



researchoutreach

Biennial Report 2014-16

University of Wisconsin Sea Grant Institute

research_outreach

FROM THE DIRECTOR

AT WISCONSIN SEA GRANT, we are always searching and reaching for answers.

What are the questions?

Simple ones like: How do we keep people safe from rip currents and other water dangers? How do we help people avoid getting ill from swimming at beaches? How can we work with the National Weather Service to warn people about violent storms? How can we clean the Great Lakes of marine debris? How can we help prevent people's homes from eroding into Lake Michigan?

Finding answers to those questions isn't so simple. But we have some of the best minds at Wisconsin's top-notch academic institutions working on them, as I hope you'll see by looking at our accomplishments from 2014-16. And it's not only our faculty and student researchers who are outstanding, our Sea Grant staff members are too. They provide strong administrative support and get scientific results out to Wisconsin residents through communications and extension efforts.

Evidence of our success has come in the form of recent reviews of our program by teams of national experts. Their comments show recognition of our program's excellence:

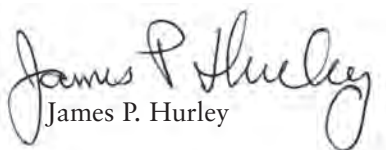
- *"The Wisconsin Idea was almost the first thing the team heard, and it came up repeatedly during the visit from many sources, and was very much in evidence in the work (Sea Grant) did and the services they provided to their Wisconsin stakeholders."*
- *"The program's work to educate and empower your researchers to become better communicators of their work with the constituents who need the information was impressive."*
- Also, our impacts and accomplishments received a national rating of "Highest Performance: exceeds expectations by an exceptional margin in most areas/aspects."

As the National Sea Grant College Program celebrated its 50th anniversary in 2016, 33 programs in coastal states followed similar paths of scientific inquiry. Our current national strategic plan focuses our network to provide integrated research, outreach and education for responsible use of coastal and Great Lakes resources and to support informed personal, policy and management decisions.

This report tells the stories of a subset of our recent efforts in Wisconsin and the Great Lakes. We're proud to be part of such an innovative network of programs and look for continued success for the next half century.

We appreciate your support in our continued quest for answers to benefit the Great Lakes and the people who live along them. I hope you find the information in this report useful and enlightening.




James P. Hurley

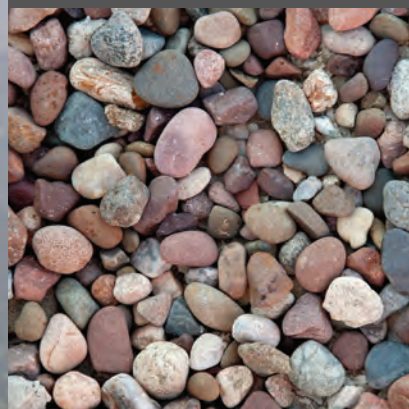


12



8

Annual value of
the Great Lakes
regional economy:
\$62 billion



6

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Searching and Reaching in Service of the Great Lakes

Inherent in every scientific exploration is a quest. It's research with a focus on search — for validation of a prior finding or a journey to arrive at the threshold of a whole new frontier of understanding.

When the object of scientific exploration is the Great Lakes, there is tremendous potential in what will result from the quest, whether it is restored habitat, improved public health or greater economic payoff from the bounty of our waters.

In the Sea Grant paradigm, one result of a quest is the application of that research to real-world situations and to the benefit of coastal communities and their businesses, residents and visitors. The term of art for that process is outreach, with the emphasis on reach.

Wisconsin Sea Grant's strength is in the research projects it funds across Wisconsin, and in reaching people with that knowledge to protect and use Great Lakes' resources in wise ways. Research findings are not solely bound up in scholarly journals but rather shared with those who can most use them. The findings go to local planners, property owners, fishermen, aquaculturists, fisheries managers, teachers, students, lifelong learners and many others.

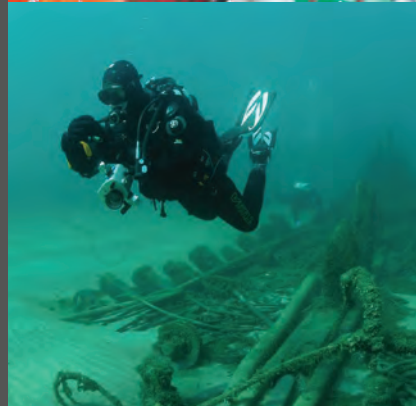
This 2014-16 biennial report is a demonstration of the search and reach that goes on for nearly 365 days a year. It happens in labs and lake basins. It involves sampling stations and classrooms. It could be on the swaying deck of a boat or within a village hall. Search and reach are in the service of the world's largest freshwater system. We are glad you are prepared to come along with us on this quest.



