

# MICHIGAN STATE of the GREAT LAKES 2015



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Cover Photo: Amy Lukas & Mary Catterlin, adventurers who circumnavigated Lake Michigan in a handmade canoe. [www.lakemichiganinadugout.blogspot.com](http://www.lakemichiganinadugout.blogspot.com)

Image: Tim Gallaway

# Introduction

## Governor Rick Snyder



Michigan's Office of the Great Lakes was established in 1985 with the Great Lakes Protection Act as a response to the potential diversion of our cherished state resource, our water. Governor Jim Blanchard believed that it was necessary to have one place in state government that thinks about the Great Lakes first. And, like him, I could not agree more. He reminds us of this thinking in the accompanying article and I join with him in affirming the value and importance of the Great Lakes to Michigan, the region and the world.

As residents of this Great Lakes state, we still bear that same responsibility to put the Great Lakes first. They sustain us physically, economically, and emotionally. With this charge comes opportunity to promote and protect this tremendous natural resource that makes Michigan so unique.

Some years ago I asked the Office of the Great Lakes to develop a comprehensive water strategy for the state of Michigan. This past year, after substantial collaboration, a public draft of that strategy was released and many of you have provided comments. The strategy will aid our state in keeping the sustainable protection and use of the waters of Michigan and the Great Lakes in the forefront of our thoughts and efforts. In particular, several of the strategy's objectives, investing in water infrastructure, preventing and managing aquatic invasive species, creating water trails, building long-term water funding capacity, targeting investments in commercial and recreational ports and harbors, and reducing phosphorous entering western Lake Erie by 40 percent, are of paramount importance.

At the regional level, I signed the Western Basin of Lake Erie Collaborative Agreement with the state of Ohio and the province of Ontario. This agreement sets a specific end date, 2025, to have reduced phosphorous inputs to western Lake Erie by 40 percent. I have been encouraged by the partnership and effort that has been generated among people and governments in Michigan, Ohio, and Ontario.

We have also stepped forward by implementing a Mutual Aid Agreement signed by all ten of the Great Lakes Governors and Premiers to address threats from aquatic invasive species. And, more specifically, Michigan, Ohio, and Ontario have kicked off a pilot project to harmonize our aquatic invasive species efforts across our jurisdictions. This project has the potential to have direct regional impacts through consistent standards and practices with a primary understanding that we are working toward a shared goal. We are also focusing on growth and opportunity in the maritime sector and on other key aspects of the regional economy.

Closer to home in Michigan, the Natural Resources Trust Fund recently released another \$28 million for public outdoor recreation projects and supports our state's important tourism industry, recognizing the value of having access to recreation opportunities, many of them water-related or located along the shores of the Great Lakes.

With an economy driven in part by our Great Lakes comes the responsibility to account for the value of our investments in our water resources- ecologically, economically, and socially. I see this as a part of good government, of accountable government, and am sincerely grateful to our philanthropic partners for supporting this blue accounting effort.

Yet, there is more to do, not just regionally, but locally. And, as shareholders – owners – in the value of our Great Lakes I encourage you to champion our water resources and Great Lakes.

## Interview with Former Governor James Blanchard:

“Our Great Lakes Are, Along With Our People,  
Our Most Precious Resource.”

**John Riley**

Office of the Great Lakes, MDEQ



Former Governor Blanchard and wife Janet at Lake Michigan, near Pentwater.

“When I became Governor, I decided to do what I urged our federal government to do, which was to have an Office of the Great Lakes. In fact, I was frankly always surprised we didn’t have it before,” two-term (1983-1990) former Governor James Blanchard recently recalled.

Legislation creating Michigan’s Office of the Great Lakes (OGL) went into effect 30 years ago, in August 1985. According to Mr. Blanchard, the effort was inspired in part by problems related to phosphorous, agricultural runoff, toxic chemicals, sewage, and the potential for diversion of Great Lakes water. “They had been issues for as long as I could remember,” he said.

Like so many people from the region, Michigan’s 45th governor grew up visiting the Great Lakes, swimming in the fresh water, playing on the beach and running up and down the Sleeping Bear dunes. He spent time as a Boy Scout on Mackinac Island. His deep, personal connection to the Great Lakes stayed with him well into adulthood.

Mr. Blanchard served four terms in the U.S. House of Representatives prior to becoming governor.

“When I got elected to Congress in 1974, those experiences came with me, so among other things, I worried about the Great Lakes,” he said “I put together some legislation to try to have the federal government coordinate all of the ways it interfaced with the lakes. It was called the Great Lakes Protection Act.

It did not become law, but we had some hearings and we got more attention with EPA and the Coast Guard about how the U.S. government interfaced with the lakes.”

On the occasion of the 30th anniversary of OGL, the former governor recounted the office’s creation and discussed some of the issues we continue to face as stewards of the world’s greatest freshwater resource.

Creating OGL through the passage of Michigan’s Great Lakes Protection Act was a high priority during the Blanchard administration because, “we had a pretty aggressive agenda. We need[ed] to have a place to pull together what we were doing, and have comprehensive policies to protect the lakes from diversion, clean up the lakes from toxic pollution, prevent further pollution, and protect the beaches and the harbors. It was really a no brainer to create this.”

The former Governor appointed Tom Martin as the first OGL Director. “ He had worked with Congressman Bonior and with the maritime unions,” Blanchard said. “He played a role with environmental groups during my campaign. He was very familiar with the workings of Congress, but it was unusual because he was a union official, but he was really into environmental issues and the Great Lakes...Tom was the right guy for this because he had a great sense of politics and policy and he knew the network of people, so he was perfect to put this together.”

## Former Governor James Blanchard, *Cont.*

“We dreamed up the Great Lakes Protection Fund to create an endowment to finance research, technology and demonstration projects to figure out how to have the best practices and technology to help improve the lakes. Also in there, we banned drilling in the lakes and continued to promote the Great Lakes in our tourism programs. I also pushed through the dunes protection, because that was a special [interest] of mine, growing up in the dunes.”

“The emerging threat was the invasion of non-indigenous species. That was serious when I was governor and it’s become even more serious. They upset the ecological balance of the lakes. Ballast water has been generally identified as a culprit and I know there have been strong regional efforts to work on that.”

It’s important to reflect on 30 years of progress while looking to the future. According to Blanchard, “over time, there’s been an evolution, but a lot of the issues are the same. I think there’s still a lot of agricultural and municipal runoff, sewage, storm water, and combined storm sewers leading to pollution.

“The big thing is to not take the lakes for granted and understand they’re not just beautiful things to look at or water to be processed to drink. It affects our tourism, our enjoyment, our quality of life, not to mention sport fishing and other things. They are a shared resource, not only with the other states, but with Canada. People forget we share, except for Lake Michigan, all the lakes with Canada. Having the international resource is a real trump card for us when we deal with other regions in our country who might want to divert water or ignore it, because it affects our treaties and our relationship with our closest ally, Canada.”

Blanchard served as Ambassador to Canada from 1993 to 1996.

Looking forward, Blanchard recognizes the uncertainty involved with managing different aspects of such a dynamic system.

“Trying to predict the cycles of the lakes, and now the impact of climate change, that’s a big issue,” he said. “How is that affecting us?...I wonder how much we really know and can predict what’s going to happen with climate change and how that will affect our agriculture, our tourism business, the quality of the water, boating, shipping, and all those things.”

If he were governor today, Blanchard said he would “not only focus on our Office of the Great Lakes,” but “highlight the fact to our state and to the world that water and our Great Lakes are, along with our people, our most precious resource. And try to elevate it even more than I did when I created the Office of the Great Lakes.”

## The Unique Challenge of the Great Lakes

Jon Allan, Director  
Office of the Great Lakes, MDEQ



I have been thinking for a while about the characteristics of the Great Lakes that make them both unique and challenging. Most of the descriptions of the lakes start with their scale, size, volume, and number of political jurisdictions. All this provides context for the system as we know it, but there are some underlying characteristics of the Great Lakes that we do not recognize or talk about enough.

First and foremost, the lakes are dynamic – there is no such thing as an average water level. The notion of average water level hampers our ability to understand the good and bad aspects of a dynamic system. Too often, we think of higher or lower than average water levels as indicating something is wrong. On the contrary, without dynamic change, a set of lakes such as the Great Lakes is an overly managed system, and one that loses ecological function. We need to think about the dynamic range of the lakes, which may increase or fluctuate. So to think of the Great Lakes as a static system does harm to our point of view and to our management strategies.

The Great Lakes are a deeply complex system. As an example, Lake Erie is not homogenous, but rather made up of three distinct zones: the Western Lake Erie Basin; the Central Basin; and the Eastern Basin. Each has different hydrological and flow dynamics, different depth profiles, and very different algal response to nutrients. And that is one lake. The implication of this concept is that frequently there are not easy or single answers to complex questions. This is not to suggest that elegant solutions to complex problems cannot be found, but that often, the simplistic answer is not necessarily one that solves or addresses a complex system. For example, the introduction of zebra and quagga mussels into the lakes has had profound effects on light penetration and water clarity, chemistry, nutrient cycling and response, food web interactions, and of course, on people and community. If we are managing the lakes to support their ecological function and integrity, then addressing the issue of complexity is of utmost importance.

Resiliency is a system characteristic of the Great Lakes and a powerful idea that has been gaining traction over the past decade. In human or psychological terms, resilience connotes being able to adapt and “roll with the punches.” In ecological terms, it means something similar, but with a focus on the ability of the system to establish structure and function after a disruption. That perturbation can be a physical (e.g. wind, wave, storm, and flood), chemical (e.g. contamination) or biological (e.g. invasive species introduction) stress. A resilient system is one that can rebound. A non-resilient system is one that degrades. Much of OGL’s work of late has concentrated on the structures and functions that create resiliency for water-related systems. In some manner, resilience is the opposite of risk. A resilient system has lower risk. A non-resilient system is high risk and high cost.

Nested scale is another system characteristic that frames our management point of view for the Great Lakes. This means that not everything is either small or large, rather the small is nested within the large – like Matryoshka dolls. The Great Lakes are a huge connected hydrological system to be sure – 20% of the world’s freshwater. But this statement does not do justice to the fact that the system is also made up of many very small watersheds and connected groundwater systems. That seeming abundance is not evenly distributed across the state or region. Even though the Great Lakes are vast, there are places where there is scarcity. In particular, groundwater is less abundant in some parts of the state than others.

## The Unique Challenge of the Great Lakes Cont.

Thus, it is in dynamic, complex, resilient and nested scales that we must position our work on the protection of the Great Lakes and in the restoration of its degraded or stressed pieces. This is not simple work and it is not work we undertake alone. One of the great hallmarks of the Great Lakes for many decades now is that we seek to manage this system in partnership with governments, citizens, organizations, businesses, and advocates. It is the human element that provides the backdrop for the connection between a healthy functional system and human wellbeing.

One more element makes managing the Great Lakes challenging: measuring how well our investment in and for the Great Lakes and all its citizens creates value. We need to build better information systems to be able to attribute investment to outcomes. Our vision is to be able to understand the lakes’ dynamics, complexity, and resilience in multiple scales and in real time – and to devise management schemes to build value. Failure to understand this system will inevitably erode value. To grasp this, we must focus on informational flows that capture not only the ecological state and condition of our lakes, but also the economic, social, and cultural values we realize from these waters.



