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Biennial Report 2010-2012

University of Wisconsin Sea Grant Institute

Science for the Sustainable Use of Great Lakes Assets

"The Wisconsin Sea Grant has been instrumental in enabling us to grow yellow perch. We have the business know-how but we would not be where we are now if Wisconsin Sea Grant technology transfer had not led the way with yellow perch aquaculture techniques that pay off. Our customers come to us for a quality food that they can share with their families or that restaurants can feature to enhance their menus. Thanks to Wisconsin Sea Grant, we can deliver. Along the way, we provide jobs, contributing to a strong local economy."

Norman D. McCowan, president and CEO,
Bell Aquaculture, Redkey, Ind.

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< Former Director Anders Andren, LEFT and Director James P. Hurley, RIGHT.

"The Sea Grant research conducted by Drs. Richard Peterson and Warren Heideman at the University of Wisconsin concerning the developmental effects of dioxin exposures, in both ecological and human health contexts, is truly exceptional. Particularly noteworthy are their elegant mechanistic studies with the zebrafish model. They are the clear leaders in this important area that has implications for numerous environmental exposures besides dioxin."

Richard T. Di Giulio, professor, Nicholas School of the Environment, Duke University

Letter From the Director

An Impressive Legacy Closes Out in 2012

Thank you for spending time with our 2010-12 biennial report. As you turn these pages, you will discover the reasons why I have been so gratified to be a part of the University of Wisconsin Sea Grant Institute, returning as director and inheriting the impressive legacy of our former Director Anders Andren, who filled the role for nearly three decades.

As you review this report, you will gain an understanding of how our staff and our program meet the charge of fostering the sustainable use of Great Lakes resources—from the successful transfer of knowledge about yellow perch aquaculture that has built a multi-million-dollar business to visualizing the bluffs along Lake Michigan through online tools to enriching children's education of aquatic ecosystems. You will also learn where we are heading in the future.

Our program was established as the first in the Great Lakes region and is proud to be the aquatic equivalent of Wisconsin's land-grant college program. Our work on behalf of the University of Wisconsin System is the truest form of the Wisconsin Idea. Sea Grant's core competencies of research, education and outreach extend to all corners of our state, which is blessed with nearly 1,000 coastal miles along and 6.4 million acres within the world's largest freshwater system.

We will continue to support science for the sustainable use of the Great Lakes, ensuring that the knowledge we acquire through Sea Grant research moves out of peer-reviewed journals and into workshops, presentations and other communication tools to bring the science to those who will apply it in their Wisconsin communities. This is a shining example of the Wisconsin Idea.

Sea Grant's foundation of accomplishments also informs our frontier. We will identify and address the emerging economic and sociological challenges of our region. We will offer non-advocacy solutions, translating science into practice and allowing coastal businesses, citizens and local decision makers to capture fully Great Lakes economic and social benefits.

If anything on these pages prompts a question or comment, please get in touch with me. I would value your thoughts as we collaboratively act as successful stewards of these sweetwater seas.

James P. Hurley





Sea Grant Broadens Knowledge, Science Informs Big Decisions

Wisconsin Sea Grant finds inspiration in the strategic plans of three entities—the University of Wisconsin-Madison, University of Wisconsin System and National Sea Grant College Program—when charting its work to ensure the sustainable use of Great Lakes resources. Importantly, Wisconsin Sea Grant is also tuned in to, and responsive to, state and regional stakeholders. These stakeholders share in the bountiful, yet finite, resources of our freshwater seas.

Wisconsin Sea Grant refines and distills its guidance, having woven it into a 2010-14 Strategic Plan with measurable goals in the areas of improving Great Lakes ecosystem health, enhancing coastal community sustainability and resilience, and supporting sustainable fisheries and aquaculture. Those are all big tasks, and Sea Grant has notched big results in each area by investing in our state's top researchers, outreach specialists and educators.

Our mission is, in part, to foster the wise use, conservation and sustainable development of Great Lakes and coastal resources. That mission plays out through the extension efforts of Aquatic Invasive Species Outreach Specialist Tim Campbell (far left). Another specialist, Gene Clark, works with partners to raise awareness about beach safety for Lake Michigan surfers and kayakers who frequent Lake Superior sea caves once the ice moves out. 2012 Weston Scholarship winner Kaitlyn Taylor and 2011 Knauss Fellow Joe Fillingham (right) embody the next generation who will carry on that conservation and sustainable development to the benefit of the world's largest freshwater system.

