

Investigating private well water contamination in southwest Wisconsin PAGE 7 2024 ISSUE 2

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





Aquatic Sciences Chronicle

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

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Milwaukee's Bradford Beach. Image by Wisconsin Sea Grant

Checking beach health virtually

By MARIE ZHUIKOV

Swimsuit season is upon us. With recreational beach season comes the scientific testing to ensure beaches are safe for the public. An estimated 8 million people visit Great Lakes beaches every year. Unfortunately, because traditional testing methods take 18-24 hours to process, information used to evaluate water quality and communicate health risks is generally a day old, meaning swimmers might be recreating when conditions aren't safe. On the other hand, swimmers could be kept out of the water at times when no problems exist.

An analysis published in 2014* determined that nearly one in five decisions to post or remove swim advisories were made in error in the Great Lakes (between 2008 and 2010), including nearly 3,000 unnecessary advisories/closures and at least 4,500 missed advisories or closures.

Free Windows software developed by the U.S. Environmental Protection Agency named Virtual Beach (**epa.gov/hydrowq/virtual-beach-vb**) addresses these shortcomings by providing beach managers with timely and cost-effective alternatives to traditional monitoring. It can help them to decide whether to issue (or lift) swim advisories/closures on a given day.

By using the software to build a model, users can predict water quality conditions at any time, on both sampled and non-sampled beaches that are monitored on the Great Lakes coasts.

With a grant from the Wisconsin Coastal Management Program, Wisconsin Sea Grant recently updated video tutorials that accompany six training modules (**go. wisc.edu/ih3s8e**) for the Virtual Beach software and created a training course that can be completed at any time via the Canvas platform. Beach managers can use it to familiarize themselves with the software.

"While our Virtual Beach training modules have been available for several years, the decommissioning of the data service EnDDaT limited their usability. Our new course explains how to collect the data needed to build a Virtual Beach model without EnDDaT and allows beach managers to go through Virtual Beach training on their own time," said Natalie Chin, Wisconsin Sea Grant's climate and tourism outreach specialist.

Chin worked with Madeline Magee with the Wisconsin Department of Natural Resources and Casey Garhart with the UW–Madison Division of Extension Natural Resources Institute's Instructional Design Unit to develop training materials. If you are interested in completing Virtual Beach training, please contact Natalie at **nchin5@wisc.edu**.

The Virtual Beach software was developed by the U.S. EPA's Ecosystem Research Division, in partnership with the USGS Wisconsin Water Science Center, the DNR and Wisconsin Sea Grant.

* *Expanded Beach "Nowcast" Modeling Across Wisconsin*, Adam Mednick and Dreux Watermolen, Bureau of Science Services, Wisconsin Department of Natural Resources, August 2014.

ON THE COVER: Fractured bedrock visible from U.S. Highway 18 west of Mt. Horeb, Wisconsin. Image by Wisconsin Sea Grant

Every five years, the University of Wisconsin Water Resources Institute (WRI) is evaluated to determine eligibility for continued support under the federal Water Resources Research Act of 1984, which is administered by the U.S. Geological Survey (USGS).

Water Resources Institute recognized for strong science, science communication and student support

By MOIRA HARRINGTON



Jennifer Hauxwell, WRI research director

WRI recently received the results of that review of 2016-20 research, student support and information transfer. The headline is the USGS found that WRI is "**performing at an outstanding level**."

The USGS review panel assessed WRI's effectiveness in using its federal grant, as well as required matching funds, which come from the state of Wisconsin. The panel also called out notable features in how WRI operates:

- The support for high-quality research, with a special call-out to collaborative work on mercury cycling with UW–Madison and the USGS's Mercury Research Lab. Another factor that was praised was the support for early faculty in the request for proposal process. In fact, the panel complimented the entire proposal review process that effectively draws on subject matter experts to evaluate what prospective investigators would study.
- An active and innovative information transfer effort that results in quality products. Reviewers particularly appreciated podcasting as a way to convey science stories.
- The focus on training post-graduates through fellowships with state agencies.
- The large-scale engagement with USGS, including at least five collaborations and 14 co-authored publications and joint work with students.

"We work every day to leverage our federal and state funding effectively to help communities across Wisconsin, and it is truly a collective team effort," said Jennifer Hauxwell, WRI's research director. "From the dozens of researchers at Wisconsin universities across the state who step up to address our shared water challenges to institute staff who coordinate our research program, create student training opportunities, manage the distribution of funding and communicate stories and archive findings, we are so very grateful. We still have a lot to learn about Wisconsin's water resources and community needs, and we look forward to tackling future challenges and opportunities together."

WRI is one of 54 national water research institutes. For 60 years, it has been a locally focused state and federal partnership supporting unbiased research and

"We work every day to leverage our federal and state funding effectively to help communities across Wisconsin, and it is truly a collective team effort."

- Jennifer Hauxwell, WRI research director

information transfer, which leads to safeguarding Wisconsin's water quantity, quality and management. Some of the research projects supported during this evaluation period looked at naturally occurring contaminants like strontium, radium and manganese. Other projects explored land use practices and the resulting levels of nitrate in groundwater.