Statewide research and outreach clockwise from left: Researchers working atop Outer Island Lighthouse, Apostle Islands; sturgeon spawn, Wolf River; South Shore Beach gets ready for its cleanup, Milwaukee; whitefish processing, Cornucopia; diving the *Australasia* shipwreck in Lake Michigan; Great Lakes Indian Fish and Wildlife Commission



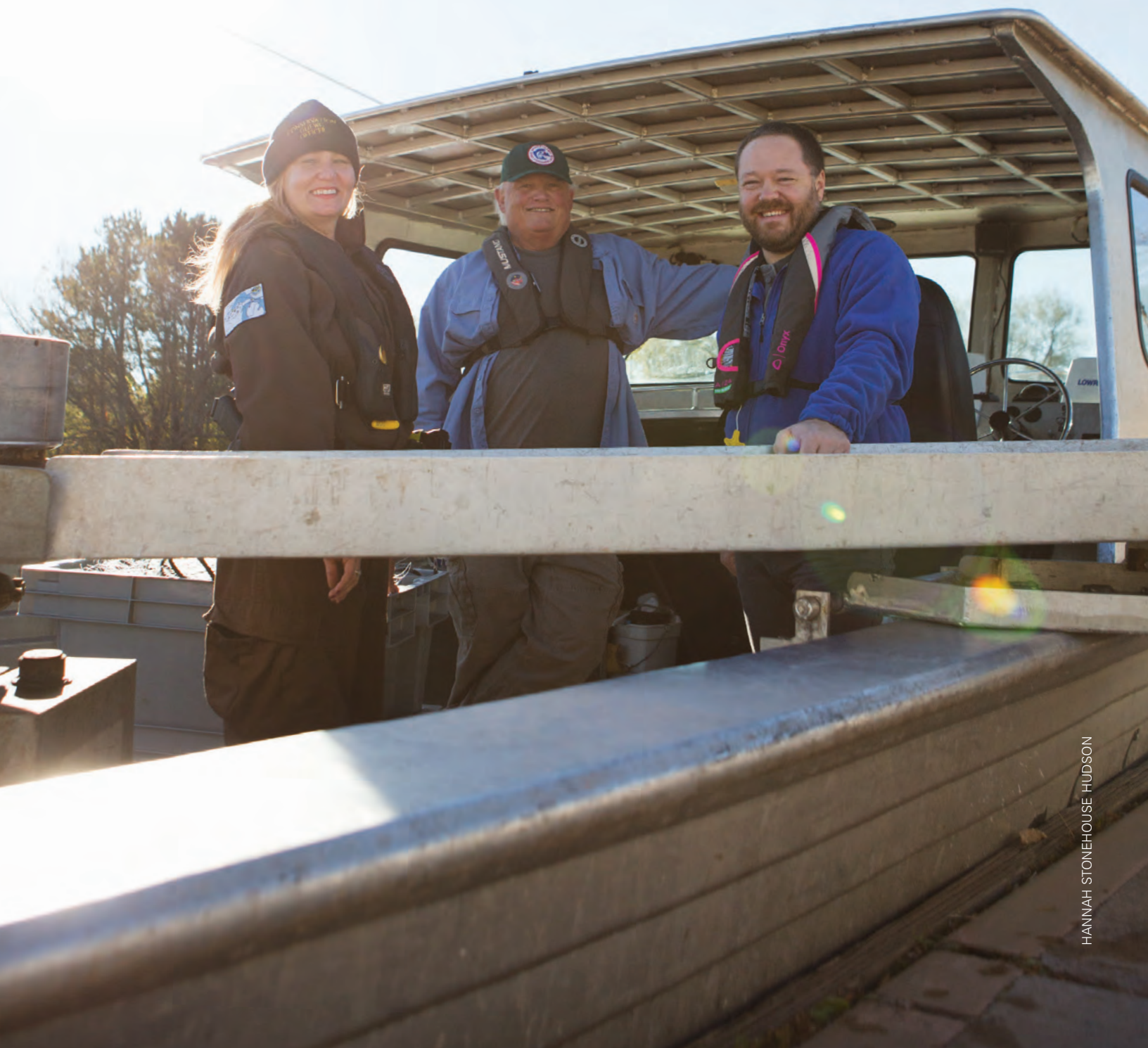
Science and
learning events:
167



partners to reduce fishing conflicts; the National Weather Service’s impact-based weather forecast system gives people more time to react before severe weather events like the widespread flooding, road and structure damage in Bayfield in 2016.

Reaching Out

Over the Largest Lake



Lake Superior stretches lengthwise for 350 miles and has the largest surface area of any lake in the world. Because of that expanse, one would think Lake Superior has plenty of room to accommodate every use. Generally, that is true but when it comes to demand for the whitefish and trout that swim in its waters, the big lake can sometimes see overlapping demands from commercial, tribal and sport fishermen.

The commercial and tribal operations stretch nets to ensnare fish, but occasionally the nets break free from their anchors, drifting, rotting and picking up debris, and perhaps even fish or waterfowl. In addition to the pollution they represent, the nets pose a hazard for sport fishermen. An entangled boat or fishing gear can be damaged or cause a capsized craft.

There is a system in place to deal with these ghost nets, as they are termed. When nets are reported, the Wisconsin Department of Natural Resources or the Great Lakes Indian Fish and Wildlife Commission (GLFWIC) will collect them. The challenge has long been one of making boaters aware of ghost nets, along with ensuring cooperation from commercial, tribal and regulatory agencies.

Cooperation had been elusive until Wisconsin Sea Grant stepped in. Aided by a grant from the National Oceanic and Atmospheric Administration's Marine Debris Program, Fisheries Specialist Titus Seilheimer, GLFWIC and Sea Grant's Advisory Council Member Al House brought the parties together. House is the president of the Apostle Islands Sport Fishermen's Association. GLFWIC's Chief Warden Fred Maulson said if it wasn't for Sea Grant, these parties wouldn't even be sitting at the same table, much less reducing fishing conflicts and bringing safety to the Great Lakes.

The initiative also produced an informational video (go.wisc.edu/49084s), provided materials at regional boat shows, and created and shared a poster for boat landings and bait shops. The next step has been workshops, engaging the very people affected by the nets.

