

Wisconsin Great Lakes Chronicle
2024



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FOREWORD

Governor Tony Evers

Dear Friends of the Great Lakes,

I have often expressed how our Great Lakes are a crucial part of Wisconsin's history and future. The Great Lakes define us and bind our region as a truly special place. The Great Lakes and St. Lawrence Seaway are part of a system of inland seas, vast waterways used for transportation, commerce, recreation, and represent crucial ecosystems as well as archaeological and cultural resources.



The protection of our lakes and coastal areas is an effort requiring cooperation and coordination across state, Tribal, local and international borders. We see diverse groups and individual citizens working together to protect the waterways that enrich our lives and support our businesses and communities. Providing equitable environmental protection and affording all Wisconsinites the opportunity to experience our Great Lakes and all outdoor recreation is a priority for me and my administration.

Last October marked the end of my term as chair of the Great Lakes St. Lawrence Governors & Premiers. Collectively, the executives of the two provinces and eight states work to sustainably grow the regional economy and enhance water resource protections. The organization continues to support our maritime commerce, grow trade, promote tourism on the Great Lakes, reduce shipping's environmental impact, and establish resilient port infrastructure.

I salute the efforts of Illinois and Michigan having signed a project partnership agreement with the United States Army Corps of Engineers for the Brandon Road Interbasin Project. The project is intended to prevent the upstream movement of aquatic invasive species into the Great Lakes, which could otherwise cause adverse ecological and economic impacts.

Here in Wisconsin, the Wisconsin Coastal Management Program (WCMP) has played a crucial role for the last 46 years in fostering sustainable development along Wisconsin's more than 800 miles of Great Lakes coastline. By collaborating with local governments, Tribes, nonprofits, businesses and residents, the WCMP takes a balanced approach to conserving natural resources while promoting economic growth. This network is key to achieving long-term environmental sustainability and economic resilience. Integrating conservation efforts and economic development strategies, WCMP supports communities in responsibly leveraging their natural assets to preserve the ecological integrity of the Great Lakes, enhance the quality of life for our residents and strengthen local economies.

Wisconsin Great Lakes Chronicle recounts the collective efforts of WCMP program partners to protect and preserve our coastal areas. I thank them all for their continued dedication and commitment and I hope you are as inspired as I am by the important work they do.

Clay Bluffs Cedar Gorge is one of the last large tracts of undeveloped land along Lake Michigan between Door County and Chicago.

CLAY BLUFFS CEDAR GORGE NATURE PRESERVE

Andrew Struck, Matt Aho and Tom Stolp

After over a decade of planning, negotiating, applying for grant funding and soliciting private donations, the Ozaukee County Planning and Parks Department (Department), in collaboration with the Ozaukee Washington Land Trust (OWLT), took a major step to improve the health of the Great Lakes ecosystem through the acquisition and protection of the 134-acre Clay Bluffs Cedar Gorge Nature Preserve County Park in August 2022.

The Nature Preserve consists of 30 acres of high-quality woodlands, 30 acres of wetlands and hydric soils, 80 acres of marginal farmland, fifteen acres of 110-foot-high steep clay seepage bluffs with ephemeral seepage wetlands (fens), a deep wooded coastal gorge with a stream draining to Lake Michigan, and 0.7 miles of Lake Michigan shoreline and beach. Located along the shore in the City of Port Washington, this property is one of the last remaining large tracts of undeveloped land along Lake Michigan between Door County and Chicago.

The City's 2035 Comprehensive Plan identified the bluff top portion of the undeveloped property as future urban low density residential. Prior to 2022, the land was listed for sale on the open market and faced significant development pressure that could have negatively impacted the clay seepage bluff, natural areas and wetland habitat. The acquisition will provide long-term protection of a unique statewide and Great Lakes significant clay seepage bluff, Cedar Heights Gorge and Port Washington Clay Banks natural areas, high groundwater recharge areas and significant wetlands.

The Nature Preserve will also conserve a primary environmental corridor to protect habitat for two important bird areas—the Ozaukee Bight Lakeshore Migration Corridor and Harrington Beach-Kohler Andrae Lakeshore Migration Corridor—and provide for migratory bird stopover habitat along the National Lake Michigan Flyway. The Port Washington Clay Banks Natural Area also contributes habitat for the short-eared owl (*Asio flammeus*), a State designated species of special concern.

In addition, the acquisition facilitates planned passive-use of the area such as Lake Michigan access, fishing, cross-country skiing, snowshoeing, hiking, wildlife viewing and bird watching. The project will also restore and manage native landscapes and natural areas, and provide a place for scientific research, nature-based education, appreciation of the Lake Michigan coast, and enjoyment of Ozaukee County's unique cultural and natural resources.

The Nature Preserve project benefited from comprehensive environmental analysis and planning. The Department, in conjunction with WDNR and other partners, and funding from the U.S. Environmental Protection agency (USEPA) and the Wisconsin Coastal Management Program (WCMP), developed a GIS-based fish and wildlife habitat decision support tool to prioritize habitat for the greatest benefit of fish, wildlife and avian species and species of local conservation interest. Habitat results were ranked moderate to high for the acquisition area.

In addition, the Department created an Ecological Prioritization GIS Tool, funded by WCMP, to prioritize parcels for preservation and/or restoration. The Nature Preserve scored very high for preservation and restoration. Therefore, the Department added the Lion's Den Gorge Nature Preserve (LDGNP) Project Area in the 2011 update of the Park and Open Space Plan for Ozaukee County, which identified the Nature Preserve property for County acquisition to expand on LDGNP County Park.

This planning supported significant fundraising efforts over several years, whereby the County secured over half of the \$5 million acquisition cost from funding partners including the U.S. Forest Service Community Forest Program, the U.S. Fish and Wildlife Service Great Lakes Restoration Initiative Joint Venture Program and National Coastal Wetlands Conservation Program, the National Oceanic and Atmospheric Administration (NOAA) through the WCMP, the USEPA Great Lakes Restoration Initiative through the WDNR Office of Great Waters, Ozaukee County, and the Town of Grafton. The OWLT secured the remaining funding through private donations and an American Rescue Plan Act grant from the State.

