

Wisconsin Great Lakes Chronicle 2014



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FOREWORD

Governor Scott Walker

Dear Friends of the Great Lakes,

Wisconsin's coastal communities have responded to their unique Great Lakes location with innovative initiatives. Residents benefit from cleaner beaches, better lake access, and increased commercial and tourism activity. Many communities have received special recognition for their forward-looking coastal projects.



The National Association of Counties recognized Ozaukee County with an Achievement Award for its Fish Passage in the Milwaukee River Watershed Program. Since 2007, the program has removed over 233 barriers to fish movement, reconnected 129 stream miles, increased fish reproduction, improved water quality and increased countywide tourism. The program received over \$8.4 million in grants with most going into the local economy through contracts.

The Gikinoow'izhiwe Onji Waaban (Guiding for Tomorrow) Changing Climate, Changing Culture Initiative (G-WOW) received the prestigious 2011-2012 Eastern Region Honor Award from the U.S. Forest Service for "Courageous Conservation." The project developed school curriculum and a

200-square-foot interactive exhibit at the Northern Great Lakes Visitor Center near Ashland. It is at the forefront of indigenous education on climate change and cultural life. Funding partners include the Great Lakes Restoration Initiative and the Wisconsin Coastal Management Program (WCMP).

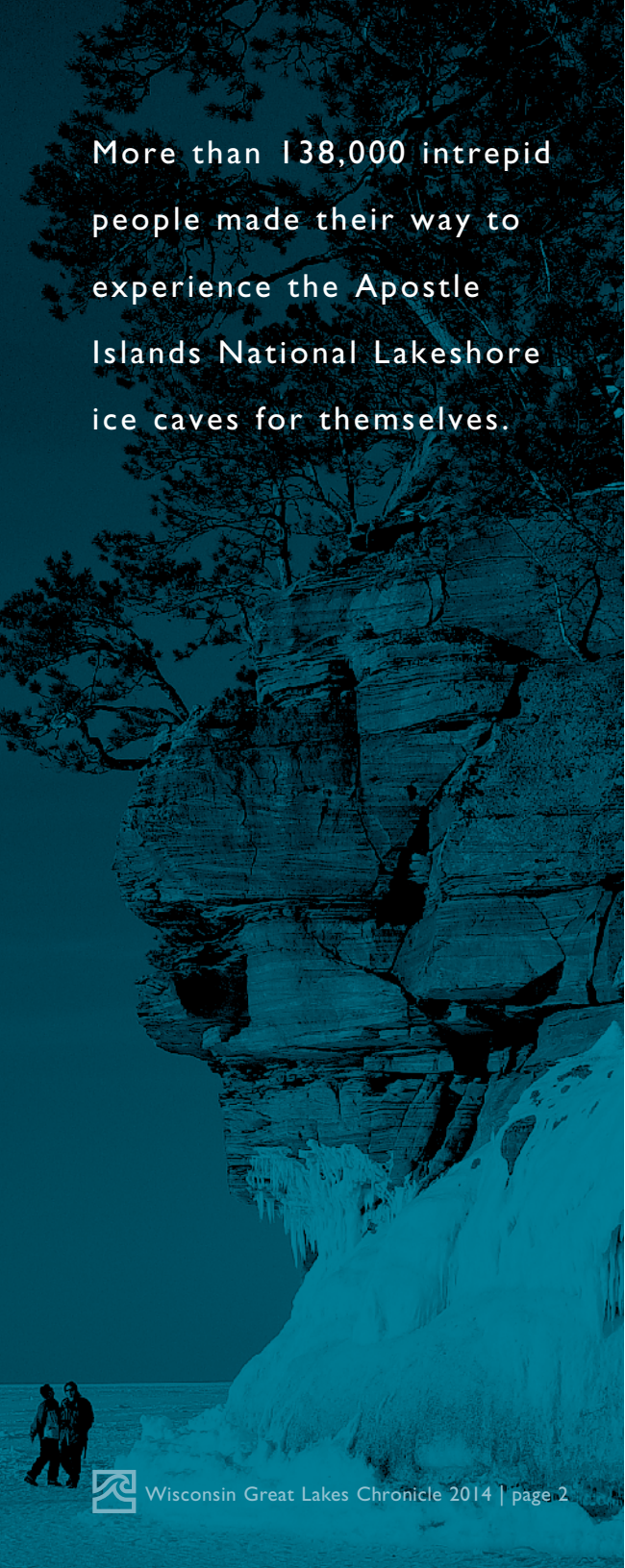
American City and County magazine recognized Port Washington's Coal Dock Park with a 2013 Crown Communities Award, a national honor based on uniqueness, short- and long-term community value and innovative financing. The park was planned and designed utilizing a 2007-08 WCMP Grant. In 2002, seventeen acres on Lake Michigan previously used for coal storage became available due to We Energies' move to gas power. The City partnered with We Energies, the Wisconsin Board of Commissioners of Public Lands, the Wisconsin Department of Natural Resources, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to bring residents their newest public access to Lake Michigan. A 1,500-foot promenade and 80-foot pedestrian bridge link four parks, the marina, downtown and North Beach.

Milwaukee's Menomonee Valley is a national model of economic and environmental sustainability, recognized by the Sierra Club as "One of the 10 Best Developments in the Nation," and the American Society of Landscape

Architects for urban land restoration. In the past ten years, results include 39 companies moving to the Valley, 5,200 jobs, 45 acres of native plants, seven miles of trails and a nationally recognized shared stormwater treatment system. Annually, ten million people visit the Valley's recreation and entertainment destinations which include the Harley Davidson Museum, Miller Park and the Hank Aaron State Trail. More than 250 organizations and 450 individuals have served on boards, committees and working teams. Thousands more have volunteered.

Wisconsin has fourteen commercial ports situated on the commercially navigable Mississippi River and Great Lakes-St. Lawrence Seaway, giving Wisconsin access to international markets. The ports provide a transportation alternative that many states cannot offer their manufacturers and suppliers. The first phase of the Wisconsin Commercial Ports Master Plan is underway and includes a comprehensive background and status inventory of Wisconsin Great Lakes ports. The planning process is examining port interaction with other freight movement forms and will recommend transportation system changes for long-term, efficient materials movement through the state.

