's ledger. Reforming liability legislation to protect operators who follow best management practices—as New Hampshire does—is one of the most impactful near-term changes available, and one of the most consistently overlooked.

Meanwhile, urban sprawl is expanding the impervious surfaces that need de-icing each winter, climate variability is making freeze-thaw cycles less predictable, and economic pressure keeps salt cheap and attractive.

The Great Lakes hold roughly 20% of the world's surface freshwater. The communities that depend on them deserve water quality standards that reflect that significance. Salt pollution is solvable, but solving it will require enforceable guidelines, liability reform, and a cultural shift toward treating salt as a last resort, not a first response.

Gabrielle Parent-Doliner is the director of Water Rangers. Dani Lindamood is the campaigns & communications director at Water Watchers. Jérôme Marty is the executive director of the International Association for Great Lakes Research. Monica Seidel is the communications and fundraising manager at Watersheds Canada.

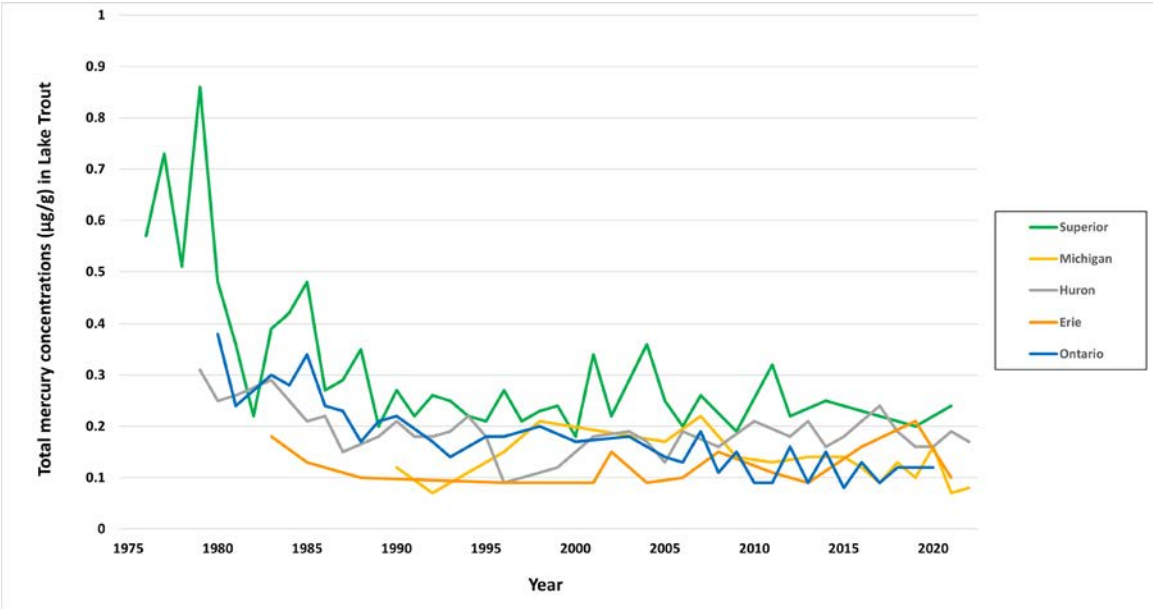
A SNAPSHOT OF GREAT LAKES CONDITIONS

State of the Great Lakes 2025

BY MATTHEW PAWLOWSKI & JACOB ORLANDI

THE ***STATE OF THE GREAT LAKES 2025 REPORT*** provides a science-based snapshot of ecosystem health across the basin. Prepared by Canada and the United States under the 2012 Great Lakes Water Quality Agreement, the report describes basinwide trends, highlights lake-specific conditions, and tracks progress toward the Agreement's general objectives.

To assess those objectives, the 2025 report uses nine indicators supported by over 40 subindicators. Together, they show both progress and continuing challenges. The report points to major gains in restoring and protecting the Great Lakes, including basinwide reduction in toxic chemicals in the environment and food web (for example, see figure below showing mercury concentrations in lake trout) as well as a decline in the rate of new non-native aquatic species entering the basin. At the same time, it shows that ecosystem stressors vary widely across the basin, and this variability is reflected in indicator assessments and ecosystem conditions.



Mercury concentrations in lake trout fillets have declined substantially across the basin since the 1970s and 1980s.

The collaboration of governments, agencies, organizations, and individuals continues to accelerate restoration and protection efforts across the Great Lakes.

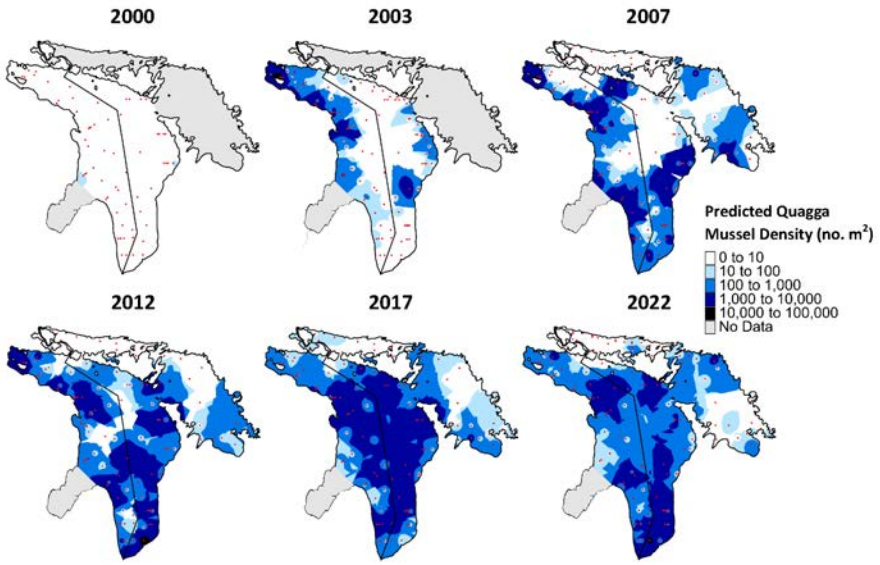
The first three general objectives focus on how people use the Great Lakes, including as sources of drinking water, recreation, and fish for consumption. Overall, the Great Lakes continue to provide safe sources of drinking water, recreation, and food, although some local advisories remain in place.