Negative emotions drive preference for herbicide treatments for aquatic invasive species in Wisconsin lakes

By WISCONSIN SEA GRANT



Volunteer Barb Schmidt looks through a plant rake for invasive species. Monitoring like this is one of the most underrated management actions when invasive species are found in lakes. Image by Paul Skawinski

A new study published by University of Wisconsin–Madison researchers is the first to explore what drives lakeshore property owners' preferences for herbicide treatments of aquatic invasive plants over other management options, even if those treatments may harm native plants and animals. The study found that negative emotions and believing that aquatic invasive species are present in the lake where a property owner lives were the strongest predictors for preferring herbicide treatments. Surprisingly, perceived impacts of aquatic invasive species did not affect preferences for herbicidal treatment of aquatic invasive species.

These results provide an opportunity for natural resource managers to educate lakeshore property owners about alternative methods for managing aquatic invasive plants while still leaving options open for herbicide treatment, if needed. Other management options include manual and mechanical removal as well as simply monitoring, since non-native plants can often co-exist with native plants in a lake without taking over and becoming a nuisance.

"People can develop negative emotions about a subject either through lived experiences or through communications about the subject," said Bret Shaw, lead author and a Division of Extension environmental communications specialist and Department of Life Science Communication professor. "Given that the perceived impact of invasive species is not driving preference for using herbicides, it is possible that fear-based aquatic invasive species prevention messages may influence higher risk perceptions that cause property owners to seek herbicidal treatment first. Considering other approaches and messaging strategies, too, may help lake organizations achieve better outcomes with their management efforts."

Aquatic invasive plants in Wisconsin lakes can negatively impact recreation and property values. Many organizations offer education and outreach programs for boaters and anglers to prevent invasive species' spread. However, some lakes already have non-native species that can become invasive, and new introductions can occur despite widespread prevention efforts. While there are many ways to manage aquatic invasive plants, lakeshore property owners and lake associations often seek permits to use chemical herbicides even though herbicides themselves can carry a potential risk of ecological harm to the treated lake, which is why herbicides may not necessarily be appropriate as a first course of action in some waterbodies.

Aquatic invasive species are a concern both globally and in Wisconsin, with the Great Lakes on Wisconsin's borders and another 15,000 inland lakes within them. While the most problematic invasive species aren't present in most lakes, where they are located, they can reach high densities that can impede boating, negatively affect fishing and alter the ecological functions of a lake. More than \$5 million is spent each year in Wisconsin on aquatic invasive species management. However, even with this annual investment and the negative impacts of aquatic invasive species, very little effort has been spent



There are many options for managing populations of aquatic invasive plants, including mechanical harvesting, shown here on a Wisconsin lake. Image by Paul Skawinski

understanding how waterfront property owners feel and think about invasive species management.

"This research is among the first to understand the opinions and beliefs of waterfront property owners about aquatic invasive species management," said Tim Campbell, the aquatic invasive species program manager for Wisconsin Sea Grant and co-author of the study. "The results of this research will help us create invasive species management education tools and programs that balance efforts to reduce the unwanted impacts of invasive species while protecting the ecological integrity of our lakes."

Other co-authors include Dominique Brossard, professor in the Department of Life Sciences Communication (LSC) as well as recent LSC graduate students, Richard Heinrich and Theresa Vander Woude. The full study can be found in the journal "Biological Invasions" (rdcu.be/dvWb9). Alternatively, email tim.campbell@wisc.edu for a copy.



A diver and kayaker remove Eurasian watermilfoil from Spring Lake in Wisconsin. Image by Paul Skawinski

PFAS in municipal drinking water: New grant designed to improve risk communication in Wisconsin

By MARIE ZHUIKOV



The PFAS research team: Lyn van Swol, Bret Shaw, Cristina Carvajal, Gavin Dehnert. Image by Hannah Hein of University of Wisconsin–Madison

A team from the University of Wisconsin–Madison received a grant from Illinois-Indiana Sea Grant to study PFAS (per- and polyfluoroalkyl substances) messaging to water users in Wisconsin with a special focus on Latinos because they are the largest and fastest-growing minority group in the state.

PFAS, sometimes called "forever" chemicals, are found in various products and can contaminate drinking water. High levels of PFAS have been linked to health risks, such as increased cholesterol levels, decreased vaccine response, risk of thyroid disease, lower birth weights and reduced fertility in women. However, health risks at lower levels are uncertain. Communicating these risks effectively to increase understanding, avoid undue fear and provide recommendations for reducing exposure is crucial to the 70% of Wisconsinites who depend on municipal water supplies.

"The Wisconsin Department of Natural Resources now requires monitoring for PFAS in municipal water supplies and reporting when any are detected at over 70 parts per trillion," said Lyn van Swol, principal investigator and a professor with UW–Madison's Department of Communication Arts. "Given these new requirements and uncertainty about the health effects of PFAS, particularly at lower levels, public health educators are struggling with how to communicate with the public about the presence of PFAS in their municipal water supplies."