Enjoy this year's *Wisconsin Great Lakes Chronicle* highlighting successful projects and current issues on our coasts.



More than 138,000 intrepid people made their way to experience the Apostle Islands National Lakeshore ice caves for themselves.

APOSTLE ISLANDS ICE CAVES GO VIRAL

Bob Krumenaker and Neil Howk

The mainland sea caves of northern Wisconsin's Apostle Islands National Lakeshore are the park's most popular summer kayaking destination. Most of the year, the National Park Service (NPS) refers to these formations as the *sea caves*, but in early winter they transform into the *ice caves*.

The ice caves form when spray from crashing waves freezes to the rock cliffs just above the surface of Lake Superior. In addition, groundwater seeps and flowing water from the land surface above the caves freeze on the cave walls and ceilings creating formations that look similar to those found in underground limestone caves. The ice formations build over the course of weeks, change rapidly and disappear in spring as quickly as they form.

While other ice caves exist, there may be no better place on the planet where these remarkable structures are so variable, so protected and often so accessible.

Access to the caves depends on whether this portion of western Lake Superior freezes. Solid ice is influenced by more than low temperatures—this part of the lake is vulnerable to big winds and waves which can break up ice quickly. NPS staff monitor ice conditions and require that the ice pack be stable and at least eight inches thick for two weeks before the ice is deemed low risk.

The webcam (wavesatseacaves.cee.wisc.edu) from the park's Real-Time Wave Observation System—developed in cooperation with the University of Wisconsin-Madison, University of Wisconsin Sea Grant, the Wisconsin Coastal Management Program and the Friends of the Apostle Islands—is vital to monitoring ice conditions. However, there is no substitute for the skill and local knowledge of park rangers who measure ice thickness directly.

The deep cold of the winter of 2013-14 arrived in December and intensified in January. The first ice started forming on the lake near the caves early in the calendar year and soon was more than a foot thick. The NPS announced the caves were open on January 15, at least a month earlier than usual.

Park staff anticipated visitation similar to previous *good ice* years—up to 12,000 people over a six week period. However, each of the first weekend days the caves were open saw the largest daily crowds the park had ever seen—winter *or* summer.

The ice formations were spectacular as a result of the deep, deep cold. Thousands of people ventured out despite extraordinarily cold conditions. In the first several weeks, steady winds from the west and southwest combined with single digit—or lower—temperatures to create wind chills in the minus 25 to minus 35 degree range on most days. It was brutal! Yet the people kept coming.



In just two months, more than 138,000 intrepid people made their way north to experience the ice caves for themselves. In 2013, the 21-island, 69,000-acre national park counted 150,000 visitors for the entire year!

The 2014 ice cave visitors hiked five miles or more across the frozen lake during some of the coldest days of the year. Some referred to their journey as a *pilgrimage*. This unprecedented popularity speaks to our basic need for a connection to nature and demonstrates a hunger to experience beauty in the world.

There are numerous reasons why the ice cave story went viral. Five years of pent up desire to see the caves had many people adding them to their bucket

list. The last time the lake was sufficiently frozen to permit walking over the ice to the mainland caves was 2009. A study of satellite images from 1973 to 2010 showed that ice cover on Lake Superior decreased 79% during that period. A string of relatively mild winters from 2010-2013 featured very little ice cover on the lake. That changed this year with the arrival of the polar vortex.

Word of the caves spread fast. Local media attention was quickly replaced by national coverage. ABC World News, National Public Radio, the CBS Evening News and NBC Nightly News sent crews to produce stories which aired nationally in prime time. The *Wall Street Journal* published a story.

The caves even went international—Australia's 7 Network aired stories on the most watched television news show *Down Under*. The *London Daily Mail* covered it, as did countless other media outlets across the globe. Al Jazeera even sent a television crew.

Social media also played a huge role in spreading the story. Ice cave visitors shared their pictures and experiences with friends. Postings and photos on the park's Facebook page received three to five times more views than the average posting before the ice caves opened.

Impacts of the 2014 ice cave season may be long lasting. The Bayfield Chamber of Commerce and Visitor Bureau (bayfield.org) estimated that the regional economy received a \$10-12 million boost from the increased winter traffic. Many ice cave visitors noted their desire to return to the park and Bayfield area during the summer season to experience the beauty of Lake Superior and the Apostle Islands when the water is blue and the trees are green.

The NPS looks forward to helping visitors enhance their intellectual and emotional connections with the national lakeshore on a return pilgrimage.

Bob Krumenaker is the Superintendent and Neil Howk is the Assistant Chief of Interpretation and Education with the National Park Service at the Apostle Islands National Lakeshore in Bayfield. They can be reached at (715) 779-3397, bob_krumenaker@nps.gov or neil_howk@nps.gov.



CRUMBLING COASTAL INFRASTRUCTURE: WHAT CAN BE DONE?

Gene Clark, PE

America's failing roads and bridges are receiving attention by legislators and citizens. However, many of the structures that protect Wisconsin's Great Lakes coastal communities, ports and harbors from storm, wave and ice damage are also aging and failing. Lawmakers and the public may want to pay attention since these structures support recreation, commerce and livelihood along Wisconsin's coasts.

Many harbor outer breakwater structures constructed by the U.S. Army Corps of Engineers near the turn of the century were built with either timber crib or timber piling foundations and then capped with rock or massive concrete covers. Maintenance of these structures has lagged behind demand and many are now in poor condition. The Corps can only provide maintenance assistance to the largest Wisconsin commercial ports and harbors, leaving smaller recreational and commercial harbors to seek maintenance or structure replacement funding elsewhere.

Recent near-record-low Great Lakes water levels have increased damage—especially in timber structures—and allow us to see the damage more easily. Failure of these structures would be catastrophic for the valuable coastal communities they protect. This damage to timber structures is not due to wood borers like those in marine harbors because no freshwater wood borers

exist. Preserved underwater, timber cribs can last indefinitely. However, when exposed to air, the timber will begin to rot and/or abrade due to ice or impacts from ships.

Recent failures of Wisconsin's Great Lakes timber structures appear to be at or slightly above the long-term water level mark. Failing timber cribs have been observed at many of Wisconsin's older ports and harbors as the timber core sections begin to decay and slump, bringing the superstructure down with them. Several of Wisconsin's Great Lakes harbors have experienced complete failure of the structures due to deteriorating timbers.