The lake-specific nature of ecosystem stressors is especially clear through the findings of the Habitat and Species indicator. Each lake contains a mix of healthy and degraded habitats and food web components. For example, lakes Michigan and Huron contain some of the basin's healthiest coastal wetlands, yet they also have the lowest aquatic habitat connectivity among the Great Lakes. Populations of *Diporeia*, an important food source for fish, have declined sharply in all lakes except Lake Superior. Lake Superior is also the only lake where lake trout populations are considered fully recovered. By contrast, the walleye population in Lake Superior remains below target, while the Lake Erie population is at nearly record levels.

Differences in invasive species conditions across the basin contribute to the variation in conditions for many other subindicators. Although the rate of new non-native species introduction has declined, established non-native species continue to spread within and between the lakes and to affect ecosystem health in significant ways. Notably, dreissenid (zebra and quagga) mussels have altered nutrient cycling, increased water clarity, and changed phytoplankton and zooplankton communities. Dreissenid mussels are widespread in all of the lakes except Lake Superior, although population trends vary both within and among the five lakes (see figure above).

The report also points to several broader challenges. While basinwide reductions in nutrient loads since the 1980s, including 2.6 million pounds of phosphorus from U.S. tributaries from 2010 to 2025 alone, were successful in decreasing high nutrient concentrations that were contributing to algal blooms, excess nutrient inputs continue to drive harmful and nuisance algal blooms in Lake Erie and in localized areas across the other Great Lakes. These blooms are linked to warmer surface water temperatures and more extreme storm events, both of which are becoming more common across the basin. Rising surface water temperatures and other changes in physical conditions, such as decreasing ice cover and increasingly variable water levels, could impact all aspects of the Great Lakes ecosystem in the years ahead.

Overall, the State of the Great Lakes 2025 Report illustrates each lake's unique set of conditions and lake-specific stressors. It also highlights the value of long-term science, monitoring, and binational cooperation in understanding basinwide changes. The collaboration of governments, agencies, organizations, and individuals continues to accelerate restoration and protection efforts across the Great Lakes. That work helps to ensure the Great Lakes continue to be a reliable source for drinking water, recreation, and other uses that support the region's environment, economy, and way of life.



Quagga mussels have spread throughout Lake Huron, but data from 2022 suggest that populations are somewhat reduced from the peak observed in 2017.

Matthew Pawlowski is a physical scientist with the U.S. Environmental Protection Agency's Great Lakes National Program Office.
Jacob Orlandi is a program officer with the Canada Water Agency's Ontario Freshwater Management Directorate.

From the global stage of IPBES to the shores of the Great Lakes, a new community of practice is bridging Indigneous, place-based, and western science and policy to drive transformative change. Pictured here, Guadalupe Yesenia Hernández Márquez takes a sunset photo in Point Pelee National Park as part of an IPBES workshop at the University of Windsor. *Photo by Michael Wilkins, University of Windsor.*

Connecting global science to local action

How IPBES & Indigenous knowledge are together reshaping Great Lakes policy

BY CATHERINE FEBRIA

Featuring insights from Abraham Francis, Dawn Martin-Hill, Sarika Suarez Sharma, Peter Stoett & Kyle Whyte

ACROSS THE GREAT LAKES BASIN AND BEYOND, the converging pressures of climate change, biodiversity loss, pollution, and environmental and social injustices call for new ways of working together. Effective science-policy—grounded in cooperation, collaboration, and consensus-based processes—is one such pathway. Among multilateral science-policy platforms, the most recognized include IPCC (climate change), IPBES (biodiversity), and the newly launched ISP-WCP (chemical pollution). Until earlier this year, all Laurentian Great Lakes and African Great Lakes countries participated in these UN-supported platforms through governmental representation and expert contributions. But international science policy can feel remote from local and place-based research and practice. Mobilizing knowledge about platforms such as IPBES can help bridge that gap.

Humans are not only dependent on but a part of Nature, and transformative change is needed to reverse declines in biodiversity, climate, and pollution.

About IPBES

Established in 2012 as a sister platform to IPCC, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services has become a leading resource for multilateral agreements including the Kunming-Montreal Global Biodiversity Framework. IPBES learned from IPCC's experience about the importance of capacity building and working across plural knowledge systems. After more than a decade and 14 assessments, IPBES has pushed intergovernmental platforms toward more meaningful inclusion of Indigenous knowledge systems, epistemologies, and cosmologies as part of its multievidence-based approach to synthesis.