Result: Improved Great Lakes Ecosystem Health

Improving the health of ecosystems is vital to ensuring the health of residents along Great Lakes shores and watersheds. Sea Grant is a leader in multidisciplinary, regional approaches in both understanding and mitigating problems such as water-quality degradation and habitat loss.

For decades, the waves of Green Bay pounded a chain of barrier islands that protected the mainland and provided waterfowl, fish and plant habitat, both in the bay and in wetlands ringing it. High water and storms took a toll. Water quality was compromised. Even as the final stretches of land slipped below the water in the 1970s, planning was underway to restore the Cat Island chain. Sea Grant's Vicky Harris (pictured) was front and center in that effort. In 2012, restoration began to take shape. Eventually, 1,400 acres of wildlife habitat will be protected thanks to a rebuilding process using 2.5 million cubic yards of material dredged from the channel of Green Bay. The re-engineered area will also improve water quality in this vulnerable section of Lake Michigan.

"We set up a great program. We had a lot of really great advice from the coordinators of the program. They were extremely helpful in offering suggestions. What we came out with has actually made big components of our business far easier to deal with, primarily in our wastewater recycling program as well as our hazardous waste containment, handling and recycling."

Michelle Shrider, Washburn Marina, Washburn, Wis., regarding the Wisconsin Sea Grant and partners' Clean Marina Program

< Part of the team at the Cat Island restoration project in Green Bay, LEFT. The beginning of the access road, RIGHT.

Cat Island in 1966. >

Improved Great Lakes Ecosystem Health continued from page 7

Ecosystem contaminants are a major concern. Consider:

- More than 800 toxic substances have been identified in Great Lakes water and sediment.
- In 2002, Wisconsin issued a statewide advisory for mercury in all of its inland waters, including those that flow into Lakes Superior and Michigan.
- A 1990s study on 11 rivers that drain 90 percent of the Lake Michigan watershed determined that one river, the Fox in Wisconsin, contributed more mercury and PCBs than the other 10 combined.

The Fox River has been targeted for extensive mitigation efforts. Wisconsin Sea Grant has funded a comprehensive longitudinal study to determine whether, and how much, such cleanup has helped in the Fox River basin, as well as 10 other tributary rivers. Such documentation is ongoing and will inform not only future remediation but also the beneficial use of sediment dredged from the river.

Broad-based education about mercury has also occurred. 2011 saw the release of a five-part audio podcast series on mankind's long relationship with the only metal that exists in liquid form at room temperature. Also covered is Wisconsin research on how mercury moves through the environment and the effect it has on the living things it touches. "Water, Wisconsin and the Mercury Cycle" is just one example of Sea Grant sharing science with lay audiences to increase marine-science literacy. Listen at aqua.wisc.edu/channel/37.

In its 43-year history, the program has funded more than 650 research projects related to toxics within the Great Lakes basin and other worldwide aquatic systems.

Martin Shafer at the University of Wisconsin-Madison led one of those hundreds of research projects. He took aim at mercury, copper and cadmium, asking how much of it is in Great Lakes waters and how much builds up in the plants and animals that live in those waters. Forms and toxicity characteristics of these metals have been historically difficult to measure *in situ*. Shafer, however, significantly modified a model that the U.S. Environmental Protection Agency is adopting to predict the toxicity of trace elements to various organisms in widespread aquatic systems.

Another UW-Madison researcher using Sea Grant funds focused on a single sentinel species in the Great Lakes region—the leopard frog—to evaluate how the overall ecosystem fares. William Karasov determined that environmental toxins are harming the frogs' immune system, growth and development, a heads-up for humans and the frogs that are linked through the food web.

In 2010, Wisconsin kicked off a Clean Marina Program in collaboration with the Wisconsin Marina Association. The outcome has been 19 certified clean marinas that have adopted recommended practices to keep toxics from waters, reduce business cleanup expenses and attract customers who favor "green" operations. Marinas and related industries and services contribute more than $2.7 billion to Wisconsin's economy. The voluntary, industry-led program gets its training and technical assistance from Sea Grant's Gene Clark, a coastal engineering specialist, and Vicky Harris, who recently earned a Lifetime Achievement Award from The Nature Conservancy and the keystone award from an international Great Lakes research association for her work on improving water quality and restoring habitats.

Result: Sustainable Fisheries and Aquaculture

The waters of the Great Lakes hold trout, salmon, whitefish and more. Wisconsin Sea Grant offers research findings, tools and advice to managers of those wild stocks. Aquaculture operations augment the wild stocks—important because Midwest consumers enjoy more than 1 billion pounds of seafood products each year. Yet only 4 percent of those meals come from aquaculture. Here too, Sea Grant has stepped in with advice and assistance on recirculating aquaculture systems and on aquaponics operations, like Milwaukee's innovative Growing Power.