The City of Washburn recently rebuilt 575 feet of its failing outer harbor timber bulkhead wall. The project cost approximately \$735,000 and was funded with grants from the Wisconsin Department of Commerce, the Wisconsin Department of Natural Resources and other sources.

Other outer harbor entrance structures and many vertical slip dock walls have been constructed with steel sheet pilings. The outer breakwater sections are often built as steel circular cells, while inner walls are straight steel bulkhead designs. Steel has also been used to cover failing timber structures.

On Lake Superior, accelerated freshwater corrosion is causing deep pits on or complete perforations through steel structures. This new phenomenon—

Many structures that protect Wisconsin's Great Lakes coastal communities, ports and harbors from storm, wave and ice damage are aging and failing.



rarely seen elsewhere—is compromising the structural integrity of steel wall in many harbors and marinas on the lake. Recent studies have shown that accelerated corrosion is not the result of stray electrical currents, the age or type of steel used or water quality issues. The studies have identified microbes as at least one factor.

To combat this problem, several million dollars have already been spent on many unstable steel structures in the City of Superior harbor. These structures were either coated with corrosion-resistant paint—by use of specially made cofferdams to de-water the region in front of the damaged steel, clean it and then coat it in dry conditions—or completely replaced with new, coated steel sheet pilings.

Corrosion has also been observed on steel pipes and H-pilings. Steel pins are used to keep timber crib structures intact and they have failed as well. Researchers continue to investigate both the cause of this unusual phenomenon and how best to rehabilitate and repair damaged structures. The Wisconsin Coastal Management Program has funded a study to determine successful methods for protecting steel pipes and H-pilings from freshwater corrosion damage.

Many other coastal structures in Wisconsin use rock or concrete for foundations, scour protection or large breakwaters. Depending on their quality—which typically deteriorate with age—rock and concrete structures can also fail. Soft rock or rock with seams or cracks can break apart. Concrete

walls can crack due to settlement or poor quality. When this happens, action by waves, ice or floods can easily displace the structure.

The outer breakwater concrete cap at Port Washington has been failing and recently received \$950,000 of federal funds to repair 990 feet of the concrete cap which has crumbled and is no longer safe for walking or fishing. Many other breakwaters are experiencing similar problems. Quality control at the source—at the rock quarry or concrete plant—is of utmost importance to obtain rock and concrete suitable for Great Lakes use. For aging concrete, maintenance is the key.

Much more state and national attention is needed to assist the many smaller Wisconsin commercial and recreational harbors with failing coastal infrastructure problems. Our coastal community economy depends upon them!

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LAKE SUPERIOR NATIONAL ESTUARINE RESEARCH RESERVE STARTS STRONG

Becky Sapper

Lake Superior's freshwater estuaries are both nursery and kitchen for diverse populations of aquatic plants, fish, wildlife and waterfowl that rely on them for shelter, food and spawning. Estuaries also benefit people by slowing runoff and acting as filters to reduce erosion and sedimentation and by providing places for hunting, fishing, recreation and tourism activities. In the case of the St. Louis River, estuaries can also be working ports. Lake Superior's freshwater estuaries and coastal wetlands are an important part of what defines the quality of life in the Lake Superior basin.

These realities were the motivation behind designating the St. Louis River Freshwater Estuary as a National Estuarine Research Reserve (NERR) in October 2010. The Lake Superior NERR is the second reserve in the Great Lakes and the 28th in a national network administered by the National Oceanic and Atmospheric Administration (NOAA). The NERR program is a non-regulatory federal and state partnership which provides federal funding and technical support to advance estuary research, education and stewardship. Wisconsin's lead state agency is the University of Wisconsin-Extension (UWEX), which works closely with the University of Wisconsin-Superior (UWS).

The Wisconsin Coastal Management Program (WCMP) has long supported the designation of a Lake Superior NERR. This began with a 2002 grant to UWEX for an initial feasibility

study and continued through participation on a multi-agency partnership for the site selection process resulting in the designation of the St. Louis River. WCMP is an active member of the Reserve Advisory Board along with the City of Superior, Douglas County, Fond du Lac Band of Lake Superior Chippewa, UWS, University of Wisconsin Sea Grant Institute and the Wisconsin Department of Natural Resources.

The Lake Superior NERR's mission is to work in partnership to improve the understanding of Lake Superior freshwater estuaries and coastal resources and address issues affecting them through an integrated program of research, education, outreach and stewardship. The Reserve is comprised exclusively of public lands and waters and contains over 16,000 acres of habitat along the St. Louis River freshwater estuary and Lake Superior.

In the four years since its designation, the Lake Superior NERR has realized many accomplishments. Eight new positions were created for oversight, education, monitoring and research. In addition, over a dozen UWS students have engaged in meaningful NERR experiences, as have several community volunteers.

The Reserve received \$5.8 million in new resources focused on its mission along with an additional \$600,000 in new funds for further research, education and outreach. An example of this additional funding is a Science Collaborative

The Lake Superior NERR
is well on its way to
providing expected benefits
to the Twin Ports region
and all of Lake Superior.



project—funded by a NOAA grant—which brings local stakeholders and scientists together to develop a process for incorporating wetland science, watershed planning and geospatial tools into decision-making.

UWS acquired two buildings on Barkers Island in Superior to house the Lake Superior NERR. An office and laboratory opened in February 2014 that houses NERR and UW Sea Grant partners. The laboratory is adding new equipment to make it a fully operational and certified lab. More renovations will create a public Learning Center, classroom and meeting space. In the meantime, temporary exhibits on loan through Great Lakes partners provide interactive opportunities for the NERR's visitors.

Rivers2Lake is the foundational K-12 education program at the Lake Superior NERR and provides extended training, mentoring and resources to teachers throughout the school year. This program supports the creation of interdisciplinary inquiry-based and outdoor experiences for students based on the St. Louis River and the Lake Superior watershed. Through Rivers2Lake, Lake Superior NERR has provided more than 800 contact hours of professional development for K-12 teachers and conducted more than 6,000 student contact hours.