A key outcome of these assessments is the convergence of knowledge: they establish patterns and processes that Indigenous Peoples and local communities have known about Nature since time immemorial, now confirmed through multiple lines of Western science-based evidence. The message is clear: Humans are not only dependent on but a part of Nature, and transformative change is needed to reverse declines in biodiversity, climate, and pollution (IPBES TfC 2024). Globally, IPBES findings show that Indigenous Peoples steward disproportionate levels of biodiversity in their territories while being disproportionately impacted by environmental degradation (IPBES 2018 Global Assessment). Heightened geopolitical uncertainty is driven by increased environmental uncertainty, given Nature's central role in all businesses (IPBES B&B 2026). Despite these trends, solutions are within reach. Leaning into relational processes—cooperation, consensus building, and collaboration—is needed now more than ever.

IPBES is more than the reports it produces; it is also a network and a set of processes united by a shared vision for a positive future for Nature and People. After more than a decade of effort, this article connects that global vision to the Great Lakes by sharing the experiences of scholars who have engaged with IPBES, including reflections on a recent workshop in Windsor, Canada (November 2025). In their own voices, diverse IPBES authors and participants from the Laurentian Great Lakes reflect on their experiences and visions for a community of practice to strengthen science-policy interactions locally, regionally, and globally.

On engaging the science-policy interface

Peter Stoett (Professor and Dean of Social Science and Humanities, Ontario Tech University, Co-Chair of the IPBES Invasive Alien Species Assessment): "It is absolutely essential that interdisciplinary approaches to the large-scale problems of our time are fostered through a community of scholars and practitioners. For my own work, it is an opportunity to learn about other disciplines engaged in the assessment, as well as to collaborate with new and interesting and incredibly talented people. On the Great Lakes, most of my work has been based in the policy realm; I'd welcome the opportunity to work more closely with those engaged in the scientific work of understanding the immense challenges the basin faces. I found that IPBES carries some respectable weight when it comes to getting policy attention, though this might be more a reflection of media coverage than genuine science-policy interfacing."

Participatory processes and diverse knowledge systems

Engaging multiple lines of evidence—not just standard peer-reviewed literature—is central to IPBES assessments. In-person, place-based dialogue workshops are a key participatory mechanism, especially for ethical engagement with Indigenous and local knowledge. Unlike IPCC, IPBES has a dedicated mandate to build capacity and engage diverse knowledge systems, reflected in its Fellows programme for early-career researchers, its work with national governments, and dedicated task forces focused on Indigenous and local knowledge, models, and data.

Kyle Whyte (Professor, University of Michigan, Citizen Potawatomi Nation, IPBES Indigenous & Local Knowledge Task Force Member, and Co-chair of the IPBES ILK Dialogue Workshop in Windsor): "Indigenous Peoples in the region should be able to lead their own institutions that make connections across local conservation practices, governance, research, and law and policy. First Nations and Tribal nations should have programs that encourage community members in a range of Indigenous and scientific knowledge systems and that uplift community members in environmental decision-making so that governance is cooperative and participatory. The governance decisions Indigenous Peoples make should have access to the best information, whether from First Nations or Tribal colleges, or from their being independent Indigenous-led science assessments that deliver policy-relevant knowledge about the environment. First Nations and Tribal governments, then, should have reciprocal relationships with First Nations and Tribal colleges

IPBES workshop comes to Windsor to discuss and co-develop methodological guidance for working with Indigenous and local knowledge in science-policy frameworks, and, to foster a Dialogue workshop with Indigenous Peoples, Local communities and science-policy authors on IPBES' 2nd global biodiversity assessment. *Photo credit: Michael Wilkins, University of Windsor.*

and research institutions. First Nations and Tribal institutions, whether Traditional Knowledge programs, governments, colleges, or research institutions, should be able to send delegates to major policy fora to represent the knowledge, interests, and brilliance of Indigenous Peoples. Policy fora should recognize Indigenous delegates, including them at each relevant level of the policy process. In this way, Indigenous Peoples begin to enjoy the same access to levers of change and education for the sake of environmental protection."

Abraham Francis (Deer clan from Akwesasne, Policy Analyst, Chiefs of Ontario, and IPBES ILK workshop participant): "Policy is important to me because it can harm communities and is often defined without our voices. They are not passive tools but powerful mechanisms with the potential to exacerbate harms, especially for Indigenous Peoples. I show up and engage as a commitment to harm reduction for my people, ancestors, future generations, and creation. I have always been extremely critical of these global mechanisms. I am firmly situated in the power of local community work to create real change. However, more recently, I have become interested in connecting the local and global, which the Haudenosaunee have been doing for centuries."

Dawn Martin-Hill (Professor Emerita, McMaster University, IPBES workshop participant): "Enhancing the role of Indigenous knowledge in the science-policy interface is a key objective of our work at Ohneganos Ohnegahdę:gyo at Six Nations of the Grand River. Indigenous knowledge and place-based ecological knowledge must be recognized as central to addressing real-world challenges. However, to be truly impactful, the funding landscape must change so that Indigenous-led conservation, water security, and climate mitigation receive support similar to that of mainstream conservation organizations."

Building capacity at the science-policy interface

IPBES's Capacity Building Task Force has delivered a long-standing Fellows programme connecting early career researchers with assessments as authors, providing mentorship and networking. This programme has propelled fellows into other science-policy roles within their own institutions, governments, and multilateral processes.