The property was formally incorporated into the Ozaukee County Park System on August 25, 2022. This historic acquisition for Ozaukee County residents and visitors will forever conserve this ecologically valuable land including Great Lakes and State-significant clay seepage bluffs along Lake Michigan identified in the 2006 Land Legacy



Report. The Clay Bluffs Cedar Gorge Nature Preserve name results from the rare clay seepage bluff and the Cedar Gorge natural area.

The acquisition also doubles the passive recreational Ozaukee County Park System land on Lake Michigan, including LDGNP and Virmond County Park. The Nature Preserve will increase publicly accessible Lake Michigan shoreline in Ozaukee County to over three miles, including access to the National Lake Michigan Water Trail and the recently designated NOAA Wisconsin Shipwreck Coast National Marine Sanctuary.

The OWLT holds a conservation easement protecting the property in perpetuity and the Department has developed a Park Master Plan supported by WCMP grant funding to address future conservation and restoration of the existing coastal community forest and wetland

habitat and improve marginal farmland to native prairie, wetland and coastal forest. The Master Plan also addresses Lake Michigan bluff erosion, management of invasive species, improved coastal resiliency, and provision of passive recreational use and access to Lake Michigan. The Department received 2023 WCMP/NOAA and WDNR Stewardship grant funding and private donations to begin these habitat restoration and public access activities in 2024 and continues to seek additional funding. For more information visit <https://www.co.ozaukee.wi.us/540/Planning-Parks>.

Andrew Struck is the Ozaukee County Planning and Parks Department Director. He can be reached at astruck@ozaukeecounty.gov. Matt Aho is a Program Manager with the Ozaukee County Planning and Parks Department. He can be reached at maho@ozaukeecounty.gov. Tom Stolp is the Executive Director of the Ozaukee Washington Land Trust. He can be reached at tstolp@owl.org.

Climate change is having extreme impacts on the relationship Ojibwe people share with the land.



CLIMATE IMPACTS ON MANOOMIN

Illeana Alexander, Rob Croll, and Hannah Panci

In late August of 2023 during peak *manoomin* (wild rice) harvesting season, temperatures rose to over 100°F in parts of the upper Midwest Ceded Territories where many Ojibwe tribal members live and have treaty-guaranteed rights to hunt, fish and gather off reservation. Harvesting *manoomin* requires spending hours poling a canoe through the *manoomin* beds and knocking the *manoomin* seeds into the boat. It's a physically demanding task and, due to the extreme heat, some tribal harvesters were forced to quit harvesting early or not harvest at all. Missing a year of a *manoomin* harvest can be devastating—*manoomin* is central to Ojibwe culture and a staple food for many families, in addition to being used in ceremonies and other cultural practices.

Climate change is making days over 90 degrees much more likely to occur. By mid-century some models project that the upper Midwest will have 20-30 additional days above 90 degrees every year. Indigenous peoples, particularly those who express their culture and relationship to their ancestral lands through subsistence practices, will be uniquely and disproportionately affected by these changes. Culturally significant plants and animals that Ojibwe people have maintained relationships with for centuries are already declining or shifting their ranges. Ojibwe tribal members today do not enjoy the same ability to move across the landscape in response to changing environmental conditions that allowed their ancestors to survive and thrive, as Ceded Territory boundaries within which Great Lakes Indian Fish and Wildlife

Commission (GLIFWC) member tribes maintain the ability to hunt, fish and gather off-reservation are legally fixed in place.

In 2023, the GLIFWC Climate Change Program released its climate change vulnerability assessment for the Ceded Territories. Entitled *Aanji bimaadiziimagak o'ow aki*, which roughly translates to “the world is changing,” this second version updates and expands the interim 2018 version. The assessment incorporates both Traditional Ecological Knowledge (TEK) and Scientific Ecological Knowledge (SEK) to examine climate change impacts on 66 culturally important beings chosen by individuals from our member tribes.

Highlights from the 340-page assessment contain a section on projected climate change impacts to the Ceded Territories, which includes personal accounts of impacts on cultural practices and lifeways from tribal members in the Ceded Territories, and a section of “being pages” in which both TEK and SEK are used to examine the vulnerability of each of the chosen beings in depth. The assessment is meant as a resource for GLIFWC's member tribes and their tribal and non-tribal partners to help them prepare for upcoming changes and to help them care for those who take care of us. Throughout the project, climate change staff were deeply honored to receive knowledge from elders and knowledge holders through a series of interviews at each of the eleven GLIFWC member tribes. Interviewees shared climate change impacts on culturally important beings as well as on their lifeways and very existence from all corners of the Ceded Territories.

Manoomin was the most vulnerable being in the assessment. It was mentioned in nearly every interview, and as the most vulnerable being in the assessment, its abundance and range in the Ceded Territories is likely to decrease significantly. *Manoomin* is impacted by a large list of climate impacts. Among them, heavy rain events and flooding can damage plants or uproot them; warmer winters can make it more difficult for seeds to germinate and create better conditions for non-local beings to outcompete *manoomin*; and pathogens such as brown spot disease can spread quickly during warm, humid summer nights.

If *manoomin* declines or even disappears from certain places on the landscape, it will have extreme impacts on the relationship that Ojibwe people share with the land. *Manoomin* is deeply embedded in culture and spirituality and many tribal citizens

fear a loss of identity as their ability to maintain their relationship with *manoomin* is lost.

“If I get out here this year, and I’d like to, for even an hour, ten minutes even, I can honestly say I was out there... somewhere in the ceded territory here ricing every year, I’ve riced every year of my life, 57 years. This would be the 57th year now.” *Fred Ackley, Mole Lake*


“To talk about the rice and how sacred and valuable it is to our people cannot be measured in any form of human methodology.”
Rose Polar Martin

“This year there wasn’t any rice anywhere, they had to go look for it because of that July storm that we had... Knocked all the rice flat, Christ, we had to go 200 miles to find some rice.”
Mary and Joey Duffy

In 2024, the GLIFWC Climate Change Team began work on a climate adaptation plan for the Ceded Territories to support the member tribes in their climate adaptation leadership in the region. We are starting with a series of listening sessions and other events at each of the tribes to get feedback and guidance from tribal leaders, staff and community members and learn about their concerns and needs. The Ojibwe tribes that created GLIFWC ceded over 60,000 square miles of land and water in Wisconsin, Minnesota and Michigan to the United States in treaties in the mid-nineteenth century. After years of prosecution and persecution their pre-existing rights to maintain their lifeways in the Ceded Territories were reaffirmed in a series of court cases and intergovernmental agreements. The Ceded Territory Climate Adaptation Plan will help tribal members continue the relationship to the land and beings that their ancestors reserved for them in the treaties and preserve Anishinaabe *mino bimaadiziwn* (the good life) for generations to come. The assessment is available online at www.glifwc.org/climatechange/aanjibimaadiziimagak_oow_aki.

