Great Lakes Protection Fund

Questions and Actions

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The Great Lakes are held in trust for future generations.

How do we ensure their value?

More than 20 years ago, a bipartisan group of governors from Illinois, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin created the Great Lakes Protection Fund, a permanent endowment with the charge to cultivate the intellectual capital needed to improve the health of the Great Lakes.

Our mission is to identify, demonstrate, and promote regional action to enhance the health of the Great Lakes ecosystem. The Great Lakes Protection Fund invests in leaders who put innovative ideas into action to answer the region's complex questions.

Our funding brings together a creative mix of talent to discover, create, and design measurable outcomes to benefit the lakes. Fund-supported work is tangible, collaborative, and has a direct connection to the ecosystem as a whole. Forces working against our ecosystem present unprecedented challenges, and our portfolio of work serves as a global example of international shared stewardship.

It has become clear that investing in a team of creative people representing a diverse range of expertise is the key. It unlocks the potential for significant, positive, catalytic change.

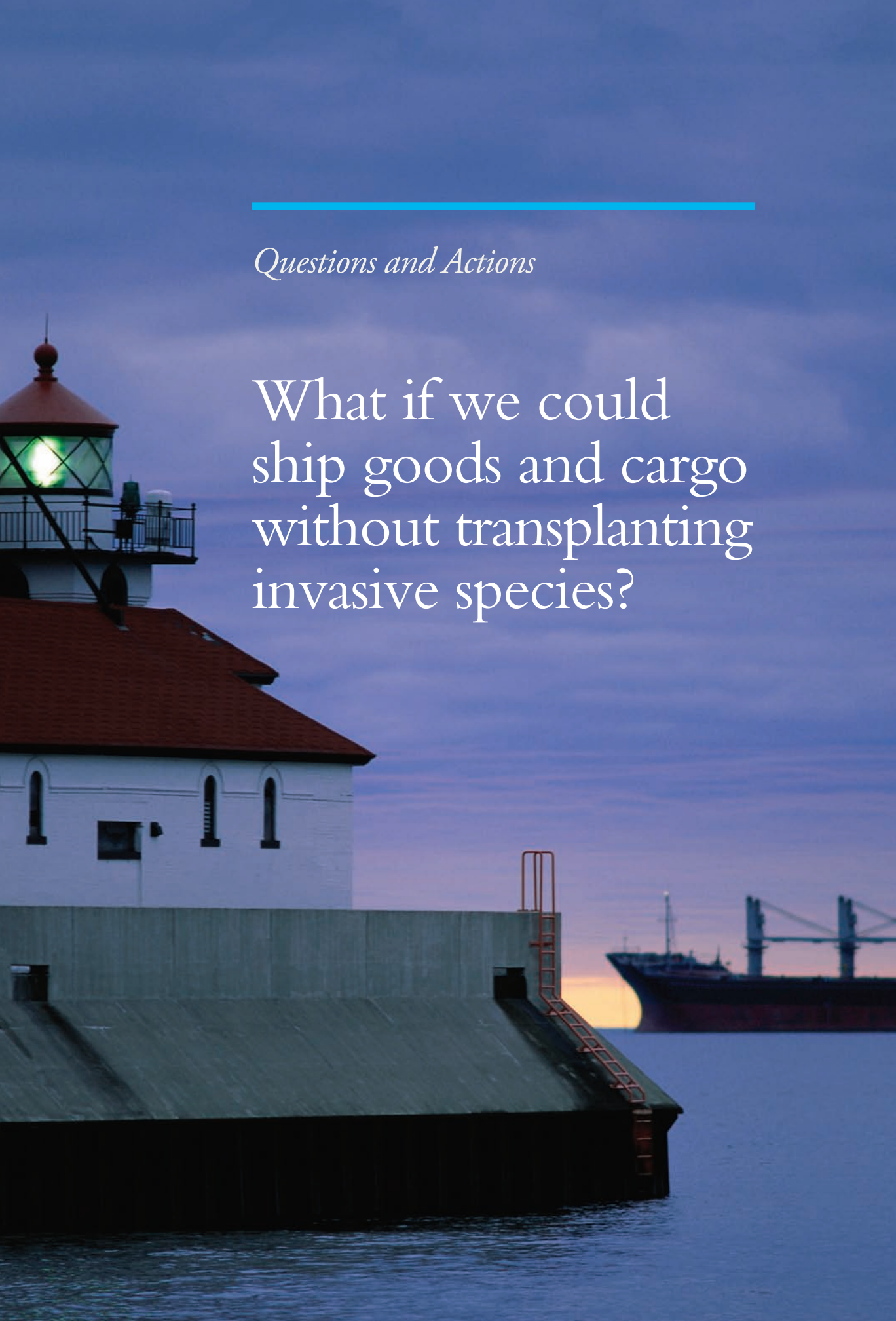
What if leaders from across sectors collaborated to test ideas for improving the health of the Great Lakes?