Will Allen (far right), a MacArthur "Genius Grant" winner, provides food security for an impoverished section of one the nation's largest cities, Milwaukee. He consults with Sea Grant's Fred Binkowski to ensure the success of an aquaponics operation that mixes genetics, broodstock development, controlled reproduction and aquatic microbiology—fish and plants raised together. "There are not a lot of relationships like this. This is where the university and a non-profit form a partnership. It's a win for everybody," Allen says.

Sustainable Fisheries and Aquaculture continued from page 11

Yellow perch are a popular consumer food fish whose numbers in the Great Lakes have fluctuated in the last 20 years, mostly downward. Great Lakes commercial fishing for the species is restricted in all the lakes except Lake Erie, and consumers who want to support Great Lakes seafood producers have diminished options.

Wisconsin Sea Grant has fueled the success of the freshwater finfish aquaculture industry to fill the gap. Staff provide technical assistance on water quality and broodstock viability to private businesses and a revolutionary not-for-profit organization in central-city Milwaukee.

At the hub of it all is the patented yellow perch propagation technique of Fred Binkowski, Sea Grant's aquaculture specialist. By manipulating light and water temperature, Binkowski convinces his fish to breed out of season, which enables year-round fish production. It also helps realize the dreams and successes of Will Allen and his non-profit urban farm Growing Power. The farm supplies fish and vegetables, and enjoys international attention as a leader and model for others worldwide who want to emulate its integrated food production system known as aquaponics.

In addition, Sweet Water Organics, located in a refurbished abandoned factory in formerly heavily industrialized Milwaukee, has a workforce of six, expecting to expand to 20 or more. In 2010, the business produced an estimated 10,000 fish (3,000 pounds of yellow perch).

Then there's Bell Aquaculture of Albany, Ind., the nation's largest yellow perch producer, shipping 1 million pounds in 2011 for a potential market value of more than $12 million wholesale and $20 million retail. Both businesses rely on Sea Grant for technical advice and assistance.

Sea Grant has also turned its attention to the Great Lakes' wild stocks. One way that has been done is increased vigilance against aquatic invasive species (AIS) that can wreak havoc with the established food web in Lakes Superior and Michigan. Education is the watchword here—recreational boaters and fishers, as well as professional anglers, are the targets since they can prevent further spread.

Wisconsin Sea Grant is leading an innovative and collaborative approach to the AIS challenge. Working with the other Great Lakes Sea Grant programs, the National Professional Anglers Association, the Cabela's Masters Walleye Circuit, The Bass Federation and Wildlife Forever, the initiative targets fishing tournaments and professional anglers as a vector in the spread of AIS. To date, our program and Sea Grant partner programs have worked with 34 tournaments reaching 11,649 professional entrants and 230 youth competitors, although duplicates are likely. Surveys indicate that anglers are taking steps to stop the march of AIS. Additionally, more than 9,445 children who participated in the Cabela's Masters Walleye Circuit youth fishing clinics received AIS prevention materials.

Finally, education leads to stewardship and Wisconsin certainly has a story in its lake sturgeon stock about which to boast. That story has been beautifully told through "People of the Sturgeon, Wisconsin's Love Affair With an Ancient Fish," an award-winning coffee-table and audio book.

The book details the prehistoric fish that can live for 100 years, weigh 300 pounds and reach a length of nine feet. The species was brought back from the brink of extirpation through the devotion of stewards in this state, including Binkowski and our outreach advisor Dr. Ron Bruch.

Result: Enhanced Coastal Community Sustainability and Resilience

Wisconsin's coastal population is diverse and growing, with increasing pressures to be economically viable and resilient in the face of coastal hazards such as erosion or flooding. Sea Grant has stepped in. The program applies the best available scientific knowledge. It provides extension and education capabilities to support the development of healthy coastal communities. It fosters varied and vibrant economies functioning well within the carrying capacity of their given Lake Michigan or Lake Superior ecosystem.

Towering bluffs along Lake Michigan are visually striking, but at times can be dangerous for the communities of which they are a part. Ozaukee County is such a place and its Lion's Den Nature Gorge is featured in the Wisconsin Coastal Atlas as an example of bluff erosion. Sea Grant's David Hart, a geographic information specialist, built the online resource and packed it full of planning tools. Director of Ozaukee County's Planning and Parks Department Andrew Struck is pictured here perched atop a 120-foot bluff that is composed of clay and sand rendering it highly erodible. Struck says Sea Grant has helped his community come to terms with the beauty, and risks, associated with the fickle topography. "The Coastal Atlas has been a great education tool for residents to understand our coastal bluff erosion and hazards."