# 30th Anniversary Retrospectives

## Reflections on the Office of the Great Lakes

J. D. Snyder – OGL Director 1989-1990

*Project Director*

*Michigan State University*



Michigan is defined by water, with its two peninsulas virtually surrounded by sweetwater seas and a wealth of inland lakes, rivers, and streams. Our state is indeed the Water Wonderland!

The Great Lakes—the crown jewels of our water resources—provide bountiful fisheries, white sugar beaches and dunes, and a cheap means of transport for iron ore, coal, stone aggregates, and other bulk materials. Whether it's fishing, swimming, boating, sailing, underwater diving, or taking a quiet walk at sunset along our endless shorelines, the lakes drive our passion for taking care of our state and the blessings of our natural resources. Protecting, preserving, and enhancing the Great Lakes waters is what motivated state leaders to establish the Office of the Great Lakes in 1985.

Michigan voters overwhelmingly approved the \$800 million Protect Michigan's Future bond proposal in 1988. Among many beneficial environmental protection projects, \$25 million was allocated to pay Michigan's share of the Great Lakes Protection Fund. This innovative research fund was one of the provisions of the Toxic Substances Control Agreement.

This was a time that multi-state and multi-provincial Great Lakes regional collaboration intensified. Building on the 1955 Congressional Compact of the Great Lakes Commission and the Great Lakes Fisheries Commission, the governors of the six upper Great Lakes states (Michigan, Ohio, Wisconsin, Minnesota, Indiana, and Illinois) formed the Council of the Great Lakes Governors in 1982, and the New York and Pennsylvania governors joined shortly after. The eight governors worked collaboratively and signed two important regional agreements: the Great Lakes Charter in 1985 and the Toxic Substances Control Agreement in 1986.

The historic Great Lakes Charter provided a regional pact and structure to prohibit diversions of Great Lakes waters outside of the Great Lakes Basin. The charter mandated that the consent of all the Great Lakes governors was needed to allow any new diversions of Great Lakes waters above the threshold of 5 million gallons per day. An accompanying management structure also was established, requiring the Great Lakes states to collect data on the volumes of water withdrawn from the states to support informed water resource management. As the director of the Office of the Great Lakes, I worked closely with then-State Representative Debbie Stabenow and then-State Senator Nick Smith (both went on to serve in the U.S. Senate and U.S. House, respectively) to enact water use reporting legislation that Governor Blanchard signed into law in late 1990. I was particularly proud of the work of the Office of the Great Lakes in the passage of this vital water management legislation to protect our precious Great Lakes.

The 1986 Toxic Substances Control Agreement Great Lakes established the Protection Fund, which consisted of two components: the regional fund administered by the Great Lakes Protection Fund office in Chicago, and the state fund administered by the Office of the Great Lakes. Michigan voters went on to play a direct role in the auspicious start for this innovative and permanent research fund by approving the Protect Michigan's Future bond proposal on the 1988 statewide ballot. To implement the state fund, a blue ribbon advisory committee was brought together to evaluate and rank the proposals received in the state fund's first year of operation.

## Reflections on the Office of the Great Lakes *Cont.*

Supported Great Lakes Protection Fund proposals in the first round of 1990 included:

- Establishing a model local emergency preparedness plan for oil spills on the Great Lakes and evaluating emergency preparedness on the Lake Michigan shore from Frankfort to the Straits of Mackinac, including Grand Traverse Bay;
- Investigating background levels of atmospheric pollutants in Sault Ste. Marie, Grand Traverse Bay, and Saginaw Bay to better understand their impact on the Great Lakes ecosystem;
- Measuring state residents' Great Lakes fish consumption to target fish consumption advisories to high-risk groups;
- Determining the long-term effects of Great Lakes fish consumption on reproduction and central nervous systems of mice to better understand the human impacts;
- Developing rapid and inexpensive methods for measuring toxic substances in fish, wildlife, and other suspected contaminant sources;
- Examining the role of zebra mussels (that had been recently identified in the Great Lakes at that time) in the assimilation, metabolism, and excretion of toxic PCBs;
- Comparing the contaminant exposure of people who have eaten large quantities of Great Lakes fish to other state residents;
- Evaluating the fate of PCBs in sediment to better understand PCB hazards.



## Guest Address at the Great Lakes Commission 60th Anniversary Celebration

**G. Tracy Mehan, III – OGL Director 1993-2001**

American Water Works Association

Executive Director, Government Affairs

American Water Works Association, September 28, 2015



Whenever I come to Chicago and the Great Lakes region, I am overwhelmed with fond memories. Not only did I have the pleasure of working on Great Lakes issues for many years, but I also had the good fortune in marrying a proud native of Wisconsin who grew up on the shores of Lake Michigan. Chicago, a city which gets better and better with each visit, is a great place to gauge the progress we have made in protecting the waters of the United States and the Great Lakes.

Upton Sinclair's famous muckraking novel, "The Jungle," excoriated conditions in the Chicago stockyards and packing houses of that era. There you will find this description of a body of water surpassing even the Cuyahoga River in terms of past degradation:

"'Bubbly Creek' is an arm of the Chicago River, and forms the southern boundary of the yards; all the drainage of the square mile of packing houses empties into it, so that it is really a great open sewer a hundred or two feet wide. One long arm of it is blind, and the filth stays there forever and a day. The grease and chemicals that are poured into it undergo all sorts of strange transformations, which are the cause of its name; it is constantly in motion, as if huge fish were feeding in it, or great leviathans disporting themselves in its depths. Bubbles of carbonic acid gas will rise to the surface and burst, and make rings two or three feet wide. Here and there the grease and filth have caked solid, and the creek looks like a bed of lava; chickens walk about on it, feeding, and many times an unwary stranger has started to stroll across, and vanished temporarily. The packers used to leave the creek that way, till every now and then the surface would catch fire and burn furiously, and the fire department would have to come and put it out."

Conditions such as these are unimaginable today, even on Bubbly Creek where you can now spy an occasional four-pound Coho salmon or buy a million-dollar residence. Former U. S. EPA Administrator Bill Ruckelshaus is reported to have said that even if all our waters are not fishable or swimmable, at least they're not flammable.

But, you have done better than that. In August 2006, lake whitefish, the number one commercial fish in the Great Lakes and a key indicator of water quality, returned to the Detroit River. They were found spawning there for the first time since 1916.

The Detroit River lost this valuable fishery due to a witch's brew of oil, phosphorus, mercury, and organochlorine pollution over many years. Relative to 1972 levels, oil and phosphorus pollution levels are down 98 percent and 95 percent respectively. Mercury contamination in fish tissue is down 70 percent, and PCB contamination is down 83 percent as measured in herring gulls from a nearby island.

The Detroit River now has naturally reproducing populations of peregrine falcons, lake sturgeon, and bald eagles, not to mention a world-class walleye fishery for which it shares honors with Lake Erie, itself once declared dead or dying. And, just two weeks ago my cab driver, Kevin, in Erie, Pennsylvania, was marveling at the luck local fishermen are having catching naturally reproducing lake trout again.

It is important to recall these successes for our children's and grandchildren's sake especially and avoid the corrosive cynicism and hopelessness that so often tinges debate over policy in this country. We have it within our power to improve human health and the natural world.

## Guest Address Cont.

As the Greek philosopher, Heraclitus once said, "Sit flux" – all is flux, all is change. You never put your foot in the same river – or lake – twice. Society, ecosystems, economies are dynamic and continually present new challenges demanding adaptation, resilience, judgment and wisdom from all of us, individually and collectively.

And there are challenges aplenty: a changing and variable climate generating extreme wet weather events that require new infrastructure investments, both gray and green; nutrient pollution from unregulated agricultural sources that create situations like those we find in Toledo, Saginaw Bay, and estuaries around the globe; the continuing scourge of invasive species; and the inevitable pressures of a growing population and, please God, economy.

The late Peter Drucker, the greatest of America's management theorists (although he was Viennese by birth), is always worth studying during times of institutional change, be it commercial, non-profit, or governmental. Drucker claimed that successful leaders do not ask, "What do I want to do?" They ask, "What needs to be done?" And of those things that would make a difference, "Which are right for me?" He maintained that leaders don't tackle things they aren't good at. But, Drucker also insisted on what has been characterized as "creative abandonment." As Drucker put it: A critical question for leaders is, "When do you stop pouring resources into things that have achieved their purpose?"

Given our limited time here together, let me try to offer a broad conceptual framework for optimizing or prioritizing your work going forward.

With respect to our great ecosystems, the Great Lakes most notably, I find myself envisioning one of those Venn diagrams with which teachers used to torment you in grade school. My Venn diagram, like most you see, is made up of three overlapping circles. The first circle represents water, or H<sub>2</sub>O. The second represents nutrients – N or P for nitrogen and phosphorus. The third circle represents the carbon cycle, or CO<sub>2</sub>.

All three of these circles represent natural cycles that are highly dynamic, if not approaching non-linear, often chaotic, status in terms of the Great Lakes as well as the global ecosystem. We have continually disrupted the hydrologic cycle or natural flow regime with everything from dams to impervious surfaces and now climate variability. Certainly, the nutrient cycle is out of control even after our multi-billion dollar investments in end-of-pipe treatment. We now have to deal with unregulated, nonpoint source agricultural runoff, say, from row crop agriculture and deforestation. Finally, the carbon cycle is disturbed, with carbon now at 400 parts per million in the atmosphere. We can have a legitimate debate as to our relative investments in either mitigation versus adaptation and resilience planning. I lean heavily toward the latter because managing water and aquatic resources cannot wait for mitigation efforts to yield any results in a meaningful time period. We have to start adapting now.

These three circles or cycles – water, nutrients, carbon or climate – overlap substantially. We need to look carefully at the overlapping areas, so to speak, and discern those opportunities where we can leverage our limited resources by addressing all three circles simultaneously. This way you can achieve multiple benefits or synergies in an integrated or systems approach.

To give one example, reducing nutrient application in farming will improve water quality and also reduce nitrous oxide that is a very intense greenhouse gas, 319 times as much as carbon. One can imagine a water quality trading system that yields financial benefits for farmers while improving water quality; reduces greenhouse gas emissions; and, depending on the management practices utilized, restores a more natural hydrologic regime. Reforestation is another example, really a no-brainer. You improve water quality, restore the natural flow regime, sequester carbon and create habitat. These are simple examples.

My aim is to suggest a strategic approach to structuring your work and prioritizing your investments of time, money and political capital in those projects of greatest economic, environmental and social benefit.

The Great Lakes community leads the world in innovative approaches to watershed management. Going forward, I am confident that it will continue to do so in the 21st century.

\*Edited excerpt from Great Lakes Commission 2015 Annual Meeting & 60th Anniversary Celebration address

## The Great Lakes Compact

### Ken DeBeaussaert - OGL Director 2003-2010



It is no coincidence that the creation of the Office of the Great Lakes in 1985 parallels some of the first discussions on regional water management.

