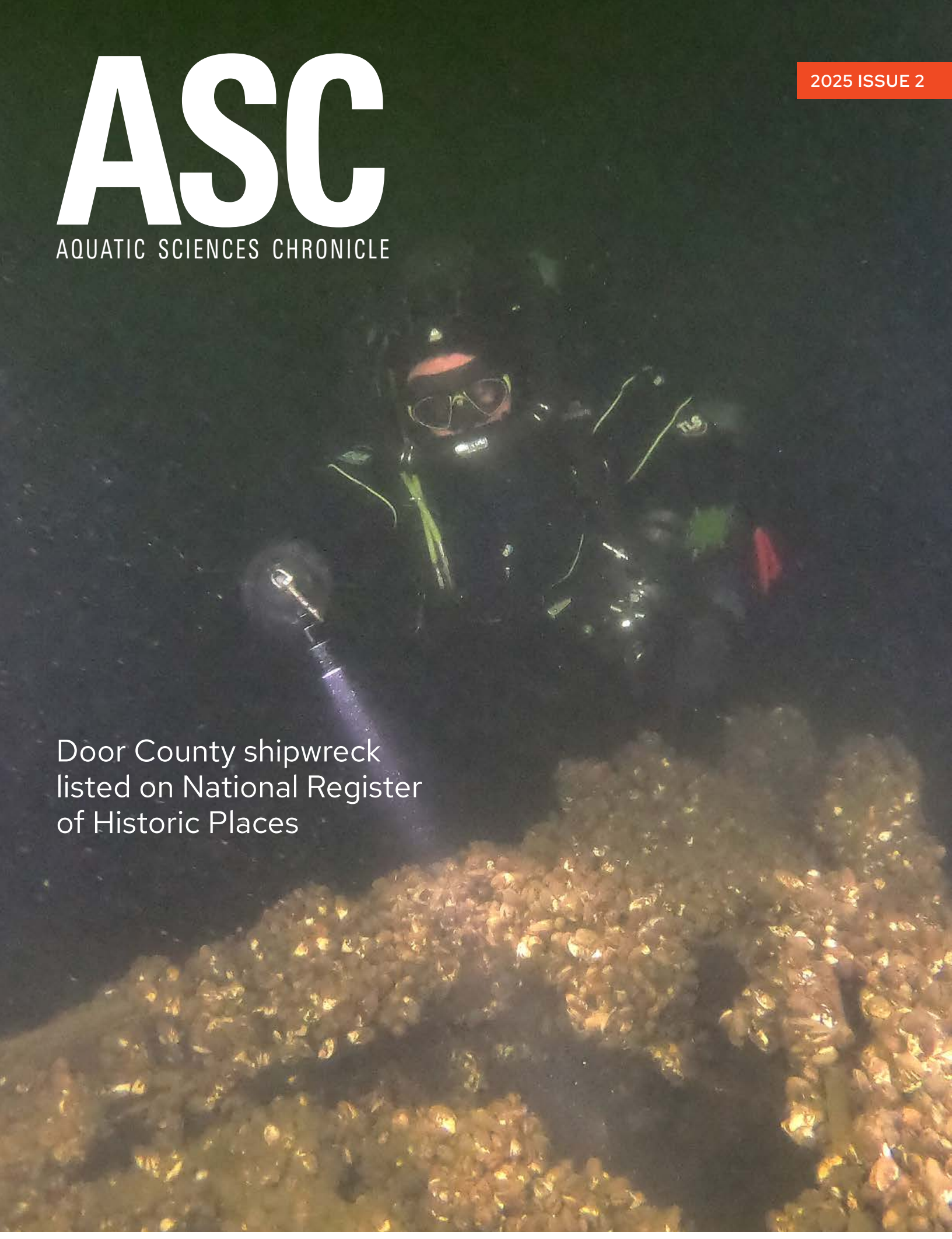
ASC

AQUATIC SCIENCES CHRONICLE

2025 ISSUE 2



Door County shipwreck listed on National Register of Historic Places

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Aquatic Sciences Chronicle

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The University of Wisconsin Sea Grant Institute is part of a national network of 34 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.

The 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.

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STAY CONNECTED

On the cover: Maritime archaeologist Caitlin Zant surveys the Little Harbor launch wreck site.

FEATURED VIDEO

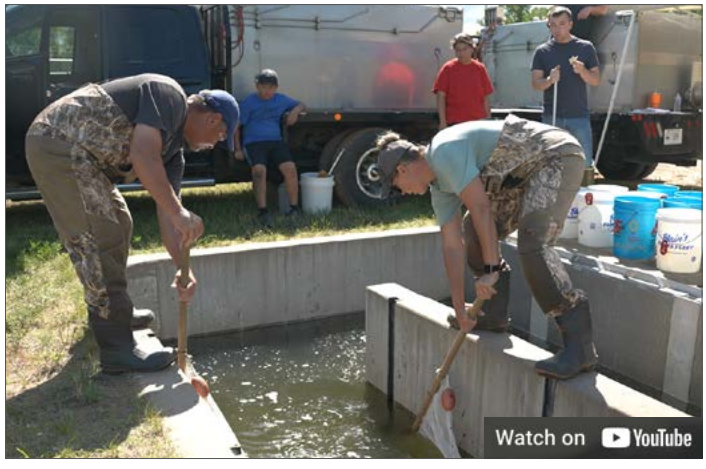
Tribal hatchery provides fish for future generations

By WISCONSIN SEA GRANT

The St. Croix Chippewa Indians of Wisconsin have been running an aquaculture operation in Gaslyn, Wisconsin, since the mid-1980s – the fish they raise are stocked in local lakes. This allows them to continue traditional practices like spearfishing and also maintains a walleye population for the entire community to harvest.