< Installing the wave sensor and kayaking at the Apostle Islands, Bayfield, Wis.

Bluff erosion at Lion's Den Nature Gorge, Ozaukee, Wis. >

"Kayaking is very popular here. We're glad to see it getting even safer with a real-time wave information Sea Caves Watch system. Sea Grant's coastal engineering knowledge was vital to this setup. Our city was a partner in the effort, along with Sea Grant. And, I was pleased with the collaboration among all the other partners—the Wisconsin Coastal Management Program, National Park Service and Friends of the Apostle Islands."

Larry J. MacDonald, mayor of Bayfield, Wis.

Enhanced Coastal Community Sustainability and Resilience continued from page 15

And, just what are those ecosystems and their pressures? Sea Grant's Geographic Information Specialist David Hart provides science-based, non-biased answers through a wealth of online information like weather data, animations demonstrating coastal erosion, and maps showing land-cover changes over time. The information is easily accessible and facilitates decision-making.

Also relevant is a joint outreach/research project focused on the boundary between Minnesota and Wisconsin along the St. Louis River near Lake Superior. The Wisconsin portion of this project has developed communication and education tools, including an open geospatial archive, a "deep map" incorporating vignettes of local communities, augmented reality games and geo-tours of the estuary, ship-based activities and a diverse array of complementary online resources.

Results of this project, coupled with the monitoring and spatial narratives constructed from Minnesota research, will guide implementation of the St. Louis River Habitat Plan—helping to prioritize monitoring, restoration and remediation, and enhancing understanding of estuaries in coordination with the 2010-designated federal Lake Superior National Estuarine Research Reserve.

These comprehensive planning-support tools are one facet of Sea Grant service to communities. There are others that are more specific and hands-on, such as raising awareness about dangerous lake conditions. In 2011 Wisconsin Sea Grant, and its partner programs throughout the Great Lakes, received an award from the Dairyland Surf Club for publicizing the dangers of rip currents.

In Lake Superior, kayakers from the world over are drawn to the beauty and challenges of sea kayaking among majestic sandstone caves. Danger can arise, literally, when the big lake's waters produce rogue or other dangerous waves. Recreational enthusiasts have tragically lost their lives. Sea Grant has worked to prevent that from happening again. With funding from the Wisconsin Coastal Management Program and in conjunction with university-based civil engineers such as researcher Chin Wu, and the National Park Service, Sea Grant has installed a wave-monitoring system on the bed of Lake Superior that transmits real-time wave conditions at the caves, providing needed safety information to kayakers.

That's prediction of one sort. Another sort, related to climate change, is also served up thanks to Wisconsin Sea Grant. Although the effects of climate change include unknowns, there are some known consequences—huge expenses related to infrastructure retrofitting for ports, harbors and along bluffs and other shorelines, for example.

Sea Grant has led a national effort to provide instructive online climate change modules aimed at educators and local decision makers. Sea Grant staff have also visited Wisconsin coastal communities and conducted face-to-face assessments to gather information from local leaders to shape adaptation and mitigation strategies. Sea Grant has also fashioned a ports-harbors matrix to predict what climate-induced variable water levels will do to piers and other expensive structures.

Wisconsin Sea Grant reaches learners of every age—from preschool to college and into the years of the lifelong learner. It's all part of an effort to build marine-science literacy and engender stewardship for our inspiring Great Lakes resources. Here, Wisconsin's Water Librarian Anne Moser leads a program for young members of the Ho Chunk community. Moser shares a relevant book and craft project, related to the turtle, which is culturally important to the Ho Chunk Nation.

Result: Information Transfer and the Next Generation of Marine-Science Leaders

From education comes understanding, from understanding comes sustainable use. Sea Grant embraces this principle through its information-transfer activities—directly through extension services and through delivery systems such as a rich website, seagrant.wisc.edu; a YouTube channel chockablock with more than 60 video offerings; social media channels; and a publication store, which offers hundreds of items at no or low cost. From 2010-12, nearly 38,400 fact sheets, cards, maps, posters and booklets on topics ranging from nuisance algae to the impact of climate change moved from the store into the hands of those who could use them.

Sea Grant also supports Wisconsin's Water Library, home to more than 30,000 volumes on water-related topics accessible to any state resident. Even if residents didn't borrow a library book or a DVD, they did benefit from the wastewater-system training manuals the library archives and shares widely.

The staff librarian also got out of her stacks and into communities, dedicating particular attention to literacy and science-literacy building among the youth of the Ho Chunk Nation and other youngsters across the state through roughly 30 visits in 2011-12.