Van Swol and the grant team will work to develop effective communication strategies about PFAS risks, focusing on engaging messages that encourage actions such as using water filtration systems. They will do this in three parts. First, they will gather data on people's internet searches related to PFAS information. Second, they will test specific messages with municipal water users, and finally, test which messages engage social media audiences.

continued on page 6

WISCONSIN SEA GRANT



Top left: Members of the Lake Superior Climate Champions Program take a field trip to an eroded area in northern Wisconsin. Pictured left to right are Dave Sletten, Matt Hudson and Tony Janisch.

Top right: Wisconsin Sea Grant's Natalie Chin discusses climate change impacts with Climate Champions teams in 2023.

Right: Members of the Washburn/Ashland Climate Champions team.

LISTEN TO THIS STORY



Wisconsin Water News Episode 57 Northern Wisconsin Communities Benefit from Climate Change Program go.wisc.edu/56y798

Northern Wisconsin communities benefit from climate change program

By MARIE ZHUIKOV | Images by Lake Superior National Estuarine Research Reserve

It's official: 2023 was the hottest since we've been keeping records, according to the National Oceanic and Atmospheric Administration. This can trigger extreme weather events such as storms and flooding. Northern Wisconsin is not immune to the impacts of climate change, and communities are taking action.

Leaders in several northern Wisconsin counties and cities were chosen to participate in a Lake Superior Climate Champions Program (**go.wisc.edu/zow5v4**) organized by Wisconsin Sea Grant and the Lake Superior National Estuarine Research Reserve in 2023. The program provided funding and guidance to two teams to work on goals of their choosing that addressed climate change, and two more teams have been chosen in 2024 to work on projects.

The first 2023 team from the cities of Washburn and Ashland included Tony Janisch, Washburn assistant city administrator, and Sara Hudson, Ashland park and recreation director and city forester. Their project involved creating the outline of a coastal adaptation plan for their cities that focused on flood resilience and climate adaptation. They also developed a project priorities list, connected with other communities at a climate-focused annual conference by the Great Lakes and St. Lawrence Cities Initiative in Chicago, and brought a coastal resilience adaptation workshop to the region in collaboration with the Northern



Institute of Applied Climate Science and the Lake Superior Collaborative.

During a webinar, Janisch described how the contacts he made during the Great Lakes and St. Lawrence Cities Initiative Conference helped him find funding for a long-standing problem in Washburn.

"We have some significant coastal erosion at one of our parks in the city. I had spent three years trying to find funding to start the work. I was connected with someone and then was able to get some FEMA funding. So, we have an engineer now doing design work for how to solve the problem," Janisch said.

Another erosion project Janisch found possible funding sources for involves Thompson's Creek, which runs underneath a local highway and along another road. "There was some erosion going on with one of the creek bends that's eating away at one of our side roads. It's very possible that it could start eroding the right-of-way on the highway itself," Janisch said.

Hudson said the champions program "opened up a couple projects that have been on the back burner in my mind. And then also just creating more of a living shoreline along our Baker City Creek Estuary and along the ore dock shoreline that is there. It's been a really good process."

The second team included emergency managers from Ashland, Bayfield, Douglas and Iron counties. These are Dorothy Tank (retired from Ashland County), Dave Sletten (Douglas County), Stacy Ofstad (Iron County) and Meagan Quaderer (Bayfield County). Their project focused on developing a digital form to record road maintenance activities for Great Lakes coastal counties in Wisconsin and beyond.

Quaderer said that development of the road maintenance form was timely. "This spring, the region had a lot of flooding and a lot of [road] damage. So, we actually had a real-world application of the document, especially in Bayfield County."

The team presented the form at a Wisconsin Northwest Region Emergency Managers Meeting, and it garnered emergency managers' interest as well as that of representatives from Minnesota. The team was asked to present the form again to the Statewide Hazard Mitigation Committee. Those members saw the significant value of the tool.

"I think it's something that will be used here within our four counties but also hopefully, within both states," Sletten said.

Tank said the form has already been used in Ashland County for a number of federally declared disasters. "It was not only approved at the state level, but by FEMA. It contained all the information they wanted," she said.

The Climate Champions Program is facilitated by Karina Heim with the reserve and Natalie Chin with Sea Grant. The two teams they chose for 2024 are from the town of Marengo, Wisconsin, and the Bayfield County Health Department.

Marengo in Ashland County has a long history of flooding. Residents have successfully banded together during each crisis, but the town would like to take a more proactive approach. Marengo team members plan to engage community members in development of a hazard mitigation plan to help prevent and better respond to climate-related crises.

The Bayfield County Health Department team plans to develop a report that outlines risks posed by extreme weather events to municipal sanitary sewerage districts in the county. This will involve discussions with sanitary sewerage district operators and development of a hazard vulnerability assessment for each sanitary system. continued from page 4

PFAS in municipal drinking water: New grant designed to improve risk communication in Wisconsin

The grant team is composed of van Swol and Bret Shaw, professor with the Department of Life Sciences Communication and an environmental communication specialist with UW–Madison Division of Extension; Gavin Dehnert, emerging contaminant scientist with Wisconsin Sea Grant; and Cristina Carvajal of Wisconsin Eco-Latinos.

