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Aquatic Sciences Chronicle

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UNIVERSITY OF WISCONSIN SEA GRANT INSTITUTE UNIVERSITY OF WISCONSIN WATER RESOURCES INSTITUTE

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WATER RESOURCES INSTITUTE

University of Wisconsin-Madison Archives and Record Management Services

WATER RESOURCES INSTITUTE TURNS 50

Abundant, good water is essential to continued economic growth and progress. The Congress has found that we have entered a period in which acute water shortages are hampering our industries, our agriculture, our recreation, and our individual health and happiness.

These are the words of President Lyndon B. Johnson as he announced the approval of the federal Water Resources Research Act in 1964. The act ultimately formed the University of Wisconsin's Water Resources Institute (WRI) and 53 other university-based programs of research, outreach and education across the country. With funding from the U.S. Geological Survey, these programs are dedicated to solving water resource problems. As a state-federal-academic partnership, Wisconsin's institute is also supported by the Wisconsin Groundwater Research and Monitoring Program. The WRI is a sister program to Wisconsin Sea Grant, operated under the umbrella organization of the Aquatic Sciences Center.

With nearly 1 million acres of lakes and more than 5 million acres of wetlands, Wisconsin ranks among the top in the nation for water

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Formed in 1964, The University of Wisconsin Water Resources Institute is the primary link between academic water experts and those who manage and use water.

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The Aquatic Sciences Center is the administrative home of the **University of Wisconsin Sea Grant Institute** & the **University of Wisconsin Water Resources Institute**.

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University of Wisconsin Sea Grant Institute is part of a national network of 33 university-based programs funded through the National Sea Grant College Program, National Oceanic & Atmospheric Administration, U.S. Department of Commerce, and through matching contributions from participating states and the private sector. seagrant.wisc.edu

University of Wisconsin Water Resources Institute is one of 54 Water Resources Research Institutes nationwide authorized by the federal Water Resources Research Act and administered through the U.S. Geological Survey. wri.wisc.edu



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FEATURED SOCIAL MEDIA + WEB



“Clean Boats, Clean Tournaments” Provides Plenty of Fish Eye Candy

seagrant.wisc.edu/cleanboats

A recently produced video offers complementary views of Great Lakes water bodies. There are scenes depicting attractive spots to hold fishing tournaments, along with the invitation to keep them free of aquatic invasive species. Then there’s a presentation of detailed, step-by-step instructions for setting up a boat-washing station to preserve uncontaminated tournament venues. Plus, the 10-minute video offers plenty of fish eye candy. Trophy-sized bass and walleye are scooped into nets, wrestled into boats and held aloft.

“Clean Boats, Clean Tournaments” acknowledges that fishing tournaments run the risk of spreading Eurasian milfoil that clogs the waters, spiny water fleas that stick to fishing lines, and zebra and quagga mussels that can out-consume species lower on the food chain and starve out sport fish higher up. There are plenty more examples of invaders, and a boat-washing station can neutralize them before they broaden their range and cause trouble.

The video invites youth and community groups to set up boat-washing stations at the competitive tournaments that make a circuit throughout the Great Lakes region each season. Using on-screen lists of equipment needed, video demonstrating specific actions, and animations of possible traffic flow patterns for vehicles, boats and trailers, any organization can easily learn how to host a boat-washing station that both protects waters and raises funds for the group.

Boat washing is a part of a successful project to affect the behavior of professional anglers to prevent the spread of aquatic invasive species. Project partners are Cabela’s Masters Walleye Circuit, the Walleye Federation, National Bass Anglers Association, the Bass Federation, the National Professional Anglers Association and Great Lakes Sea Grant Network.

The “Clean Boats, Clean Tournaments” video can be viewed at seagrant.wisc.edu/cleanboats and additional information is available at no cost in the Publications Store at aquawisc.edu/publications under the “invasive species” tab.

SEA GRANT INSTITUTE RESEARCH

Does Beach Redesign Resolve Contamination Problems?

MEASURING WATER QUALITY FOR AN IMPROVED DAY AT THE BEACH



When you visit a Wisconsin beach, the last thing you’re likely thinking about is how it’s been designed. You see the water, you see the sand and you begin to look for a perfect place to lay your towel down and go for a swim.

Beach design is, by contrast, the first thing Greg Kleinheinz sees. What’s the drainage situation? Why is that stormwater pipe there? Man, there are a lot of gulls on this beach.