The NERR System Wide Monitoring Program—located at each of the 28 Reserves—provides researchers, resource managers, educators and other coastal decision makers with standardized,




quantitative measures to determine how Reserve conditions are changing in both the short-term and the long-term. The Lake Superior NERR water quality monitoring program collects data at fifteen minute intervals with live data links accessible to the community and researchers nation-wide. In addition to this core program, the Lake Superior NERR was selected as one of six national Sentinel Site locations adding to a national network of long-term sites measuring the effects of climate change on estuaries.

The 4th annual St. Louis River Estuary Summit succeeded in bringing the community, students, scientists, industry and natural resource managers together to share information about the St. Louis River estuary. The 2014 Summit was attended by

over 200 people and with talks focused on social science, or how people relate to and interact with the environment.

In just four short years, the Lake Superior NERR is well on its way to providing expected benefits to the Twin Ports region and all of Lake Superior. The Lake Superior NERR makes Superior home to an internationally important research program with unique education opportunities and continued focus on a freshwater estuary that is a source of community pride and activity. To learn more, visit the Lake Superior NERR on Facebook and its website at lsnerr.uwex.edu.

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From the ruins of abandoned factories arose interest in opening up the Oak Creek lakefront for the enjoyment of the entire community.

OAK CREEK REDEVELOPMENT

Mayor Steve Scaffidi

The City of Oak Creek's Lake Michigan waterfront had long been a place that commerce and opportunity call home. For almost a century, this area—eight miles south of downtown Milwaukee—hosted a range of industrial uses that drove the local economy and created a thriving community of factory workers, business owners and their families. Carrollville—the small company town near the waterfront—had been a vibrant neighborhood for nearly 60 years by the time Oak Creek was incorporated in 1955. It was a place that drew immigrants from all over the world to work and start a family by offering stable jobs and a strong community.

For 80 years, the heavy industry located along the Oak Creek lakefront brought prosperity to the region. However, those gated and intense industrial uses stood between the heart of our Oak Creek community and Lake Michigan. For the residents who did not work in industry, Oak Creek's Lake Michigan shoreline was just out of reach and completely inaccessible. With the loss of manufacturing jobs throughout the country in the 1980s and 1990s, Oak Creek's once bustling industrial waterfront was slowly abandoned, leaving the land polluted and unusable.

Yet this was only the beginning of a new chapter in the City's story. From the ruins of the abandoned factories arose a new interest in opening up the Oak Creek lakefront for the enjoyment of the entire community.

Oak Creek—now a city of 35,000—suddenly found itself with the largest section of undeveloped waterfront in southeast Wisconsin. Our residents and leaders understood we had a rare opportunity to completely transform the character of our community while reviving the jobs center and neighborhood that had thrived in decades past.

To jumpstart the redevelopment process, the City in 2009 invited a panel from the Urban Land Institute (ULI) to forge a vision for reconnecting the community with the lakefront through mixed-use development and a network of coastal open spaces. Two years later—with financial assistance from the Wisconsin Coastal Management Program—the City prepared the Lakefront Redevelopment Action Plan. This expanded the ULI panel's vision and developed more detailed plans for public gathering spaces, ecological restoration areas and tax-generating redevelopment. The action plan identifies durable funding and partnership strategies as well as catalytic priorities that will keep our lakefront redevelopment effort—now called Lake Vista—moving forward.

Bolstered by the support of the Oak Creek community, the City quickly got to work. We leveraged federal and state grant monies and local tax dollars to acquire abandoned properties, demolish the remaining structures, and clean up and cap the site to provide safe access once again.

We are undertaking major infrastructure improvements that will set the stage for the transformation of our section of Lake Michigan. In 2016, the City will start construction on an extension of Highway 100 to serve as the southern gateway into Lake Vista. New internal trails and roads are scheduled for construction in 2015—they will allow for safe and unhindered bicycle and pedestrian access along the bluff top edge, connecting to the recreational and environmental amenities in Milwaukee County's Bender Park to the south. New recreational fields and scenic overlooks will be Oak Creek's first city gathering spaces that feature views of our great lake. Upon completion, residents and visitors will have access to this section of our city's lakefront for the first time in over 80 years.


Oak Creek is also leveraging the scale and timing of this transformative redevelopment to create a comprehensive green infrastructure system throughout the Lake Vista area. Stabilization and environmental remediation of the bluffs will restore land- and water-based native ecological communities and significantly improve the quality of water entering Lake Michigan from the site. On top of the bluff, a network of sustainable stormwater treatment areas will filter pollutants and extend restored native landscape into the redevelopment areas.



Land adjacent to these new public open spaces will eventually be redeveloped as residential, retail, office and light industrial areas. WISPARK—a real estate development company and trusted partner for cities throughout southeast Wisconsin—plans to build a business park in Lake Vista that could house water-based research and businesses. The adjacent Milwaukee Metropolitan Sewer District treatment plant—once seen as a liability—offers a uniquely sustainable opportunity to reuse hot water discharged from the plant to heat new buildings.

Our Oak Creek lakefront—which for so long was inaccessible and underutilized—has now become an incredible opportunity for community access to the lakefront, as well as a catalyst for economic revitalization of the area. With its revitalizing focus on active recreation, ecological restoration and bluff resiliency—along with the redevelopment of the former brownfield areas—Lake Vista will play a dynamic role in forging new jobs and new neighborhood connections.

Steve Scaffidi is Mayor of the City of Oak Creek. He may be reached at (414) 768-6500 or sscaffidi@oakcreekwi.org.



Culture and science agree that climate change is affecting the sustainability of Lake Superior coastal resources.

G-WOW CHANGING CLIMATE, CHANGING CULTURE, CHANGING COASTS

Cathy Techtmann

Unprecedented cancellations of the Bad River tribal wild rice harvest. A trend of diminishing ice cover at Bayfield harbor. Greater frequency of storm and flooding events. Place-based evidence is building that climate change is affecting Lake Superior coastal communities, resources and economies.

For federal agencies like the Chequamegon-Nicolet National Forest and the Apostle Islands National Lakeshore, these changes have created new management issues. The Great Lakes Indian Fish and Wildlife Commission viewed climate change as a threat to Ojibwe treaty rights. The University of Wisconsin-Extension (UWEX) realized that traditional science-only climate change education models were not resonating with audiences. A new approach was needed to engage people on this issue.