Sarika Sharma (University of Windsor, early career researcher): "The Windsor IPBES workshop offered excellent insight into the realities and importance of multiscaled policy making and the inclusion of Indigenous and local knowledge voices. It was refreshing to see space being held for the honest, respectful, and vulnerable sharing of these diverse perspectives. And it was also a reminder that policy is created by and meant to adapt with people and communities. For policies to be truly effective, diverse voices need to be part of policy-making processes through relationship and reciprocity. Policies are not perfect, nor are people, but their re-evaluation is not a failure. Instead, these discussions are a natural opportunity for dialogue and connection. They are critical to improving policy relevance, strength, and stature as a common ground for all."

Abraham Francis: "It was wonderful to build community at the IPBES workshop in Windsor through discussions, dinners, and an adventure to Peele Point. For a community of practice, the creation of a fund to support the organizing and meeting of Indigenous Peoples around the Great Lakes is critical—cultivating relationships and translating global messages into collaborative solutions for local contexts. Indigenous Peoples participating in these spaces tend to find themselves over-extended and alone. These spaces offer hope through a knowledgeable and culturally grounded group to care for each other."

Toward transformative change

Transformative change is defined as "fundamental, systems-wide shifts in views, structures and practices that address the underlying causes of biodiversity loss and nature's decline" (IPBES 2026). The evidence underpinning assessments emerges from years-long collaboration between scientists, knowledge holders, governments, and organizations. Yet transformative change remains elusive, partly because many still don't connect global science-policy platforms to on-the-ground actions and regional collaborations across the Great Lakes.

Despite the withdrawal of the United States from UN-affiliated organizations, many U.S. citizens continue contributing to IPBES as independent scholars and practitioners. As IPBES Chair David Obura notes, the departure "harms everybody, including themselves." He reminds us that we cannot ignore the fact that more than one million species face extinction, nor can we change the reality that the global economy loses up to $25 trillion per year in environmental impacts. Crucially, he points out the missed opportunities of inaction: failing to generate more than $10 trillion in business value and 395 million jobs by 2030.

The mandate of IPBES remains clear: to objectively provide credible science and evidence about biodiversity to all decision-makers for better-informed action. The commitment of the IPBES community to this goal—"science and policy for people and nature"—is unwavering.

Peter Stoett: "When it comes to a community of practice, it's difficult right now to get people concerned about climate change, but Great Lakes communities will face grave problems ahead. The diminishment of aquifers and rivers will increase pressure on the lakes as commercial water prospects become more enticing. Systems thinking is more important than ever, as are the spiritual ontologies of Indigenous communities around the lakes and their connecting rivers. An effective community of practice would weave all these elements together publicly. The power of media and film should not be overlooked. Getting youth more engaged is a central question; we must improve the role of universities, but it needs to start sooner."

Kyle Whyte: "The IPBES workshop solidified in my mind that such a system, with feedback loops and direction, is possible, not only at the Great Lakes scale but also at continental and global scales. At one level, this would be done in a way that's authentic to Indigenous Peoples; but at another level, it's no different from how nation states, universities, and multilateral institutions have coordinated among each other for some time—they have just excluded Indigenous Peoples from being able to operate in a multi-institutional fashion."

Nature has taught us that diversity is a strength, and that connections across levels and over time ensure resilient and thriving ecosystems. The same holds for the Great Lakes science-policy-practice network. The diverse outputs of IPBES can strengthen local and regional priorities — but only if people pick them up and use them. To join a growing network of Great Lakes scholars and practitioners connecting IPBES to their own organizations and mandates, reach out. We will be launching a community of practice and further initiatives to ensure that global processes can have local and regional benefits.

Catherine Febria is a member of the IPBES Multidisciplinary Expert Panel, co-chair of the IPBES Indigenous and Local Knowledge Task Force, and associate professor and Canada Research Chair in Freshwater Restoration Ecology at the University of Windsor.

Resources

For more information on the regional community of practice, please contact ipbes@uwindsor.ca

Explore IPBES reports, social channels, and resources by scanning the QR code or visiting the link below.

bit.ly/4wz4xwU

Full group participating in the first water ceremony held at a Caldwell First Nation wetland restoration site as part of the IPBES workshop in Windsor. *Photo credit: Michael Wilkins, University of Windsor.*

The Great Lakes-St. Lawrence region anchors a deeply integrated binational economy. Pictured are the cities of Detroit, Michigan, and Windsor, Ontario, with the Detroit River between.

Sustaining the Great Lakes–St. Lawrence Region

Integrating freshwater stewardship with economic modernization

BY VANCE BADAWEY

THE GREAT LAKES–ST. LAWRENCE region is one of the most strategically important freshwater systems in the world, supporting over 100 million people, enabling trillions in economic activity, and anchoring a deeply integrated binational economy between Canada and the United States. Its ecological integrity and economic performance are not separate realities; they are fundamentally interdependent. This means the region's long-term competitiveness in global trade depends directly on how effectively it integrates freshwater stewardship with economic modernization.

Yet, despite its global significance, the region faces mounting pressures: climate change, aging infrastructure, ecosystem degradation, and increasing demands on water and transportation systems.

From the Council of the Great Lakes Region (CGLR) perspective, the path forward requires more than incremental improvements. It calls for systems change, an intentional shift in how we think, collaborate, and act across borders, sectors, and disciplines. Sustainability must be understood as the integrated outcome of economic growth, environmental stewardship, and social equity, where freshwater protection is not a constraint on development, but a foundational driver of modern economic performance.