Over the last few years, there’s been an increased amount of attention paid to beach health in Wisconsin, a state that was just named as having the 8th worst beach-water quality in America by the U.S. Environmental Protection Agency. But while water quality at public beaches in Wisconsin has been monitored under the BEACH Act since the early 2000s, there’s also been a missing piece.

“We’ve been doing beach monitoring for a decade, and we’ve gathered information on what causes contamination,” said Kleinheinz, a professor of environmental engineering at University of Wisconsin-Oshkosh. “The problem is that there’s no funding to do much about it.”

Funding from the Great Lakes Restoration Initiative helped to re-engineer a handful of Great Lakes beaches, but that money didn’t extend to something Kleinheinz said he considers even more important—assessing whether the beach redesign reduced contamination.

That’s where Kleinheinz and his team are stepping in. Backed by funding from Sea Grant, Kleinhienz spent the 2014 summer measuring numbers of fecal bacterium indicators (think *E. coli*) at two Door County beaches that have

undergone a redesign, then compared them to two that hadn’t.

“It’s a logical progression,” he said. “We’re asking the question directly—what’s the benefit of beach redesign?”

Kleinheinz’s study is specifically focusing on Sunset Park in Sturgeon Bay and the main public beach in Egg Harbor, both of which have undergone redesign efforts to improve quality. On the other side of the equation will be public beaches in Fish Creek and Ephraim, communities that have plans to redesign their beaches but have yet to implement them.

“We’re hoping to show the entire process, from identification of contamination to mitigation,” said Kleinheinz. “We’re revealing a real economic and environmental benefit to these communities.”

Kleinheinz need look no further than Egg Harbor for a powerful example. Greg Coulthurst, a conservationist with Door County Soil and Water Conservation, said he’s watched usage of the village’s main public beach soar since a 2009 redesign that installed a stormwater filtration system, as well as bioswales, porous pavements and vegetative plantings to deter gulls and geese.

“Egg Harbor is one beach that has just gotten incredible usage,” said Coulthurst. “And a big part of that is because we’ve prevented a lot of the pollutants from reaching the beach. Up here, it’s all about the usage. When one community

The three biggest sources of bacterial contamination for most Wisconsin beaches are typically stormwater discharge, runoff from nearby parks/parking lots and avian fecal matter.

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Who Lives in and Around the Great Lakes?

Many are familiar with the Peterson's Field Guide series, but there are many other excellent nature guides available both in print and on the Web that include the Great Lakes region. Can't tell if that's a chipmunk or a ground squirrel in your yard? Researching amphibians of the Great Lakes? Curious about the birds at your feeders? You need to take a look at these books!

AMPHIBIANS AND REPTILES OF THE GREAT LAKES REGION

By James H. Harding. Ann Arbor: University of Michigan Press, 1997.

Harding has produced a nontechnical guide to the identification, distribution and life history of reptiles and amphibians found in the Great Lakes area.

BIRDS OF MINNESOTA AND WISCONSIN

By Robert B. Janssen, Daryl D. Tessen and Gregory Kennedy. Auburn, Wash.: Lone Pine Publishing, 2003.

This book is a useful tool for learning more about the biological diversity of the upper Midwest. 322 species of birds are grouped and color coded in this guidebook for easy reference. It includes the top 10 birding sites in both Wisconsin and Minnesota.

GUIDE TO GREAT LAKES FISHES

By Gerald Ray Smith. Ann Arbor: Michigan Sea Grant and University of Michigan Press, 2010.

"The Guide to Great Lakes Fishes" describes 62 of the region's most commonly found species, from giants like the sturgeon all the way down to the minnows and shiners, some of the lakes' smallest residents. Illustrations by Emily S. Damstra.

MAMMALS OF THE GREAT LAKES REGION

By Allen Kurta and William Henry Burt. Ann Arbor: University of Michigan Press, 1995.

Heavily illustrated and easy-to-use, this quick reference guide contains information on 83 species relating to their appearance, behavior and ecology.

If you wish to see more books on this topic (and about Great Lakes flora, too), visit our recommended reading list at go.wisc.edu/5aptg8.

Anyone in Wisconsin can borrow these books. Just email askwater@aqu.wisc.edu.

Terri Liebmann Our New Assistant Director

We'd like to take this opportunity to introduce you to the Aquatic Sciences Center's new assistant director for operations.

She's been working here for the last 15 years.



Terri Liebmann, who was recently named to this newly created position, had served as the center's program assistant supervisor since 2003. In her new role, she'll be responsible for oversight of all of the center's financial activities, grant management and reporting, as well as day-to-day office and information technology operations.