Other partners include UW–Madison Division of Extension, the Wisconsin Dept. of Health Services, the Wisconsin Dept. of Natural Resources, Public Health Madison & Dane County and the UniverCity Alliance.

The study is part of a larger project coordinated by Illinois-Indiana Sea Grant that addresses PFAS knowledge gaps in the Great Lakes region. ■

Invasive Species Language Workshop inspires, gets people talking

By MARIE ZHUIKOV

Communicating effectively about invasive species, whether the plants and animals are on land or in water, can be challenging. Is it better to "wage a war" on invasives, or should communicators take an alternative approach?



In conjunction with National Invasive Species Awareness Week, the Sea Grant programs in Michigan, Orgon and Wisconsin bosted a

Sea Grant programs in Michigan, Oregon and Wisconsin hosted a workshop with the North American Invasive Species Management Association on the topic of using messaging and metaphors in communicating about invasion biology. The "Invasive Species Language Workshop" was held in February. A half-day of webinar presentations was followed by a workshop in Washington, D.C., where attendees drafted guidelines and research priorities for

inclusive communication and naming conventions.

More than 400 researchers, science communicators and invasive species managers attended. If you missed it, the webinar is available on YouTube. **go.wisc.edu/899694**

Workshop co-organizer and Wisconsin Sea Grant Aquatic Invasive Species Outreach Specialist Tim Campbell summed up the experience. "This is the first time all of us have been surrounded by people with similar (but different) expertise and a willingness to dive into these issues. It's also the first time any of us had the occasion to immerse ourselves in the topic. It was both inspiring and productive."

Funding for the workshop was provided by the National Sea Grant College Program.

WATER RESOURCES INSTITUTE COVER STORY

Investigating private well water contamination in southwest Wisconsin

By JENNA MERTZ



Maureen Muldoon, Wisconsin Geological and Natural History Survey.

Above: Farmland and treecovered rolling hills of the Driftless Area in southwest Wisconsin. Image by Eric Carson, WGNHS

Right: Fractured bedrock. Image by Wisconsin Sea Grant A WRI-funded study is determining the health risk of pathogens found in private wells in southwestern Wisconsin. The research builds upon the findings of the Southwest Wisconsin Groundwater and Geology (SWIGG) project (**go.wisc.edu/476dh4**), which found livestock manure and human wastewater in private well water from Grant, Iowa and Lafayette counties in 2018 and 2019.

The new research will also shed light on the relationship among groundwater, human and livestock waste, and antibiotic resistance.

Maureen Muldoon, a hydrogeologist with the Wisconsin Geological and Natural History Survey, is leading the study. Having previously worked on the SWIGG study, she's now investigating how local geology and well construction influence the contamination of private wells.

She says wells in the southwestern part of Wisconsin are particularly vulnerable to contamination due to fractured bedrock, which has a lot of holes and cracks.

"When you drive down Highway 151 towards lowa and you look on the sides of the road and it just looks like Swiss cheese, kind of yellowy-brown Swiss cheese, that is [fractured bedrock]," said Muldoon. "You can imagine how quickly stuff moves through that." This porous, Swiss cheese-like bedrock means wastewater from septic systems and agriculture can quickly enter the aquifer, carrying

pathogens that can end up in private wells. The SWIGG study found viral, bacterial and protozoan pathogens in 66 of 138 private wells sampled, including norovirus, salmonella and multiple species of Cryptosporidium.

Just how many people could get sick from these pathogens is what Tucker Burch, a research engineer with the U.S. Department of Agriculture, is trying to figure out. Using archived water samples collected during SWIGG, Burch can estimate the risk of gastrointestinal illness using a tool called quantitative microbial risk assessment, or QMRA. He likened it to a weather report.

"It's a forecasting method; it's a modeling approach," said Burch. "We're using the data we have to make an estimate about what's going to happen."

In addition to determining the public's risk of gastrointestinal illness, Burch and the research team will identify whether pathogens came from



Bottom center: LIDE UF sampling unit. Image by Joel Stokdyk

human or livestock waste in the upper or lower parts of the aquifer.

Muldoon said well location matters when it comes to water quality. The lower aquifer is generally more protected from contaminants than the upper aquifer due to a layer of rock that restricts the downward flow of water. Certain types of well construction, however, allow water to pass through to the lower aquifer.

"It is not good to connect the upper and lower aquifer in this environment because we are exporting water quality problems to the deep, relatively protected aquifer," said Muldoon. She is currently gathering and analyzing construction reports for the 138 wells used in the study.

In addition to microbes that cause gastrointestinal illness, the research team is also testing the water for antibiotic resistance genes (ARGs) to learn more about where they come from. ARGs are the building blocks of antibiotic resistance.

"Antibiotic resistance, like any other biological trait, is mitigated by genes," said Burch. "So bacteria have specific genes that give them different mechanisms to fight the antibiotics."

Joel Stokdyk, a biologist with the U.S. Geological Survey leading the research team's inquiry into

ARGs, emphasizes that the study isn't delving into the impacts of ARGs on human health or antibiotic resistant infections.

"A point worth making is that the detection of the antibiotic resistance gene in someone's drinking water does not mean it's in a pathogen, does not mean it could make them sick, but it does help us address these other questions."