Illeana Alexander is the GLIFWC Tribal Climate Adaptation Specialist, Rob Croll is the GLIFWC Climate Change Program Coordinator, and Hannah Panci is the GLIFWC Climate Change Scientist. The GLIFWC Climate Change Team can be reached at climate@glifwc.org.





Once a property is developed there is no turning back.

PARTNERSHIP TO PROTECT PEBBLE BEACH

Cinnamon Rossman

The Door Peninsula and its chain of islands separate Green Bay waters from Lake Michigan. Hundreds of thousands of tourists and seasonal residents flock to the Peninsula for its scenic beauty, clean waters and rustic charm, and this tourism focus pushes demand for waterfront development for vacation rentals and residences higher every year. Balancing the need for publicly accessible waterfront versus economic development presents challenges for municipalities—but partnerships between land trusts, landowners and municipalities can protect high-price properties.

In December 2018, the well-known and cherished shoreline called Pebble Beach at Little Sister Bay was thrown into the spotlight when a local zoning commission considered a proposal to divide the undeveloped waterfront property into four lots for private development. The property had been a de facto public beach since the Lubber and Downey families purchased it in 1967. The beach was a best-kept secret with few people even knowing it was privately owned.

Despite all their efforts to keep the pristine beach open, garbage, camping and even truckloads of pebbles being removed by a backhoe became larger issues. Paul Lubber said, “We were always open to seeing the property used, but cautious of property abuse, litter and campfires.” Public sentiment for protecting the beach from development was voiced loudly in letters to the editor, across social media and throughout the community.

Protecting the property was an idea that had been on the radar for nearly 20 years. A local geologist then tried to have the property re-zoned and the Lubber and Downey families considered protecting the property with Door County Land Trust (DCLT). But managing a public beach and cost were more than the Land Trust, a non-profit organization, could take on at that time.

DCLT more recently responded to the community desire to protect the land by exploring conservation funding through the DNR Knowles-Nelson Stewardship Program and Wisconsin Coastal Management Program. The Lubber and Downey families then reduced the sale price with a desire for the property to be protected in its natural state. Paul Lubber said, “We are so excited to see this land which has been so significant to our families be preserved as untouched shoreline that will be enjoyed by generations for year to come.”

DCLT staff turned to the Village of Sister Bay to create a partnership to apply for grant funding, provide for future beach management and create a conservation easement to prevent future development. Village president Dave Leinaw said, “This is a rare opportunity to keep a local treasure pristine and untouched. It will keep the essence of Door County’s natural beauty alive and well in Sister Bay.”

DCLT also launched a public fundraising campaign to raise money to supplement potential grant awards. Heartfelt stories from people with fond memories of the beach poured in, along with

donations and photos. Kids sent in earnings from lemonade stands. Newlyweds, in lieu of gifts, asked for donations to be sent to the Land Trust.

Meredith and Fraser Hart requested their gift be used to launch a challenge to the community. The Harts' challenge gift propelled more than 500 households to donate. The Harts said, "We're so grateful that the Land Trust and Sister Bay have found a way to preserve this magical place, and we're delighted to play a part." Meredith passed away at age 96 in 2019, but her children, grandchildren and great-grandchildren can now enjoy the property knowing it is permanently protected.

"Pebble Beach is community conservation at its finest! As the saying goes... it takes a Village, a Land Trust, the generosity of the community, state and federal granting partners and a conservation minded landowner to protect forever a place that has captured our hearts for countless generations," shares Terrie Cooper, DCLT Community Conservation Director.

In September 2019, the Village of Sister Bay purchased the property for \$2.4 million. To fund the purchase, DCLT secured a \$1 million grant for the Village through the Wisconsin Department of Administration via a National Oceanic and Atmospheric Association (NOAA) Coastal and Estuarine Land Conservation Program grant and raised more than \$500,000. DCLT also assisted Sister Bay with an application to the Wisconsin Knowles-Nelson Stewardship Program which was awarded \$392,000.



Paul Luber offers advice to any town considering developing its waterfront: "Once a property is developed there is no turning back so think long and hard about the ultimate impact and end game. Door County, like other communities, is getting over-developed and it's important to preserve the natural beauty of these places for the future."

Now permanently protected, Pebble Beach is free, open to the public and protects a rare geological formation created by the natural weathering of the Niagara Escarpment during glacial eras. Martha Luber says, "Our world needs to change rapidly in order to mitigate climate change, and loss of

biodiversity and water quality/wetlands, including the shorelines. Door County is an especially fragile place sitting on the Niagara Escarpment. I encourage all land trusts, municipalities and landowners to preserve the most resilient and diverse lands as an alternative to development. We need to all work together as it is possible to build a world where nature and people thrive!"

Cinnamon Rossman is the Director of Charitable Giving at the Door County Land Trust. She can be reached at crossman@doorcountylantrust.org.

The Green & Healthy
Schoolyards initiative
integrates coastal
resilience and climate
justice for happier,
healthier students.

GREEN AND HEALTHY SCHOOLYARDS

Heather Dietzel and Michael Timm

Milwaukee Public Schools is leading a unique effort to transform its asphalt-covered properties into green spaces that manage stormwater on its way to Lake Michigan, provide safe and healthy outdoor learning opportunities for the next generation, and reconnect our urban communities to nature.

Wisconsin's largest school district has assembled an impressive collective of partners to transform 26 schoolyards so far, with more on the way. Seas of asphalt becoming green oases means more than a makeover. Underground cisterns beneath play spaces capture stormwater runoff that could overwhelm Milwaukee's sewer system and pollute Lake Michigan. Rain gardens provide pollinator habitat and attract hummingbirds and bees to native flowers whose deep roots loosen compacted clay soils pressed tight from decades of urban use.