Her appointment is the first step in an ongoing reorganization of administrative structure

implemented by ASC Director Jim Hurley, a shift that will see the hiring of new assistant directors of research and extension before year's end.

"Terri's been involved in just about all things administrative at the Aquatic Sciences Center over the last decade, and I've been especially appreciative of the excellent work she's done during my first two years as director," said Hurley. "I'm really pleased she'll be taking on this critical leadership role, and I'm confident she'll do a great job with the many diverse challenges that lie ahead."

Liebmann joined UW Sea Grant in 1999 as a financial specialist, fresh off a frantic stint with UW-Madison's transportation department, where she helped to schedule and oversee special events parking surrounding the construction and opening of the Kohl Center, an athletics venue also used for large lectures and other functions.

An aquatic sciences environment proved a perfect match for a woman whose family spent more than its share of time recreating on and near the Great Lakes.

"It's the water," Liebmann said of what first drew her to Sea Grant and the Water Resources Institute. "I grew up with a

dad who was a diver—he spent lots of time diving near Point Beach on Lake Michigan. My siblings and I were the rug rats playing around on the barge."

When she began, Liebmann worked under Dan Marklein, who recently retired as a finance and grants administrator. Marklein served as a mentor to Liebmann and inspired her to return to school to earn a degree. Liebmann adopted that advice and earned a B.S. in management in 2011.

When she's not working, Liebmann and her husband, Tim, tend and enjoy a 53-acre property in Blue Mounds, a tract of land that features a sizable stream and pond. One of the Liebmanns' oak trees was actually part of an ongoing Water Resources Institute study that is using tree rings to measure the effects of changing climate on the environment. Liebmann said she was happy to be able to aid the center's research mission in a direct way and is looking forward to the challenges and promise of her new position.

"I appreciate my talented co-workers and Jim's leadership," Liebmann said. "I am pleased to be able to contribute through this new role to our longstanding mission—fostering understanding and stewardship of all of Wisconsin's water assets."

Lessons Learned by Departing AIS Outreach Specialist Tim Campbell

Sea Grant's Aquatic Invasive Species Outreach Specialist Tim Campbell has moved on to other AIS-infested waters, so to speak. Campbell left in July to start a new job as a communications specialist in AIS prevention for University of Wisconsin-Extension. At least he didn't have to move his private residence—a change from his Sea Grant job, which took him to three different locations during his three-year tenure: Manitowoc, Waukesha and Madison.

Campbell is philosophical and excited about the change. "The thing I'm going to remember most is working with the stakeholders in the pet industry, wakeboard boat industry and fishing tournaments," Campbell said. Growing up with a father who was a conservation officer opened Campbell's eyes to behavior change through regulations and enforcement. But "with Sea Grant, I was able to talk to people before they were having problems, or while they were currently having problems, and help them fix them before law enforcement and regulators needed to be involved. I helped them become part of the solution," he said.

Some of Campbell's favorite projects involved developing methods for AIS control in the wakeboard boat industry and organizing the Great Lakes BIOTIC (Briefs on Invasive Organisms



Whether he's reminding people not to release non-native pets into the environment or warning against the dangers of aquatic hitchhikers, Tim Campbell is all about building relationships and finding success.

Traded in Commerce) symposium (see page 7 for a conference recap). For the symposium, "We had all the right people attending from national to local levels," Campbell said. "Everyone had positive feedback afterwards about how great opening up a dialog was so we can move management of organisms-in-trade pathways forward."

What's the most effective method for invasive species control? Campbell discovered that it's listening. "No one just sat down with the folks in the pet industry, wakeboard boat industry or fishing tournaments to have a conversation and figure out what their issues are regarding invasive species," Campbell said. "It takes time to build those relationships. They have some pretty good ideas about what will work."

Campbell will miss his Sea Grant colleagues and working within the Sea Grant model of research, outreach and education. "All of us AIS folks across the network worked with stakeholders and really tried to understand the people that we're helping. It doesn't always happen that way," he said.

Known for his prolific blogging and tweeting during his tenure, Campbell will put those same communications skills to good use in his new job. We wish you well, Tim!

WRI TURNS 50

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resources. And we can't forget about the 1.2 quadrillion gallons of water that are underground. The WRI provides competitive grants for research, offers training and aids entry of new research scientists into water resources fields, and transfers project results to water managers and the public.

"Water Resources Institutes across the country are small but very powerful programs," said Jim Hurley, current director of the WRI—a title he holds along with director of the Wisconsin Sea Grant Institute. "It's amazing the number of ways the programs use the small federal investment to manage other programs. Here, it helps us manage the state groundwater program.