**Ghost nets
removed from
Lake Superior
since awareness
campaign began:
5,000 feet**

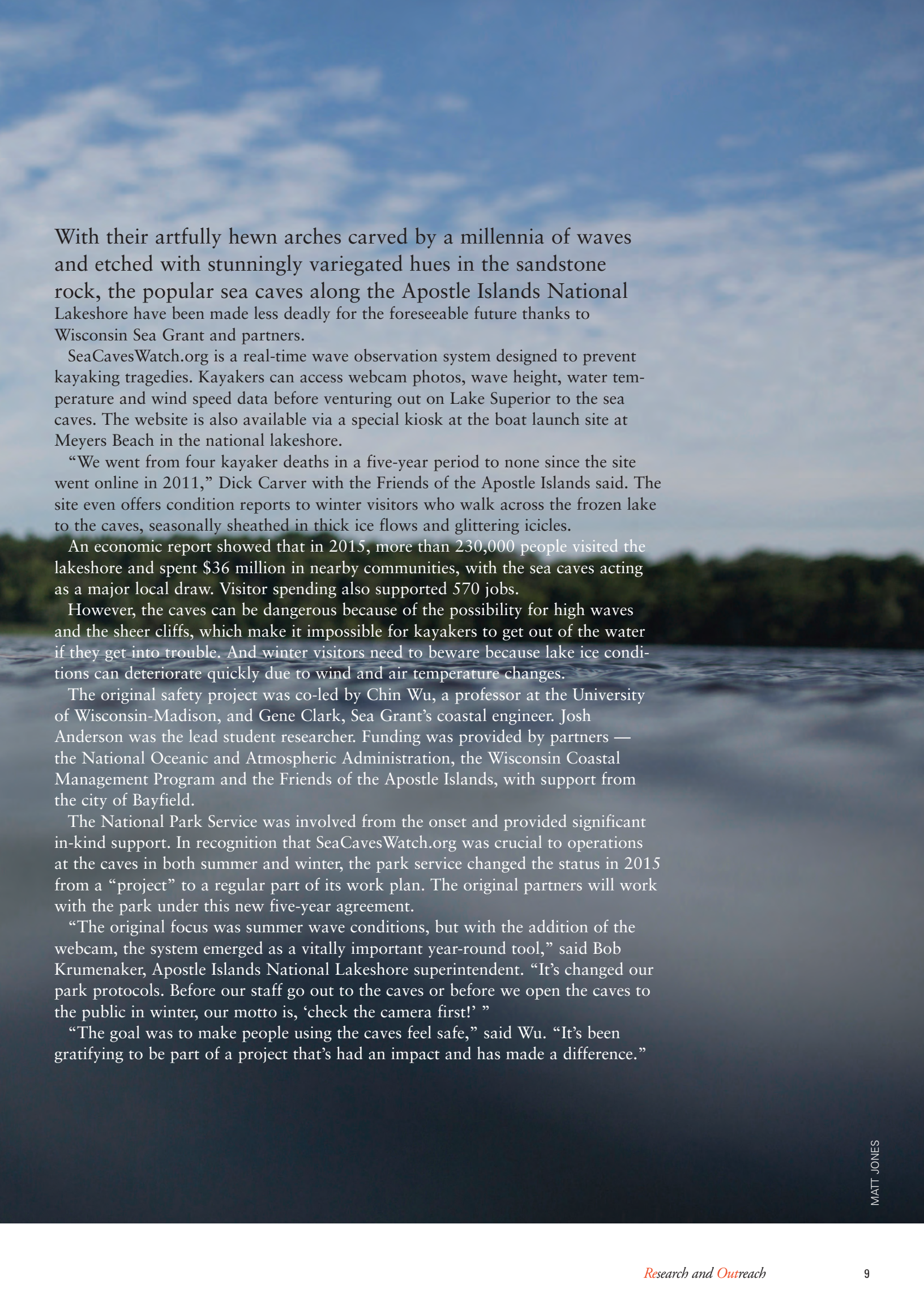
They ain't afraid of no ghost nets. Heather Bliss, outreach officer, Great Lakes Indian Fish and Wildlife Commission; Al House, president, Apostle Islands Sport Fishermen's Association; and our own fisheries specialist, Titus Seilheimer, work together to make ghost nets less of a safety hazard.



Searchlight on Safety, Sea Caves Project Saves Lives

**Deaths at sea caves since
operation of real-time
wave observation system:**

0



With their artfully hewn arches carved by a millennia of waves and etched with stunningly variegated hues in the sandstone rock, the popular sea caves along the Apostle Islands National Lakeshore have been made less deadly for the foreseeable future thanks to Wisconsin Sea Grant and partners.

SeaCavesWatch.org is a real-time wave observation system designed to prevent kayaking tragedies. Kayakers can access webcam photos, wave height, water temperature and wind speed data before venturing out on Lake Superior to the sea caves. The website is also available via a special kiosk at the boat launch site at Meyers Beach in the national lakeshore.

“We went from four kayaker deaths in a five-year period to none since the site went online in 2011,” Dick Carver with the Friends of the Apostle Islands said. The site even offers condition reports to winter visitors who walk across the frozen lake to the caves, seasonally sheathed in thick ice flows and glittering icicles.

An economic report showed that in 2015, more than 230,000 people visited the lakeshore and spent \$36 million in nearby communities, with the sea caves acting as a major local draw. Visitor spending also supported 570 jobs.

However, the caves can be dangerous because of the possibility for high waves and the sheer cliffs, which make it impossible for kayakers to get out of the water if they get into trouble. And winter visitors need to beware because lake ice conditions can deteriorate quickly due to wind and air temperature changes.