New tree plantings soak up water, cast cooling shade and provide calming zones for kids amid lives filled with stresses. Trees also restore canopy hit hard by the invasive Emerald Ash Borer, with some fallen wood upcycled into benches installed at outdoor classrooms. These flexible spaces are designed for teachers of English Language Arts, Science, Technology, Engineering, Math, and Art who use Outdoor Discovery Carts custom-outfitted with the tools they need to make every fresh-air moment an opportunity for student success.

Scaling up from pilot efforts at two schools in 2018, Milwaukee's Green & Healthy Schools program now encompasses 41 schools—over a quarter of the district's 140 school properties—benefiting tens of thousands of young people,

their families and the general public. A collective of partners banded together to make the magic happen. The Milwaukee Metropolitan Sewerage District—with its green infrastructure vision and strategic investments—has provided a key platform for collaboration. The nonprofit organization Reflo—with just nine FTE in 2024 and described as the project's "secret sauce"—acts as a catalyst to bridge partners throughout a multi-year process to turn community visions into reality.

We enlisted a broad coalition to support this work. Federal and state partners include the Fund for Lake Michigan, the Wisconsin Coastal Management Program, the U.S. Department of Education's ESSER funds, the U.S. Environmental Protection Agency Great Lakes Restoration Initiative, and the National Fish & Wildlife Foundation Sustain Our Great Lakes and Five-Star Urban Waters Restoration programs. Locally support is provided by the City of Milwaukee Environmental Collaboration Office and Department of Public Works Green Solutions program, private contributions to the Milwaukee Public Schools Foundation, and schoolyard health research conducted by the Medical College of Wisconsin.

In addition, thousands of individuals and families from the school communities support the work through their hands-on contributions, as do community-based environmental organizations, dedicated professionals at stormwater management engineering firms, and construction contractors who provide local jobs.

The process promotes equity and inclusion. Each fall, community representatives from across the Milwaukee area gather to listen to schools make their pitch to join the process. Five new schools are selected based on need and enthusiasm, and Reflo then supports each cohort in a multi-year process. In year one, school “green teams” co-create conceptual plans. In year two, partners raise funds. In year three, funds raised support detailed design, permitting and construction. Each schoolyard is tailored to the needs of the schools and their families and feature amenities like soccer fields available to the public on weekends. The effort also includes long-term maintenance and stewardship to keep the spaces vital.

The hard work, intentional coordination and diversity of investment is paying off. Shantee Williams is principal of Nathaniel Hawthorne Elementary School, which received its schoolyard improvements in 2022. “This green space has helped our students tremendously in such a short time,” says Williams. “This space has allowed us to decrease idle play time to a more adventurous recess, meaningful outdoor classroom activities, less behavior referrals, and increased attendance. Hawthorne was fortunate to be selected and I hope that other schools take the opportunity to apply and be the next cohort of schools that will help to change Milwaukee Public Schools playgrounds, one greener space at a time.”

Continued investment is needed to sustain and accelerate positive impacts in the face of climate-related threats like intense precipitation and excessive heat, and a legacy of environmental injustice characterizing many of America’s inner cities. In Milwaukee, led by diverse community leaders championing the effort at every level of local government, the project attracts new partnerships by turning liability into opportunity, and flipping environmental injustice on its head.

In 2015, the City of Milwaukee estimated over 45% of the city consisted of impervious surfaces. Over 500 acres of hard surfaces existed at public school properties alone. In nine years, the collective Green and Healthy Schoolyards approach has raised over \$30 million, removed over seventeen acres of asphalt, and manages over 3.1 million gallons of stormwater per rain event with green infrastructure.

In a city where communities can have strained relationships with water, these vibrant spaces reconnect people to nature and—with environmental education offerings aligned to “blue/green job” career pathways—help prepare our next generation to survive and thrive. When we consider projects that both illustrate and integrate “coastal resilience” and “climate justice,” Milwaukee’s Green and Healthy Schoolyards offer a truly inspirational paragon.

Heather Dietzel is the MPS Facilities and Maintenance Sustainability Project Manager for Milwaukee Public Schools. She can be reached at dietzehm@milwaukee.k12.wi.us. Michael Timm is the Milwaukee Water Storyteller for the nonprofit Reflo. He can be reached at michaelalantimm@yahoo.com.



Researchers are studying why Wisconsin's shoreline has become the epicenter for blue green algae blooms in Lake Superior.



LAKE SUPERIOR CYANOBACTERIAL BLOOMS

Matt Hudson

Lake Superior has long been revered as the clearest, coldest and most pristine of the Great Lakes. The Wisconsin shoreline boasts some of the most enchanting features of the lake, highlighted by the abundant sand beaches and sandstone cave formations of the Apostle Islands National Lakeshore and the Bad River/Kakagon Sloughs, a Ramsar-designated Wetland of International Importance and cultural cornerstone for the Bad River Band of Lake Superior Chippewa.

But a new threat has emerged that may already be damaging this reputation for pristine wonder. Portions of Wisconsin's shoreline of Lake Superior have also become the epicenter for cyanobacterial (also known as blue-green algae) blooms in the lake over the past decade. Once unheard of for the largest body of freshwater on the planet by surface area, cyanobacterial bloom reports have become a nearly annual occurrence in some harbor and coastal areas from the City of Superior northeast to the Apostle Islands. Fodor's, a well-known travel guide company, recently placed Lake Superior on its 2024 "No list" of places to avoid travel, due in part to the emergence of cyanobacterial blooms in the lake. This sort of negative exposure is something that many have worried would put a dent in Lake Superior's reputation as a pristine travel destination.

So far, the Lake Superior cyanobacterial blooms are far from the version of blooms that have plagued other parts of the Great Lakes like Green Bay and western Lake Erie. In those places, nutrient runoff

from intense agriculture fuels extensive blooms that have led to large-scale water quality problems. In contrast, the watershed of Lake Superior remains primarily forested and most observed blooms to date have been short-lived and small in area.