Youth also benefitted from the rigors of marine curriculum in classrooms across Wisconsin. In more than 25 state schools, oceanography classes are available and many of those those schools also field teams to the regional qualifying round of the National Ocean Sciences Bowl. For four straight years, a team from Wisconsin has won that bowl. Student interest in these topics is further stimulated by a prize structure that includes pertinent field experiences with scientists. Members of the winning 2009, 2010, 2011 and 2012 Wisconsin teams are pursuing careers in science or engineering, including at least one who is an aspiring marine biologist.

College students are also a core priority. In 2013, and beyond, the program will support a newly established Wisconsin Sea Grant Fellows initiative. Providing professional development, networking and further research/educational opportunities, the effort affirms our commitment to nurturing the next generation of marine-science leaders.

Wisconsin Sea Grant College Program Mission Statement

UW Sea Grant supports scientific research, education and outreach to foster the wise use, conservation and sustainable development of Great Lakes and coastal resources. We strive to provide unbiased science-based information to Great Lakes coastal residents, resource managers and other stakeholders. Our audiences include specific stakeholders and agencies, state and federal officials, the general public, the UW community and the National Sea Grant Program.

Connect With the University of Wisconsin Sea Grant Institute
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School of Freshwater Sciences, UW-Milwaukee
600 E. Greenfield Ave.
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(414) 382-1723

Lake Superior National Estuarine Research Reserve Building
14 Marina Drive
Superior, Wis. 54880
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Students

Wisconsin Sea Grant has a long and proud tradition of inspiring students, whether at the K-12 level or by supporting students in their education and hands-on training to become scientists, resource managers and policy leaders in their own right.

Number of undergraduate, graduate and post-doctoral students supported by Sea Grant funds, 2010-12
82

Number of K-12 students reached, 2010-12
66,571

Weston Scholarship Recipients
The scholarship is named for Carl J. Weston and awarded to undergraduate students pursuing studies related to the Great Lakes.

Morgan Rose Schroeder, 2012
Kaitlyn Taylor, 2012
Kathryn Ballard, 2011
Alex Gooding, 2010
Sue-Zanne Tan, 2010

Dean John A. Knauss Marine Policy Fellowship
This nationally competitive one-year fellowship offers the opportunity to work with a federal agency or lawmaker in Washington, D.C.

Jennifer Phillips, selected in 2012 and will serve her fellowship in 2013

Joseph Fillingham, 2011

National Oceanic and Atmospheric Administration Coastal Management Fellowship.
This nationally competitive two-year fellowship provides on-the-job education in coastal resource management and policy for postgraduate students.

Kathy Johnson, 2010-12. Johnson worked collaboratively with the Wisconsin Coastal Management Program on the Wisconsin Coastal Atlas (wicoastalatlas.net).

Wisconsin Sea Grant also sponsors students to participate in the program and was proud to have placed:

Robbie Greene, 2012-14. Green is working in the Mariana Islands, developing online portals for geo-spatial information.

Julie Caldwell Noordyk, 2010-12. Noordyk was a fellow with the Maine Coastal Program, developing a marine spatial planning approach for ocean management.

Leadership

Sea Grant has a five-person management team and is also guided by an external advisory council and a committee, which provide policy input within established institutional goals, approve the overall program plan and budget, and participate in program planning.

The council is appointed by the UW-Madison chancellor. Consisting of state leaders from academia, state and local government, industry and the public, the council brings a wide variety of viewpoints to the program and helps ensure the program's accountability to Sea Grant constituencies.

The Wisconsin Sea Grant Committee on Outreach and Education was formed to provide additional guidance on the direction of the program's advisory services, education and communications efforts. It also draws from multiple disciplines.

Sea Grant Management Team

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Sea Grant Advisory Council

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

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

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

Marie Colton, director, National Oceanic and Atmospheric Administration-Great Lakes Environmental Research Laboratory, Ann Arbor, Mich.

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.

David Garman, dean, School of Freshwater Sciences, University of Wisconsin-Milwaukee

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

Mark T. Harris, School of Freshwater Sciences and professor, Department of Geosciences, University of Wisconsin-Milwaukee

Al House, vice-president, Apostle Islands Sport Fisherman's Association and town board chairman, Bayview, Wis.

Larry J. MacDonald, owner, Cooper Hill House Bed & Breakfast and mayor, Bayfield, Wis.

Kevin McSweeney, professor, Department of Soil Science, University of Wisconsin-Madison

John R. Sullivan, bureau director, Integrated Science Services, Wisconsin Department of Natural Resources, Madison, Wis.