The original safety project was co-led by Chin Wu, a professor at the University of Wisconsin-Madison, and Gene Clark, Sea Grant’s coastal engineer. Josh Anderson was the lead student researcher. Funding was provided by partners — the National Oceanic and Atmospheric Administration, the Wisconsin Coastal Management Program and the Friends of the Apostle Islands, with support from the city of Bayfield.

The National Park Service was involved from the onset and provided significant in-kind support. In recognition that SeaCavesWatch.org was crucial to operations at the caves in both summer and winter, the park service changed the status in 2015 from a “project” to a regular part of its work plan. The original partners will work with the park under this new five-year agreement.

“The original focus was summer wave conditions, but with the addition of the webcam, the system emerged as a vitally important year-round tool,” said Bob Krumenaker, Apostle Islands National Lakeshore superintendent. “It’s changed our park protocols. Before our staff go out to the caves or before we open the caves to the public in winter, our motto is, ‘check the camera first!’ ”

“The goal was to make people using the caves feel safe,” said Wu. “It’s been gratifying to be part of a project that’s had an impact and has made a difference.”

Improved Warnings for Treacherous Weather

In 2011, a tornado roared through the small town of Joplin, Mo., killing 159 people and injuring more than 1,000. The extraordinary number of casualties in spite of multiple and early warnings puzzled the National Weather Service (NWS) since there have been vast improvements in warning technology and forecasting. Despite that, many sectors of the public remain vulnerable to severe weather. Just as in Joplin, weather-related devastation has come to countless communities that have been leveled, forcing people to rebuild lives, homes, schools and businesses.

The service decided to improve communication, enhancing traditional tornado watch and warning information. In 2012, the NWS piloted an impact-based weather forecast system. The premise was to use more straightforward language that would convey direct and detailed descriptions of what being in the path of a storm could mean to personal safety and property.

The NWS was interested in evaluating the efficacy of this system and whether it merited expansion nationwide to save lives, and protect infrastructure and other property. The service didn't have its own capacity to do this assessment.

The service's Central Region turned to Wisconsin Sea Grant, a fellow program within the National Oceanic and Atmospheric Administration. Sea Grant coordinated a team of social scientists from the Great Lakes Sea Grant Social Science Network to evaluate a new severe storm communication tool. The assessment included focus groups, surveys and interviews with weather forecasters, emergency managers and broadcast reporters. Following that information gathering and based on Sea Grant's analysis, the NWS modified the warning system to be more effective.

The NWS first implemented the new communication tool throughout the Midwest and Great Lakes states and in succeeding years expanded it nationally. Plus, more than 450 NWS and American Meteorology Society members have been briefed on the Sea Grant information related to the system. Sea Grant programs created a report and fact sheet that have been disseminated and are available at go.wisc.edu/gc1mf9.

A ghostly tornado skips and hops across the central Minnesota landscape as it lifts momentarily, narrowly missing this rural farmstead. Residents in the heartland, and beyond, are better protected from severe weather thanks to Wisconsin Sea Grant.



Annual value of
National Weather
Service activities
to U.S. households:
\$26.4 billion

Annual average
number of days
South Shore
Beach closed
due to poor
water quality:

50

On the Beach,



Science has led the way in the recovery of one Milwaukee beach — Bradford. A second — South Shore — is tapped for attention so they both can regain their popularity as Lake Michigan swimming spots. At South Shore, the efforts have also attracted a half-million dollar corporate donation and \$1 million from the county for cleanup.

South Shore Beach is closed from 20 to 50 percent of the swimming season due to water-quality advisories. Wisconsin Sea Grant-funded research by Sandra McLellan, a microbiologist at the University of Wisconsin-Milwaukee School of Freshwater Sciences, revealed the sources of pollution included local and regional stormwater runoff, and other regional sources such as combined sewer overflows and fecal waste from gulls and waterfowl.

The first improvements planned for South Shore Beach will be focused on the parking lot.

“We support the planned improvements at South Shore Beach,” said Cary Solberg, South Shore Park Watch. “Dr. McLellan’s research helped us determine the primary pollution sources at the beach. Her research has better positioned us to advocate for the best management practices to improve conditions.”

To raise public awareness about the beach issues, Jane Harrison, Wisconsin Sea Grant’s former social scientist, hosted information tables at the South Shore Farmers’ Market and organized community volunteers for monthly trash cleanups.

A Successful Search for Clean Waves and Sand

The research and outreach activities at the beach are modeled after past work at Bradford Beach. Bradford used to attract thousands of people in the early 1930s, but pollution and beach closures slowly made it a less-desirable place to swim. By the end of the century, Bradford was a desolate, wasted half-mile of sand in the heart of Milwaukee used by only a few diehard sunbathers and dog walkers.

McLellan’s Sea Grant-funded research found that local stormwater discharges were a major source of fecal pollution for Bradford Beach. The county and MillerCoors provided a total of \$1.5 million and worked with local partners to improve the beach’s water quality, including construction of a rain garden, a gull-deterrent program, removal of dead nuisance algae and improvements to amenities.

The project was a success and now thousands of visitors have returned to Bradford Beach, which has also earned a coveted national Blue Wave Beach designation from the Clean Beaches Coalition and has been termed one of the nation’s top 10 freshwater beaches by USA Today in 2016.

With McLellan’s findings and the continued work of local partners, it looks like South Shore Beach may be on the same path. Other project partners include Milwaukee County Parks, Friends of South Shore Park, Alliance for the Great Lakes, Milwaukee Metropolitan Sewerage District and the Wisconsin Department of Natural Resources Office of the Great Lakes.