Outside of one bloom sample from Wisconsin Point in late September 2022, toxins have not been detected in open lake blooms. Low levels of toxins have been detected in some recent blooms, however, in harbor areas near Barker's Island at Superior. Still, local communities and resource managers wonder if this is the tip of the iceberg and they are concerned about the potential impacts these blooms pose to public health, as well as how to appropriately adapt and respond without raising unnecessary alarm.

The emergence of cyanobacterial blooms in Lake Superior has also sparked a wave of scientific studies aimed at figuring out what is causing the blooms and whether they can be prevented. Evidence is mounting that the occurrence of blooms in Lake Superior is driven by climate change. Lake Superior is one of the fastest warming lakes in the world. Warmer water temperatures, along with excess sediment and nutrient runoff associated with recent climate change-fueled flooding events are leading to conditions favorable for cyanobacterial growth. The species of cyanobacteria that has consistently dominated coastal Lake Superior blooms (*Dolichospermum lemmermannii*) has been known to bloom in other cold, oligotrophic lakes.



Although climate change is emerging as the key culprit behind Lake Superior cyanobacterial blooms, another key question facing researchers is why blooms tend to consistently pop up where they do? The coastal areas between Superior and the Apostle Islands have been hot spots, yet warm, shallow, isolated embayments like Chequamegon Bay have not. Understanding why blooms form in some areas of the lake and not others is a key component to developing management strategies to address them. The Mary Griggs Burke Center for Freshwater Innovation at Northland College has been involved in these efforts, with funding support from the Wisconsin Coastal Management Program and the Brico Fund and project support from partners at the University of Minnesota Large Lakes Observatory.

Field and laboratory studies between 2019 and 2022 revealed that *D. lemmermannii* is not a new arrival to Lake Superior and other recent studies show it occurs throughout the entire lake. However, our 2021 field studies from 31 locations across the entire Wisconsin shoreline of the lake showed that the relative abundance of *D. lemmermannii* increased during late July and late September in the same areas where blooms have been most commonly reported (Superior to the Apostle Islands), but not in areas where they haven't been observed like Chequamegon Bay.

Lab studies conducted by the University of Minnesota-Duluth and the Burke Center revealed that tributaries may be an important seed source



of cyanobacterial cells to nearshore areas of Lake Superior, but again, only in those parts of the Wisconsin shoreline where blooms have been observed and not the Chequamegon Bay region. Understanding how physical factors like tributary inputs and lake currents that run from Superior northeast to the Apostle Islands affect the growth and physiology of *D. lemmermannii* will likely be key in nailing down exact drivers of the blooms and

whether management activities could be targeted to specific areas to mitigate the formation of blooms. We have learned a lot about Lake Superior cyanobacterial blooms in the past few years of research but there is still much left to be discovered.

Matt Hudson is the Associate Director-Great Lakes at the Mary Griggs Burke Center for Freshwater Innovation at Northland College. He can be reached at mhudson@northland.edu.

Aquatic and nearshore species, coastal communities and recreational users will benefit from the Great Lakes Coastal and Nearshore Habitat Assessment Project.

RESTORING HABITATS IN GREAT LAKES COASTAL WATERSHEDS

Vidya Balasubramanyam and Todd Breiby

What does it mean to take a Great Lakes-wide approach to holistic ecosystem restoration? What role do place-based projects play in contributing to a thriving Great Lakes watershed? A partnership between Wisconsin Coastal Management Program (WCMP) with a national non-profit and other federal agencies serves as a model to explore these questions through strong multi-level relationships, enthusiastic local support, and an interdisciplinary project team.

It all started in 2010 when the Great Lakes Restoration Initiative (GLRI) was launched. Housed under the U.S. Environmental Protection Agency (EPA), it catalyzed unprecedented federal agency coordination to accelerate efforts to protect and restore the Great Lakes and make it a better place for the next generation. Ever since, the GLRI has funded a variety of projects ranging from remediating areas of concern, to addressing water quality, to making way for native vegetation.

The GLRI's strength lies in coordination between federal agencies. Most importantly, the National Oceanic and Atmospheric Administration Office for Coastal Management (NOAA) partners with EPA to invest GLRI funding to protect Great Lakes habitats and species along the coastal watershed. Implementation of the funding occurs through a distributed network of non-governmental organizations including the Coastal States Organization (CSO), a national association representing the nation's coastal states and territories of which the WCMP is an active member.

Through close coordination between GLRI, NOAA, CSO and WCMP, a strong partnership was developed to design habitat restoration projects for ecosystems within Wisconsin's coastal watershed.

The process began in 2019 when CSO, in partnership with NOAA and state coastal management programs, convened workshops across the Great Lakes. The objective was to identify shared coastal management principles, goals, priorities and data needs throughout the basin, and identify place-based habitat restoration actions in each state for future implementation. Representatives from federal, tribal, state and local governments, non-profit organizations and universities actively participated in the workshops.

The workshops culminated in a prioritized list of sites across the Great Lakes that could benefit from habitat restoration. Sites were identified based on the species that were most in need of protection, climate vulnerability, and sociocultural significance to local communities.

Starting in 2020, CSO used the menu of prioritized sites to contract engineering and design work for four sites across the Great Lakes each year. CSO used a competitive bidding process to bring together an interdisciplinary team of ecologists, engineers and wetland scientists to collect data at each site and then develop 60-80% engineering and design plans based on the data.



The design team was guided by natural and coastal resource stewards at each of the Great Lakes sites, including staff from the state's coastal zone management program, local land trusts and non-profits, city and county officials, tribal nation representatives, and community members. Each site had its own unique design goal based on its local characteristics, ecological processes, significance to the community, and regulatory requirements of the state.

In Wisconsin, WCMP coordinated with state and local partners to identify coastal resource and project needs, and partnered with CSO, NOAA and state and local partners in developing 60-80% engineering and design plans for coastal and nearshore habitat restoration. In the first project, engineering plans were developed to improve streambank stabilization and enhance habitat at a site on the Peshtigo River in Marinette County.

Bioengineering practices and resiliency were incorporated into the designs. Local partners included Marinette County Land and Water Conservation Department and the Department of Natural Resources (WDNR). Final designs are complete, and funding for construction is being secured.