One of those questions concerns how many ARGs come from humans versus livestock. Stokdyk said that's what makes this research novel.

"The research field knows antibiotic resistance genes come from these sources, but we don't know how much from each. So that's one of the gaps we're trying to address," said Stokdyk.

Although the research team is currently in the data collection and lab phase of the study, they're already excited about the results. Knowing the amount and source of ARGs could help tailor current manure management strategies and shape future research in livestock production or human medicine.

Said Burch, "There [are] people out there in the real world that take these results and turn around and use them. And that's always very satisfying. We're not just running numbers across a computer screen."

Great Lakes Community Read Starting This Summer

By MOIRA HARRINGTON



The Wisconsin Water Library (WWL) at the University of Wisconsin-Madison and the Wisconsin Library Association (WLA)

are facilitating Great Lakes, Great Read, (greatlakesgreatread.org) a basin-wide community read program with scheduled activities beginning in late summer.

The books chosen for this communal reading initiative were announced on Earth Day in April. The adult selection is "The Best Part of Us" by Sally Cole-Misch. This novel explores family ties — to each other, a common heritage and culture, and the natural world.

The children's selection is "The Water Walker" by Anishinaabe author, illustrator and waterprotection activist Joanne Robertson. Her book is based on the true story of Josephine Manadamin who, along with others, walked around all of the Great Lakes in honor of water and the planet.

The WWL is supported by the Water Resources Institute and Sea Grant. Water

Library Director Anne Moser said the reading program is based on the need for greater education about the Great Lakes. While approximately 34 million people in the U.S. and Canada live in the Great Lakes basin, recent surveys, such as the International Joint Commission Great Lakes Regional Poll in 2021, show a lack of understanding of the threats facing the greatest freshwater resource in the world.

"It's difficult to care about something you know nothing about," said Moser. "Education, in this case, environmental literacy, is central to cultivating stewardship of the Great Lakes and of water resources more broadly."

WLA Executive Director Laura Sauser said the "one book, one community" model, already adopted by many libraries, is a natural fit for the idea of a basin-wide community read. She noted that Wisconsin is the perfect state to pilot this idea, catalyzing other Upper Midwestern states and Canadian provinces to engage and inspire passion and connection to the freshwater seas through reading.

"Wisconsinites have a deep connection to water through culture, economy, tourism and way of life. This connection, coupled with the WLA's network of academic, public and special libraries, gives us a strong foundation for success," she said.

All Wisconsinites will be encouraged to read these titles, and libraries around the state will be encouraged to engage their residents through book discussions and related activities such as public presentations.

Join the Great Lakes, Great Read 2024 email list (**go.wisc.edu/3n8mny**) for updates. ■



WISCONSINWATERLIBRARY More Great Reads

The Wisconsin Water Library is proud to be collaborating with the Wisconsin Library Association on the Great Lakes, Great Read program. One of the challenges of the project is choosing just two books.

Here are some of our favorites for the young and the young at heart. To see more, be sure to visit the Great Lakes, Great Read website.

greatlakesgreatread.org

The Accidental Reef and Other Ecological Odysseys in the Great Lakes by Lynne Heasley. East Lansing, Mich.: Michigan State University Press, 2022.

The Fishermen, the Horse, and the Sea by Barbara M. Joosse. Madison, Wis.: Wisconsin Historical Society Press, 2021.

The Great Lakes: Our Freshwater Treasure by Barbara Rosenstock. New York: Knopf Books for Young Readers, 2024.

HOMES by Moheb Soliman. Minneapolis, Minn.: Coffee House Press, 2021.

The Life of the Lakes: A Guide to the Great Lakes Fishery, 4th edition by Brandon C Schroeder and Shari Dann. Ann Arbor, Mich.: University of Michigan Press, 2019. Pandora's Locks: The Opening of the Great Lakes-St. Lawrence Seaway by Jeff Alexander. East Lansing, Mich.: Michigan State University Press, 2011.

People of the Sturgeon by Kathleen Kline, Fred Binkowski, Ron Bruch. Madison, Wis.: Wisconsin Historical Society Press, 2009.

Stories from the Wreckage: A Great Lakes Maritime History Inspired by Shipwrecks by John Odin Jensen. Madison, Wis.: Wisconsin Historical Society Press, 2019.



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

Hart Wins Prestigious Outreach Award in Honor of Service to Wisconsin

By MOIRA HARRINGTON

Maps are tools displaying the fixed boundaries of a city, the curve of a river, a distance between two points. Maps represent conditions and scenarios: what was, is and could be. Maps are the means to connect people.

Just as maps connect people, so too, does David Hart. Maps — in fact, a broad range of geographic information science, urban planning and coastal managements skills — make up his career and the way he has fulfilled public service and outreach to communities across Wisconsin through his role as Sea Grant's geographic information specialist and assistant director for extension.

"I've had a lifelong fascination with maps and nature. I remember when I realized that fascination could lead to a career. I love applying geographic information science to better understand the Great Lakes and finding those moments when it becomes clear that something you've done has had an impact to make things better," Hart said.