Sandra McLellan’s research is leading to changes. Buffer strips will be planted to separate the beach from paved surfaces, and an in-ground trench drain system on the boat launch will direct runoff away from the lake to a buffer strip basin. Additional plantings will help with other stormwater issues on the site.



Pounds of
garbage picked
up during beach
cleanup events:
200



Wisconsin jobs
created/retained:
5,071

Materials in the
Wisconsin Water Library:
30,000



Weather forecasts
U.S. adults obtain
each year:
300 billion



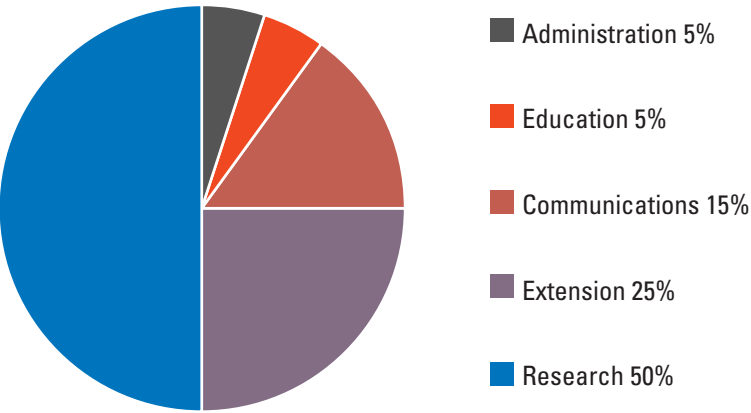
Acres of restored
Great Lakes
coastal areas:
760



By the Numbers

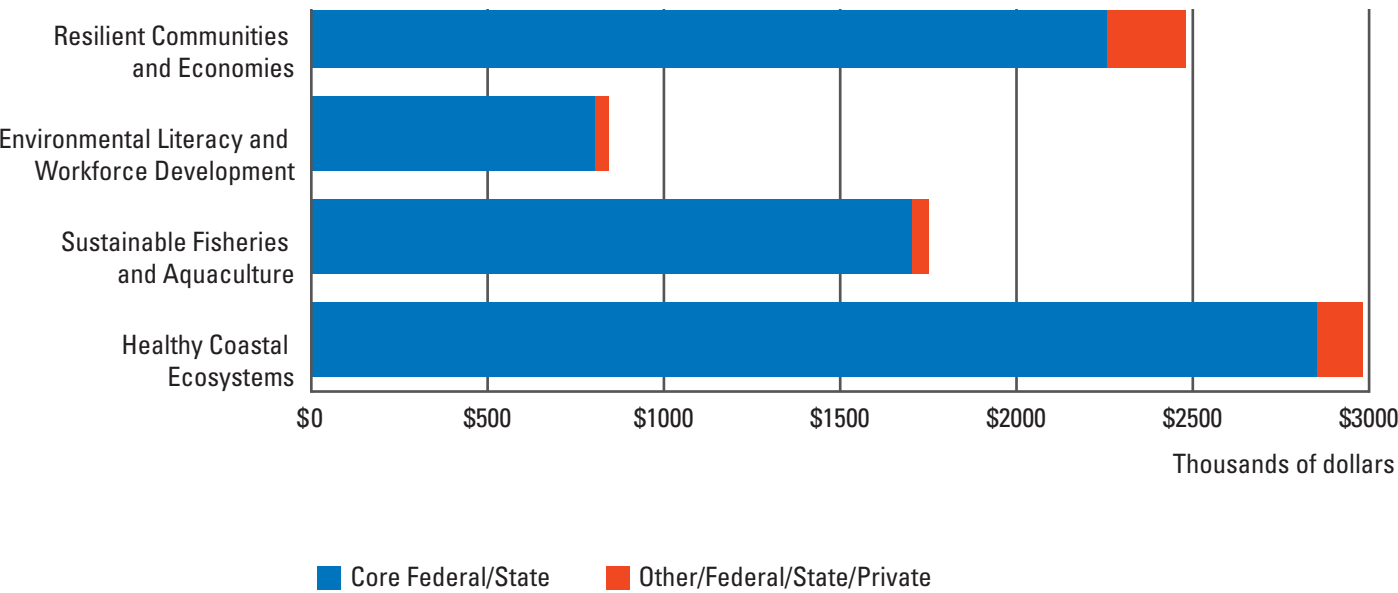
BUDGET OVERVIEW

Funding allocation 2014-16



People reached
at science and
learning events:
16,772

Focus areas 2014-16



Wisconsin Sea Grant Mission and Vision Statements and Core Values

MISSION

Promote the sustainable use of Great Lakes resources through research, education and outreach.

VISION STATEMENT

Thriving coastal ecosystems and communities.

CORE VALUES

Service, science-based, discovery to application, academically grounded, collaborative, inclusive of diversity, educational and visionary.



Addresses

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Green Bay, Wis. 54311-7001
(920) 465-2795

UW-Manitowoc
705 Viebahn St., Room F103
Manitowoc, Wis. 54220-6699
(920) 683-4697

School of Freshwater Sciences,
UW-Milwaukee
600 E. Greenfield Ave.
Milwaukee, Wis. 53204
(414) 382-1723

Lake Superior National Estuarine Research
Reserve Building
14 Marina Drive
Superior, Wis. 54880
(715) 919-2154

Leadership

Sea Grant has a five-person leadership team, and also benefits from guidance offered by two external bodies. The Sea Grant Advisory Council is appointed by the University of Wisconsin-Madison chancellor, and the Sea Grant Committee on Outreach and Education was formed to provide additional input.