Moving beyond silos: Freshwater as a catalyst for economic modernization

Historically, policy and investment in the Great Lakes region have been fragmented across jurisdictions and sectors, creating artificial divisions between economic development and environmental protection. Science makes clear that this divide is untenable.

Freshwater systems underpin industrial productivity, energy generation, agriculture, and trade logistics. When these systems are degraded, the economic consequences are immediate and measurable, through disrupted supply chains, increased infrastructure costs, declining water quality, and reduced system reliability. Conversely, strategic investments in freshwater stewardship, such as wetland restoration, watershed management, and water quality improvements, function as enabling infrastructure for economic modernization.

A systems approach reframes freshwater not simply as a natural resource to be protected, but as critical economic infrastructure that must be managed, modernized, and integrated into regional development strategies.

A science-policy lens on integration priorities

Applying a science-policy lens ensures that the integration of freshwater stewardship and economic modernization is grounded in evidence, data, and measurable outcomes. Several priority areas illustrate this convergence:

1. **Freshwater protection as enabling infrastructure** The Great Lakes are central to industrial activity, trade, and energy systems. Strengthening binational coordination, through aligned Canadian and U.S. restoration and protection initiatives, can ensure

Sustainability must be understood as the integrated outcome of economic growth, environmental stewardship, and social equity, where freshwater protection is not a constraint on development, but a foundational driver of modern economic performance.

sustained, science-based investment in ecosystem health. This directly supports economic stability, reduces systemic risk, and enhances the reliability of cross-border trade.

2. **Climate resilience as a driver of system efficiency**
   Climate variability is already affecting water levels, port operations, and shoreline infrastructure. Science-based adaptation strategies, including nature-based solutions and integrated watershed management, are essential not only for environmental protection, but for maintaining efficient, predictable trade and transportation systems.
3. **Low-carbon transportation and supply chain transformation**
   The Great Lakes–St. Lawrence corridor is a backbone of North American trade. Modernizing this system through green shipping technologies, resilient port infrastructure, and multimodal integration enables both emissions reductions and productivity gains. Here, freshwater stewardship and economic modernization converge directly in the transition to low-carbon logistics.
4. **Data-driven systems management**
   Advanced monitoring, data integration, and digital technologies are critical to managing complex freshwater and economic systems. From hydrological modeling to AI-enabled supply chain optimization, integrating science and technology enhances decision-making, reduces uncertainty, and improves both environmental and economic outcomes.
5. **Inclusive growth and system resilience**
   Equity is a key determinant of system performance. Communities with equitable access to clean water, infrastructure, and economic opportunity are more resilient to environmental and economic shocks. Embedding social equity into freshwater and economic strategies strengthens long-term regional stability.

Achieving these priority areas requires more than technical solutions—it demands a fundamental shift in how we govern and collaborate.

Redefining how we work: Integration through collaboration and convening

Achieving this level of integration requires a fundamental shift in governance and collaboration. The Great Lakes–St. Lawrence region is inherently binational, and its freshwater and economic systems are deeply interconnected. Addressing its challenges and unlocking its opportunities demands a model of collaborative, science-informed governance that operates across borders and sectors.

Salmon fishing on Muskegon Lake, a drowned river mouth lake that flows into the eastern shore of Lake Michigan. Last year, after decades of cleanup and restoration, the lake was officially removed from the binational list of Great Lakes Areas of Concern and is now seeing the community benefits from restoration and remediation. Recreational use of the rivers and Muskegon Lake by residents and visitors has increased, tourism is up, and property values have grown.

CGLR plays a critical role as a binational convenor, bringing together governments, industry, academia, and civil society to align freshwater stewardship with economic modernization strategies. By fostering multinational, multisector collaboration, CGLR helps translate scientific knowledge into coordinated policy and investment action.

This approach includes:

- Aligning Canada–U.S. policy and regulatory frameworks around shared freshwater and economic objectives
- Integrating public and private sector investment to accelerate infrastructure modernization
- Embedding science into decision-making through iterative, data-driven processes
- Moving from fragmented coordination to true co-creation of solutions

Strengthening binational trade performance through integration

If the Great Lakes–St. Lawrence region were a country, it would rank as the third-largest economy in the world, an economic powerhouse rivaling the GDP of major nations. Spanning eight U.S. states and two Canadian provinces, the region generates trillions in annual output through advanced manufacturing, agriculture, energy, technology—all underpinned by one of the planet's most critical freshwater systems.

This immense economic scale is underpinned by a deeply integrated binational supply chain that supports tens of millions of jobs and facilitates a significant share of North America's trade. In an increasingly competitive global economy, the region's ability to deliver reliable, efficient, and low-carbon trade infrastructure is a defining strategic advantage.

Strengthening this advantage requires aligning economic performance with environmental stewardship. Integrating freshwater protection with infrastructure modernization ensures that healthy, well-managed water systems continue to support consistent shipping conditions, reduce operational risks, and enhance the resilience of ports, corridors, and critical trade assets.

At the same time, investing in modern, low-carbon transportation networks improves efficiency, lowers emissions, and reinforces the region's competitiveness in global markets.

Holding over 20% of the world's surface freshwater, the Great Lakes are not only an economic engine but also a globally significant environmental and resource asset. Through sustained binational collaboration, the region can further solidify its role as a premier international trade corridor, improving supply chain reliability, advancing climate resilience, and attracting investment aligned with environmental, social, and governance priorities.