These state, federal and tribal agencies partnered to develop the Gikinoo'wizhiwe Onji Waaban (Guiding for Tomorrow) Changing Climate, Changing Culture Initiative, nicknamed G-WOW. The result is a new model for climate change educational that links culture with science and prompts action to mitigate its impacts.

G-WOW is the first climate literacy model that links culture and science. It is based on understanding the how the sustainability of key species that support cultural and economic practices important to coastal communities will be affected by climate change.

For generations, the Lake Superior Ojibwe have relied on the sustainability of coastal species—such as fish and wild rice—to support subsistence, cultural and spiritual lifeways. Their long relationship with these natural systems offers culturally relevant *place-based* insight into how the region's climate is changing.

The G-WOW model integrates place-based evidence of how climate change is affecting traditional Ojibwe lifeways with scientific climate research to provide an indicator of how climate change is affecting people of all cultures.

For example, *manoomin* or wild rice is the key species supporting the Ojibwe lifeway of aquatic harvesting. The sustainability of wild rice depends on shallow water habitats. Since 2007, the unprecedented loss of wild rice due to flooding, high temperatures, drought and disease has disrupted the traditional tribal harvest. This provides culturally relevant, place-based evidence that climate change may be affecting habitat conditions this species needs to survive.

The strategy of using the sustainability of key species to link culture and science makes the G-WOW model transferable to other cultures and locations. Because a key component of G-WOW is engaging people to fight climate change with change, the model includes a service learning component to develop a project or activity to mitigate climate change.

With funding support from the Great Lakes Restoration Initiative and the Wisconsin Coastal Management Program (WCMP), the G-WOW Changing Climate, Changing Culture Discovery Center was developed at the Northern Great Lakes Visitor Center (NGLVC) in Ashland in 2010. This 200 sq. ft. interpretive exhibit explores the impacts of climate change on Ojibwe wild rice harvesting and other coastal resources based on the G-WOW model. The exhibit's authentic birch bark canoe and Ojibwe word sound board offer unique cultural components.

In 2013, WCMP funding completed the G-WOW Discovery Center with the addition of a 32-inch touch screen kiosk featuring the four season G-WOW curriculum in a condensed, interactive format. Approximately 33,000 visitors, community members, and students view the

G-WOW Discovery Center annually. It is the focal point for school and teacher education climate change programs.

With WCMP support, the full G-WOW curriculum for middle school to adult learners was created and went live on the G-WOW website (g-wow.org) in 2013. This robust web based curriculum features four seasonal units that explore climate change impacts on Ojibwe lifeways, including maple sugaring, birch bark harvesting, fishing, wild ricing and respecting culture. Learners can test their own climate change hypothesis, create a service learning climate change activity, and share their results via the website's "talking circle" blog.

In 2014, WCMP funding supported a four-day summer G-WOW professional development institute for teachers and community educators

with the goal of building capacity to teach about climate change using the G-WOW model. As part of their training, teachers will engage their students in a climate service project, post it to the G-WOW website and participate in a Coastal Climate Camp with the students during the school year. Portions of the institute will be videotaped to create a virtual teacher training resource on the G-WOW website to maximize professional development opportunities.

The G-WOW Initiative is gaining recognition beyond our region. In 2012, the G-WOW team was presented with an Honor Award by the Eastern Region of the U.S. Forest Service. In 2013, the G-WOW curriculum was incorporated into climate change kiosks at the Aldo Leopold Nature Center in Monona, Wisconsin. This year, the Fond du Lac Tribal and Community College in Duluth received a \$1.09 million NASA Innovations in Climate Change-Tribal grant that uses the G-WOW model to increase climate literacy through the Ojibwe Ceded Territories of Minnesota, Wisconsin and Michigan.

Do culture and science agree that climate change is affecting the sustainability of Lake Superior coastal resources? You be the judge!

Cathy Techtmann is an Environmental Outreach State Specialist at the University of Wisconsin-Extension and a member of the G-WOW Team. She may be reached at (715) 561-2695 or catherine.techtmann@ces.uwex.edu.



Projects that enhance the quality of life and business climate, provide sustainability and improve environmental quality are good investments.

EGG HARBOR BEACH AND MARINA IMPROVEMENTS

Josh Van Lieshout

For many years, the Village of Egg Harbor on the west shore of Door County operated a small and underused beach. In 2005, Door County Soil and Water—in partnership with the Wisconsin Coastal Management Program and others—began a comprehensive study to better understand environmental issues that had caused several beach closures on the Door Peninsula. Closures had created some significant press and local concern because much of the northern Door County economy is tied to tourism, and the use and enjoyment of natural resources—including the bay of Green Bay and public beaches—is a critical component of the economy.

About this same time, the Village of Egg Harbor was trying to determine what to do with a failing breakwater at its public marina and boat launch. The marina and boat launch had originally been constructed as a commercial dock for transport and fishing before the turn of century. Through the years, the dock was expanded, rebuilt and upland improvements were added and expanded. As time and weather took their toll, the community determined that the marina facility needed to be reconstructed and made to last another century.

At the time marina issues were beginning to be defined, the Egg Harbor Village Trustees made a commitment to look at the project through the lenses of environmental quality and public access. Given our proximity to the bay of Green Bay and

our economic dependence, water quality was of paramount importance.

As the marina site plan began to take hold, the Harbor Committee and engineer realized that with some smart design, we could increase the available parking space, reduce the amount of impervious area and provide parking lot storm water runoff filtration. Placing a biofilter at the end of a parking lot that juts out into the bay may seem like a waste of real estate and money. However, this improvement provided much needed storm water treatment and green space, and softened an otherwise unattractive fuel and pump station area.

At the Egg Harbor Beach, the Village stepped up to be one of the first communities to implement the recommendations of Door County Soil and Water studies. The recommendations included grading, construction of storm water basins and re-vegetation with native grasses. The project originally constructed in 2009 at a cost of \$70,000 was an immediate success on all fronts. More people came to the beach, we had fewer to no instances of beach closures and nuisance birds found another place to gather.

With success comes other opportunities. Parking was a major shortcoming at the beach—it was impossible to find a place to park after 10:00 a.m. The success of the first beach improvement project made it palatable to the public to add parking spaces on this property.