The diverse nature of a successful team encourages examination of a problem, and its root causes, from multiple perspectives. Our member Governors have detailed their priorities for the Great Lakes, and Fund-supported teams identify opportunities where targeted work can produce tangible improvements that, when implemented at scale, will benefit the entire Great Lakes ecosystem.

Since inception, the Great Lakes Protection Fund has awarded more than $60 million to support more than 240 projects implemented by more than 800 institutions and thousands of innovative individuals that test new ideas, take risks, and share what they learn.

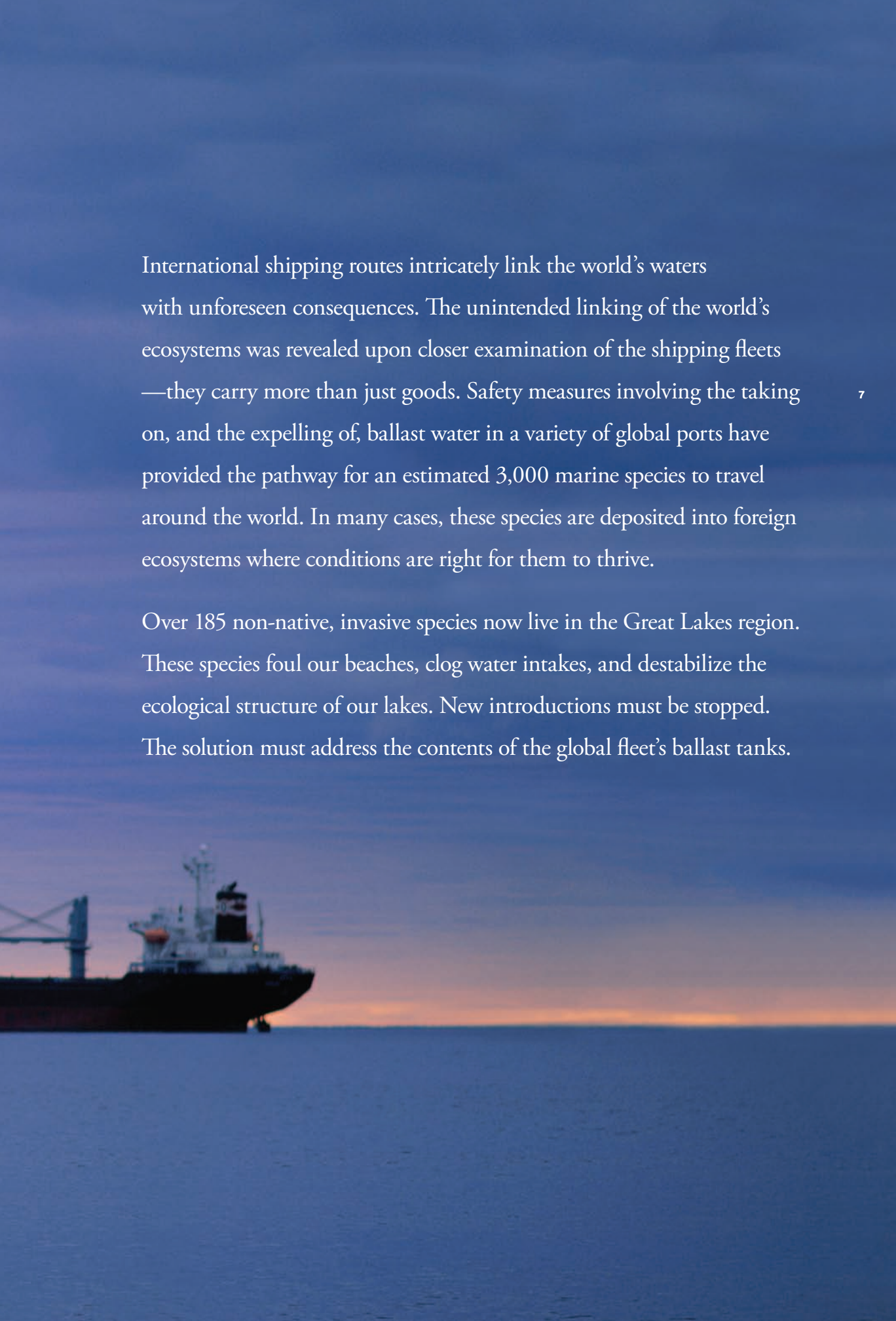
In addition, more than $41 million of the Fund's earnings has gone directly back to participating states for investment in local projects which promote the health of the region's freshwater resources.