SEA GRANT MANAGEMENT TEAM

Director

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Assistant Director for Operations

Terri Liebmann
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**Wisconsin
fishing licenses
issued annually:
1.51 million**

WISCONSIN SEA GRANT ADVISORY COUNCIL

James Hurley (Ex-officio), director, UW Sea Grant, University of Wisconsin-Madison

Will Allen, farmer, founder and CEO, Growing Power Inc., Milwaukee, Wis.

Kristine Andrews, assistant vice president, federal relations, University of Wisconsin System, Madison, Wis.

Thomas J. Blewett, former program director, University of Wisconsin Cooperative Extension, Madison, Wis.

Carrie Bristol-Groll, owner of Stormwater Solutions Engineering, Milwaukee, Wis.

Sharon Cook, owner of Sharon D. Cook, LLC, Milwaukee, Wis.

Sheila Coyle, member of the Wisconsin Women Forward for Environmental Education Foundation, Bayfield and Madison, Wis.

Michael Friis, program manager, Wisconsin Coastal Management Program, Madison, Wis.

H. J. (Bud) Harris, professor emeritus, Natural and Applied Sciences, University of Wisconsin-Green Bay, Green Bay, Wis.

Al House, president, Apostle Islands Sport Fisherman's Association, Washburn, Wis.

J. Val Klump, senior director and associate dean of research, School of Freshwater Sciences, University of Wisconsin-Milwaukee, Milwaukee, Wis.

Larry J. MacDonald, former mayor, Bayfield, Wis.

Dreux Watermolen, section chief, Science Information Services, Bureau of Science Services, Wisconsin Department of Natural Resources, Madison, Wis.

Larry Wawronowicz (chair), natural resource director, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac du Flambeau, Wis.

Undergraduate,
graduate and
post-doctoral
students
supported:
183



WISCONSIN SEA GRANT COMMITTEE ON OUTREACH AND EDUCATION

Carmen Aguilar, associate scientist,
School of Freshwater Sciences, University of
Wisconsin-Milwaukee, Milwaukee, Wis.

Bill Brose, principal, JJR, Madison, Wis.

Bart deStasio, professor, Lawrence
University, Appleton, Wis.

Matt Eitrem, geographic information systems
coordinator, city of Ashland, Ashland, Wis.

Mary Erpenbach, president, Cherry
Street Agency, Beloit, Wis.

Denny Fox, national tournament director,
AIM Pro Walleye Series, Little Chute, Wis.

Lee Haasch, president and captain,
Haasch Guide Service, Algoma, Wis.

Vicky Harris, coordinator, Wisconsin
Clean Marina Program, De Pere, Wis.

Lynn Kurth, teacher, Prairie River
Middle School, Merrill, Wis.

Edith Leoso, tribal historic preserva-
tion officer, Bad River Band of Lake
Superior Chippewa, Odanah, Wis.

Marge Louch-Wouters, children's librar-
ian, LochWorks, La Crescent, Minn.

Travis Olson, wetland protection and habitat
restoration coordinator, Wisconsin Coastal
Management Program, Madison, Wis.

Pat Robinson, freshwater estuary
specialist, UW-Green Bay Extension

Jason Serck, economic development/planning
and port director, city of Superior, Superior, Wis.

Angie Tornes, senior planner for
rivers, trails and conservation, National
Park Service, Milwaukee, Wis.

Pat Wilborn, aquaculture farmer,
PortFish Ltd., Port Washington, Wis.



FELLOWS

Wisconsin Sea Grant is committed to fostering the next generation of water science leaders through support for fellowships. From 2014-16, a half-dozen inspiring young people participated in Sea Grant-supported fellowships.

Dean John A. Knauss Marine Policy Fellows

Shelby LaBuhn and Danielle Cloutier have been selected as fellowship finalists for 2017.

Caroline Mosley, 2015

Kristina Surfus, 2015

Catherine Simons, 2015

Sarah Wilkins, 2014

Great Lakes Commission Fellow

Michael Polich, 2016

J. Philip Keillor Fellow

Adam Bechle, 2016

NOAA Coastal Management Fellow

Joe Dwyer, 2016

Partners and Collaborators

GOVERNMENTAL

AmeriCorps	National Oceanic and Atmospheric Administration National Sea Grant Office
Center for Great Lakes Literacy	National Oceanic and Atmospheric Administration National Weather Service
Department of Fisheries and Oceans Canada	National Oceanic and Atmospheric Administration Office of Ocean Exploration and Research
Executive Office of the President	National Park Service
Federal Emergency Management Agency	New York State Department of Environmental Conservation
Fond du Lac Band of Lake Superior Chippewa	Ohio Department of Natural Resources
Great Lakes Fishery Commission	Oneida Tribe of Indians of Wisconsin
Ho-Chunk Nation	Red Cliff Band of Lake Superior Chippewa
Illinois Coastal Management Program	U.S. Army Corps of Engineers
Illinois Department of Natural Resources	U.S. Department of the Interior Bureau of Indian Affairs
Illinois Environmental Protection Agency	U.S. Department of Transportation
Illinois Natural History Survey	U.S. Environmental Protection Agency
Indiana Department of Natural Resources: Lake Michigan Coastal Program	U.S. Fish and Wildlife Service
Julius Kühn-Institut, Federal Research Centre for Cultivated Plants	U.S. Forest Service
Lake Superior National Estuarine Research Reserve	U.S. Geological Survey
Michigan Coastal Zone Management Program	Wisconsin Historical Society
Michigan Department of Environmental Quality	Wisconsin Coastal Management Program
Michigan Department of Natural Resources	Wisconsin Department of Health Services
Minnesota Department of Natural Resources	Wisconsin Department of Natural Resources
Minnesota Pollution Control Agency	Wisconsin Department of Public Instruction
National Oceanic and Atmospheric Administration Office for Coastal Management	Wisconsin Department of Tourism
National Oceanic and Atmospheric Administration Coastal Storms Program	Wisconsin Department of Transportation
National Oceanic and Atmospheric Administration National Marine Sanctuaries	Wisconsin Veterinary Diagnostic Laboratory