In this sense, the Great Lakes–St. Lawrence region is more than a geographic system, it is a globally significant economic, ecological, and geopolitical force whose coordinated stewardship and strategic investment will shape the future of North American prosperity and sustainability.

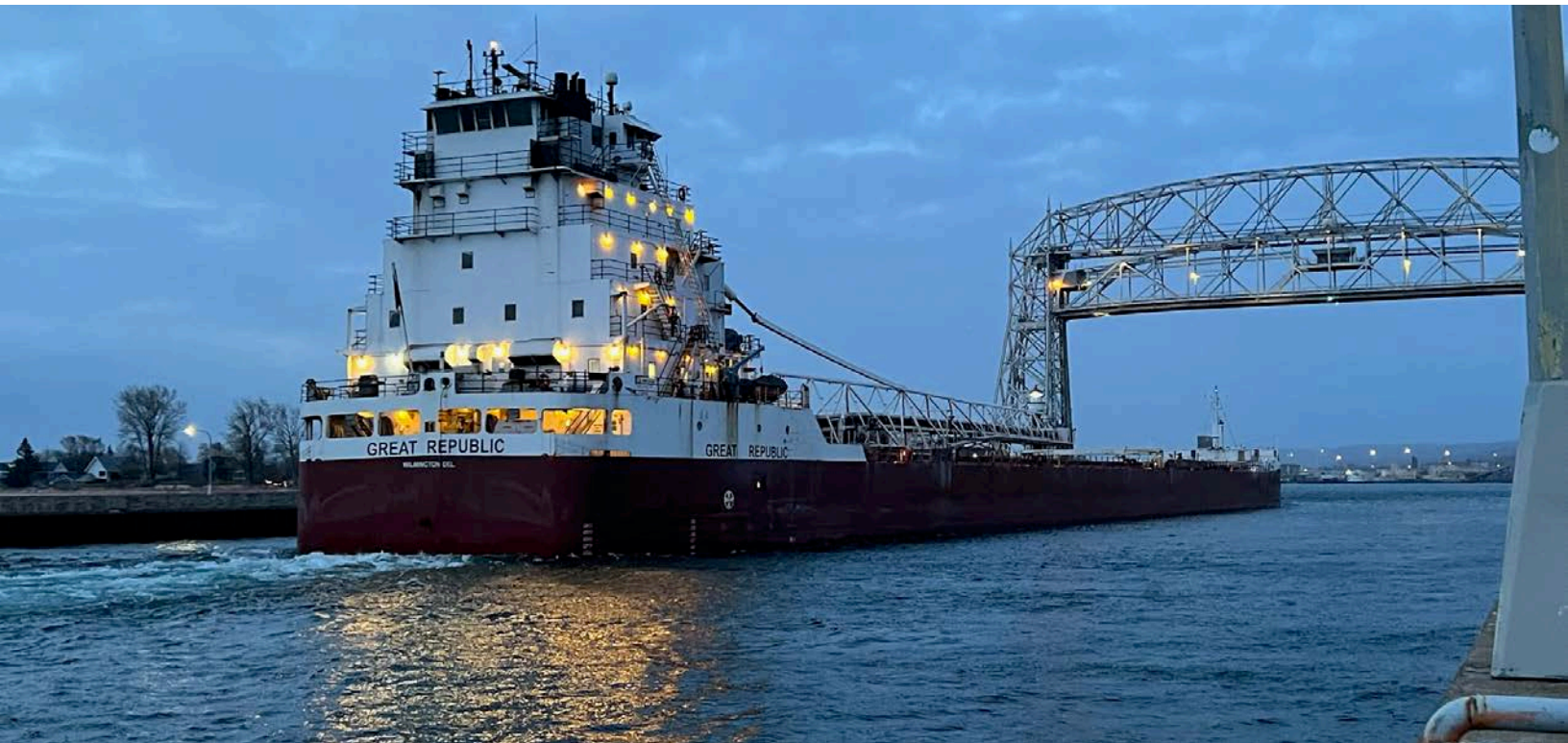
A regional model for integrated systems leadership

The Great Lakes–St. Lawrence region can be more than a case study in freshwater management—it can be a global proof of concept: that protecting the ecosystems which sustain trade, industry, and communities is not a cost of competitiveness, but its source. CGLR's strategic framework, anchored in economic growth, environmental stewardship, and social equity, provides the foundation for this leadership.

The path forward demands what this region is uniquely positioned to deliver: science aligned with policy, cooperation across borders, and a commitment to outcomes that are both environmentally and economically transformative. If the region seizes this opportunity, it will not only secure its own future—it will show the world that sustainable prosperity is possible where freshwater and economic ambition go hand in hand.

Vance Badawey is president and CEO of the Council of the Great Lakes Region.

Freshwater is not just a resource to be protected, but a critical infrastructure for the Great Lakes region. Pictured is the *Great Republic*, a self-discharging bulk carrier, in Duluth Harbor at the western tip of Lake Superior. *Photo by Colleen Pilat Images.*



Securing the sustainability of Great Lakes basin groundwater resources

BY JAMES POLIDORI

OFTEN REFERRED TO as the "sixth Great Lake," the total volume of groundwater within the Great Lakes basin is estimated to be greater than the volume of Lake Michigan. Despite its massive scale and its intrinsic connection to the quality and quantity of the region's surface waters, extensive knowledge gaps remain regarding groundwater availability at the statewide, basin, and regional scales.