The Fund's projects have introduced new industries, encouraged new actions, and shaped new value chains by asking deceptively simple questions.



Questions and Actions

What if we could ship goods and cargo without transplanting invasive species?



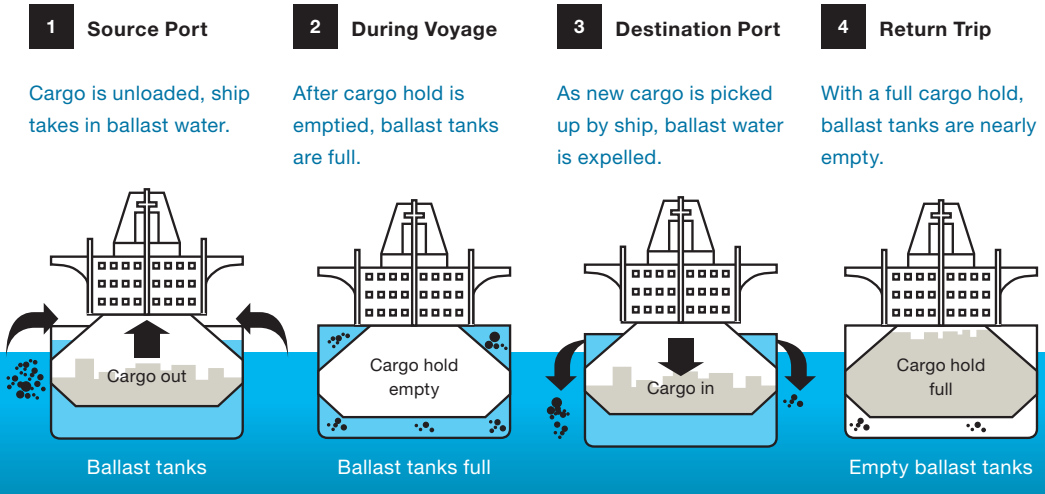
International shipping routes intricately link the world's waters with unforeseen consequences. The unintended linking of the world's ecosystems was revealed upon closer examination of the shipping fleets —they carry more than just goods. Safety measures involving the taking on, and the expelling of, ballast water in a variety of global ports have provided the pathway for an estimated 3,000 marine species to travel around the world. In many cases, these species are deposited into foreign ecosystems where conditions are right for them to thrive.

Over 185 non-native, invasive species now live in the Great Lakes region. These species foul our beaches, clog water intakes, and destabilize the ecological structure of our lakes. New introductions must be stopped. The solution must address the contents of the global fleet's ballast tanks.

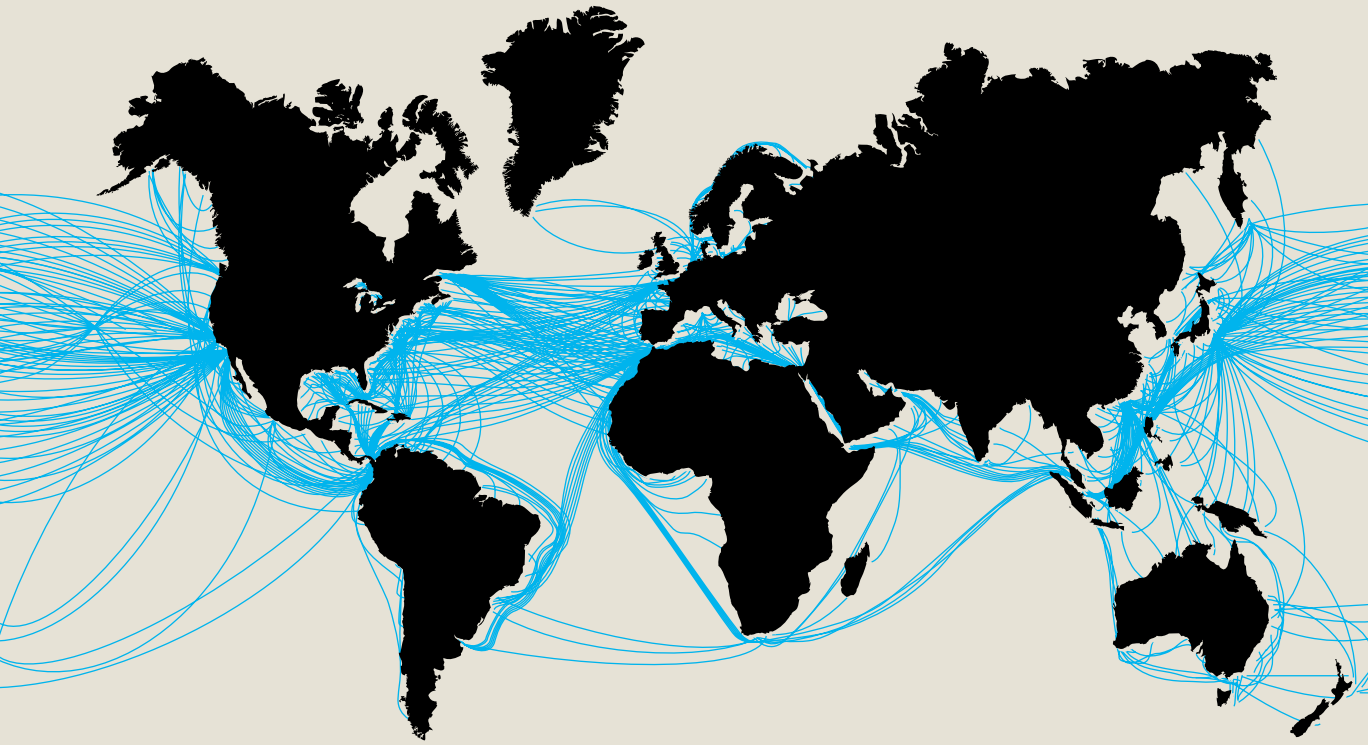
How can we keep critters out of ballast water?