Using Great Lakes Restoration Initiative funding, the Village embarked on a new plan to double the available parking spots. Keeping our water quality concerns in mind, the Village used a type of paver brick to pave the newly reconstructed parking stalls. For this work the Village received a Gold Award from the Wisconsin Masonry Alliance. Again, the response from the public was very favorable. Moreover, the Village continues to receive inquiries from other communities three years after completion of the parking lot project.

While a lot of people enjoy Egg Harbor and Door County, it is unlikely anyone comes just for the beach or marina. They come for the Door County experience of being outdoors, shopping, clean water, great boating and fishing, and access to one of the greatest bodies of water in the world. Having top notch facilities has enabled our business community in Egg Harbor to capture more of the Door County visitors and give them a quality, positive experience like no other place.

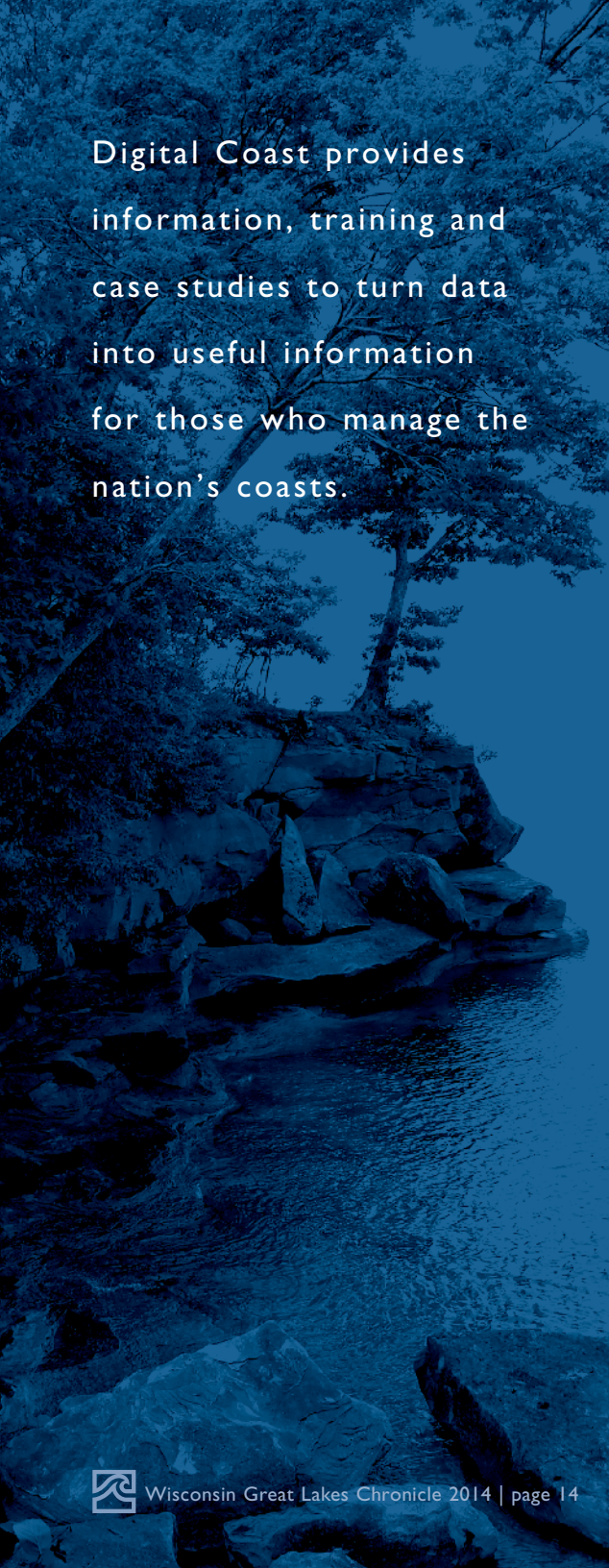
However, it isn't all about business. Egg Harbor has a very active and thriving summer community of property owners. As we discovered, as much as the business community and visitors benefit, so do residents because they too have more and better access to the Bay. Their experience and quality of life in Egg Harbor is enhanced.



The additional benefit of investing in infrastructure focused on water quality and public access has allowed the community to gain other accolades and exposure, which reach well beyond the limits of Egg Harbor and Door County. As well as being designated a Harbor of Refuge, the improvements at the marina made it possible for the facility to become certified through the Wisconsin Clean Marina Program. And recently, the marina received certification as a bronze level Water Star Community through Water Star Wisconsin. For these efforts, and many others, the Village of Egg Harbor has earned Travel Green Wisconsin certification through the Department of Tourism.

Investing public dollars in infrastructure is a challenge for appointed and elected officials because many worthy projects compete for limited funding. However, projects that enhance quality of life and business climate, provide for sustainability and improve environmental quality are universally good investments. The Egg Harbor Beach and Marina initiatives are such projects.

Josh Van Lieshout is the Administrator of the Village of Egg Harbor. He may be reached at (920) 868-3334 or jvanlieshout@villageofegggharbor.org.



Digital Coast provides information, training and case studies to turn data into useful information for those who manage the nation's coasts.

DIGITAL COAST

Rebecca Love and Jeff Stone

There are many places to download coastal data and information. So much that at times it can be mind-boggling just trying to find the data needed to address a particular issue.

Enter the Digital Coast. The Digital Coast website (csc.noaa.gov/digitalcoast) is a central place to find information, training and case studies to help turn data into useful information for those who manage the nation's coasts. Launched in 2008, the site provides information to address timely coastal issues, including land use, coastal conservation, hazards, ocean planning, community resilience and healthy coastal economies.

Less visible to users of the Digital Coast is the partnership effort behind the web platform. The Digital Coast partnership has built a strong collaboration of coastal professionals intent on addressing common needs.

The Digital Coast partnership includes the American Planning Association, Association of State Floodplain Managers (ASFPM), Coastal States Organization, National Association of Counties, National Estuarine Research Reserve Association, National States Geographic Information Council, The Nature Conservancy, and Urban Land Institute. The responsiveness of these organizations has proven essential for creating a platform that evolves and adapts to changing needs and priorities.