Bonnie Willison, Wisconsin Sea Grant videographer, highlighted the aquaculture facility in a recent video showing tribal members harvesting small fingerlings and transferring them into a local lake.

WATCH THE VIDEO



Walleye stocking with the St. Croix Chippewa Indians of Wisconsin.

go.wisc.edu/x6288n

Jamie Thompson, air quality outreach coordinator for the St. Croix Chippewa Indians, said, "I don't think that communities know that the tribes are also restocking these lakes along with the DNR. They're always planning for seven generations after the generation here."

Thompson explained that area lakes no longer favor walleye reproduction due to changing environmental conditions, so stocking is needed. "It's very rewarding for me to be able to stock these fish into a lake and then five or eight years later, see my family and my kids harvesting those fish – whether it's ice fishing, whether it's on a line, whether it's spearing. It's not just benefiting my kids, it's benefiting other tribal families as well as anyone who uses these area lakes." ■

Remucal named Aquatic Sciences Center Director

By **NATASHA KASSULKE,** Director of Strategic Communications, Office of the Vice Chancellor for Research, UW–Madison

Slightly edited for length

Having been raised in New Mexico, Christy Remucal has developed a real thirst for water.

"Growing up in the desert gave me a deep appreciation for water," says Remucal, professor of civil and environmental engineering.

That appreciation for water resources and passion for uncovering the mysteries of water contamination followed her through her academic studies and has led her to not only become a world-class water treatment sleuth but also a campus leader in water research and education.

On April 6, Remucal was named director of the Aquatic Sciences Center, headquartered in the Office of the Vice Chancellor for Research. Most recently, Remucal had been the interim director of the ASC. She also leads the Aquatic Chemistry group at the UW–Madison and is the director of the Water Science and Engineering Laboratory.

"Christy is a consummate collaborator and researcher who is guided by a goal to help solve one of society's most complex and important environmental and health problems – water contamination," says Dorota Brzezinska, vice chancellor for research. "This goal resonates especially in a state like Wisconsin that is rich in water, both groundwater and surface water. Efforts in the ASC impact the water Wisconsinites drink every day and have broader implications for drinking water everywhere."

ASC administers two major multidisciplinary research programs – the Sea Grant Institute and Water Resources Institute. Both support research, education, and outreach to ensure sustainable use of Wisconsin's water resources and are supported by the National Oceanic and Atmospheric Administration and U.S. Geological Survey. ASC is also the administrative home of Water@UW, an umbrella organization of over 170 water researchers and scholars at UW–Madison.

The mission of ASC is directly related to the newly announced UW–Madison's RISE-EARTH initiative, specifically reimagining economic and environmental systems centering around water sustainability.

"One of the things that got me really excited about coming to UW–Madison is that interdisciplinary research and collaboration are highly valued on this campus. For the kind of work that I do, working on environmental systems that are complex and messy, you have to be able to work across disciplines," Remucal says.

Remucal came to UW–Madison as an assistant professor in 2012. She holds a master's degree and a doctoral degree in civil and environmental engineering from the University of California–Berkeley, and a bachelor of science degree in environmental engineering science from Massachusetts Institute of Technology.

Before joining the UW–Madison faculty, Remucal completed a postdoc in the Institute for Biogeochemistry and Pollutant Dynamics at the Swiss Federal Institute of Technology.

Her current work includes research on per- and poly-fluoroalkyl substances, known as PFAS, which are manufactured chemicals that have been used in everything from fire-suppressing foam to non-stick pans to food packaging. Unlike contaminants like PCBs, which tend to be found more in sediment, PFAS dissolve easily in water and move about more freely. There are more than 9,000 different PFAS compounds.

continued on page 12

When art and science join forces

By JENNA MERTZ

When it comes to art, perhaps you feel like Wisconsin Sea Grant's aquatic invasive species outreach specialist, Tim Campbell.

"My background is in science. I feel like I've always been a science-logic person," he said. "I don't make any art. I don't feel like I have any artistic bones in my body."

But are science and art really that different, or can they be used to achieve common goals? This is one of the core questions driving the latest season of "Introduced," Wisconsin Sea Grant's aquatic invasive species podcast (**seagrant.wisc.edu/audio/introduced/**). Co-hosts Bonnie Willison and Jenna Mertz explore the relationship between science and art by talking with artists weaving aquatic invasive species (AIS) – both figuratively and literally – into their work.