The Great Lakes Protection Fund supported a series of efforts to tackle this challenge. Expansive, cross-disciplinary project teams of university researchers, engineers, utility companies, ship owners, policy specialists, and government agency personnel began work in 1996. From this portfolio of work, a significant series of "firsts" were produced.

- Designed, installed, and tested the world's first ballast water filtration system on a working vessel.
- Developed and demonstrated the first set of protocols to evaluate the effectiveness of ballast water treatment—on ship, on the shore, and in the lab.
- Developed, verified, and used the first set of methods to evaluate "hatch out" of organisms that remain in ballast tanks after water is discharged.
- Documented the makeup of the sediment in tanks on ships categorized as having no ballast on board.
- Designed and deployed the first remote monitoring technologies to track water levels, pumping activity, and water chemistry in ballast tanks while ships are underway.



Fund-supported teams designed, installed and tested the first ballast water filtration system on a working vessel. Our teams also developed the first set of protocols to evaluate the effectiveness of ballast water treatment—on ship, on the shore, and in the lab.



What have we learned?

Fund-supported teams have come at the ballast issues from many angles and determined that because the threat of invasive species is dynamic, any response must be dynamic as well. They have found effective ways to evaluate not only the specific risks imposed, but the treatment systems at hand to prevent the transfer of invasive species… and they didn't keep these exciting findings to themselves.

On an ongoing basis, project teams told the story of their work and relayed findings through a variety of channels. Journal articles and news stories reached a broad audience to inform the public about the potential harm of invasive species. Meanwhile, videos and conferences educated technologists and business investors about the cutting-edge developments coming out of the Great Lakes to improve the handling of ballast water.

These projects laid the groundwork for additional Fund investments to further the science of species detection. A current project team is working to produce an innovative, rapid detection technology—a genetic test to identify non-native organisms in real time. This test platform moves invasives detection technology out of the laboratory and into the field, drastically reducing the time it will take to learn the specific invasive species threat posed by a particular vessel.

Looking forward, the International Maritime Organization has established guidelines for ships to maintain specific ballasting standards. As these guidelines become requirements, it is estimated that the global ballast water treatment industry will be worth $34 billion over the next 10 years.

The Fund's initial investment laid the foundation for a new, global industry and shaped a new fact of maritime commerce – ballast treatment systems. What originally began as a series of projects supported by the Great Lakes Protection Fund catalyzed widespread environmental and economic change.

It is estimated that 3,000 marine species traverse the globe within the global shipping fleet. Through ballasting operations, these hitchhikers are deposited in foreign ecosystems where conditions are right for them to thrive.

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How can we as a region manage Great Lakes waters for future generations?

Over one trillion gallons of basin waters are used each day. Those waters are used for drinking, generating electricity, irrigating agricultural fields, treating wastes, and supporting a wide range of industrial operations. They also support an ecosystem of living things that, in turn, supports a recreational industry. There is no "unused" water in the system.

Until recently, the governance of users and uses was fragmented, driven by a patchwork of regulatory and common-law schemes, and only loosely connected to the health of the Lakes and the natural resources that depend upon those waters. When a firm secured the rights to export millions of gallons of Lake Superior water in tanker ships to Asia, the region was challenged to rethink how the two countries—eight states and two provinces—manage their shared waters.

How can water use drive ecosystem improvements?