As a member of the Coastal States Organization, the Wisconsin Coastal Management Program (WCMP) has played an integral role representing the nation's state coastal management programs in the partnership. The WCMP has provided technical assistance and convened local organizations for collaborative projects in the Great Lakes. Over the past two years, coastal watersheds in Wisconsin have also benefited from the work of Laura Flessner, a NOAA Digital Coast Fellow working with the ASFPM and The Nature Conservancy.

The partnership—including the WCMP, the University of Wisconsin Sea Grant and the University of Wisconsin-Extension—worked together to develop the Great Lakes Coastal Resilience Planning Guide. Funded through EPA's Great Lakes Restoration Initiative, both NOAA's Coastal Services Center and ASFPM played a leadership role in the Planning Guide's creation.

Through peer-reviewed case studies and local stories, the Coastal Resilience Planning Guide shows how coastal communities are using science based information to address coastal hazards such as flooding, shore erosion and lake-level fluctuations. The Planning Guide connects people with tools, data, publications and other stakeholders needed to consider natural hazards and climate change in local planning efforts.



For example, Brown County Zoning shared its challenge in helping property owners see how lake levels and coastal flooding could affect their homes. This became the first case study titled “Visualizing Coastal Flooding and Lake Level Changes.” The case study describes the process of using a visualization tool—like CanVis—that can be used to see potential impacts from coastal development or changes in Great Lakes water levels resulting from storms or long-term fluctuations.

In Ozaukee County, a future case study will highlight bluff erosion processes and science-based methods for determining setback ordinances while supporting risk communication. And in Sheboygan County, a future case study will use analytical tools like NOAA’s Nonpoint Source Pollution and Erosion Comparison Tool (OpenNSPECT) to prioritize wetland restoration. The case study will investigate potential water quality impacts and flood risk reduction strategies through wetland restoration in a sub-watershed of the Sheboygan River near Plymouth. This work connects agricultural and land-use decisions, conservation and future climate conditions.

The Land Cover Atlas is an easy-to-use web-based viewer for visualizing Coastal Change Analysis Program (C-CAP) regional land cover data and change information for the coastal United States over multiple dates. The tool summarizes general trends in land cover change—such as forest losses or new development—and can highlight specific

changes such as marsh losses to open water, or evergreen forest losses to development. This type of information is useful in planning and preparing for Wisconsin’s green infrastructure needs to mitigate the impacts of flooding and climate change. The Land Cover Atlas has recently been updated to include data for 2010 and the ability to view change information by watershed.

The Economics: National Ocean Watch (ENOW) data describe six economic sectors that depend on the Great Lakes and oceans including living resources, marine construction, marine transportation, offshore mineral resources, ship and boat building, and tourism and recreation. The ENOW Explorer allows users to view changes over time and from place to place. Users can discover which sectors are the largest contributors to coastal economies in various parts of Wisconsin, which are growing and declining, and which account for the most jobs, wages and gross domestic product. ENOW data are available for counties, states, regions and the nation and can be compared across geographies.

Coming soon, the Lake Level Viewer is a map-based tool that will help people visualize flooding and exposed land caused by variable water levels on the Great Lakes. The tool is scheduled for



release later this fall and is a collaborative effort with Wisconsin Sea Grant, the University of Wisconsin-Madison and the NOAA Coastal Services Center.

The Digital Coast partnership is a growing collaboration. If you have suggestions, questions or examples of how you have applied a tool or resource within the Digital Coast, feel free to contact your state’s coastal management program or a partnering member, or send us an email at digital.coast@noaa.gov.

Rebecca Love is a Marine Scientist with the NOAA Coastal Services Center. She may be reached at (843) 740-1169 or rebecca.love@noaa.gov. Jeff Stone is a Senior Project Manager and GIS Coordinator with the Association of State Floodplain Managers. He may be reached at (608) 828-6340 or jeff@floods.org.

2014 WISCONSIN COASTAL MANAGEMENT PROGRAM GRANTS

Project Name

Grantee

WCMP Award

Project Description

Contact

Coastwide

Native Coasts: A Partnership for Indigenous Coastal Education

Board of Regents of the University of Wisconsin System

\$43,385

Build a place-based learning model that includes conducting a Water Stewardship Institute, developing stewardship training curriculum, providing service learning projects and engaging tribal youth.

Mr. Michael Morris, (608) 262-0153

Gikinoo'wizhiwe Onji Waabang (Guiding for Tomorrow)

Board of Regents of the University of Wisconsin System, UW-Extension

\$29,900

Develop a G-WOW professional development training program for middle and high school educators, primarily targeting educators serving students in Wisconsin's Lake Superior coastal communities.

Ms. Catherine Techtmann, (715) 561-2695

Integrated Outreach to Private Wetland Landowners

Wisconsin Wetlands Association

\$29,700

Connect northeastern Wisconsin private wetland owners with information, tools, funding and other resources to manage and protect wetlands.

Ms. Katie Beilfuss, (608) 250-9971

Lake Superior Rivers2Lake Education Program

Lake Superior National Estuarine Research Reserve

\$28,518

Provide extended training, mentoring and resources to K-12 teachers to support a year-long interdisciplinary learning experience for students.

Ms. Deanna Erickson, (715) 392-3141

Technical Assistance

Bay-Lake Regional Planning Commission

\$20,000

Support coastal management activities and technical assistance to local governments in the Bay-Lake region.

Ms. Angela Pierce, (920) 448-2820

Technical Assistance

Northwest Regional Planning Commission

\$20,000

Support coastal management activities and technical assistance to local governments in the Northwest region.

Mr. Jason Laumann, (715) 635-2197

Technical Assistance

Southeastern Wisconsin Regional Planning Commission

\$20,000

Support coastal management activities and technical assistance to local governments in the Southeast region.

Dr. Donald Reed, (262) 547-6721



Ashland County

Maslowski Beach Water Quality Education

City of Ashland

\$29,745

Develop a redesign and management plan to improve beach health and water quality, conduct an integrated water quality sampling effort to identify contamination sources and survey beach users.

Ms. Sara Hudson, (715) 682-7059

Bayfield County

Thompson's West End Beach

Stormwater Management

City of Washburn

\$59,000

Construct dunes and a rain garden, and plant native vegetation to address upland runoff.