"Besides that, it's one of the only federally funded programs designed to support the next generation of water resource managers," Hurley said. "It's got a lot of Congressional support, but I'd love to see it grow."

Currently, the WRI supports the work of faculty, staff and students at UW-Madison, Milwaukee and Platteville. Recent research highlights include:

- WRI research led to the design of a water-purifying system that destroys a variety of contaminants in drinking water by a photocatalytic process that uses ultraviolet light. The devices received a U.S. patent and the resulting Wisconsin-based company has attracted more than \$7 million in investment capital.
- A WRI researcher determined that wetlands play a vital role in removing nitrogen from the environment. That removal is important because excess nitrogen in waters can lead to growth of harmful algae or fish kills.
- The Nuclear Regulatory Commission and the Department of Energy are changing the design of covers and barrier systems for low-level radioactive waste disposal and uranium mine tailings sites across the country based on WRI research findings. The researcher found that the closer a cover mimics environmental conditions surrounding it, the longer it will last.
- Elevated levels of strontium have been found in deep wells in Brown, Calumet, Oconto and Outagamie counties. This natural element can cause rickets and damage tooth enamel in young people. Thanks to WRI research, this important public health matter was investigated and publicized.—MEZ

Day at the Beach

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has all the beachgoers, the competition bar gets a little higher."

Unlike beaches in urban centers like Milwaukee and Chicago, the source of contamination for most Wisconsin beaches, including those in Door County, is usually local. The three biggest sources are typically stormwater discharge, runoff from nearby parks/parking lots and avian fecal matter.

Both Fish Creek and Ephraim face political and practical obstacles to implementing beach redesign, said Coulthurst, like sacrificing needed parking space for tourists. A planned state highway improvement project scheduled in Fish Creek may delay that community's redesign efforts.

Door County beaches don't typically suffer the same levels of closures and advisories that beaches in urban centers like Milwaukee do—Kleinheinz said it typically hovers around 4 percent annually—but the impact is in some respects greater.

"Because of how these communities are structured, keeping beaches clean and open becomes more important economically," he said. "In many of these places, one closure is too many."

For his part, Coulthurst and his staff are gearing up to implement redesigns on five Door County beaches. This spring installation started at both Hotz and Sand Bay Park in Liberty Grove, and this fall, installation is expected at Lakeside Beach in Jacksonport, Haines Park in Nasewaupee, and Murphy Park in Egg Harbor. Those redesigns will include things like adding a couple feet of coarse sand nourishment, as well as installing curved cordwalks and vegetative berms of beach grass to distract geese populations.

Kleinheinz and his team continued collecting beach-bacteria data through August, with an eye toward presenting their findings sometime in 2015. —ARC



Matthew and Karen Huber/Creative Commons



New Coastal Storms Projects Designed to Save Lives

Sea Grant Coastal Engineer Gene Clark will participate in two projects funded through the newly created NOAA Great Lakes Coastal Storms Program, a regional effort to make Great Lakes coastal communities safer and more resilient to storm and weather hazards and climate change.

Implementing Dangerous Currents Best Practices, \$199,700

Partners: Michigan and Illinois-Indiana Sea Grant; Coastal Management Programs in Wisconsin, Illinois, Indiana and Michigan

This two-year project will address a pressing need to raise awareness among Great Lakes audiences about dangerous currents. Local partners will provide input and resources to connect with a variety of populations. Project managers will create new, consistent rip current messages for Lake Michigan beaches based on past experience and research. Beach safety kits that feature life jackets, throw rings, rescue boards and signs will be distributed along with publications. The project will also develop long-term strategies that incorporate regional collaboration and the latest technology and will continue after the grant work is complete.

Development of an Observation, Forecasting and Warning System for Rip Currents at Three Beaches in Lake Michigan and Lake Superior, \$199,900

Partners: University of Wisconsin-Madison, Minnesota Sea Grant, NOAA/National Ocean Service, Wisconsin Coastal Management Program

This two-year project will use beach hazard forecasting technology to improve rip current identification, forecasting and public notification. Three rip-current-prone beaches are targeted: Bradford Beach in Milwaukee, North Beach in Port Washington, Wis., and Park Point Beach in Duluth, Minn. Video imaging will allow for identification and detection of hazardous wave conditions, and computer models will be used to better predict hazardous wave conditions.