The Great Lakes Protection Fund assembled, directed, and funded a team of legal experts to advise the region's governors on their legal authority over their shared waters. That team concluded that a single decision-making body needed to be created through a multi-state compact approved by Congress and the President. Further, it was advised that conflicts be resolved through the lens of what is best for the region's water dependent natural resources, not on the basis of economic advantage or the sale of water as a commodity.

The Fund supported multi-year negotiations and an expansive process of public participation to make possible a unified submission for Federal approval. In parallel, The Fund supported a broad set of project teams that explored the scientific, technical, and practical dimensions of such a governance system. These teams:

- Created technology to link water development, land cover, geological features, and ecological impacts. This work led to Michigan's ground-breaking Water Withdrawal Assessment Tool.
- Demonstrated how habitat, flow, and stream restoration techniques can improve the health of the basin's waters and water-dependent natural resources.
- Documented how uses of the same amount of water have differing impacts depending on where and when the withdrawals are made, what the water is used for, and where those flows are returned.
- Developed online monitoring, mapping, and networking platforms to encourage campus, neighborhood, city, and basin cooperation in adopting new conservation practices.
- Developed scenarios of likely water withdrawals and informed how governance systems should be designed to anticipate those reactions.
- Facilitated the design and development of what became the Great Lakes-St. Lawrence River Basin Water Resources Compact and associated Regional Agreement, providing over $1 million for expert advice, travel support, and staff time.

What have we learned?

The work of these teams has led to a new generation of water governance in the Great Lakes region. The federally-approved Great Lakes Basin Compact requires the states to act with a single voice on new, regionally significant water uses.

Building upon the Compact negotiations, the states and provinces also entered into an international agreement about how water use decisions will be reviewed and managed across borders. The Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement was signed on December 13, 2005. These agreements place the health of the basin's resources at the center of governmental decision-making. Both agreements were driven by the objective "…to protect, conserve, restore, improve and effectively manage the Waters and Water Dependent Natural Resources of the Basin…"

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Teams supported by Great Lakes Protection Fund have explored the nexus between human actions and the physical hydrology of the environment with the aim of providing greater benefits to the natural resources we use. These teams have:

- worked to identify, demonstrate, and refine the most promising strategies for dam operation, run-off regimes, wetland restoration, and shoreline processes;
- built a suite of tools to identify candidate restoration projects, measure impacts, and assess alternatives;
- supported frameworks for water resource use decisions that allow for a more natural flow regime in the Great Lakes ecosystem.

What began as a wake-up call—a formal approval to export water in bulk for sale abroad—became a concerted set of research explorations and led to the creation of a new regional authority to manage major new uses of water. Along the way, the region pioneered new science and created new practical approaches that tie our management of water uses to the value of our natural resources.

The Fund has helped to ensure that new uses of water are better than those they displace. The legal, technical, and practical products of these teams have accelerated the rate of innovation, which will allow both our region's economy and ecology to emerge stronger and more resilient.

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What if farming could become more freshwater friendly?

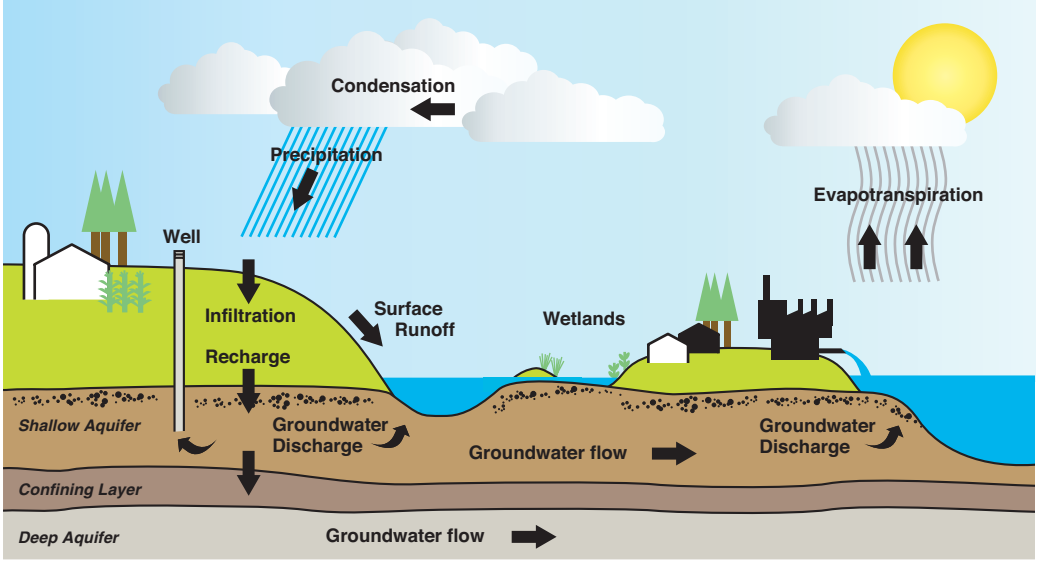
Great Lakes agriculture generates more than $15 billion a year in products from livestock, dairy, grain and corn, and it accounts for 7% of total U.S. food production. The environmental issues related to agricultural practices directly shape the current and future health of both our water and our region's farming economy. The sustainability of the industry depends on the health of the land it uses.