As fears of proposals to divert Great Lakes water to other parts of the U.S. rose, Governor William Milliken brought the eight Great Lakes Governors together at Mackinac Island in 1982. Those discussions ultimately led to the creation of the Great Lakes Charter, signed by Governor James Blanchard in 1985, and his formation of the Michigan Office of the Great Lakes. The charter called for a common commitment among member states to manage large water withdrawals and share information about water use. States began to share water usage data, but implementation of water management programs lagged in some states, regrettably, including Michigan.

Perhaps this happened because Great Lakes members of Congress passed legislation to allow Great Lakes Governors the right to veto any diversion proposals without addressing in-basin usage. While the Water Resources Development Act process was used for some time, its durability and effectiveness was called into question when the provincial government of Ontario gave preliminary approval for Great Lakes water to be shipped by tankers out of the Great Lakes. Since it involved a Canadian province, the Great Lakes Governors had no say in the "Nova" proposal.

This challenge set into motion new discussions, and Governor John Engler and colleagues signed a new Annex to the Great Lakes Charter in 2001. The Annex called for the creation of permanent, binding agreements among the states and inclusion of the provinces of Ontario and Quebec.

To fulfill the Annex directives, a working group of policy and technical representatives from the states and provinces, staffed by the Council of Great Lakes Governors, toiled to reach common understandings and agreements. To assist in the effort, the working group sought input from a group of representative stakeholders as well as resource groups from federal and international organizations. The working group held separate discussions and consultations with governments of tribes and first nations. Staff kept Congressional staff informed, as the Compact would require Congressional approval. The meetings were frequent, long, and sometimes contentious. The group shared a common goal, but had different visions of how to achieve it.

Finally, in December 2005, Governor Jennifer Granholm and other Great Lakes Governors and Premiers signed the newly developed agreements to protect the Great Lakes from threats of diversion and manage water use within the basin. The pacts were a good-faith state-provincial agreement, coupled with a binding U.S. Compact. By 2008, the Compact had become law in eight states, won Congressional approval, and featured President George W. Bush's signature.

The new Compact prohibited diversions of Great Lakes waters, with strictly regulated exceptions. In addition, each jurisdiction committed to using a common standard to ensure that overall in-basin uses were reasonable and would not result in significant impacts to the waters and water-dependent resources of the basin. Each party committed to developing conservation programs for water users based on agreed upon goals and objectives. And, a regional body consisting of the eight Great Lakes states and two Canadian Provinces now convenes regularly to review progress on conservation and water withdrawal programs, study the cumulative impacts of water withdrawals, and conduct other reviews based on scientific advances.

The agreements represent better, stronger protections for the Great Lakes because thousands of citizens from across the region took the time to attend meetings and express their concerns. Whether acting on their own or on behalf of industry, agriculture, municipal water systems, local government or environmental organizations, all those Michigan citizens who took the time to be part of this historic process should be proud of the compact's passage and continued existence.

As the 1985 Great Lakes Charter stated, "The waters of the Great Lakes Basin are interconnected and part of a single hydrologic system." The waters pay no allegiance to human-made boundaries or partisanship. The non-partisan, bi-national approach used in developing the agreements represents a united commitment to ensure that the Great Lakes will be protected for our enjoyment and use for generations to come.

# Chapter I

## Strategies

### Sustaining Michigan's Water Heritage

Emily Finnell

Office of the Great Lakes, MDEQ

Michigan is defined by its water, with four Great Lakes, more than 11,000 inland lakes, 76,000 miles of rivers and streams, 6.5 million acres of wetlands and more than 3,200 miles of freshwater coast.

Recognizing the importance of water to Michigan, in his Special Message on Energy and Environment two years ago, Governor Snyder posed a very simple question, "We have all this water. What's our strategy?" He called upon the Office of the Great Lakes to lead the development of a comprehensive water strategy for the state. He provided three guideposts – use an ecosystem approach, enhance Michigan's economic opportunities, and strengthen connections to place.

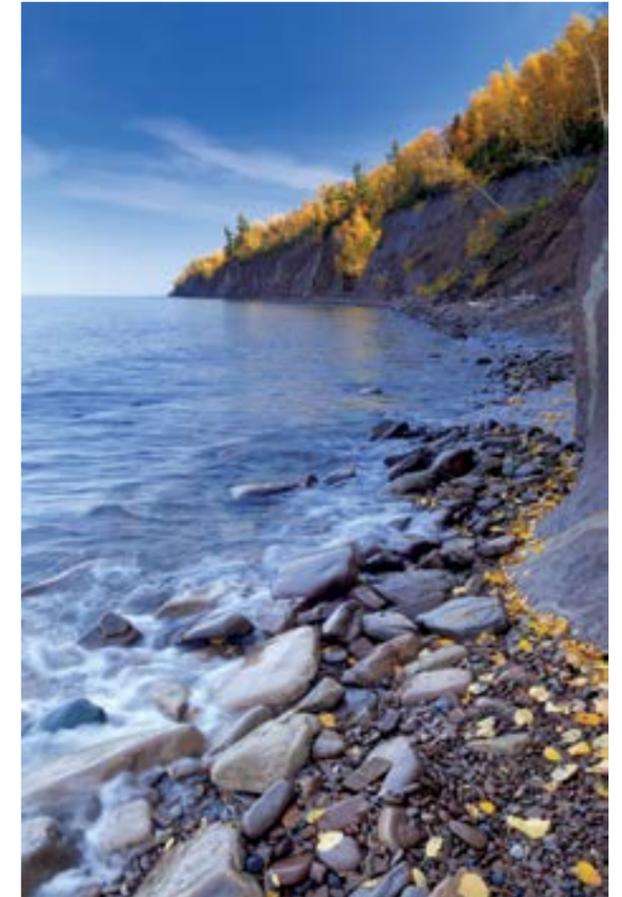
In June 2015, the OGL released the draft Water Strategy, Sustaining Michigan's Water Heritage, A Strategy for the Next Generation, for review and comment. The water strategy was developed with a collaborative outreach and engagement plan involving tribal governments, diverse groups and individuals as well as communities and regions across the state. As part of the development process, the OGL formed a multi-agency steering committee that developed draft visionary goals and long-term desired outcomes. Over the course of two years, the OGL formed an ad hoc external advisory group called the Water Cabinet, engaged subject matter experts, hosted numerous regional and community conversations, and participated in hundreds of presentations and conversations to inform development of the draft strategy.

The draft water strategy provides a roadmap for the future of Michigan's water use that builds economic capacity while sustaining the ecological integrity of the resource and ensures that water resources are protected, valued and cared for by present and future generations. This strategy is not a specific action plan for government. It is a strategy for the people of Michigan, knowing that together we can drive actions forward and have a collective impact on the future for Michigan.

While not specifically focused on the Great Lakes, the strategy instead encompasses all of Michigan's water resources -- surface, groundwater, lakes, rivers, and connecting channels. The strategy presents a 30-year vision for water: That Michigan's water resources support a healthy environment and healthy citizens, vibrant communities, and sustainable economies.

The strategy takes an ecosystem approach in the belief that all values associated with water – economic, environmental, social, and cultural – are equally important. It also builds on many existing principles, some of which are housed within the Great Lakes-St. Lawrence Compact Agreement and decades of work to rebuild towards healthy aquatic systems and clean water.

The strategy highlights the most pressing issues that must be addressed to ensure Michigan's water resources support healthy ecosystems, communities, and economies. It charts a course by presenting strategies for achieving this vision and provides recommendations for how to meet those challenges and opportunities. To that end, the strategy is aspirational and ambitious, and yet recognizes that decisions made now regarding infrastructure, technology, monitoring, and water literacy will set the course for decades.



## Sustaining Michigan's Water Heritage *Cont.*



The strategy includes 62 priority recommendations structured around nine goals designed to drive performance and behavior change across the landscape. The nine overarching goals are based on recurring themes from the hundreds of conversations held across the state:

- Protect and Restore Aquatic Ecosystems
- Ensure Clean and Safe Waters
- Create Vibrant Waterfronts
- Support Water-Based Recreation
- Promote Water-Based Economies
- Invest in Water Infrastructure
- Monitor Water Quality
- Build Governance Tools
- Inspire Stewardship for Clean Water

As part of the public release of the draft strategy, the OGL reconvened regional and community conversations around the state to provide an opportunity for feedback and to discuss opportunities for leadership and ownership by others on implementation. Hundreds of people participated in these conversations, and over 150 written comments were received, with more than 750 verbal comments.

As a result, implementation efforts have already begun even while the strategy is still in draft form. For example, the Michigan Coastal Zone Management Program has committed over \$1 million to support development and enhancement of water trails along the coast. The Saginaw Chippewa Indian Tribes have identified specific actions they will implement for each of the strategy recommendations. In April 2016, MDEQ working in partnership with Michigan Water Environment Association (MWEA) will host a leadership summit to explore opportunities to rethink traditional wastewater treatment facilities to promote resource recovery, recycling and conservation in the areas of biosolids, nutrients and energy.

Many other efforts and initiatives are also underway furthering progress toward achieving the goals and outcomes in the strategy. A final strategy is being developed and expected to be released in 2016.

## Consumers Energy is Charting a Fresh Course for Muskegon Lake's Ports

### Dennis Marvin

Communications Director  
Consumers Energy

### Casting a New Vision

The Port of Muskegon has provided safe harbor from the elements on Lake Michigan for decades. Now, Consumers Energy is working to help the port remain prosperous in its hour of need.

The company imports more than 640,000 tons of coal each year to its B.C. Cobb generating plant on the east end of Muskegon Lake, which is connected by channel to Lake Michigan.

The coal, delivered to the harbor by lake freighters, comprises roughly two-thirds of the port's shipping activity. However, Consumers Energy will suspend operations at the Cobb plant by April 2016. Now, the company is working with Muskegon-area officials to offset the loss of the coal shipments through the Port of Muskegon.

"The Port of Muskegon is the only commercially viable port on the Lake Michigan side," community engagement manager Dennis Marvin said. "Certainly there are great opportunities for this area to be positioned as a major logistics center for Michigan's manufacturing and agricultural sectors."

### Dreams for the Future

The company has funded studies to analyze new uses for the Cobb site and dock, and to determine how the port can make new shipping connections to Europe and Asia.

Consumers Energy also is helping regional community leaders find new solutions to market and manage the port and reimagine the potential for Muskegon Lake, which has grown steadily cleaner over the decades.

Increasing port activity after the Cobb plant closes is crucial to the region's economic success.

During the summer months, Consumers Energy supported a series of public forums designed to gather community feedback and create a vision for Muskegon Lake in the coming decades. Discussions focused on the lake's environmental, recreational, commercial, and residential future.

"Consumers Energy has helped the community look at the closure of the plant as an opportunity and imagine the vision we're trying to create," said Erin Kuhn, executive director of the West Michigan Shoreline Regional Development Commission. "The plant closing is definitely an obstacle. But it's something that can have a positive outcome."

With support from Consumers Energy, local leaders from Muskegon attended a national workshop in November to help reimagine their economic future after the Cobb plant closes.

The Innovation Challenge, hosted by the National Association of Counties, was a three-day event in West Virginia designed to support county and regional leaders in coal-reliant communities with retooling their economies to become more resilient to changing conditions.