Communications with local communities will improve management and public safety at local beaches and increase public awareness about dangerous waves and currents in the Great Lakes.

Wisconsin Lake Sturgeon at Home in the Land of Lincoln

Fourteen lake sturgeon born and bred in Wisconsin have now become fully acclimated residents of the Land of Lincoln.

Back in December, Sea Grant Aquaculture Specialist Fred Binkowski took the fish to the Shedd Aquarium to become residents of the "At Home on the Great Lakes" exhibit. For the health and safety of this Wisconsin piscine crew and the current Shedd family, the sturgeon were quarantined. Now, they are all out of quarantine. Four of them greet Shedd guests each day as part of the touch exhibit. Five are in the habitat next to Asian carp. The remainder of the sturgeon are behind the scenes growing up for future exhibition.

"The reception for the sturgeon by our guests has been great. These animals are very popular and great ambassadors for the Great Lakes," said Kurt Hettiger, senior aquarist for the exhibit.



St. Louis River Speaker Series Concludes

More than 115 people attended an informal monthly series of eight talks to learn more about the St. Louis River Estuary. The "River Talks" were hosted by Wisconsin Sea Grant and the Lake Superior National Estuarine Research Reserve to engage residents in discussions and learning opportunities about the river. Speakers included agency representatives, scientists, tribal representatives and outreach specialists. To revisit the series, check out blog posts at bit.ly/VpgkMf

The series will return again later this year. Stay tuned for more information.

Take That, Invasives

More than 60 representatives from nine different states gathered in Milwaukee in early June at the Great Lakes Briefs on Invasive Biological Organisms Traded in Commerce (BIOTIC) symposium. The event, organized by recently departed Invasive Species Outreach Specialist Tim Campbell and Minnesota Sea Grant's Doug Jensen, collected several groups that don't typically talk to each other: pet shop owners, industry representatives, outreach specialists and regulators. The primary aim was to identify and discuss both the major aquatic and plant invasive pathways and the research gaps that prevent developing best practices to manage them. In this respect, Campbell said the BIOTIC symposium was an unqualified success.

"We make the most progress when we're talking to each other, sharing information and collaborating," said Campbell. "The symposium showed us there's a lot of great work going on, and how we can leverage it to do even better."

A New Wave for the Fish Classic

It will be a fresh "Taste of Lake Superior" this year as Lake Superior Magazine takes the lead role for the fourth annual Lake Superior Fish Classic, to be held Sept. 24 at Glensheen, the Historic Congdon Estate in Duluth, Minn., on the shores of Lake Superior.

Sea Grant partnered in last year's classic, bringing chefs from Wisconsin into the fish-cooking competition, which was started by Minnesota Sea Grant in 2010 as a way to promote Lake Superior's commercial fisheries. Both Sea Grant programs will be sponsoring this year's event, and Michigan Sea Grant will be added to the mix.

The 2014 Lake Superior Fish Classic will again feature a competition by regional chefs, with winners chosen by judges as well as popular vote by event attendees. Tastings of regional craft brews and fine wines will be available along with entertainment by area musicians. Tables on the estate grounds will feature items from local vendors and Sea Grant sharing Lake Superior facts.

To purchase tickets (\$25) or for more information, access TasteofLakeSuperior.com.

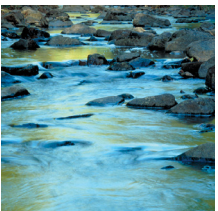




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a joint newsletter from UW Sea Grant and UW Water Resources

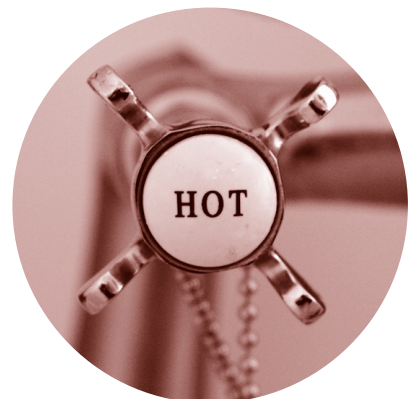


CALENDAR OF EVENTS

OCT. 20 – 22, 2014
Upper Midwest Invasive Species Conference
Duluth, Minn.
umisc2014.org/

NOV. 1 – 6, 2014
7th National Summit on Coastal and Estuarine Restoration and the 24th Biennial Meeting of The Coastal Society
Washington, D.C.
estuaries.org/summit

NOV. 3 – 6, 2014
AWRA Annual Water Resources Conference
Tysons Corner, Va.
awra.org/meetings/Annual2014/



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