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

Committee on Outreach and Education

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

Bill Brose, principal, JJR, Madison, Wis.

Ron Bruch, biologist, Wisconsin Department of Natural Resources, Oshkosh, Wis.

Jeff DuMez, geographic information specialist, Land Information Office, Brown County, Green Bay, Wis.

Karen Green, educator, Milwaukee Public Schools

Lee Haasch, owner, Haasch Guide Service, Algoma, Wis.

Al House, Apostle Islands Sport Fisherman's Association and town board chairman, Bayview, Wis.

John Kennedy, environmental manager, Green Bay Metropolitan Sewerage District

Konnie LeMay, editor, Lake Superior Magazine, Duluth, Minn.

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

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

Larry Wawronowicz, natural resources director, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac du Flambeau, Wis.

Partners

Sea Grant's service is amplified when it teams up with external groups and individuals to create a force greater than the sum of its parts. To that end, Sea Grant staff members serve on boards and committees, as well as broadly forging partnerships to meet the needs of varied audiences and the Great Lakes basin. Recent partners and collaborators include:

State, Federal, Tribal and Provincial Governmental Agencies

Bad River Tribe of Lake Superior Chippewa
Conservation Ontario
Environmental Canada Fisheries and Oceans Canada
Fond du Lac Band of Lake Superior Chippewa
Ho-Chunk Nation
Illinois Geological Survey
Illinois Natural History Survey
Indiana Department of Natural Resources
Iowa Department of Natural Resources
Iowa Department of Transportation
Library of Congress
Lac du Flambeau Tribe
Los Alamos National Laboratory
Marine Advanced Technology Center
Menominee Indian Tribe of Wisconsin
Michigan Department of Natural Resources
Michigan Department of Environmental Quality
Minnesota Coastal Management Program
Minnesota Department of Natural Resources
Minnesota Department of Transportation
National Science Foundation
National Wildlife Health Center
NOAA-Climate Program Office
NOAA-Coastal Services Center
NOAA-Great Lakes Environmental Research Laboratory
NOAA-National Marine Estuarine Research Reserve
NOAA-National Marine Fisheries Service
NOAA-National Marine Sanctuary Program
NOAA-National Weather Service
Oneida Tribe of Indians of Wisconsin
Ontario Ministry of Natural Resources
Oregon Coastal Management Program
Red Cliff Tribe of Lake Superior Chippewa
St. Croix Chippewa Indians of Wisconsin
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Coast Guard Auxiliary
U.S. Department of Agriculture
U.S. Department of the Interior-National Park Service
U.S. Environmental Protection Agency
U.S. Forest Service
U.S. Geological Survey
U.S. Fish and Wildlife Service
Waterford Waterways Management District, Waterford, Wis.
Wisconsin Council on Invasive Species
Wisconsin Department of Administration: Wisconsin Coastal Management Program and Geographic Information Office
Wisconsin Department of Health Services
Wisconsin Department of Natural Resources
Wisconsin Department of Transportation
Wisconsin Department of Tourism
Wisconsin Historical Society
Wisconsin State Laboratory of Hygiene
Wisconsin State Cartographer's Office

Academic

Bemidji State University
Harvard Medical School
Marquette University
Michigan State University
Michigan Technological University
North Carolina State University
Northland College
The Ohio State University
Oregon State University
Pennsylvania State University
Purdue University
State University of New York-Brockport
State University of New York-Oswego
University Corp. for Atmospheric Research
University of Florida
University of Illinois at Urbana-Champaign
University of Maine
University of Michigan
University of Minnesota-Duluth
University of New Hampshire
University of North Carolina
University of Notre Dame
University of Puerto Rico
University of South Florida
University of Southern California
University of Vermont
University of Wisconsin System
University of Wisconsin-Extension
Woods Hole Oceanographic Institution

Local, Municipal and County Agencies

Bay-Lake Regional Planning Commission, Green Bay, Wis.
Bayfield County, Wis.
Brown County, Wis.
Brown County Land and Water Conservation Department
City of Ashland, Wis.
City of Au Train, Mich.
City of Bayfield, Wis.
City of Duluth, Minn.
City of Green Bay, Wis.
City of La Pointe, Wis.
City of Manitowoc, Wis.
City of Milwaukee
City of Port Washington, Wis.
City of Racine, Wis.
City of Sheboygan, Wis.
City of Superior, Wis.
City of Two Rivers, Wis.
City of Washburn, Wis.
Door County, Wis.
Douglas County, Wis.
Green Bay Metropolitan Sewerage District, Wis.
Fox River Navigation System Authority, Wis.
Madison School District, Madison, Wis.
Milwaukee County
Milwaukee Metropolitan Sewerage District
Newport State Park, Wis.
Northeast Wisconsin Stormwater Consortium
Outagamie County, Wis.
Ozaukee County, Wis.
Washington Island, Wis.
Wauwatosa Recreational Department, Wis.