The U.S. Economic Development Administration also supported the event to help community leaders consider new strategies for job creation and business growth.

## Consumers Energy is Charting a Fresh Course for Muskegon Lake's Ports *Cont.*

### Leaving It Better

Consumers Energy also has commissioned end-use and environmental impact studies and is exploring alternative uses for the plant property.

"We won't just walk away," decommissioning program manager Keith Welcher said. "We've got a good longstanding corporate citizenship program with Muskegon and we're determined to make sure that continues after the plant closes."

The primary recommendation is to focus on commercial development in the Port of Muskegon. "In the long term, this could involve a wide variety of options, from agri-business to container-type shipping," Marvin said. "In the short term, while the public and private sectors work to market the Port of Muskegon across the Great Lakes and beyond, increased shipping of aggregate materials and other products that are shipped on a demand basis are seen as an important measure to keep Muskegon a commercially viable Great Lakes port."

The final Great Lakes coal freighter delivering coal came through the Port of Muskegon and arrived at the Cobb plant in early November 2015.

The 1,000-foot M/V James R. Barker docked at the plant following a ceremonial escort across Muskegon Lake and a hearty welcome by Muskegon-area residents, completing a two-and-a-half day voyage from Superior, Wisconsin.

The freighter delivered more than 59,000 tons of low-sulfur Western U.S. coal, which provides the Cobb plant enough fuel to continue operations until its scheduled shutdown. The Cobb plant has provided reliable, affordable electricity to Michigan residents since 1948.

"This is a bittersweet occasion for Consumers Energy and the hundreds of current and retired Cobb employees who have worked safely to provide power to our customers," said Timothy Sparks, the company's vice president of energy supply operations.



## The Importance of the Great Lakes to Michigan Tourism

Dr. Sarah Nicholls

Departments of Community Sustainability and Geography  
Michigan State University

### Tourism in Michigan

Tourism is one of Michigan's largest industries. In 2014, visitors to Michigan spent \$22.8 billion throughout the state, generating nearly \$2.4 billion in state/local and \$2.5 billion in federal tax revenue. This tourism activity created direct employment opportunities for more than 214,000 Michiganders, jobs that can never be outsourced to another location. If the tourism industry did not exist in Michigan, the cost to each household would be in the order of \$640 additional tax dollars per year (Tourism Economics, 2015).

The state's natural resources feature prominently in the award-winning Pure Michigan campaign, with many of those ads highlighting the Great Lakes and their beaches. These settings are also home to a multitude of cultural and heritage resources that travelers enjoy (Figure 1).

The 2014 Michigan Tourism Advertising Evaluation and Image Study (Longwoods International, 2015) highlights the importance of Michigan's water-based activities as strengths in the regional and national travel markets. In a survey of approximately 2,000 American travelers from Illinois, Indiana, New York, Ohio, Pennsylvania and Wisconsin, four of Michigan's top ten image strengths were water-related (Figure 2). When asked to compare Michigan to its regional competition, participants rated water-related items even more strongly, giving them four of the top five slots.

Though Michigan's image is weaker in all aspects in the national market, water-related activities still rank highly (Figure 4), and all four of the reported strengths relative to the national competition pertain to the state's water-based recreation opportunities.

### The 2012-2017 Michigan Tourism Strategic Plan

Recognizing the need to continue to grow the tourism industry in a sustainable manner, a five-year Michigan Tourism Strategic Plan (MTSP) was developed in 2012 with input from more than 1,000 industry stakeholders from all sectors of the industry and all areas of the state (Nicholls, 2013). The MTSP's vision is that Michigan be recognized as one of America's favorite four-seasons travel experiences. Now, a committee of industry volunteers is working toward each of the eight MTSP goals and their associated objectives. At its core, the MTSP recognizes the need to deliver a travel experience that meets or exceeds the very high expectations set by the success of the Pure Michigan campaign.

Figure 1. Tourism Economics. 2015. The Economic Impact of Travel in Michigan: Tourism Satellite Account Calendar Year 2014. Philadelphia, PA: Tourism Economics. Michigan Tourism Connections to Our Water Resources



# The Importance of the Great Lakes to Michigan Tourism Cont.

One of the eight MTSP goals is that Michigan’s tourism industry be internationally recognized for our stewardship of – and rich opportunities to experience – our natural, cultural, and heritage resources. A recent survey of industry members revealed that water-related issues – including the spread of invasive species, and the quality, diversion and levels of our lakes, rivers, and streams – are some of the most critical issues perceived to be facing tourism in the state.



Holland State Park

As a result, the MTSP was presented at the 9th Biennial State of Lake Michigan/15th Annual Great Lakes Beach Association Joint Conference, held in Traverse City in October 2015, to identify opportunities for collaboration. Industry members have actively advocated for legislation protecting the Great Lakes from aquatic invasives; similarly, in 2015 the industry has supported the passing of legislation banning the continued production of harmful microbeads. In 2016, the inaugural Pure Award, designed to recognize innovative tourism industry efforts to keep Michigan’s resources and environment pure, will be presented at the Governor’s Conference on Tourism.

Another MTSP goal is to enhance infrastructure to support the delivery of a world-class Pure Michigan travel experience. Vibrant waterfronts – and the setting for recreation and entertainment that they provide –

are the most critical focal point of Michigan’s coastal towns. Another increasingly recognized element of tourism infrastructure is the state’s many and varied trails, including the fast-growing segment of water trails. Water trails are the aquatic equivalent of hiking/biking/equestrian trails, providing opportunities for canoeists, kayakers, and other small craft to enjoy linear journeys along and across lakes, rivers, canals, and bays. Just as is the case for land-based trails, water trail users enjoy the natural, cultural and historical attractions highlighted along the trail, and appreciate easy access to restaurants, bars, shops, lodging places and other amenities. Given its Great Lakes coastline and vast length and number of inland rivers, streams and lakes, Michigan is well positioned to become a leading water trail destination.

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# The Importance of the Great Lakes to Michigan Tourism Cont.

Figure 2. Michigan’s Top Ten Image Strengths in the Regional Market

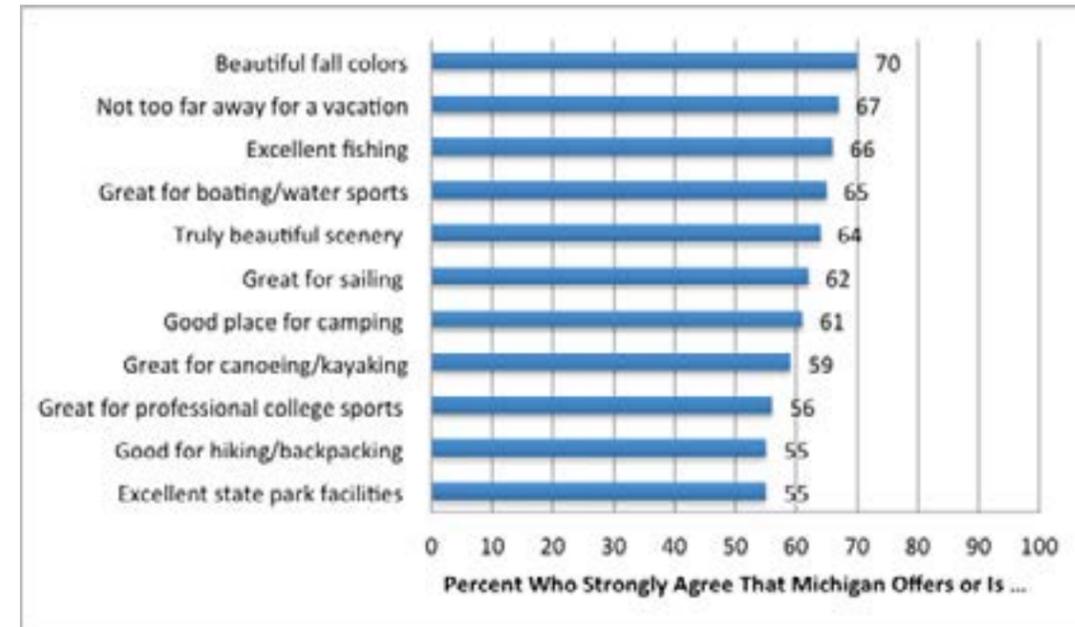
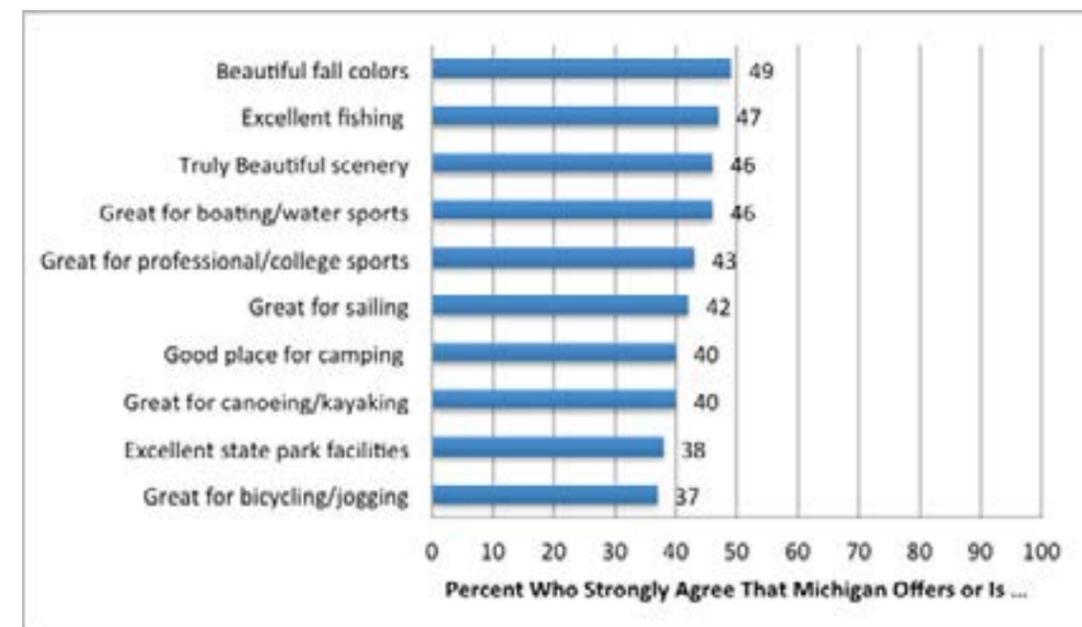


Figure 4. Michigan’s Top Ten Image Strengths in the National Market



# Chapter 2

## Partnerships

### Decade-Long, Science-based Partnership Spawns Fish Habitat Restoration in Two of Michigan's Great Lakes Areas of Concern

**Mary Bohling**

Educator, Michigan Sea Grant  
Michigan State University Extension



It was just before Thanksgiving 2001 when Michigan Sea Grant was asked to take the lead on a potential project in the Detroit River. On the surface it was a simple, one-time chance to construct habitat in the river to restore native fish populations. Sea Grant, Michigan State University Extension, United States Geological Survey (USGS) and others had a limited time to put together a team and to come up with a proposal. From the beginning, the team agreed that performing assessments, before and after the restoration work, was critical to the viability of the project. The team carefully considered where to put rocks, place them specifically, and record what happened. The team approached this effort as an experiment because they were uncertain about what would work.