One resource available to help address these gaps is the Great Lakes Regional Water Use Database, which the Great Lakes Commission (GLC) maintains in partnership with the Great Lakes-St. Lawrence River Water Resources Compact Council and Regional Body. This collaborative effort provides uniform, consistent data on withdrawals, diversions, and consumptive uses across jurisdictions, watersheds, and sectors. These data provide a baseline understanding of groundwater usage across the basin and inform regional water resources management.

From 2020 to 2024, an average of more than 1.2 billion gallons of groundwater were withdrawn daily from the Great Lakes basin across all sectors. Agricultural water use—specifically for irrigation and livestock watering—currently makes up the second most significant withdrawal of groundwater in the basin at an average of 370 million gallons of groundwater per day over that same period, trailing only public supply. While agriculture in the Great Lakes region is currently primarily rain-fed, climate projections indicate that increasing drought severity and frequency by the end of the century will expand the need for supplemental irrigation. This shift could result in an increased demand on groundwater aquifers throughout the basin.

Rapid growth and advancement in the technology sector is also raising questions about potential impacts on the basin's water resources. Recognizing its role in sustainable water resource management, the GLC recently passed a series of policy resolutions on impacts to Great Lakes agriculture and water use, the water-energy nexus of emerging technologies, and non-potable water reuse development. These resolutions support the economic growth and sustainable development of these sectors while protecting the region's water supply.

To ensure the security of the Great Lakes region's economy and the sustainability and balanced use of the Great Lakes basin's water resources, we must continue to improve our understanding of the impacts of shifts in agriculture and energy production, technology growth, and changing climate conditions. Coordinated and informed policy and decision-making will help us secure the "sixth Great Lake" for generations to come.

James Polidori serves as a senior program specialist for the Great Lakes Commission's water and resilience programs.

Corn field irrigation, Plymouth Road at Curtis Road, Superior Township, Michigan. Camera location 42° 20′ 05.91″ N, 83° 36′ 20.3″ W. View this and other nearby images on OpenStreetMap.

The author will be presenting this research at the IAGLR & SCAS Joint Conference in May in the session *Quantifying Groundwater Resources in the Great Lakes St. Lawrence River Basin.*

Bridging policy and practice in New York State

Barriers to shoreline adaptation along Lake Ontario

BY REWA PHANSALKAR & KRISTEN HYCHKA

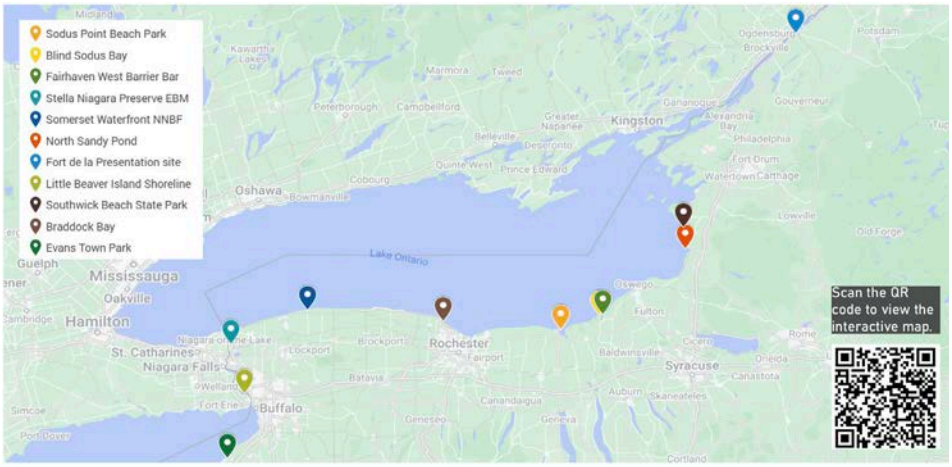
COMMUNITIES ALONG New York's Lake Ontario shoreline are increasingly vulnerable to flooding and erosion as climate change drives greater lake-level variability. In response, the state launched the Coastal Lakeshore Economy and Resiliency (CLEAR) initiative in 2019, following rapid funding through the Resiliency and Economic Development Initiative. CLEAR aims to work with communities to identify adaptation strategies, prioritizing landuse approaches and nature-based demonstration projects over reactive shoreline armoring.

This effort reflects a broader policy shift toward long-term resilience, supported by the 2014 Community Risk and Resiliency Act and the Climate Leadership and Community Protection Act. Federal priorities also align, notably through the 2022 Nature-Based Solutions Roadmap. Yet, despite this momentum, a local "adaptation deficit" persists. Shoreline hardening remains the dominant response: 16% of the U.S. Lake Ontario shoreline is classified as "artificial," and 40.6% is armored across the U.S. and Canada (USACE, 2020; State of the Great Lakes, 2022).

To understand this gap, our research assessed barriers to adaptation using a mixed-methods approach that combined practitioner interviews, document reviews, and participation in public meetings. Using a diagnostic framework by Moser and Ekstrom (2010), we conceptualized adaptation as a process moving through three phases: understanding, planning, and managing. Barriers can emerge at each stage and often compound.

In the understanding phase, communities directly impacted by recent high-water events prioritize flooding, while inland residents often do not. Competing narratives about the causes of flooding further shape how risks are interpreted.

In the planning phase, constraints are structural. Many municipalities operate with limited staff, technical expertise, and time, resulting in reactive approaches. Governance is fragmented, with authority split across local, county, and state actors, and much of the shoreline remains under private ownership. Even where data and tools exists, stakeholders struggle to navigate scattered and sometimes outdated information.