Businesses and Non-governmental Organizations

Abbey Marina, Lake Geneva, Wis.
American Meteorological Society – DataStreme Earth's Climate System, Washington, D.C.
Aquafauna Bio-Marine, Inc. Hawthorne, Ca.
Aquarium Pets, Oshkosh, Wis.
Association of Floodplain Managers, Madison, Wis.
The Bass Federation, Ponca City, Okla.
Bell Aquaculture, Albany, Ind.

Bird Studies Canada

Cabela's Master Walleye Circuit, Minnetonka, Minn.

Centerville Cares, Manitowoc, Wis.

Chippewa-Ottawa Resource Authority, Sault Saint Marie, Mich.

Citgo, Romeoville, Ill.

Coolwater Farms, Deerfield, Wis.

Centers for Ocean Sciences Education Excellence-Great Lakes

Council of Great Lakes Governors

Elkhart Lake Multisports, Elkhart Lake, Wis

Eden Gardens\Living Waters, Muskegon Heights, Mich.

Friends of the Fox

Gaslight Pointe Marina, Racine, Wis.

Gathering Waters, Milwaukee

Great Lakes Commission, Ann Arbor, Mich.

Great Lakes Fishery Commission, Ann Arbor, Mich.

Great Lakes Indian Fish and Wildlife Commission, Odanah, Wis.

Great Lakes Information Network, Ann Arbor, Mich.

Great Lakes Observing System, Ann Arbor, Mich.

Great Lakes Research Foundation Inc.

Great Lakes Shipwreck Preservation Society Inc.

Great Lakes Sportfishing Council, Elmhurst, Ill.

Growing Power, Milwaukee and Chicago

Harbor Centre Marina, Sheboygan, Wis.

Hunger Task Force, Milwaukee

Illinois Marine Towing, Lemont, Ill.

International Coastal Atlas Network

Jerry's Dock, Shawano, Wis.

Kindra Marine, Chicago

Lake Michigan LaMP Forum

Lake Michigan Stakeholders

Lakeshore Towers Marina, Racine, Wis.

Los Angeles County Natural History Museum

Manitowoc Maritime Museum

Material Service Corp., Chicago

Michigan Small Harbors Coalition

Miller Brewing Co., Milwaukee

National Professional Anglers Association, Forestville, Wis.

The Nature Conservancy of Wisconsin

Nestegg Marine, Marinette, Wis.

NEW North, De Pere, Wis.

Neville Public Museum, Green Bay, Wis.

Oshkosh Public Museum

Outagamie Museum, Appleton, Wis.

Pikes Bay Marina, Bayfield, Wis.

Racine Riverside Marine

Racine Yacht Club

Rogers Street Fishing Village, Two Rivers, Wis.

Schlitz Audubon Nature Center, Milwaukee

Seagull Marina, Two Rivers, Wis.

Skipper Bud's Marinas (Harbor Club, Reefpoint, Yacht Center and Quarterdeck), multiple Wisconsin locations

John G. Shedd Aquarium, Chicago

South Bay Marina, Green Bay, Wis.

Southeast Wisconsin Invasive Species Consortium

Southshore Yacht Club, Milwaukee

Southport Marina, Kenosha, Wis.

Star Prairie Trout Farm, Star Prairie, Wis.

Sturgeon for Tomorrow, Lake Winnebago watershed, Wisconsin

Susie-Q-Fisheries, Two Rivers, Wis.

Sweet Water Organics, Milwaukee, Wis.

Town and Country RC&D, Jefferson, Wis.

University Consortium for Geographic Information Science, Corvallis, Ore.

West Shore Marine, Racine, Wis.

Wildlife Forever, Brooklyn Center, Minn.

Wisconsin Alumni Association, Madison, Wis.

Wisconsin Commercial Ports Association

Wisconsin Marina Association

Wisconsin Underwater Archeology Association

Awards

2012 DISTINGUISHED SERVICE AWARD to Dr. Anders Andren, former Wisconsin Sea Grant director, from the Sea Grant Association.

2012 Water Quality and Habitat Restoration Outreach Specialist Vicky Harris won the INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH JOHN R. (JACK) VALLENTYNE AWARD.