That meant the team approached the project in two ways. As a research project, they asked, what would happen if? As a restoration project, they said, here's an existing population of sturgeon and other native fish spawning on similar rock types. If the team could build spawning habitat in the right areas, out of the right materials, would the populations sustain and grow?

Starting out, the team did not know what kinds of rocks to use, or what size. They did not know where a reef should go. Meeting spawning requirements is one thing, but when the fish hatch they need a hospitable environment to hide, feed and grow. When they get bigger, they have to avoid poaching and survive to spawn. The post-restoration assessment work would help figure out all of those factors.

The assembled team, consisting of scientists from the USGS, U. S. Fish and Wildlife Service, Michigan Department of Environmental Quality and Michigan Department of Natural Resources as well as others, had decades of experience working with fish and aquatic habitats.

After a significant assessment, lining up the science, laying out objectives, and research on spawning and juvenile fish survival needs, the team built reefs. In 2004, they installed a series of rock reefs in the Detroit River near Belle Isle. The reefs were created with different sizes and types of rocks to learn what might draw the most fish and then monitored for spawning activity.

At the time, no one knew that these initial reefs off Belle Isle and the science-based partnership that was created would become the foundation for a long-term fish spawning habitat restoration initiative in both the St. Clair and Detroit River Areas of Concern (AOCs). The 1987 version of the Great Lakes Water Quality Agreement between Canada and the U. S. identified 43 geographic areas in the Great Lakes Basin (including 14 in Michigan) where changes in the chemical, physical or biological integrity of the water resulted in severe environmental degradation.

Since 1987, these AOCs have been the focus of cleanups throughout the Great Lakes basin, with progress measured by the number of Beneficial Use Impairments (BUIs) restored. These impairments include restrictions on fish and wildlife consumption, beach closures, and drinking water restrictions.

## Decade-Long, Science-based Partnership Spawns Fish Habitat Restoration in Two of Michigan's Great Lakes Areas of Concern *Cont.*

Local stakeholder-driven plans for removing the fish- and wildlife-related BUIs in the St. Clair and Detroit Rivers include several fish spawning habitat restoration projects. In an effort to implement the BUI-removal plans, the reef team partnership that worked on the 2004 Belle Isle reef installation identified three suitable sites in the St. Clair AOC and four additional sites in the Detroit AOC. These sites became part of each AOCs list of projects that, when completed, would demonstrate enough fish spawning habitat restoration to compensate for some of the historical habitat losses and lead to the BUI removal.



Young sturgeon



Along the way, the team added partners such as the University of Michigan Water Center, hydrologists, the local Sturgeon for Tomorrow chapter, and the Lake Carriers Association. Contributions from these new partners added to the team's understanding of the reefs and how native fish used them while also increasing opportunities for public outreach and engagement.

By the end of 2015, the three St. Clair AOC projects (Middle Channel, Harts Light, and Pointe Aux Chenes) and two of the four Detroit River AOC projects (Fighting Island and Grassy Island, along with a test reef near Fort Wayne) were all constructed.

Planning, including pre-construction monitoring, for a Belle Isle reef expansion and full-sized Fort Wayne projects will be explored in 2016 with future construction, where suitable.

Post-construction evaluation of all sites continues to provide valuable information towards adaptive management for the partnership.



## Building a Network of Coastal Water Trails

**Cheri Meyer**

Public Access/Water Quality Specialist  
Office of the Great Lakes, MDEQ

The Great Lakes are an integral part of the history, culture and community of our wonderful state. In 2012, the Michigan Coastal Zone Management Program (MCZMP) saw a need to bring awareness to this amazing resource we share and enhance recreational opportunities for residents and visitors to our coastal communities. This was realized with the implementation of the Great Lakes Water Trails Initiative. This initiative centers on the MCZMP partnering with local communities and organizations to promote and enhance water trails in Michigan's coastal areas.

The MCZMP, housed within the Office of the Great Lakes, promotes wise management of the cultural and natural resources of Michigan's Great Lakes coast. With our local, state and federal partners, the MCZMP supports creative coastal projects to foster productive coastal ecosystems, and resilient, vibrant and sustainable coastal communities.

In 2013, Phase I of the initiative awarded over \$342,000 in Coastal Zone Management grants to 10 coastal communities, nonprofit organizations, and universities for projects that comprehensively planned, mapped, and marketed local, regional or statewide coastal water trails along the Great Lakes. In 2014, the office launched Phase II, which provided over \$184,000 in additional grant funding for the implementation of water trail plan recommendations.

Funded projects have been both diverse and innovative. One pivotal project is the development of a Michigan Great Lakes Water Trails website, [www.michiganwatertrails.org](http://www.michiganwatertrails.org). Through the convenience of a computer or mobile device, water trail enthusiasts can now obtain statewide water trail information and resources, including site amenities, local attractions, and weather and safety information. Created by the organization LIAA, the site is updated as new water trails are created and has been adopted by the State of Michigan to showcase our amazing resource.

In addition to these great projects, the Great Lakes Water Trail Initiative sparked a momentum that expanded our partnership to the state level with our sister agency, the Michigan Department of Natural Resources. In 2014, the MCZMP was excited to contribute to the recreational opportunities offered at Belle Isle State Park by supporting the construction of two new kayak launches, connector pathways, and a picnic shelter. The launches will be used by visitors to explore the island's waterways and the Detroit Heritage River Water Trail. In 2015, we continued our partnership by providing resources to create a Belle Isle State Park Trails Master Plan, which is currently under development. The plan will identify gaps in the existing trail system and determine the location of trails, trailheads, and site amenities. As the southern terminus for the Iron Belle Trail, a statewide trail traveling 1,000 miles from Detroit to Ironwood, the Master Plan will develop the park as a regional trail hub, connecting it to the region's trail system.

In 2015, the MCZMP focused on the importance of connecting coastal water trails with tourism opportunities. This led to a special call for projects in June to place an enhanced emphasis on the promotion of coastal community trails and trail towns. Trail towns is a tourism development approach that builds the connection between "trails and town" for recreation, economic, and tourism benefits by using local and regional recreational trail systems as the focus for community re-engagement, economic revitalization, and resource stewardship. As well as the development of Trail Town Master Planning documents, which provide a framework for implementing the trail town program, projects funded under this round of grants include the development of a statewide water trail manual, which will be a "how to" guide to aid communities in developing a water trail.

The work MCZMP has been doing to enhance and promote water trails directly supports the goals of the Michigan water strategy, called for by Governor Rick Snyder in 2012. Jon Allan, Director of the Office of the Great Lakes, said, "Promoting and enhancing water trails and trail towns continues to be a priority of the Coastal Management Program and directly supports the development of a designated statewide water trail system, as recommended in Michigan's draft Water Strategy."

As part of the water strategy, the MCZMP has placed special emphasis on the promotion of water trails by directing over \$1 million in grant funding to develop and enhance approximately 1600 miles of water trails along Michigan's Great Lakes coastline. The MCZMP is proud to continue our partnership with coastal communities and organizations to develop a designated coastal water trail system.

# Great Lakes Islands

**Matt Preisser**  
 Lake Coordinator  
 Office of the Great Lakes, MDEQ

An astounding number of islands – more than 32,000 – exist in the Great Lakes. These range from small exposed rocks to Lake Huron’s Manitoulin Island, the largest freshwater island in the world. The far majority are small and uninhabited; some actually come and go with fluctuating Great Lakes water levels.

While scientists have long appreciated the biological value of these remote places, some are special for an entirely different reason: the unique communities of people that live, work, and play on them. The number and diversity of “peopled” islands in the Great Lakes is not widely known or appreciated, save for a few notable examples. One can even find an astonishing number of Great Lakes maps where the major populated islands are completely missing – imagine seeing a map with blank white space where your mainland town should be!

It is rare that one can stump a Great Lakes management crowd with a Great Lakes trivia question. At a recent conference, I posed the following question to a room full of managers, researchers, and advocates from around the Great Lakes basin: “How many Great Lakes islands contain year-round communities of at least 50 people?” The answers were varied, ranging from none (the “trick question” answer) to five.

The answer: roughly 26 islands (the qualifier “roughly” owing to the vagaries of assessing head counts on these unique rural landscapes). I was struck by the low guesses and number of dropped jaws, given that these were people that study the Great Lakes for a living.

The permanently populated islands can be found in all five of the Great Lakes, plus the connecting waters and the St. Lawrence River system. They have amazing histories going back centuries, many with early settlement by Native Americans, periods of conflict, and fluctuating dependence on things like timber, fisheries, and tourism. On these islands, it is not uncommon to find families that have lived for three or more generations.

Of course, island communities are much more than an answer to a trivia question. There are a number of challenges unique to living on an isolated, remote, rural community surrounded by water. But because island communities are, at best, poorly understood and under-appreciated – or at worst, largely forgotten or ignored – the implication is that some of their needs are underserved.



Beaver Island, Matt Preisser



Beaver Island, Matt Preisser



St. James Boat Shop, a local shop run on Beaver Island using 100% island resources

Though Great Lakes island communities are very different from one another, the one thread that ties them all together is isolation. While some of the peopled islands have permanent bridges or tunnels, most are accessible only by boat or air. It is not uncommon for these communities to become ice-locked for months at a time due to the freezing over of the Great Lakes.

Present-day challenges facing island communities are varied, interrelated, and complex, spanning the social, cultural, economic and environmental spectrum. They include developing coastal resources sustainably, providing reliable and affordable energy for residents, managing waste, expanding communications infrastructure, improving access and quality of rural health care, and providing quality K-12 educational experiences for island children. Though many mainland communities face similar challenges, the risks and implications are amplified on islands.

Underlying each of these challenges is island demographics – many island communities are small, aging, and fluctuate seasonally. Some islands are seeing declining populations as young people move off the island. Many islands are struggling to attract and keep young families. New conflicts arise as the balance shifts between year-round residents and seasonal residents and tourists.

Taken collectively, Great Lakes islands are a special class of rural community. Unfortunately, progress to address the unique challenges of “island living” has been slow in coming, at least historically. Government agencies and organizations are usually located on the mainland, and most do not maintain much of a day-to-day presence on many islands. Islanders say they find it difficult to convince funders and other decision-makers to invest time, money and other resources in these remote places with small populations.

State government in Michigan is starting to reestablish our relationship with our island communities. These are awe-inspiring places with distinct character, and as such, deserve dedicated attention. As one example, the Michigan Department of Natural Resources has been updating its Northern Lake Michigan Islands Management Plan. The new vision calls for collaborative governance, where islanders and others will have a say in how state-owned island resources are managed.

Also in the past year, the Michigan Office of the Great Lakes has begun to learn from islanders about their unique way of living with limited resources. We wonder whether islands may serve as models of sustainability for the rest of the state. Through our new partnership with the Beaver Island Association in northern Lake Michigan, we are facilitating the exchange of ideas with similar island communities off coastal Maine, where island communities have worked together collaboratively for decades. Together we are testing the premise that islanders can best learn from one another and would benefit from sharing innovative island solutions to common island problems.