In Kimballs Bay and the St. Louis River Estuary, engineering plans are being developed to minimize erosion at culverts, prevent sediment from being added into adjacent wetland systems, improve water quality, ensure hydrologic connectivity, and protect wetland and upland habitat. Local partners include the City of Superior, WDNR, and the Lake Superior National Estuarine Research Reserve. Engineering plans are scheduled to be completed in 2024. Project partners will collaborate on construction once final designs are complete.

In the most recent example, engineering plans will be developed to reconnect the hydrology and restore the wetland and upland habitats of a Milwaukee Metropolitan Sewerage District's (MMSD) property in southeast Ozaukee County. Engineering plans are needed to address past alterations made to the wetland. Local partners include MMSD and Southeastern Wisconsin Regional Planning Commission and the project will start in 2024. All of these projects are designed to improve coastal and nearshore habitat, enhance coastal resiliency, restore connectivity, improve water quality, benefit aquatic and terrestrial species, and promote ecosystem services where applicable.

The Great Lakes Coastal and Nearshore Habitat Assessment Project plays an integral and continuing role in improving the health of Great Lakes coastal resources, realizing multiple co-benefits, and impacting the watershed. Beneficiaries will include aquatic and nearshore species, coastal communities and recreational users that rely on these important resources. GLRI, NOAA, CSO and WCMP will continue to collaborate with state and local partners to improve coastal resources not only in Wisconsin, but across the Great Lakes.

Vidya Balasubramanyam is the Research, Science and Program Director at the Coastal States Organization. She can be reached at vbalasubramanyam@coastalstates.org. Todd Breiby is the Coastal Habitat, Wetland and Nonpoint Coordinator with the Wisconsin Coastal Management Program. He can be reached at todd.breiby@wisconsin.gov.



Making Bayfield the way we like has been the slow and loving task of 150 years. To destroy the Bayfield we know can take but the careless act of a single day.

A BROAD AND NARROW VIEW OF COASTAL MANAGEMENT

Larry MacDonald

My wife Julie and I once spent six weeks in Nicaragua and the most thrilling moment of our vacation may have been the drive home from the airport. Even after so many days along the ocean, we were delighted to again lay eyes on Lake Superior. That moment was a reminder of the deep connection we and so many others have to the Great Lakes.

We moved from the Twin Cities to Bayfield in 1989 in large part because of Lake Superior. I traded a career in sales so Julie and I could run a bed and breakfast and general store and sail among the Apostle Islands. A desire to serve my neighbors and protect our beautiful community drove me to run for Mayor in 1994 and I served almost continually until retiring in 2016. During that time and beyond, the people of Bayfield and elsewhere taught me much about the entire Great Lakes.

Every resident and visitor we've met appreciates the Lakes and will do what they can to protect them. This is not unique to Bayfield but plays out in cities and towns of every size across the Great Lakes. For instance, Chicago Mayor Richard M. Daley and I served on the Great Lakes and St. Lawrence Cities Initiative, a coalition of U.S. and Canadian mayors dedicated to protecting the basin. We agreed that water, land and air are central to quality of life in our communities, and led a discussion group of our fellow mayors in Milwaukee to demonstrate we all, regardless of size, have an equal stake in the health of the Great Lakes.

While Bayfield and Chicago each value the Lakes, our approaches are necessarily different. About twenty years ago, Bayfield City Clerk Billie Hoopman came up with the Clean It-Green It Program to educate our citizens on best practices to keep our waters clean. I convinced the City Council to approve tax dollars to provide each City household with a cotton bag filled with bio-friendly cleaning supplies (vinegar, baking soda, liquid castile soap) and a green cleaning booklet. Instead of receiving complaints for this use of tax dollars, citizens quickly adopted green methods and Andy's Market soon sold out of vinegar.

Clean It-Green It is a small but important example of citizen engagement to preserve and protect the Great Lakes, and I had a front row seat to many others. The Wisconsin Coastal Management Program, funded by the National Oceanic and Atmospheric Administration (NOAA), has over the decades supported countless local initiatives that improve water quality and provide citizens and visitors with important connections to the Great Lakes. The Wisconsin Coastal Management Council—on which I've served and chaired through the administrations of Governors McCallum, Doyle, Walker and Evers—sees to it.

The Coastal Management Program works because it is nonpartisan and deeply connected to visionary local leaders with the desire and knowhow to produce results for their communities and the

entire Great Lakes basin. The Program takes a holistic approach by supporting not just water quality initiatives, but also resource protection, economic development, public access and educational projects along our Lake Superior and Michigan coasts. More, its talented staff connects coastal managers in Wisconsin and beyond by sharing ideas and best practices that broaden the impact of local initiatives.

The Coastal Program is also the place where big things take root. For instance, the Council approved a planning grant in the early 2000s to study the feasibility of a national estuary research reserve on Lake Superior. Within a decade, that small investment grew into the Lake Superior National Estuarine Research Reserve, which in turn set the stage for the proposed Green Bay National Estuarine Research Reserve. These major projects each owe thanks to Coastal Management.

The Coastal Management Program isn't alone in helping our Great Lakes flourish. It works closely with other organizations that take a basin-wide approach to critical issues facing our coastal communities. The University of Wisconsin Sea Grant Program, Alliance for the Great Lakes, Great Lakes St. Lawrence Governors & Premiers, Great Lakes Commission and many others each work toward solutions to preserve and protect the Lakes.

Looking ahead, the Wisconsin Coastal Management Program is well positioned to take on the challenges of local projects while working



toward basin-wide solutions. Nationally, NOAA regards Wisconsin as one of the nation's premiere coastal programs and looks to us for expertise to assist coastal managers in other states. Here at home, communities across our coasts turn first to Coastal Management as they develop innovative ideas into reality.

The Wisconsin Coastal Management Program succeeds because it solves today's problems and has a vision for tomorrow. When the Coastal Management Council was created decades ago, state leaders had the foresight to include a Tribal representative as a member. My Tribal colleagues on the Council remind us that wise stewards do

not plan for today, but for seven generations in the future. It doesn't matter if you are the mayor of Chicago or Bayfield or just enjoying a day on the beach, the Great Lakes's future is contingent on people being aware of this precious asset and protecting it in ways big and small. Wisconsin Coastal Management will help our communities lead the way.