The work supported by the Great Lakes Protection Fund explores new ways that agriculture can support healthier water as it moves over the land as surface water, through the land as groundwater, and on into streams, rivers, and lakes. Where land is used for agricultural purposes, we must pay special attention to how actions affect the health of all natural resources. Pesticide and fertilizer use, nutrient runoff and changes to water structures can have a negative impact on the land and on the watershed. The future of water—upon which both the lakes and our region's agricultural resources depend—needs assurance of improved human choices.

How can farmers safely try something new?

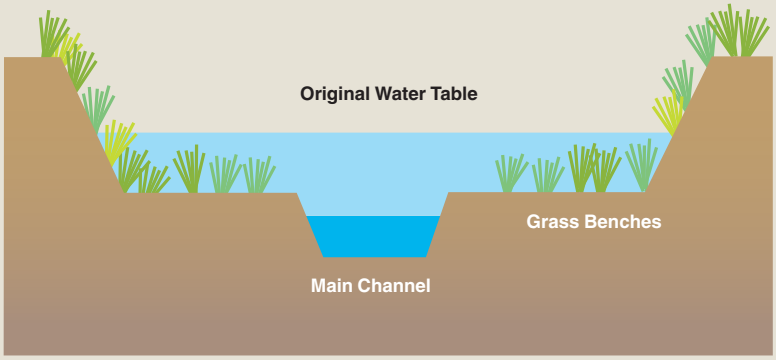
Teams guided and supported by the Great Lakes Protection Fund are actively addressing issues that most directly affect the water moving through the region's economy and ecology. These teams are working in fields, laboratories and meeting rooms to change these symbiotic relationships for the better. Fund-supported teams have looked at issues related to agriculture from many different perspectives and have developed a series of game-changing practices.

- Improved the ecological function of man-made drainage with 2-stage ditches that permanently reduce sediment, capture phosphorous, and denitrify nitrogen in the water that flows through them.
- Developed a nutrient yardstick to help farmers determine more precisely the actual nutrient needs of their particular soil to curtail excessive chemical inputs.
- Provided warranty products to protect farmers against financial losses that could result from adopting conservation tillage or new practices to reduce fertilizer and chemical use.
- Developed new ways to reach absentee landowners to introduce and implement conservation practices on land they may lease to others.



Hydrologic Cycle

The work supported by the Great Lakes Protection Fund examines the hydrologic cycle, following water as it passes through the watershed in surface waters, ground waters, and through time.



2-Stage Ditch Design
Fund-supported teams have improved the ecological function of man-made drainage with 2-stage ditches that permanently reduce sediment, capture phosphorous, and denitrify nitrogen in the water that flows through them.

Two-stage, or natural channel, design provides a more stable ditch that requires less periodic maintenance. By providing natural steps and filters, these ditches reduce sediment and nutrient movement and improve ecological function.

What have we learned?

This portfolio of Fund-supported work has demonstrated that the economic interests of agriculture can be sustained and improved through next-generation resource practices that improve the integrity of our waters. Fund-supported teams have tested their ideas on the landscape and have developed tools and practices that can have value and impact throughout the basin.

These teams have prevented significant amounts of nutrient and chemical inputs from entering our soils and water and created assurances that improved practices will sustain themselves. More importantly, the tools they have created are being used, refined, and shared by a wide range of farmers, input providers, not-for-profits, and governments to improve the basin's health.