Hart's embodiment of the Wisconsin Idea, the tenet that the boundaries of the university are the boundaries of the state and the expertise of the campus is used for the benefit of the state's residents, led him to being named the 2024 winner of the Robert and Carroll Heideman Award for Excellence in Public Service and Outreach for the University of Wisconsin-Madison.

"I work at an organization with great people advancing an important mission to enhance the conservation and health of Great Lakes resources and the well-being of Great Lakes communities," he said. "I feel the award is a reflection of those people and that mission and I'm humbled and honored by the recognition that comes with it."

Hart accepted the award at a spring ceremony where UW–Madison's Chancellor Jennifer Mnookin noted that the honor is given to an individual who reflects the public service mission of the university.

That public service was highlighted by those who wrote to support his nomination. One



David Hart (center) talks with Sea Grant Fisheries Specialist Titus Seilheimer (left) and Congresswoman Gwen Moore (right). Image by Eron Laber

state-level official said, "He led development of the Wisconsin Coastal Atlas and the Wisconsin Coastal Guide, both of which remain important online tools for viewing and exploring information about the Great Lakes. Professional planners and resource managers regularly use the Coastal Atlas to explore and analyze coastal issues, share coastal data and inform decision-making about sustainable use of the Great Lakes. Consistent with the Wisconsin Idea, this tool makes the knowledge and expertise of the university available to a wide range of users."

The writer continued, "David's efforts to network Wisconsin's Coastal Atlas with similar tools via the internet has allowed stakeholders to investigate the effects of complex issues — like climate change and invasive species — more rigorously and on more appropriate scales."

In addition to Hart's own geospatial technology work, he oversees the efforts of 13 outreach specialists. The specialists both solicit thoughts about local needs, seeking to find solutions and offer resources, as well as share their knowledge and the findings born of Sea Grant research. The team of specialists includes leaders in fisheries, coastal engineering, tourism, climate

change, coastal community challenges, food fish outreach, aquaculture, social science, emerging contaminants, aquatic invasive species, education and workforce development.

One of Hart's colleagues who fills a similar role with Michigan Sea Grant said, "David consistently demonstrates his competency and willingness to work effectively with others for the common good. And, when misunderstandings inevitably happen, David humbly invites others into conversations that need to repair any misunderstandings and identify how to move forward together, including when it involves modifying procedures, creating best practices, or reprioritizing current tasks to create an optimal, collaborative working environment that values and includes all perspectives."

With award-winning work behind him, Hart stressed he will continue efforts to advance the Wisconsin Idea. "I'm currently collaborating with planners, cartographers and environmental educators to address coastal natural hazards, enhance public access to the coast, use story maps to share Great Lakes natural and cultural heritage and apply a process called geodesign that links scenario planning and impact simulation to promote green stormwater infrastructure."

Wisconsin & Minnesota Aquaculture Conference showcased the latest in fish farming education and research

By JENNA MERTZ | Images by Wisconsin Sea Grant

The largest aquaculture event in the upper Midwest, the Wisconsin & Minnesota Aquaculture Conference, was held March 22–23 at the Legendary Waters Resort and Casino in Red Cliff, Wisconsin.

This year's conference was hosted and organized by the University of Wisconsin-Stevens Point Northern Aquaculture Demonstration Facility (UWSP NADF) and Wisconsin Sea Grant. The conference featured more than 40 presenters from industry, state, federal and tribal facilities discussing current research and best management practices. Attendees also had the opportunity to tour one of four local facilities: the Red Cliff Tribal Hatchery, Red Cliff Fish Co., Bodin Fisheries' processing facility and the UWSP NADF.

Presentation topics were wide ranging and included discussions of water quality management, the economics of aquaculture, workforce development, fish health and how to bring aquaculture into the classroom. The event also featured a trade show, cooking demonstrations and student poster competition.

Above: UWSP NADF Director Chris Hartleb leads the fish necropsy demonstration for a recirculating aquaculture workshop, offered in addition to the conference.

Right: Wisconsin Sea Grant's Food-Fish Outreach Coordinator Sharon Moen led an aquaculture marketing panel and then donned her chef's hat alongside Titus Seilheimer, fisheries outreach specialist, to demonstrate how to cook dishes featuring locally raised fish with help from students at the conference. "This conference brings together such an amazing group of experts across our region, including representatives from state, federal, tribal and private industries and organizations," said Emma Hauser, aquaculture outreach specialist with UWSP NADF and Wisconsin Sea Grant. "The most exciting aspect of this event is that it supports important networking opportunities, critical for building relationships within the aquaculture industry."

Hauser participated in a panel discussion with Dong-Fang Deng, aquaculture outreach and extension specialist with Wisconsin Sea Grant and the University of Wisconsin-Milwaukee School of Freshwater Sciences, on the workforce development issues and needs in the industry. Said Hauser, "Workforce development continues to be one of the major bottlenecks to the aquaculture industry's growth. I [was] thrilled to have aquaculture education experts, including Sea Grant, from across the country featured on this panel, to share their experiences, current educational pathways as well as help us strategically plan for workforce development into the future."