Larry MacDonald is Chair of the Wisconsin Coastal Management Council and former Bayfield Mayor (1994-2004, 2006-16). Memberships include Great Lakes St. Lawrence Cities Initiative, Alliance for the Great Lakes, UW-Madison Sea Grant Advisory Council, Wisconsin DOT Scenic Byways Advisory Committee, and numerous others.

2024 WISCONSIN COASTAL MANAGEMENT PROGRAM GRANTS

Project Name

Grantee

WCMP Award

Project Description

Contact

Coastwide

Natural Area Ecological Restoration and Management Planning

Southeastern Wisconsin Regional Planning Commission

\$40,000

Develop management plans for select Natural Areas and Critical Species Habitat Sites in Racine, Milwaukee and Ozaukee Counties.

Dr. Thomas Slawski, tslawski@sewrpc.org

Habitat Restoration of Two Greenseams® Sites

Milwaukee Metropolitan Sewerage District
\$37,200

Restore 31 acres of crop fields to native forest at two sites in Milwaukee and Ozaukee Counties.

Ms. Anna Kettlewell, akettlewell@mmsd.com

Coastal Hazards Fellowship

University of Wisconsin Sea Grant Institute
\$32,993

Sponsor a one-year fellowship focused on tackling science and policy challenges related to increasing coastal community resilience across the Great Lakes region.

Dr. Jennifer Hauxwell,
jennifer.hauxwell@aqua.wisc.edu

Technical Assistance

Bay-Lake Regional Planning Commission
\$30,000

Provide public information and outreach on issues affecting coastal resources by providing information, presentations, support, newsletter articles, social media posts and technical assistance.
Mr. Brandon Robinson, brobinson@baylakerpc.org

Technical Assistance

Northwest Regional Planning Commission
\$30,000

Provide technical assistance to the Wisconsin Department of Administration in the implementation of the Wisconsin Coastal Management Program.

Mr. Jason Laumann, jlaumann@nwrpc.com

Technical Assistance

Southeastern Wisconsin Regional Planning Commission
\$30,000

Provide technical assistance to the Wisconsin Department of Administration in the implementation of the Wisconsin Coastal Management Program.

Dr. Thomas Slawski, tslawski@sewrpc.org

WATERshed Program Coastal Engineering Education

Watershed Program of Southeast Wisconsin Inc.
\$24,155

Engage 2,000 students from Racine and Kenosha Unified School Districts in a place-based coastal engineering education program that will include field trips to coastal sites.

Ms. Nancy Carlson, nancy@watershedprogram.com



Geologically-Realistic Preliminary Numerical Groundwater Flow Model

Wisconsin Geological and Natural History Survey
\$17,447

Develop a preliminary groundwater numerical flow model—3-D transient MODFLOW—for southern Door and Kewaunee Counties.

Dr. Maureen Muldoon,
maureen.a.muldoon@wisc.edu

Piering into the Past: Archaeological Remains of Ghost Ports

Wisconsin Historical Society
\$16,629

Investigate, map and evaluate submerged and associated shoreline cultural resources associated with historic lumber and commercial piers in Manitowoc, Sheboygan and Ozaukee Counties.

Ms. Kendra Kennedy,
kendra.kennedy@wisconsinhistory.org

Northwest Sands Auto Trail: A Story of Ecology, History and Culture

Northwest Regional Planning Commission
\$10,000

Develop an Auto Trail focusing on the ecological, historical and cultural values of the Northwest Sands in Bayfield and Douglas Counties.

Mr. Jason Laumann, jlaumann@nwrpc.com

Ashland County

Comprehensive Outdoor Recreation Plan 2025-2029

City of Ashland
\$10,000

Update the City's Comprehensive Outdoor Recreation Plan.

Ms. Sara Hudson, shudson@coawi.org

Bayfield County

Whittlesey Creek

Bayfield County
\$71,648

Acquire 160 acres of coastal forests and wetlands in the Whittlesey Creek watershed.

Mr. Jason Bodine,
Jason.Bodine@bayfieldcounty.wi.gov

Brown County

Coastal Habitat Evaluation Tool (CHET)

State Cartographer's Office
\$59,469

Support One Map by developing a model Coastal Habitat Evaluation Tool to assess priorities for coastal habitat conservation in the Brown County study area.

Dr. Howard Veregin, veregin@wisc.edu

Toward Flood Resiliency Implementation in the East River

University of Wisconsin Sea Grant Institute
\$30,000

Provide community engagement and capacity to identify actions and practices that will reduce flood risk and increase flood resilience in the East River Watershed of Brown County.

Dr. Adam Bechle, bechle@aqua.wisc.edu

Wequiock Creek Flood Study

Town of Scott
\$26,980

Conduct a study on areas adjacent to Wequiock Creek to prioritize sites to be protected to reduce impacts of flooding and nutrient loading into the Bay of Green Bay.

Mr. Dave Cerny, build@townofscottbrownwi.gov

Protecting Public Health through Increased Awareness of HABs

NEW Water
\$16,275

Lead a harmful algal blooms (HABs) educational campaign about how to keep safe and tools needed to recognize, prevent and mitigate impacts from HABs.

Ms. Angela Kowalzek, akowalzek@newwater.us

Door County

Fish Creek Property Acquisition

Town of Gibraltar

\$175,000

Acquire 125 acres of property located in Fish Creek. The acquisition, which will be added to the park system, will protect remnant natural communities and over 1 mile of Fish Creek.

Mr. Travis Thyssen, tthyssen@gibraltarwi.gov

Escarpment Park Interpretive Panels

Greater Escarpment Organization of Door County, Inc.

\$6,500

Develop four educational panels for Escarpment Park located south of Ellison Bay, in the Town of Liberty Grove. The panels will feature the formation, history, and flora and fauna of the Niagara Escarpment.

Ms. Nancy Goss, nancy@geo-dc.org

Invasive Species Inventory and Management

Wisconsin Department of Natural Resources

\$4,500

Update the 2012 inventory of woody invasive species found within the 55-acre White Cedar Forest State Natural Area in Peninsula State Park.