Examples of projects using natural and nature-based features in New York's Great Lakes basin, compiled by NYSWRI and NYSDEC Great Lakes Watershed Program staff. These projects can serve as demonstration sites for broader promotion and replication.

Barriers become most visible during implementation. Nature-based approaches—such as restored beaches, dunes, and living shorelines—are often seen as infeasible. Stakeholders cite high wave energy, steep bluffs, limited parcel sizes, and competing priorities such as maintaining lake views. Uncertainty around siting and design, limited contractor expertise, and complex permitting pathways further complicate adoption. These challenges are reinforced by a strong path dependency on shoreline hardening; rooted in familiarity and established engineering standards, gray infrastructure remains the predictable choice.

Similarly, resilient land use policies—zoning updates, setbacks, and conservation overlays—face persistent hurdles. Local governments hesitate to adopt regulations that might affect property values or reduce tax revenue, particularly in high-value shoreline areas. These challenges are compounded by limited legal and technical capacity and the time-intensive nature of adopting new local laws.

Taken together, our findings suggest the challenge is not simply a lack of awareness or funding. Rather, it reflects a mismatch between how adaptation strategies are promoted and the conditions under which they must be implemented. As new state-led tools and funding streams create opportunities, overcoming these barriers will be critical. Supporting shoreline adaptation in the Great Lakes will depend not just on advancing new ideas, but on making them workable within the realities of local decision-making.

Rewa Phansalkar is an extension associate and Kristen Hychka a research and outreach specialist at the New York State Water Resources Institute at Cornell University.

This research will be presented at the IAGLR & SCAS Joint Conference in May in the session *Informing Freshwater Policy & Practice by Reflecting on Successes and Failures. Download the full report to learn more.*

Grand opening of the Walpole Island First Nation fish hatchery

STUDENTS AT Anishinaabeg Kinomaagewgamig Immersion School on Walpole Island First Nation are raising lake sturgeon in a new, school-based hatchery that places Indigenous knowledge, ceremony, and environmental responsibility at the center of learning. The hatchery, Giigoonyig Enjintaawgiwaad—meaning *Place Where Fish Are Raised*—serves as a living classroom for Anishinaabe language, teachings, and relationships with water and land.

"The Giigoonyig Enjintaawgiwaad hatchery is more than a science initiative, it's a living expression of Anishinaabe knowledge and stewardship," explains Mino Giizhgad, the school's immersion coordinator, emphasizing that the hatchery reconnects students and community members to waterways that have sustained Bkejwanong "since time immemorial."

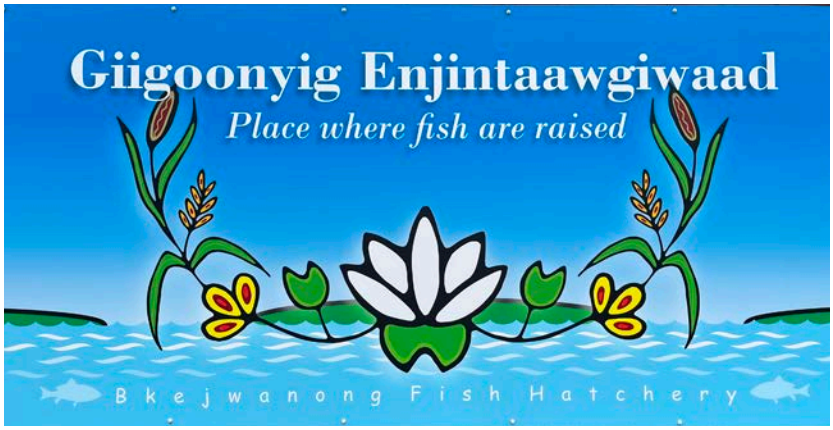
Students are involved in every stage of the process, from caring for sturgeon eggs to releasing young fish into local waters. This hands-on approach supports sturgeon restoration while helping youth develop a long-term sense of responsibility for the environment. Giizhgad noted that beginning this work early shapes how young people relate to the land and water.

"When we do this at an earlier age, I think it does have great benefits," he notes, adding that students become more aware of pollution and threats to water quality.

The hatchery was supported by Trevor Pitcher, a professor with the Great Lakes Institute for Environmental Research at the University of Windsor, who helped provided equipment and training needed to open the facility. Pitcher continues to offer technical support and training as the program grows, reinforcing what he describes as "an ongoing relationship."

All learning in the hatchery takes place in Anishinaabemowin, ensuring language revitalization advances alongside ecological knowledge. By blending ceremony, cultural teachings, and hands-on stewardship, the hatchery supports both environmental balance and what Giizhgad calls "the next generation of caretakers," grounding education in lived Indigenous relationships with the natural world.

By Trevor Pitcher, University of Windsor.



Students from Anishinaabeg Kinomaagewgamig Immersion School gather around a lake sturgeon during the grand opening of the Giigoonyig Enjintaawgiwaad (*Place Where Fish Are Raised*) hatchery on Walpole Island First Nation in April. The hands-on moment reflects the school's approach to blending Anishinaabe language, ceremony, and environmental stewardship through lived experience. More than 200 students visited the fish that day, alongside dozens of Walpole Island community members. University of Windsor Professor Trevor Pitcher (right) is pictured showing the sturgeon to students and supporting learning at the hatchery. *Photo by Michael Wilkins, University of Windsor.*

Great Lakes, Global Impacts

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