The Great Lakes Aquaculture Collaborative, a major sponsor of the conference, supported underrepresented students from around the region to attend and present on aquaculture topics. These student groups include Emerging Ladies Academy and Fiber Arts Omaha.

Tiffany Gamble, founder of Emerging Ladies Academy stated, "Engagement in the conference for the academy ensures our curriculum stays current, fostering connections with industry professionals for potential collaborations and resources. This aligns with our commitment to empowering women in diverse fields, including aquaculture, and enhances our overall educational experience."

The conference was supported by the Wisconsin and Minnesota aquaculture associations, the Great Lakes Aquaculture Collaborative, Wisconsin Sea Grant, Minnesota Sea Grant and UWSP NADF, as well as various business sponsors.



OUTREACH

Training the next generation of Great Lakes commercial fishers

By JENNA MERTZ



A Great Lakes commercial fisher cleans a fishing net. Image by Wisconsin Sea Grant

A recent publication from a team of Sea Grant researchers lays out a framework for training the future fleet of small-scale commercial fishers and processers in the Great Lakes.

The study, published in the March issue of "Fisheries" magazine (**go.wisc.edu/q6fzjq**), proposes place-based, adaptable training content for the Great Lakes Future Fishers Initiative, an apprenticeship program aimed at recruiting and preparing young people for commercial fishing.

The initiative responds to the industry's concerns about the lack of a future workforce.

"It's an aging fleet. It's definitely a hard business," said Titus Seilheimer, fisheries outreach specialist with Wisconsin Sea

Grant and coauthor of the study. "We talked to the industry folks and found out what they needed. And you know, what they need is people."

Seilheimer, alongside Wisconsin Sea Grant's food–fish outreach coordinator, Sharon Moen, and Michigan Sea Grant's Lauren Jescovitch, surveyed and conducted focus groups with those involved in the Great Lakes commercial fishing industry, including Anishinaabe fishers, multigenerational fishing families and staff from regulatory agencies, to learn more about workforce challenges and what's needed to be successful in the job.

"A message we heard was that everyone's needs were different," said Seilheimer. "Different businesses wanted different things."

As a result, the Great Lakes Future Fishers Initiative framework is designed to be used more as a menu rather than a curriculum, meaning businesses can select training content that is relevant to their workforce. Content is categorized into three topic areas: fundamental skills (e.g., business planning and marketing), processing skills (e.g., food safety training and knife handling) and deckhand skills (e.g., gear repair and boat navigation).

For the complete story, visit our website at go.wisc.edu/jsr589.





Sharon Moen honored by Wisconsin's commercial fishers

By MOIRA HARRINGTON

In January, Sea Grant's Sharon Moen was the recipient of an Appreciation Award from the Wisconsin Commercial Fishing Association to honor her work to secure the overseas market for whitefish and cisco roe in Sweden.

In 2021, Moen responded to Wisconsin commercial fisher and fish processor requests for help in addressing challenges to the export of Great Lakes lake whitefish and Lake Superior cisco roe to Sweden. Negative sustainability ratings developed by the World Wildlife Fund-European Union prompted ICA Sweden-the largest grocery market chain in the country-and other markets, to remove the roe from shelves.

Moen, food-fish outreach coordinator, intervened and due to that educational outreach spanning roughly two years, the rating was changed last fall so sales valued at \$15 million annually can resume.

"I'm so pleased Wisconsin Sea Grant could facilitate the flow of evidencebased information in a way that helped the commercial fishing industry," Moen said. "Sustainable fisheries management is an important topic and one our commercial fishers, fisheries managers and Sea Grant takes seriously."

For the complete story, visit our website at **go.wisc.edu/95mjmm**.



Sea Grant communications director plunges into retirement

By MARIE ZHUIKOV

Moira Harrington, Wisconsin Sea Grant assistant director for communications, recently announced plans to retire, effective June 14. Rather than tiptoe into the waters of retirement gradually, Harrington plans to dive right in, making the decision only three months beforehand.

"I've never taken an exercise class scheduled in the middle of a workday, but I feel like I need to plunge right in and try it. I retire on a Friday and the next Tuesday, I'm doing a strength-training class," Harrington said.

As the head of communications, Harrington supervised a staff of five, including writers, podcasters, editors, a videographer and graphic designer. She directed the creation of materials that promote science literacy and coordinated media relations. Harrington also assisted with external relations. She was a former reporter for newspapers, magazines and a statehouse news service. She also worked for Wisconsin's statewide public television broadcasting system, public health tobacco education campaigns, and as the state director and press secretary for former U.S. Sen. Russ Feingold of Wisconsin.

Her departure after almost 15 years will leave ripples felt throughout the program, both locally and nationally.

"We've been so fortunate to have a comprehensive science communications team," said David Hart, Wisconsin Sea Grant assistant director for extension. "Moira crafted and guided that team. She contributed to the success of our Sea Grant and Water Resources missions in so many ways that it is hard to keep track. Besides writing and reviewing hundreds of stories, she did all our reporting, organized legislative visits and prepared us for rigorous program reviews. Then there are the smaller, but priceless ways she helped us stay connected like preparing a monthly newsletter sharing the personal side of our staff and co-organizing a bi-weekly travelogue series. I think we are going to reflect on all those little things she did long into the future."