## Chapter 3

# Technical Insights and Innovation

## Innovations in Michigan's Beach Monitoring System

**Dr. Shannon Briggs**

Environmental Quality Specialist  
Water Resources Division, MDEQ

Finding a beach in Michigan is easy, with over 1,226 public beaches across the state on inland lakes and along the Great Lakes shoreline.

To ensure the health of swimmers and visitors, local health departments test for *Escherichia coli* (E. coli) at approximately 400 of the most visited public beaches. The Michigan Department of Environmental Quality assists local beach monitoring efforts with state and federal funds. Annual monitoring efforts produce over 3,000 results, with 96% of the samples meeting water quality standards. Monitoring data from beaches that report exceedances are carefully reviewed by the MDEQ and local health departments.

In partnership with local health departments, the MDEQ received over \$3 million in 2013 from the Great Lakes Restoration Initiative to identify and remediate contamination sources at Great Lakes beaches. The experience gained in implementing best management practices at the Great Lakes beaches were easily applied to inland lake beaches.

In addition to these efforts to clean up beaches, the MDEQ is also working with local health departments to begin using a rapid test method for E. coli. Michigan is the first to monitor beaches statewide with rapid testing equipment producing same-day results. Testing currently relies on culture methods that require 18-24 hours to produce results. The rapid testing equipment uses a new method called quantitative polymerase chain reaction (QPCR) to measure DNA and produce results in 4 hours or less. DNA testing will identify fecal contamination quicker and will help local officials re-open beaches faster when test results show they are safe for swimming.

To implement the testing, the MDEQ provided \$500,000 worth of equipment to test beaches at 10 new labs using the QPCR method. In addition, local health departments received \$443,000 in grants to monitor 231 Great Lakes Beaches, including 155 that will be tested using the QPCR method and 132 inland lake beaches that will be tested using the QPCR method. Monitoring results are posted on the MDEQ's BeachGuard website at <http://www.deq.state.mi.us/beach/>.

Water quality standards for beach monitoring rely on E. coli results from culture methods. During the transition to QPCR methods, beach monitoring will use results from both culture and QPCR methods to build correlations and comparisons for future water quality standards for the new method.

Additionally, the MDEQ provided \$30,000 to Michigan State University to provide specialized training for the new labs on the use of the QPCR method and beach water testing. Hands-on training started in the spring with additional site visits throughout the summer. At the 2015 Annual Great Lakes Beach Association Joint Conference, QPCR labs met to present and discuss the statewide beach testing results of the QPCR method. For more information on the conference, please visit [http://www.michigan.gov/deq/0,4561,7-135-3308\\_3333\\_4169\\_21606-345563--,00.html](http://www.michigan.gov/deq/0,4561,7-135-3308_3333_4169_21606-345563--,00.html).

## Innovations in Michigan's Beach Monitoring System *Cont.*

\$496,000 provided by MDEQ for equipment to 10 labs:

1. \$48,000 for Central Michigan District Health Department
2. \$42,000 for Chippewa County Health Department in Cooperation with the Environmental Analysis Laboratory at Lake Superior State University
3. \$50,000 for District Health Department #10, in cooperation with Cadillac Wastewater Treatment Plant
4. \$50,000 for Genesee County Health Department
5. \$47,000 for Health Department of Northwest Michigan
6. \$39,000 for Kalamazoo County Health and Community Services
7. \$51,000 for Marquette Area Wastewater Treatment Facility
8. \$39,000 for Public Health Muskegon County, in cooperation with the Robert B. Annis Water Resources Institute at Grand Valley State University
9. \$91,000 for Oakland County Health Division (\$40,000 from Kent County's Returned Equipment)
10. \$39,000 for Saginaw County Department of Public Health

Labs testing inland lake beaches:

1. Genesee County Health Department
2. Oakland County Health Division
3. Saginaw County Department of Public Health

Labs testing Great Lakes Beaches and inland lakes beaches:

1. Assurance Water Lab of the Central Michigan District Health Department (Arenac County)
2. Chippewa County Health Department in Cooperation with the Environmental Analysis Laboratory at Lake Superior State University (Chippewa County)
3. Cadillac Wastewater Treatment Plant (Mason, Manistee, Oceana, and Wexford Counties)
4. Health Department of Northwest Michigan (Luce, Mackinac, Alger Schoolcraft District Health Department, Grand Traverse, Benzie, Leelanau Counties)
5. Kalamazoo County Health and Community Services Lab (Berrien and Van Buren Counties)
6. Marquette Wastewater Treatment Plant (City of Marquette and surrounding areas)
7. Public Health Muskegon County, in cooperation with the Robert B. Annis Water Resources Institute at Grand Valley State University (Muskegon County)

Lab already using QPCR Methods to test Great Lakes beaches:

1. HEART Lab at HCMA Lake St. Clair Metropark Beach (Macomb and St. Clair Counties)
2. Saginaw Valley State University (Iosco, Bay and Huron Counties)
3. Hope College (Allegan County Beaches)

## Aquatic Invasive Species – Advancements in Michigan

Sarah LeSage

Aquatic Invasive Species Program Coordinator  
Water Resources Division, MDEQ

"Prevent, detect, and control" is the mantra for Michigan's aquatic invasive species (AIS) program. To help in this goal, Governor Snyder and the Michigan Legislature included \$5 million of state funding to support an aquatic and terrestrial invasive species program during the 2015 fiscal year. This is the first time that state funding has been invested for the targeted purpose of protecting Michigan's waters from the harmful effects of invasive aquatic plants, animals, and microorganisms.

Michigan's AIS State Management Plan serves as the strategic foundation for the program. The management plan was updated in 2013 by an interdepartmental team from the Departments of Environmental Quality, Natural Resources, Agriculture and Rural Development, and Transportation, with input from partners. The plan identifies strategic actions in categories including legislative and policy, regulation (including compliance, enforcement, and inspection), information and education, research and monitoring.

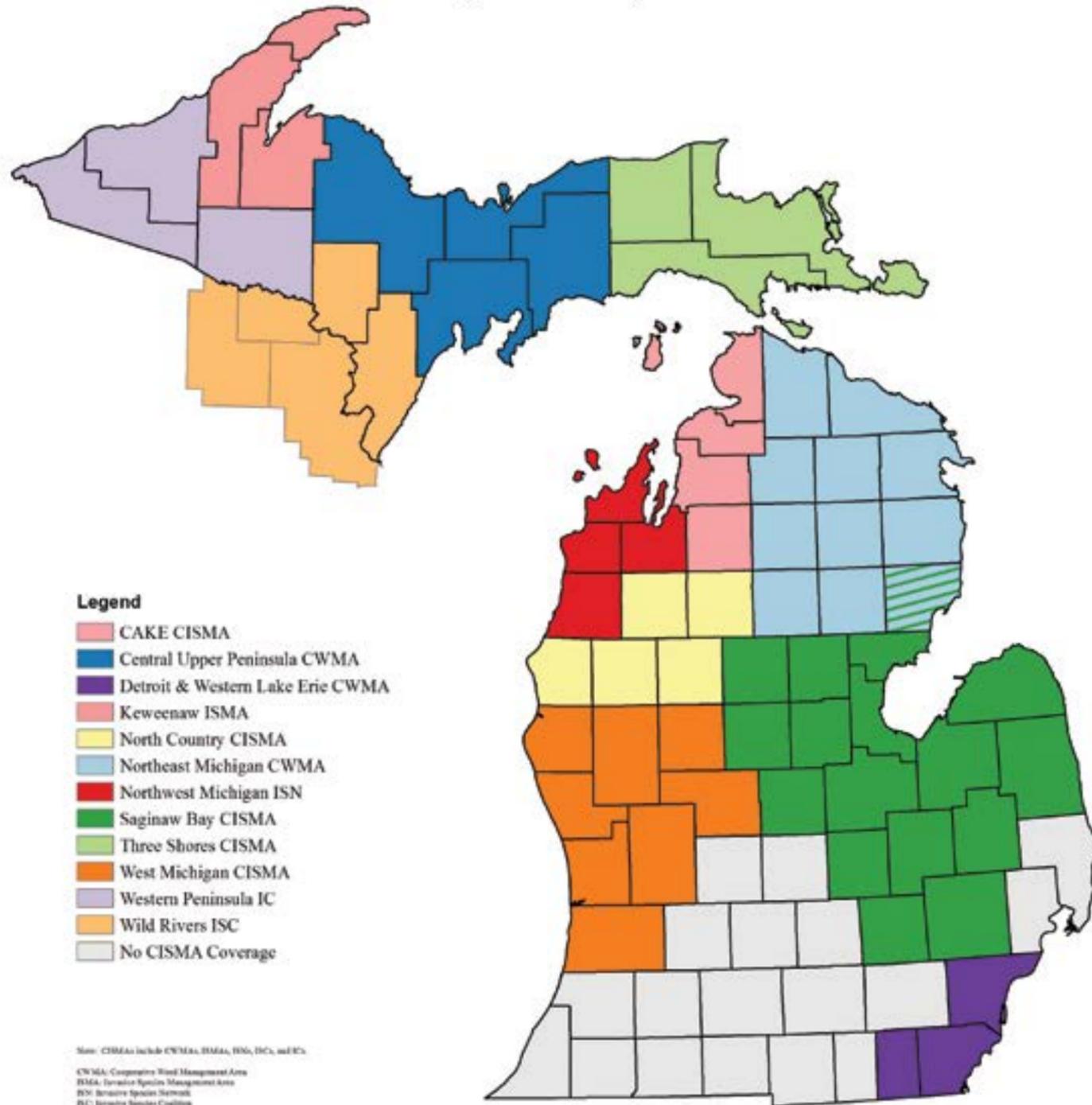
The goals of Michigan's AIS program can only be accomplished through the coordinated efforts of partners at multiple scales ranging from local prevention, detection, and control efforts to Great Lakes basin-wide initiatives. The new Michigan Invasive Species Grant Program is the main component of Michigan's enhanced program that supports partners throughout the state. In 2015, over \$4 million was awarded in grants. Almost 65% of the funding was allocated to Michigan's Cooperative Invasive Species Management Areas (CISMAs). CISMAs are regional partnerships of federal, state, and local government agencies, tribes, non-governmental organizations, businesses, individuals, and various interested groups that prevent and manage invasive species in a defined area, usually across multiple counties. Ten CISMAs received support through the Michigan Invasive Species Grant Program in 2015, increasing CISMA coverage from 70% to 80% of the state, for a total of 64 counties. The grants support staff, training, and outreach materials for CISMAs to accomplish critical on-the-ground work that ranges from strategic herbicide treatment of priority plants to boater outreach to prevent new introductions.

Regional CISMAs are complemented by collaboration at the Great Lakes basin-wide scale through the Conference of Great Lakes and St. Lawrence Seaway Governors and Premiers Aquatic Invasive Species Task Force. This AIS task force boosted the ability of the states and provinces to cooperate on AIS response through a pioneering Mutual Aid Agreement. As of March 2015, the Mutual Aid Agreement was signed by the eight Governors and two Premiers. The agreement outlines protocols for the parties to share and leverage information and resources to respond to serious AIS threats in the basin. Operationalization of the Mutual Aid Agreement has occurred through training exercises to prepare staff and managers for on-the-water action. For example, in September 2014, Michigan and Ohio led a successful joint response exercise targeting grass carp in Lake Erie. Illinois, New York, Minnesota, Pennsylvania, and Ontario also assisted in this effort.