ACADEMIC

- Arizona State University

Bowling Green State University

Central Michigan University

Consortium of Universities for the
Advancement of Hydrologic Science Inc.

Cooperative Educational Service Area 6

Cornell University

East Carolina University

Gustavus Adolphus College

Iowa State University

Japan Agency for Marine-Earth
Science and Technology

Loyola University Chicago

Marine Biological Laboratory, Woods Hole,
an affiliate of the University of Chicago

Marquette University

Medical College of Wisconsin

Michigan State University

Milwaukee Public Schools

Northwestern Michigan College

Northland College

Ohio State

Oregon State University

Pennsylvania State University
- Purdue University

St. Norbert College

Stony Brook University, New York

University of Connecticut

University of Illinois

University of Miami

University of Michigan

University of Minnesota Duluth

University of Minnesota Twin Cities

University of Notre Dame

University of St. Thomas

University of Texas

University of Vermont

University of Wisconsin-Extension

University of Wisconsin-Green Bay

University of Wisconsin-Madison

University of Wisconsin-Milwaukee

University of Wisconsin-Manitowoc

University of Wisconsin-Oshkosh

University of Wisconsin-Stevens Point

University of Wisconsin-Superior

Uppsala University

Yale University



Partnering and
collaborating
organizations:
240





Volunteer
hours:
4,139

LOCAL, MUNICIPAL, COUNTY AND TRIBAL

- Bay-Lake Regional Planning Commission
- Bayfield, county
- Brown, county
- Chicago, city
- City of Milwaukee Health Department
- City of Racine Health Department
- Public Health Madison & Dane County
- Door, county
- Douglas, county
- East Central Wisconsin Regional Planning Commission
- Fox-River Valley County Land Conservation Departments
- Fox-Wolf Watershed Alliance
- Great Lakes Indian Fish and Wildlife Commission
- Marinette, city
- Metropolitan Water Reclamation District of Greater Chicago
- Milwaukee, city
- Milwaukee, county
- Milwaukee Metropolitan Sewerage District
- NEW Water
- Northwest Regional Planning Commission, Wisconsin
- Ozaukee, county
- Racine, city
- Sheboygan, city
- Sheboygan, county
- South Milwaukee, city
- Southeastern Wisconsin Regional Planning Commission
- Vilas County Land and Conservation

BUSINESSES AND NONGOVERNMENTAL ORGANIZATIONS

- 1000 Friends of Wisconsin
- Abbey Marina, Lake Geneva
- AlgaXperts, LLC
- Alliance for the Great Lakes
- AMI Consultants
- American Boat and Yacht Council
- American Planning Association
- Apostle Islands Sportfisherman’s Association
- AquaTerra Farms
- Association of Public and Land-Grant Universities
- Association of State Floodplain Managers
- The Bass Federation
- Bayfield City Dock
- Birchline Planning, LLC
- Blue Iris Fish Farm, LLC
- Braise
- Cabela’s Masters Walleye Circuit
- Central States Water Environment Association - Wisconsin Section
- Centro Hispano
- Chequamegon Bay Area Partnership
- Clean Bay Backers
- Clean Wisconsin
- Coolwater Farms, LLC
- David and Julia Uihlein Charitable Foundation Inc.

- Door County Maritime Museum

Ducks Unlimited

Ecosystem-Based Management Tools Network, NatureServe

Egg Harbor Marina

Escuela Verde

Esri

FarmedHere

Forequarter

Fort Fremont Marine

Fox Brothers Charter Service

Fox-Wolf Watershed Alliance

Friends of the Apostle Islands National Lakeshore

Friends of the Manitowoc River Watershed

Friends of South Shore Park

Fund for Lake Michigan

Gathering Waters Conservancy

Gaslight Pointe Marina, Racine

Great Lakes Commission

Great Lakes Ecological Services, LLC

Great Lakes Shipwreck Preservation Society

Great Lakes Shipwreck Research Foundation

Great Lakes Observing System

Greater Milwaukee Committee

Groundwork Milwaukee

Growing Power Inc.

Harbor Centre Marina, Sheboygan

Harbor Club Marina, Sturgeon Bay

Henriksen Fisheries

International Coastal Atlas Network

Jerry's Dock & Shoreline, Shawano

Kingdom Animalia Exotic Animal Rescue

Lakeshore Culinary Institute
- Lake Michigan Stakeholders

Lakeshore Natural Resource Partnership

Lakeshore Towers Marina, Racine

Living Adventure Inc.

Madison Area Chefs Network

Manitowoc Marina

McKinley Marina, Milwaukee

Metcalf's Market

MillerCoors

Milwaukee Riverkeeper Inc.