13 SEAGRANT.WISC.EDU 1 WRI.WISC.EDU

A common theme in Harrington's career was working for organizations that contribute to society in a positive way. In terms of Sea Grant, she said, "It touches so many sectors of a community, it touches our culture and sparks research that has applications in people's lives. It's our role as communicators to share that information and it's so rewarding."

Not long after she began her job with Sea Grant, Harrington took on a leadership role, chairing the Great Lakes Sea Grant Communications Network (2011-2012). Later, she chaired the Network's Advisory Council, which is a committee within the



Sea Grant Association, and the National Sea Grant Communications Network (2016-2018). One of her legacies is reinstating a national communications award program. "I think it's important to recognize our work through a formal process and I hope it continues after I retire," she said.

"Moira has done so much for Sea Grant," said Jill Jentes Banicki, current National Sea Grant Communications Network chair. "With every initiative she oversaw and every communicator, educator and director she worked with, she showed how important telling the Sea Grant story is to a successful and impactful Sea Grant network. We are so grateful to Moira for everything she has done for Sea Grant Communications over the last fourteen years and will miss her beyond words."

Another legacy attributable to Harrington's behindthe-scenes work is the creation of the university's recent Center of Excellence in PFAS Environmental Science (**go.wisc.edu/M8bzgw**). In 2023, she wrote a story (**go.wisc.edu/4855de**) based on research by UW–Madison's Christy Remucal on per- and polyfluoroalkyl substances and how they were moving via groundwater into Lake Michigan.

Right: Moira Harrington studies a young fish temporarily collected from Green Bay on Lake Michigan. Image by Marie Zhuikov, Wisconsin Sea Grant

Below: The Madison Metropolitan Sewerage District facilities sparkle on a sunny day. Image by Wisconsin Sea Grant



"I pushed the story a bit more than I sometimes do, and it got picked up in the media in various places," Harrington said. "The findings have implications for PFAS contamination everywhere because it can be applied to other situations where people are trying to understand a contamination site."

A few weeks later, Harrington was contacted by the Federal Relations Office on the Madison campus. "They said they'd like to work with a member of the house of representatives or maybe one of the U.S. senators from Wisconsin. They wanted to figure out some way to put additional money specifically into PFAS research. So, I just connected people. I was like, okay, here's Christy and you guys work together," Harrington said.

Remucal, who is now the interim director of Wisconsin Sea Grant, wrote a proposal for the center. "Then we both kind of forgot about it," Harrington said. But about a year later, after a grueling federal budgeting process, the funding came through for the center.

"I didn't do the research and I didn't get the funds from the federal government, but my ability to tell the story of that sparked a bigger thing that's now resulting in almost a million dollars coming to support even more PFAS research. That feels good," Harrington said.

"It's been a true honor working with the communications staff here. Everybody brings such a talent set. I love how we come together as a team to create meaningful and useful products. It's been incredibly stimulating to have an idea and know that I can turn to a colleague in communications and they'll make it happen. That's just really fun."

- Moira Harrington, assistant director for communications

Some of her favorite projects involved creating biennial reports for the public and other communications products. Harrington credited her staff, one of the largest Sea Grant communications teams in the country, for their contributions.

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Above: Harrington at Representative Mark Pocan's announcement of the Center of Excellence in PFAS Environmental Science. Image by Wisconsin Sea Grant

Left: In retirement Harrington plans to spend more time on her new beekeeping hobby and expand her number of hives. Image by Brian Koenig

Below: Harrington and husband Brian Koenig.

Harrington expects her retirement will involve four Bs: Brian, baby, bees and books. Brian Koenig is her husband, who has plans for his own retirement and will no doubt enjoy having Harrington around more. One of their daughters had a child in April, so the baby part is regarding their

first grandbaby. Bees is about beekeeping. Harrington learned how to keep honeybees a few years ago. She's maintained one hive and is getting a second (or more) in retirement. The fourth B is for books. Harrington has been in the same book club for 24 years and plans to spend more time reading.

Beyond that, she will immerse herself more fully into her current volunteer work, which includes chairing the city of Madison's Board of Park Commissioners and serving on the board for Olbrich Botanical Gardens in Madison.

Harrington leaves behind a solid team and significant list of accomplishments. At least one team member was heard musing, "We'll do our best to stay afloat without her."



University of Wisconsin Aquatic Sciences Center 1975 Willow Drive Madison, WI 53706-1177



Aquatic Sciences Chronicle

a joint newsletter from UW Sea Grant and Water Resources Institutes

Provide feedback to Sea Grant review team

Wisconsin Sea Grant will be reviewed Dec. 3-5 by a team convened by the National Sea Grant College Program.

The review will be conducted at the University of Wisconsin–Madison and will consider all aspects of the program, including management and organization, performance, engagement and collaborative activities, such as activities involving various offices of the National Oceanic and Atmospheric Administration.

This notice invites your participation in the review. **The comment period ends on Nov. 26.** Please indicate "Wisconsin Sea Grant site review" in the email subject line.

EMAIL COMMENTS TO oar.sg-feedback@noaa.gov.