In addition to the work of the AIS task force, the Great Lakes states and provinces are working with The Nature Conservancy, researchers, and the U.S. and Canadian federal governments on an interstate project to develop AIS surveillance and response plans. These efforts are supported by a Great Lakes Restoration Initiative grant from the U.S. Fish and Wildlife Service to Michigan. The surveillance plan will use an innovative technique layering information on risk of AIS introduction posed by different pathways, such as ballast water discharges and organisms in trade. The resulting maps will identify hotspots for potential new introductions of priority species. The development of sampling plans and protocols will guide future monitoring for AIS. An interstate response plan is expected to be completed by September 2016 and will provide a framework for communication and coordinated response actions.

Local and regional collaboration at multiple scales is the key to successfully identifying and addressing new AIS threats while also managing those that are already established in Michigan. This is a time of extraordinary need to protect our water resources from AIS and Michigan is rising to meet the daily challenge.

## Michigan Cooperative Invasive Species Management Areas (CISMAs)



Note: CISMAs include CWMA, ISMA, ISN, IC, and ISC.  
 CWMA: Cooperative Invasive Species Management Area  
 ISMA: Invasive Species Management Area  
 ISN: Invasive Species Network  
 IC: Invasive Species Coalition  
 ISC: Invasive Species Coalition

Updated November 2014  
 Michigan Invasive Species Coalition

## Restoration of the Cass River in the City of Frankenmuth

**Sheila Stamiris**  
 Executive Director, Downtown Development Authority  
 City of Frankenmuth

With the completion of the Frankenmuth Fish Passage Project at the Cass River Dam, what was a fish wish in 2010 is now a fishway in 2015. The long-awaited project to open up 73 miles of historically significant spawning area upstream of the dam for Saginaw Bay fish is complete. To celebrate, a well-attended ribbon cutting was held on the banks of the Cass River on a beautifully crisp, pure Michigan morning this past October.

The City of Frankenmuth, the U.S. Army Corps of Engineers (USACE) and the U.S. Fish and Wildlife Service combined efforts to build a constructed rapids, one of the largest projects of its kind in the Midwest. The new fishway brings the environment and economy together to achieve benefits for both.



Vintage photo of the dam

The Cass River Dam was one of more than 300 dams in the Saginaw Bay watershed. Stream spawning and tributary habitat for migratory fish from Saginaw Bay had become scarce. Approximately two-thirds of this type of habitat was severed from Saginaw Bay through the construction of dams. The Cass River is one of six rivers in the watershed that are key to increasing the natural reproduction rate of walleye. The Michigan Department of Environmental Quality, the U.S. Fish and Wildlife Service, and other agencies had identified the dam as one of three critically important fish passage opportunities. Also, the Great Lakes Fishery Commission gave the project a "high priority" ranking when evaluating the fisheries and ecosystem benefits. Additionally, the aging, pre-Civil War dam was at risk of failure.



To find the perfect solution for the structure was to find a balance between the economy and environment. Removal of the dam was not an option, as a loss of water depth upstream would have eliminated commercial boating, changed the river profile for properties along the river, and released silt and soil from behind the dam. Choosing to use repair money as leverage for a better improvement, the city looked for a permanent fix with environmental benefits and a foundation to develop ecotourism. The project achieved removal of the dam as a barrier for fish passage and in time the work will help sustain local employment levels

in Frankenmuth's valuable tourism sector while spurring new business development oriented toward the river.

After years of discussion, the perfect solution was a rock ramp or constructed rapids at the dam. From the top of the dam to about 300 feet downstream, a large wedge of stone was placed. Large stone weirs (or arches) were constructed on top of the ramp to form step-pool rapids, allowing fish movement upstream to spawning grounds. Now, fish move through the weirs in low- and high-water conditions, accommodating the diverse fish species of the Saginaw Bay Watershed.



Finished rock ramp

With the city as owner and project sponsor, the USACE served as the project manager, contracting with CTI and Associates of Wixom, Michigan

## Restoration of the Cass River in the City of Frankenmuth *Cont.*

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Placing the boulders

to construct the project. Assisted financially with a grant from the U.S. Fish and Wildlife Service, the City of Frankenmuth hired Dr. Sandy Verry of Ellen River Partners in Minnesota to provide the basis of design for the project. The USACE adapted Dr. Verry's design for implementation.

In all, about 50 million pounds of stone were installed in the rock ramp. Stone sizes ranged from small chink and choke stone from Bay Port, Michigan to very large limestone footer and header stones from Alpena, Michigan. The ramp was built in stages, with each stone placed with accuracy as measured by a surveyor to maintain less than a 3 percent slope from top to bottom of the ramp. While the project had been in planning stages at the city since 2002, the actual construction in the river took only eight weeks, once the stone was on site.

The cost to complete this project was about \$3.5 million. The federal share of the project, 65%, was provided by the USACE through the Great Lakes Restorations Initiative. The city funded the remainder, about \$1.27 million, through a combination of local tax dollars from the city's general fund and the Downtown Development Authority. About \$500,000 was provided through the generosity of local foundations and businesses from the region who believe in the Saginaw Bay Watershed and the benefits of a strong fishery and good water source for the Great Lakes Bay Region.

The City of Frankenmuth had very specific reasons for doing this project. As a community and region, the area will benefit economically and environmentally. And, in the end, the presence of a healthy fishery means the presence of good water. This is beneficial for all living and working in the Saginaw Bay Watershed. Frankenmuth's fish way project is just the beginning of a new fish story for the Saginaw Bay region.



Ribbon cutting ceremony



Aerial view of finished rock ramp

# Chapter 4 Regional Initiatives

## Michigan's Implementation Plan for the Western Lake Erie Basin Collaborative

### Michael Alexander

Environmental Manager  
Water Resources Division, MDEQ

Lake Erie has seen many water quality problems over the past 50 years, including problems with nutrient enrichment. In the 1960s, the lake was declared "dead."

Major pollution control efforts targeting the municipal and industrial point sources in the 1970s greatly improved lake quality. Lake Erie recovered and was soon recognized as a tremendous walleye fishery and recreational resource. Environmental conditions began to change again in the late 1980s as new aquatic invasive species, like Dreissenid mussels, established in Lake Erie. These invasive species changed the lake ecosystem in many ways that are not well understood. Additionally, farming practices changed over a similar timeframe, with the advent of no-till farming and increased use of drain tiles. All of these changes resulted in blue-green algae blooms occurring in nuisance conditions on a regular basis in the Western Lake Erie Basin (WLEB), particularly off the mouth of the Maumee River. In August 2014, the Toledo, Ohio, drinking water supply was overwhelmed with harmful algal bloom toxins and had to stop supplying drinking water for a few days. As a result, a sense of urgency was given to taking action to correct the problems Lake Erie is facing today.

In June 2015, Governor Rick Snyder signed the Western Basin of Lake Erie Collaborative Agreement with Premier Kathleen Wynne of Ontario and Lieutenant Governor Mary Taylor of Ohio. This agreement establishes a collaborative initiative that has a defined goal, establishes specific implementation plans, and is measured against expected results.

A goal of the agreement is to work to achieve a recommended 40 percent total load reduction in the amount of total and dissolved reactive phosphorus entering the WLEB by the year 2025 with an aspirational interim goal of a 20 percent reduction by 2020. The phosphorus loading data from 2008 was established as the base year from which progress will be measured.

Each state and province has committed to developing, with stakeholder involvement, a plan outlining their proposed actions and timelines toward achieving the phosphorus reduction goal. The focus of all of these efforts will be to achieve the desired outcomes in Lake Erie, which are reducing the nuisance algae blooms in the WLEB, controlling the harmful algal bloom toxins to acceptable levels, and minimizing the hypoxia (low dissolved oxygen) in the central basin of Lake Erie.

Michigan has been strategically aggressive in pursuing total phosphorus reductions since Lake Erie was first declared dead in the 1960s, seeing dramatic declines especially in the Detroit Water and Sewerage Department (DWSD) phosphorus loadings. DWSD is by far the largest point source discharge to Lake Erie. The reductions in this discharge were the main reason the Lake Erie ecosystem rebounded the first time and why Michigan continues to strategically pay attention to this discharge. Michigan recently concentrated on the DWSD discharge in 2011 due to a confluence of events, including the large Lake Erie algae bloom, reissuance of the DWSD National Pollutant Discharge Elimination System permit, and preparing for the end of federal court oversight after 33 years. These events pushed Michigan and DWSD to focus and implement additional phosphorus controls early in the process – a proactive approach.

Michigan also implemented a statewide residential fertilizer phosphorus ban in 2012. A similar ban in 2006 in the city of Ann Arbor has been shown to reduce phosphorus loadings in surface waters in residential areas by about 30 percent. This reduction may be used as a guide to estimate load reductions in residential areas in other watersheds.

Michigan has three main areas of focus for future phosphorus reductions – the Detroit River, the Raisin River, and the state's portion of the Maumee River basin. Our first step is to determine where phosphorus loads are relative to the reduction goals. Next, we will determine how to focus future efforts. Finally, we recognize that this plan will be adaptive in nature, responding to data and knowledge gained as we move forward in this process to solve the issues in Lake Erie.

Michigan's proposed implementation plan will concentrate on the following ongoing actions:

1. Maintain the reductions achieved in the DWSD discharge as a result of the tightened permit limits.
2. Achieve reductions in the Wayne County Downriver Wastewater Treatment Plant discharge.
3. Attain the target reductions in the Maumee River basin in Michigan. Michigan will develop a specific plan for these watersheds in 2016.
4. Help with monitoring and understanding harmful algal blooms regarding presence, timing, and cause in Michigan waters, including the Great Lakes.
5. Assist with understanding the role of invasive mussels in causing Lake Erie algae blooms and the effect of potential invasive mussel control options.
6. Understand the specifics regarding the Raisin River phosphorus reductions, share this success story, and continue to reduce nutrient loads that may contribute to site-specific watershed or seasonal fluctuations in water quality.

Throughout the implementation of the proposed plan, Michigan will continue to track reduction for the Detroit River and the River Raisin, as well as develop a monitoring strategy for Michigan's Maumee River tributaries. Results of these reduction efforts and progress on the implementation of a monitoring strategy for the Maumee tributaries will be reported on an annual basis.

For a complete copy of Michigan's draft implementation plan for the Western Lake Erie Basin Collaborative, visit [http://www.michigan.gov/documents/deq/wrd-western-lake-erie\\_503547\\_7.pdf](http://www.michigan.gov/documents/deq/wrd-western-lake-erie_503547_7.pdf)



## Thirty Years of Agriculture Conservation

### Michelle Selzer

Lake Coordinator  
Office of the Great Lakes, MDEQ

### Steve Shine

Manager, Conservation Programs Unit  
Michigan Department of Agriculture and Rural Development

The passage of the Federal Clean Water Act and the establishment of the binational Great Lakes Water Quality Agreement in 1972 were the initial steps taken to improve the water quality of the Great Lakes Basin. It was not long before attention was shifted to understanding agriculture's role in affecting Great Lakes water quality.