Milwaukee Talent Dividend

National Association of Counties

National States Geographic Information Council

National Professional Anglers Association

The Nature Conservancy

Nestegg Marine, Marinette

Northside Enterprises

Northwest Passage

Oconto County 4-H

Outpost Natural Foods

Pet Industry Joint Advisory Council

Pikes Bay Marina

Port of Duluth-Superior, Twin Ports

Port Washington Marina

Princess Marissa Sportfishing

Racine Riverside Marina

Racine Yacht Club

River Alliance of Wisconsin

Riveredge Nature Center

Salmon Specialist Sportfishing Charters

Seafood Center

Seagull Marina

Shorebirds Powered Parachute Club

Sixteenth Street Community Health Centers



Average length
of a trap net:
2,500 feet



- SkipperBud's marinas
- South Bay Marina
- Southeast Michigan Council of Governments
- South Shore Yacht Club
- Southport Marina
- St. Croix Marina
- Superior and Douglas County Chamber of Commerce
- Superior Public Museums
- Susie Q Fish Co.
- Sweet Water, Southeastern Wisconsin Watersheds Trust Inc.
- ThedaCare
- Urban Ecology Center
- Urban Farm Project
- Van's Catch Sport Fishing
- Washburn Marina
- The Water Council
- West Shore Marine
- Wildlife Forever
- Will Allen Farms, LLC
- Willy Street Co-op
- Wisconsin Academy of Sciences, Arts and Letters
- Wisconsin Alumni Association
- Wisconsin Commercial Ports Association
- Wisconsin Environmental Education Board
- Wisconsin Federation of Great Lakes Sport Fishing Clubs
- Wisconsin Green Industry Federation
- Wisconsin Harbor Towns Association
- Wisconsin Marina Association
- Wisconsin Maritime Museum
- Wisconsin Underwater Archaeology Association
- Wisconsin Waterfowl Association
- Wisconsin Wastewater Operators' Association
- Woodland Dunes Nature Center and Preserve



Publications and Other Information Transfer Publications

Akins, AL, MJ Hansen, and MJ Seider. Effectiveness of a Refuge for Lake Trout in Western Lake Superior II: Simulation of Future Performance *North American Journal of Fisheries Management* 35, 1003-1018 DOI:10.1080/02755947.2015.1074960 (DOI) (2015)

Anderson, JD, CH Wu and DJ Schwab. Wave Climatology in the Apostle Islands, Lake Superior *Journal of Geophysical Research-Oceans* DOI:10.1002/2014JC010278 (2015)

Althouse, B, SN Higgins and MJ Vander Zanden. Benthic and Planktonic Primary Production Along a Nutrient Gradient in Green Bay, Lake Michigan, USA *Freshwater Science* 33: 487-498 (2014)

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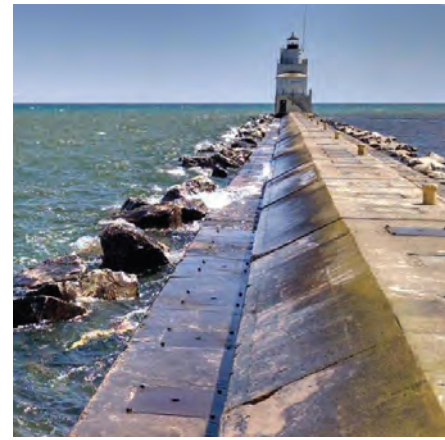
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RESOURCES

The Wisconsin Sea Grant 2014-17 strategic plan and the work plan for the same period are available at go.wisc.edu/26ed50.

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2015 GREAT LAKES SEA GRANT NETWORK, OUTSTANDING PROGRAMMING AWARD for the St. Louis River Estuary Stories and Science project

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2015 APEX GRAND AWARD for the Eat Wisconsin Fish communications campaign

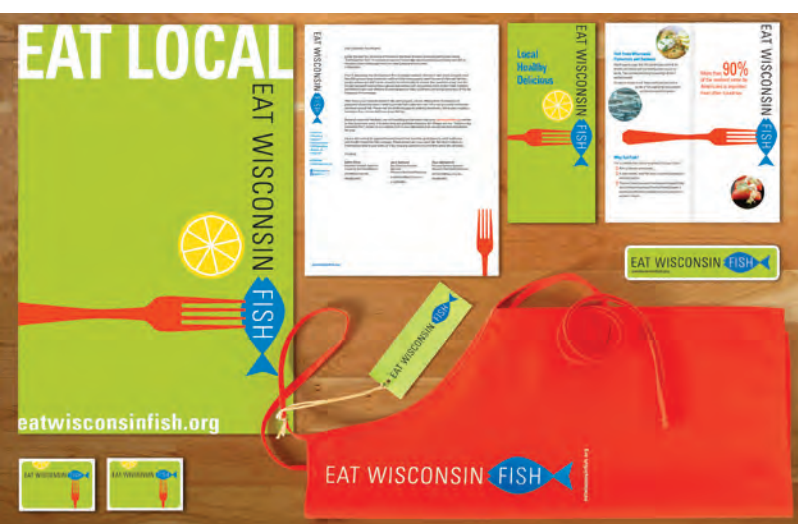
2015 UNIVERSITY OF WISCONSIN REGENTS ACADEMIC STAFF EXCELLENCE AWARD presented to Gene Clark, Wisconsin Sea Grant coastal engineer

2014 RESEARCH TO APPLICATION AWARD from the National Sea Grant Association recognizing work to understand and mitigate damage from accelerated freshwater corrosion of structures within the port of Duluth-Superior

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Breaking

Did I believe I had a clear mind?

It was like the water of a river

flowing shallow over **the ice.** And now

that the rising water has broken

the ice, I see that what I thought

was the light is part of the dark.

—Wendell Berry