2012 Water Quality and Habitat Restoration Specialist Outreach Specialist Vicky Harris won the EARTH CARETAKER AWARD from the University of Wisconsin-Green Bay.

2012 NATIONAL INDIE EXCELLENCE BOOKS AWARD for "People of the Sturgeon, Wisconsin's Love Affair With An Ancient Fish," for the audio book edition.

2012 APEX AWARD for John Karl and his video, "What Will Round Gobies Do to Great Lakes Streams?"

2011 APEX AWARD for John Karl and his video, "Testing Well Water for Microorganisms."

2011 DAIRYLAND SURF CLASSIC ANNUAL AWARD for rip current awareness work.

2010 "People of the Sturgeon, Wisconsin's Love Affair With an Ancient Fish" won 12 STATE, REGIONAL AND NATIONAL AWARDS.

2010 Water Quality and Habitat Restoration Outreach Specialist Vicky Harris won the LIFETIME ACHIEVEMENT AWARD from The Nature Conservancy.

Publications and Other Information-Transfer Products

From 2010-12, Wisconsin Sea Grant-funded researchers published in peer-reviewed journals. Sea Grant-funded Ph.D. students, along with outreach advisory services and communications staff members, produced varied products that transferred scientific information.

2012

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Karl J, Campbell T, Slowing the Spread of Aquatic Invasive Species video (2012).

Karl J, Final Video From Shipwreck Exploration 2012 - June 24, Sunday, Part II video (2012).

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Karl J, Shipwreck Exploration 2012 - June 23, Saturday video (2012).

Karl J, Shipwreck Exploration 2012 - June 22, Friday video (2012).

Karl J, Shipwreck Exploration 2012 - June 21,Thursday video (2012).

Karl J, Shipwreck Exploration 2012 - June 20, First Day in Jacksonport video (2012).

Karl J, Sheboygan River Cleanup: A Little Patience, a Big Payback video (2012).

Karl J, Hart D, Specialist in Geographic Information Systems video (2012).

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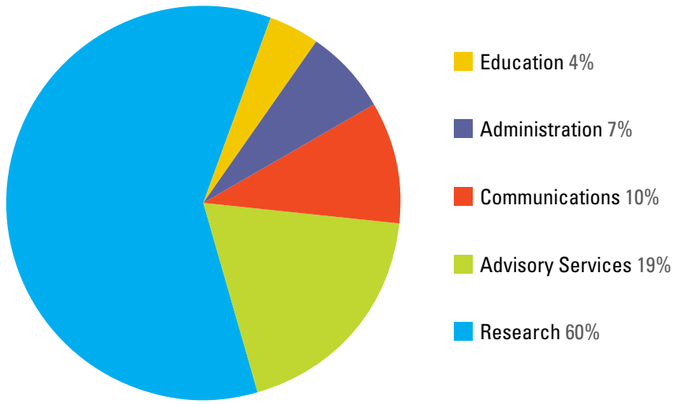
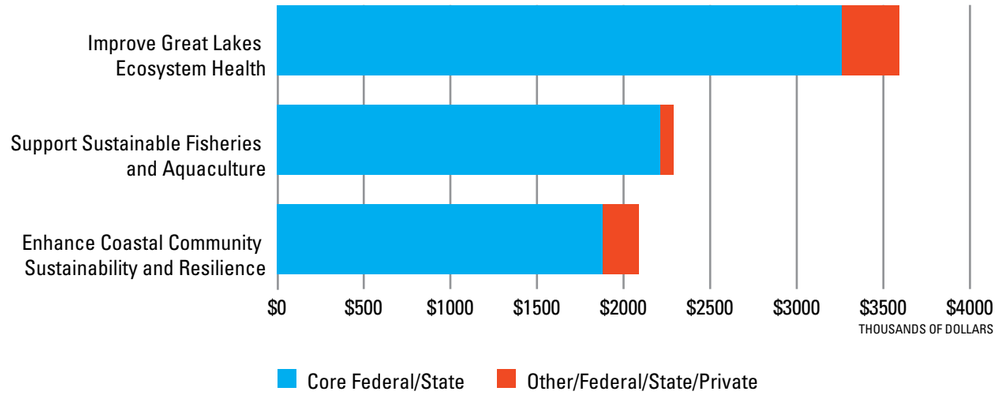
Budget Overview

Funding allocation 2010-12



Focus areas 2010-12



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"With my primary focus on the Mississippi River, information from Sea Grant's Chronicle, Web pages and publications are a real help in keeping me informed about the broader picture of aquatic work in Wisconsin and the Great Lakes. Keep it up!"

Barry L. Johnson, chief, Long Term Resource Monitoring Branch, U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wis.

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