Mr. Eric Hyde, eric.hyde@wisconsin.gov

Kenosha County

Southport Park Project

City of Kenosha

\$46,000

Install outdoor improvements to protect the historic Southport Park Beach House.

Mr. Delano Smith, dsmith@kenosha.org

Manitowoc County

Coastal Wetland Bird Habitat Restoration in Lincoln Park Zoo

City of Manitowoc

\$95,375

Restore a site adjacent to the Little Manitowoc River to create habitat for coastal and wetland birds.

Mr. Andy Janicki, lpzcoordinator@gmail.com

Bayshore Recreation Trail Public Water Access

City of Manitowoc

\$26,074

Install an accessible kayak launch and educational signage at Lincoln Park on the Little Manitowoc River.

Mr. Brock Wetenkamp, bwetenkamp@manitowoc.org

Milwaukee County

Strengthening Climate Resiliency in Milwaukee's 30th Street Corridor

Clean Wisconsin

\$48,140

Work with the Sherman Park and Amani neighborhoods to assess the impact of green infrastructure on improving stormwater management through modeling.

Mr. Tamar Cloyd,

grantsmanager@cleanwisconsin.org

Greener Schools, Stronger Communities

Milwaukee Public Schools

\$50,000

Develop conceptual designs and engineering plans, create bid documents and acquire permits for projects that incorporate green infrastructure at five Milwaukee Public Schools.

<https://mps.milwaukee.k12.wi.us>

MPS Green Vision: Great Lakes Education for All

Milwaukee Public Schools

\$40,000

Partner with Reflo to provide Great Lakes education and experiential opportunities at five MPS schoolyards.

<https://mps.milwaukee.k12.wi.us>



Youth & Community Watershed Education

Riveredge Nature Center, Inc
\$28,260

Implement an educational program which brings middle-school students to their local watershed for macroinvertebrate exploration and preliminary watershed testing.

Ms. Anna Jean Hallmann,
ajhallmann@riveredge.us

Milwaukee County Boat Launch Redesign

Harbor District, Inc.
\$30,000

Develop plans for redevelopment of the Milwaukee County boat launch and adjacent City easement as imagined in the Harbor District's Water and Land Use Plan.

Ms. Tia Torhorst, tia@harbordistrict.org

Sturgeon Protectors

Milwaukee Riverkeeper
\$30,000

Develop educational materials for the public focused on sturgeon and protection efforts in the Milwaukee River.

Ms. Cheryl Nenn,
cheryl_nenn@milwaukeekeeper.org

Ozaukee County

Tendick Creek and Wetland Restoration

Ozaukee County Planning and Parks Department
\$93,333

Complete stream and habitat restoration on Tendick Creek in Tendick Nature County Park in the Town of Saukville.

Mr. Andrew Struck, astruck@ozaukeeconomy.gov

Upper Lake Park/North Beach Bluff Stabilization

City of Port Washington
\$40,000

Install drainage pipes in the North Beach bluff to dewater sand seams that make the bluff unstable.

Mr. Robert Vanden Noven,
rvandenoven@portwashingtonwi.gov

Racine County

Continuous Monitoring of Root River Water Quality Parameters

City of Racine
\$35,000

Purchase and install instrumentation to monitor water temperature, specific conductance, dissolved oxygen, turbidity and Chlorophyll-a at Colonial and Lincoln Park.

Mr. Adrian Koski, adrian.koski@cityofracine.org



ACKNOWLEDGMENTS

The Wisconsin Coastal Management Program was established in the Department of Administration (DOA) in 1978 under the Federal Coastal Zone Management Act. The program and its partners work to achieve balance between natural resource preservation and economic development along Wisconsin's Great Lakes coasts. The program thanks its principal federal partner, the National Oceanic and Atmospheric Administration, Office for Coastal Management, for the technical and financial support it provides on behalf of Wisconsin's coastal communities.

Wisconsin Coastal Management Program

Tony Evers
Governor

Kathy Blumenfeld
Secretary, DOA

Dawn Vick
Administrator, DOA Division of Intergovernmental Relations

Mike Friis
Resource Policy Bureau Director, DOA

Kathleen Angel
Program Manager, WCMP

Todd Breiby
Coastal Habitat, Wetland and Nonpoint Coordinator, WCMP

Lauren Leckwee
Public Access and Environmental Compliance Coordinator, WCMP

Lydia Salus
Bipartisan Infrastructure Law Program Coordinator, WCMP

Hannah Paulson
J. Philip Keillor Coastal Management Fellow

Helena Tiedmann
J. Philip Keillor Coastal Management Fellow

Wisconsin Coastal Management Council

Larry MacDonald, *Bayfield, Chair*

Sharon Cook, *Milwaukee*

Mike Halsted, *Wisconsin Department of Transportation*

Representative Joel Kitchens, *Sturgeon Bay*

Ken Leinbach, *Whitefish Bay*

Mayor Cory Mason, *Racine*

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William Schuster, *Sturgeon Bay*

Wade Strickland, *Wisconsin Department of Natural Resources*

Dawn Vick, *Wisconsin Department of Administration*

Chuck Wagner, *Luxemburg*

Senator Robert Wirch, *Kenosha*

Editor

James Langdon

Production Director

Todd Breiby

Photographs

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Contents, Pebble Beach, Door County Land Trust

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5, Ricing, CO Rasmussen

6, Pebble Beach, Dan Eggert

7, Pebble Beach, Joe Taylor

8, Hawthorne School, Reflo

9, Bayview Montessori, Reflo

10, Water Resource Specialist, Matt Hudson

11, Stockton Island, Bayfield Chamber and Visitor Bureau

12, Dwight's Point, Karina Heim

13, Peshtigo River, LimnoTech

14, Bayfield Pavilion, Bill Millhouser

15, Julie and Larry MacDonald, Janet Sternat

16, Sam Myers Park, Hannah Paulson

20, Gile Flowage, Cathy Techtmann

21, Herbster Sunset, Bayfield Chamber & Visitor Bureau

Wisconsin Coastal Management Program

101 East Wilson Street

PO Box 8944

Madison, Wisconsin 53708-8944

(608) 267-7982

<http://coastal.wisconsin.gov>

coastal@wisconsin.gov

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**WISCONSIN COASTAL
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