Mr. Scott Kluver, (715) 373-6160

Chequamegon Bay Geomorphic and Flood Flow Monitoring

Northland College

\$30,000

Purchase equipment to support watershed modeling and integrated monitoring in the Chequamegon Bay region.

Mr. Matt Hudson, (715) 682-1481

Bayfield Waterfront Trail

City of Bayfield

\$13,500

Develop an interpretive walking trail along the Bayfield waterfront including installing nine markers and three kiosks.

Ms. Billie Hoopman, (715) 779-5712

Wisconsin Lake Superior Byway Map

Town of Russell

\$6,235

Develop and print a comprehensive map that identifies the geological, historical, cultural and recreational sites of Wisconsin's 70-mile Lake Superior Scenic Byway.

Ms. Mary Nowakowski, (414) 698-5479

Brown County

AMO Outreach Plan to Reduce Nutrient Pollution in Green Bay

Alliance for the Great Lakes

\$29,985

Develop and implement an outreach strategy to promote participation by farmers in adaptive management option joint pilot projects with NEW Water in Brown County.

Dr. Olga Lyandres, (312) 445-9749



Door County

Sturgeon Bay Festival Waterfront

City of Sturgeon Bay

\$50,000

Develop plans and specifications for the Sturgeon Bay Festival Waterfront.

Mr. Marty Olejniczak, (920) 746-6908

Baileys Harbor Town Marina Sediment Transport Study

Town of Baileys Harbor

\$31,246

Study and map bathymetry, currents and sediment movement in the harbor and develop a report to guide management of the Baileys Harbor Town Marina.

Mr. Robert Bultman, (920) 421-2283

Dunes Lake Protection and Feasibility Study

Door County Soil and Water Conservation Department

\$5,000

Study existing site conditions within the Dunes Lake watershed to address eutrophication of Dunes Lake and excessive discharge of nutrients to Lake Michigan.

Mr. Greg Coulthurst, (920) 746-2275

Douglas County

Billings Park Renovation

City of Superior

\$93,280

Complete designs for improvements to public access at Billings Park.

Ms. Mary Morgan, (715) 395-7279

Kenosha County

Pike River Watershed Stormwater Basins and Outfalls

City of Kenosha Public Works

\$35,000

Monitor stormwater infrastructure throughout the Pike River watershed and identify pollutant loading potential.

Ms. Shelly Billingsley, (262) 653-4149

Harbor Sediment Mitigation Project

City of Kenosha

\$30,000

Study lakebed sediments in and near the Kenosha Harbor and develop plans to better control sedimentation of the harbor.

Mr. Michael Lemens, (262) 653-4151

Manitowoc County

West Twin River Public Transient Marina and Access

City of Two Rivers

\$20,000

Develop an engineering survey and design documents to construct a new transient public marina facility with public access piers.

Mr. Greg Buckley, (920) 793-5532

Two Rivers Woodland Dunes Habitat Restoration

City of Two Rivers

\$8,200

Remove invasive plants from twenty acres of a City of Two Rivers park and Woodland Dunes Nature Center.

Ms. Judy Goodchild, (920) 793-4007



Milwaukee County

Milwaukee 30th Street Corridor

Green Infrastructure

Clean Wisconsin

\$60,000

Facilitate implementation of the Milwaukee Metropolitan Sewerage District's Regional Green Infrastructure Plan in the 30th Street Industrial Corridor through public outreach.

Mr. Mark Redsten, (608) 251-7020

South Shore Park and Marina Water Quality

Milwaukee County Department of Parks, Recreation and Culture

\$38,000

Develop a conceptual site and design plan for a multi-phase project to reconstruct paved surfaces at South Shore Park and Marina to reduce stormwater volume and remove pollutants.

Mr. John Dargle, (414) 257-4501

Menomonee River Watershed

Fish Passage Impediments

Milwaukee Riverkeeper

\$30,000

Disseminate the results of an assessment and prioritization of fish passage barriers in the Menomonee River watershed and produce design/engineering plans for the removal of four priority barriers.

Ms. Cheryl Nenn, (414) 287-0207

Menomonee Valley Hands On: Experiential Education at Three Bridges Park

UEC/MVP Project Inc.

\$35,000

Support experiential educational programming, citizen science and participatory land stewardship at the newly designated Three Bridges Park in the City of Milwaukee.

Ms. Laura Bray, (414) 274-4654

Menomonee River Watershed

Green Infrastructure

Milwaukee Metropolitan Sewerage District

\$30,000

Identify near-term green infrastructure opportunities in the separated sewer area of the Menomonee River Watershed with an emphasis on urban nonpoint pollution control.

Ms. Karen Sands, (414) 225-2123

Municipal Code Review to Promote

Green Infrastructure

1000 Friends of Wisconsin

\$27,640

Review local zoning codes and ordinances for four municipalities and identify priorities for revisions that will facilitate implementation of green infrastructure.

Mr. Steve Hiniker, (608) 259-1000

Racine County

Samuel Myers Park Public Access

City of Racine

\$50,000

Improve a degraded coastal site that lacks appropriate public access with the implementation of a plan to redesign Samuel Myers Park.

Dr. Julie Kinzelman, (262) 636-9501

CNH Riverfront Schematic Design

Racine County Economic Development Corporation

\$41,600

Develop a schematic design and vision document for the Case New Holland industrial site on the Root River in Racine.

Ms. Karen Frost, (262) 898-7412

Urban Great Lakes Environmental Education Programs

UW-Parkside, College of Natural and Health Sciences

\$10,000

Provide experiential Great Lakes education to youth from underrepresented communities in Racine at the Root River Environmental Education Center.

Dr. Penny Lyter, (262) 595-2927



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 of Ocean and Coastal Resource Management, for the technical and financial support it provides on behalf of Wisconsin's coastal communities.

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11, Kakagon Sloughs, Cathy Techtmann

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13, Egg Harbor Beach, County Materials Corporation

14, Big Bay State Park, Travis Olson

15, Lake Level Viewer, NOAA Coastal Services Center

16, Mashek Creek, Travis Olson

20, Cana Island, Wis. Department of Tourism

21, Sand Island, Wis. Department of Tourism

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**WISCONSIN COASTAL
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