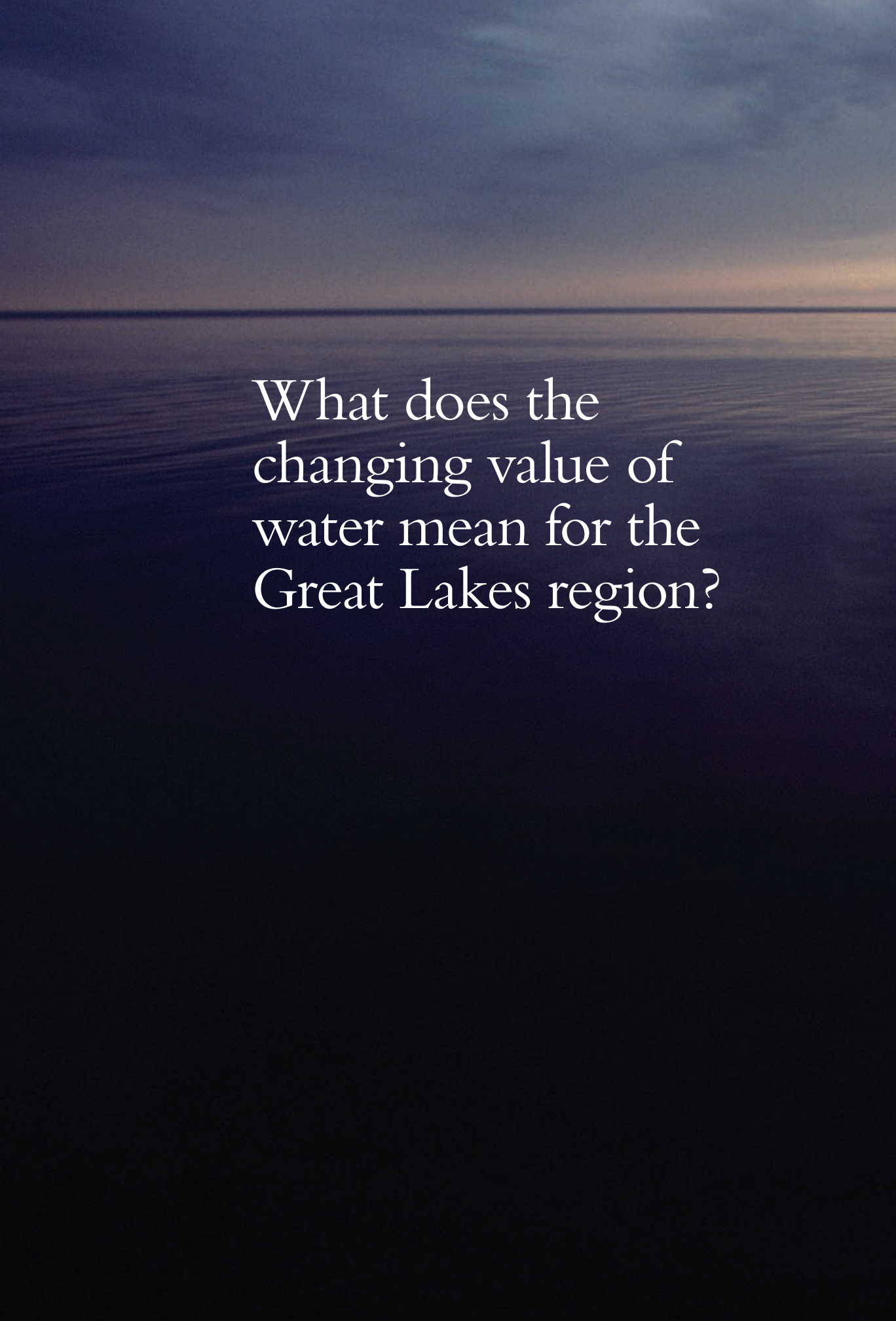
The investment in service warrantees and educational programs to support farmers experimenting with new practices sparked new trends in field conservation that have spread across the Midwest and from California to North Carolina. Likewise, conservation organizations are currently implementing improved ditch designs on farms across Indiana, Ohio, and Michigan.

Projects guided and supported by Great Lakes Protection Fund demonstrate that businesses can maintain a profit while having a positive environmental impact and innovative thinkers can develop and apply creative solutions that will shape regional actions. This work is transforming the landscape in the Great Lakes region and beyond, altering the physical, chemical and biological integrity of the structures through which our water flows.