The Great Lakes basin has some of the most fertile and productive farmland in the country. The lakes themselves buffer the climate and allow for a great diversity of crops and a value-added agriculture economy. However, this agricultural productivity can affect water quality.

The U.S. Congress passed the first Farm Bill in 1985, which shifted focus away from farm subsidies and called for the implementation of the initial compliance measures for highly erodible lands and wetland impacts on agriculture lands, known as the "Sod Buster" and "Swamp Buster" provisions. For the Sod Buster provision, all Michigan farmland participating in Farm Bill programs were evaluated by looking at the crop rotations and tillage practices used for production. The Swamp Buster provision required a

review of all hydric (or wetland) soils that were previously converted fields. Even now, both provisions continue to reduce soil loss on erosion-prone agriculture lands and protect wetlands for multiple benefits including flood control, sediment control, groundwater recharge, water quality, and wildlife habitat.

During the mid- to late-1980s, experimentation and innovations in the farming community also focused on conservation practices that primarily addressed nutrient runoff. "No-till" clubs emerged in many counties across Michigan, offering farmers an opportunity to share lessons learned and identify innovative ways to balance high yields while maintaining voluntary compliance with the new Farm Bill provisions. The Conservation Reserve Program established under the 1985 Farm Bill also encouraged farmers to take sensitive lands out of production. The program has been one of Michigan's most effective conservation programs for reducing soil erosion and nutrient runoff. It has also simultaneously established hundreds of thousands of acres of high quality wildlife habitat benefitting many game and non-game species throughout the state.



During the establishment of the Farm Bill, the United States was also faced with an energy crisis. To help farmers adapt to high operating costs, the Michigan Energy Conservation Program was brought on-line to promote energy savings related to tillage, nutrient management, and integrated pest management practices. The benefits were both economic and environmental as farmers took a closer look at how they conducted business. Technical assistance was funded by the federal Department of Energy through the state Department of Agriculture, and Conservation Districts employed staff tasked with promoting these practices and assisting with their implementation.

## Thirty Years of Agriculture Conservation Cont.



The Michigan Energy Conservation Program was very successful and accounted for thousands of acres of conservation tillage, significantly reducing sediment delivery to the Great Lakes. Farmers took a serious look at soil testing and developed nutrient management plans which accounted for the residual soil nutrient levels. Livestock operations evaluated the nutrient value associated with the manure generated on the operations. Those nutrient values were incorporated into Nutrient Management Plans that helped farmers improve their operation's bottom line. The effects of these two actions significantly reduced the amount of phosphorus leaving the farm.

In the early 2000s, the Conservation Reserve Enhancement Program was initiated to take the potential of the Conservation Reserve Program to a higher level. It focused on Michigan's

priority agricultural regions, including the Lake Macatawa, Saginaw Bay, and River Raisin watersheds. Over the program's 15 year history it has restored wetlands and grasslands in excess of 77,000 acres.

The Michigan Agriculture Environmental Assurance Program (MAEAP) was developed in 1997 by a coalition of farmers, commodity groups, state and federal agencies, and conservation and environmental groups to provide an educational venue for farmers to learn about management options for protecting and enhancing the quality of natural resources. MAEAP provides technical assistance to farmers to comply with the both the 1972 Clean Water Act requirements as well as the Farm Bill provisions. Overall, this comprehensive, voluntary, and proactive program is designed to reduce farmers' legal and environmental risks through a three-phase process: 1) education; 2) farm-specific risk assessment and practice implementation; and 3) on-farm verification that ensure farmers have implemented environmentally sound practices.



In 2011, Governor Snyder signed the first legislation of his new administration, establishing MAEAP into law. The goal is to have 5,000 MAEAP farm verifications by 2016. There has been growing enthusiasm among the farming community in promoting MAEAP, and to date, Michigan farms have achieved more than 3,100 MAEAP verifications across the state on farms of many different sizes producing many different crops. The MAEAP efforts have positioned Michigan as a leader in agriculture conservation planning and implementation across the country.

Today, agriculture represents the second largest sector of Michigan's economy at nearly \$100 billion dollars annually. Michigan's food and agriculture industry is uniquely positioned for continued expansion. Michigan's farmers care about the land and water and are committed to pursuing innovative conservation on the landscape to protect our wonderful Great Lakes resource. They continue to embrace programs like MAEAP that will continue to demonstrate the agriculture community's environmental performance well into the future.

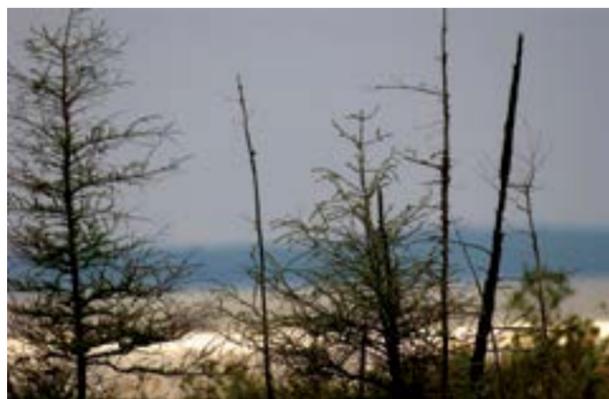
## Partnering for Watershed Restoration in Michigan's Upper Peninsula

**Chris Kovala**  
 Environmental Coordinator  
 United States Forest Service



The Partnering for Watershed Restoration (PWR) group is a non-binding collaborative effort of federal, tribal, state and local agencies, academic institutions, non-profits, citizen groups, and industry to accelerate watershed restoration through sharing information and opportunistically pursuing projects of shared interest throughout the Western Upper Peninsula. A steering committee for PWR was formed in April 2013, including the USDA's Forest Service, the Trust for Public Lands, the U. S. Department of the Interior's Fish and Wildlife Service, the Keweenaw Bay Indian Community, and the Superior Watershed Partnership. The initial goal of the committee was to plan and facilitate a one-time workshop to discuss watershed threats affecting the western and central Upper Peninsula as outlined in the Lake Superior Lakewide Action and Management Plan.

The first workshop was held at the Ottawa National Forest's Black River Harbor Recreation Area on June 25, 2013, and attended by 51 individuals representing 23 organizations. Interactive polling software was used to promote conversation and encourage responses to topics of shared concerns, including threats to our watersheds, restoration work underway, funding opportunities and ideas for future cooperation. Due to strong interest from the initial workshop participants, four additional workshops have taken place. Interest in sustaining dialogue and coordinating trainings to promote and accelerate watershed restoration is the driver for continued biannual workshops. Currently, over 200 individuals representing 41 organizations have participated in PWR workshops.



While this effort involves many stakeholders representing a variety of public and private organizations, the group has maintained its focus solely on promoting collaborative watershed restoration. One project currently underway and originating from the PWR group is the collection and analysis of road stream crossings leading to the creation of a regional, road-stream crossing geodatabase. This project is being led by the Keweenaw Bay Indian Community and utilizes data collected from 11 PWR partners. This sharing and aggregation of data will provide a regional tool to assist local organizations when prioritizing where restoration work is most needed and will provide the most benefit. Additional projects, workshops, and trainings of mutual interest are in development to support local watershed restoration activities.

## The Great Lakes Maritime Transportation System and Maritime Strategy

**Larry Karnes**  
 Freight Policy Specialist  
 Michigan Department of Transportation



Commercial navigation on the Great Lakes is extremely important to Michigan's economy. Our 36 commercial cargo ports handle 65 to 85 million tons of cargo each year.

Most of the traffic consists of bulk cargoes serving Michigan's steel, construction, electric power generation, and agricultural industries. Major examples of outbound cargo include iron ore from Upper Peninsula mines, limestone from northern Michigan quarries, and cement from several state manufacturers. Inbound cargoes at Michigan's ports include stone and cement for the construction industry, iron ore for the steel industry, coal for electric utilities and other industries, fertilizer for agriculture, salt for treating our highways in the winter, and petroleum products for our business and mobility needs. A variety of other cargoes are also handled, including imported turbines and towers for wind farms, wood pulp for paper production, and other miscellaneous products.

The Great Lakes and St. Lawrence River are generally treated as a single transportation and ecological system. However, the management of this system is highly fragmented with numerous federal agencies in both the U. S. and Canada involved in specific responsibilities regarding the construction and maintenance of navigation channels, operation of locks and dams, aids-to-navigation, ice-breaking, pilotage services for ocean vessels, ships ballast water management, environmental regulations, and trade promotion. U. S. government agencies involved include the Army Corps of Engineers, Coast Guard, Maritime Administration, Environmental Protection Agency, St. Lawrence Seaway Development Corporation, and others. Canadian agencies include the Canadian Coast Guard and St. Lawrence Seaway Management Corporation. Additionally, individual states and provinces impose their own regulatory authorities that affect dredging, the disposal of dredged material, and ballast water management. Finally, there are local port authorities and private sector companies that own and operate the marine terminals and vessels.

In recognition of this fragmented system and the need for increased investment in its infrastructure, the Conference of Great Lakes and St. Lawrence Governors and Premiers (formerly known as the Council of Great Lakes Governors, and chaired by Governor Rick Snyder) launched a Maritime Initiative in 2013 to improve the region's maritime transportation system. The Conference created a Maritime Task Force to help rejuvenate this critical component of the region's transportation and infrastructure system, and an Advisory Committee consisting of industry, government agencies, and others to assist in this effort.



# The Great Lakes Maritime Transportation System and Maritime Strategy *Cont.*



The Maritime Task Force has undertaken a series of important actions. It first completed a state and provincial maritime asset inventory that identified the key components and needs of the region's maritime system. Secondly, it developed a set of regional maritime priorities to establish regional consensus and guide future management and funding. These maritime priorities were adopted by the Governors and Premiers at their Leadership Summit in June 2015.

The Task Force is currently developing a "Strategy for the Great Lakes-St. Lawrence River Maritime Transportation System" in cooperation with industry, governmental, and non-governmental partners. The strategy will include recommended policies, programs, and projects designed to maintain and improve the system's assets and align them with regional priorities, including optimized connectivity and linkages with

other transportation modes. The strategy will anticipate tomorrow's needs and create a 21st century vision for a system that has developed over the past two centuries. A draft of the maritime strategy is expected to be released for public review early in 2016 and adopted by the Governors and Premiers in late spring or summer of 2016.

The Great Lakes-St. Lawrence maritime transportation system offers one of the region's competitive advantages and is the backbone of the \$5 trillion regional economy. It is a key to the region's continuing prosperity. The states and provinces will continue to work together, in cooperation with our industry and federal governmental partners, to capitalize on this interconnected, bi-national, inter-jurisdictional transportation system. Improved management and increased investment in our infrastructure will increase the economic competitiveness of the entire region.



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 Rick Snyder, Governor  
 Jon W. Allan, Director, OGL  
[www.michigan.gov/deqogl](http://www.michigan.gov/deqogl)

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