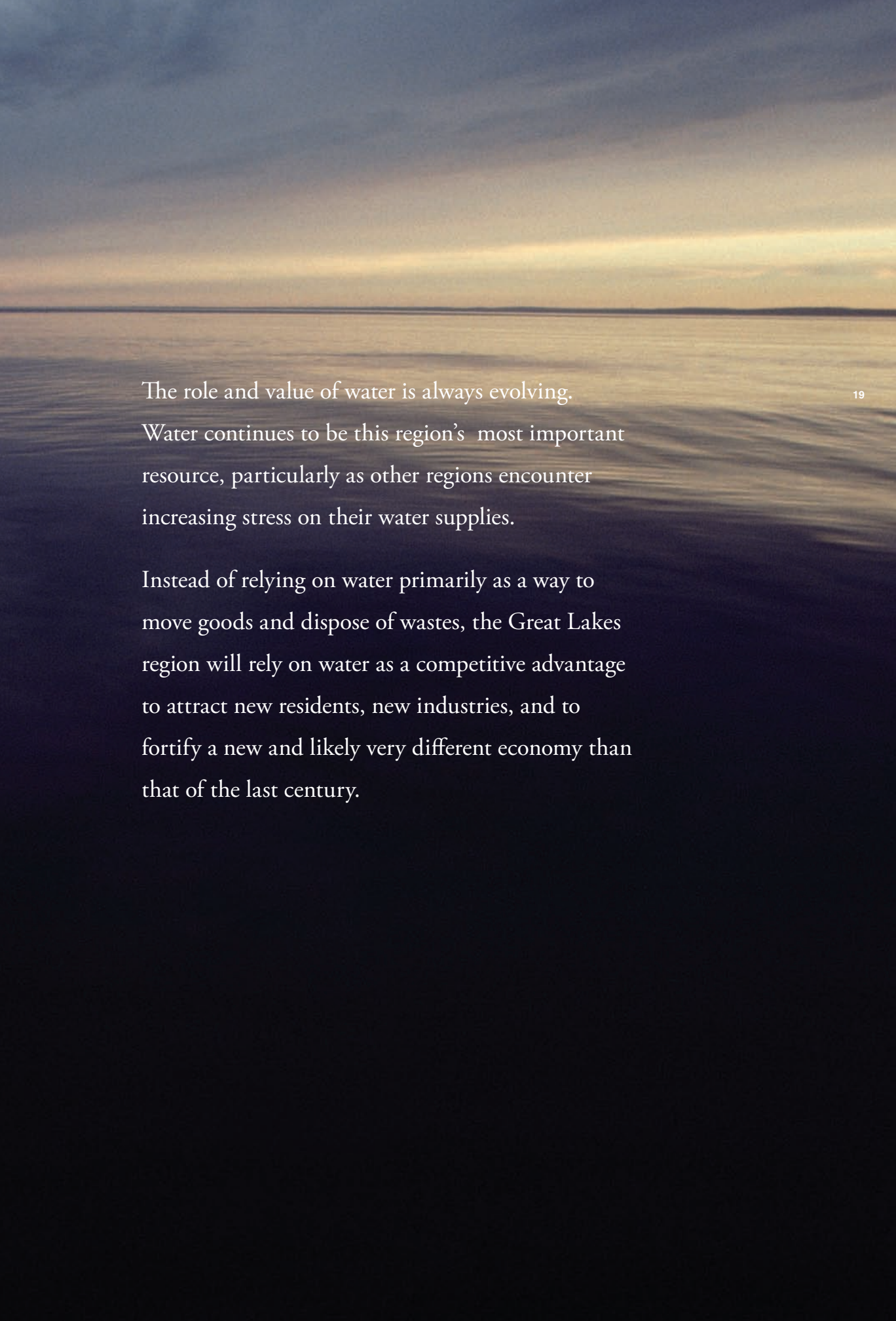
Fund-supported teams have developed a nutrient yardstick to help farmers determine more precisely the actual nutrient needs of their particular soil (soil sample is pictured) to curtail excessive chemical inputs. Farmers use the yardstick to measure their progress in reducing nutrient loss over time.

Teams have also provided warranty products to protect farmers against financial losses that could result from adopting conservation tillage or new practices to reduce fertilizer and chemical use.

Photo (bottom right) by Keith Weller courtesy of US Department of Agriculture/Agricultural Research Service.



What does the changing value of water mean for the Great Lakes region?



The role and value of water is always evolving. Water continues to be this region's most important resource, particularly as other regions encounter increasing stress on their water supplies.

Instead of relying on water primarily as a way to move goods and dispose of wastes, the Great Lakes region will rely on water as a competitive advantage to attract new residents, new industries, and to fortify a new and likely very different economy than that of the last century.

In 1989, a bipartisan group of governors established the Great Lakes Protection Fund to identify ways to support new uses and users of our water—to explore the unexplored. They envisioned a region where water is used productively—not damaged. They saw a region where water is used to add value to other products and where its future is considered in every decision making process.

The initial Fund endowment of $81 million—contributed by Illinois, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin—has grown to more than $100 million. It has generated earnings of more than $140 million to support new project financing of creative innovations that flow through the region to answer questions with action.

The Fund is seeking innovative thinkers and doers throughout all sectors of our society to take on this challenge and create opportunities to change the world through improved uses of water.

Every project starts with a conversation.

Every conversation tackles tough questions.

We welcome your ideas, questions, suggestions, solutions, and not-yet-fully-formed enquiries.

startaconversation@glpf.org

Design: Tandemodus

Great Lakes
Protection Fund

The Fund's mission is to identify, demonstrate, and promote regional action to enhance the health of the Great Lakes ecosystem.

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