"This season, we wanted to bring listeners stories about community and communication, and art bridges both those themes," said Willison. "It's really good at grabbing people's interest who may otherwise never have thought about AIS before. It's also a lot of fun, and the artists we interviewed are incredibly talented."

This season features three artists creating AIS-inspired work:

Astrid Hooper Lofton, a student who sews a giant, stuffed, "huggable" biocontrol beetle;
go.wisc.edu/225heg

Daniel Murray, the mastermind behind Deep Lake Future, a one-of-a-kind immersive art exhibit in Milwaukee; and
go.wisc.edu/435a73

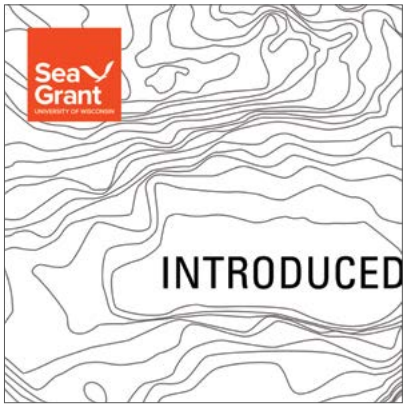
Kim Boustead, an artist whose stalwart pursuit of the perfect fish leather nearly ended with a jug of urine and some very (very!) bad smells.
go.wisc.edu/299k80

Campbell also appears on the podcast as a guest host and resident left-brainer. In addition to showcasing his own artistic endeavors, he reflects on how scientists can lean on art to better connect with audiences.

"We all think people are rational beings that collect data and facts – they weigh the pros and cons and make the decision that's best for them. But there's these things called emotions and feelings that get in the way and influence decision making. And I probably can't make anyone feel anything with just data alone, except maybe bored," laughed Campbell.

Art alongside science, however, can cast a wider net. Those not captivated by spreadsheets might gravitate towards a colorful mural or sculpture and learn something new about the issues impacting their community.

"And when everyone is engaged, good things can happen for invasive species management and the Great Lakes," said Campbell. ■



LISTEN TO THE CURRENT SEASON

Listen to "Introduced" wherever you get your podcasts.
pod.link/1514628828

Top Left: Lofton's biocontrol beetle enjoys some sun. Center left: Visitors interact with a part of the Deep Lake Future exhibit. Bottom left: Boustead working with a carp to produce fish leather.

Sea Grant welcomes new coastal resilience specialist

By JENNA MERTZ

Carrie Malone likes working on projects with people. It's a fitting skillset for her new role as Wisconsin Sea Grant's coastal resilience and adaptation outreach specialist.

"I want to come up with ideas and problem solve," Malone said. "I want projects that I get to see through and that make a difference to people."

Located in Sea Grant's field office at the University of Wisconsin-Milwaukee School of Freshwater Sciences, Malone will partner with local communities to build resilience to changing lake levels, flooding and other coastal issues that come with living along a Great Lake. The position is new, so her first order of business is getting her bearings and identifying projects to work on. "I'm really excited to have the freedom to navigate my own route," she said.

Located in Sea Grant's field office at the University of Wisconsin-Milwaukee School of Freshwater Sciences, Malone will partner with local communities to build resilience to changing lake levels, flooding and other coastal issues that come with living along a Great Lake.

The needs and interests of the community will help Malone chart that course. With a master's degree in sustainable urban planning and design, she often thinks about the ways governments can work with residents to achieve common goals.

"There's only so much that the average person can do," she said. "So, we have a job as municipalities or institutions or state or federal governments to say, okay, we have the capacity that you don't, so we're going to make your lives easier."

Malone saw firsthand how community engagement can improve lives while working with the Office of Sustainability and Innovation at the city of Ann Arbor in Michigan. She was part of a team tasked with implementing the city's carbon neutrality plan, which included projects like community solar panels and home weatherization. These were priorities identified by residents, but the city used its resources to bring them to life. The team also strived to make it easier for residents to give feedback on projects by providing meals at public meetings and activities for children.

"[The office] just really gets things done and in a very community-engaged way," said Malone.

Building relationships with community partners also has another perk: helping Malone get to know Milwaukee. Originally from Washington and accustomed to the mountains and ocean views of the Pacific Northwest, she's excited to gaze over the open water of Lake Michigan and try new things.

"I'm ready to be surprised. I'm ready to throw a bunch of spaghetti at the wall, and some things will stick, and some things won't, and that's alright," she smiled. "I'll keep throwing things." ■

Sea Grant colleagues Carrie Malone (left) and Deidre Peroff (right) enjoy a walk along Lake Michigan. Photo: Carrie Malone

How tree rings and community conversations are bringing fire back

By BONNIE WILLISON

Research into centuries-old fire-scarred trees in northern Wisconsin is helping shape current fire management practices for tribal and state partners. The project, "We are all gathering around the fire," or "Nimaawanji'idimin giiwitaashkodeng" in Anishinaabemowin, combines dendrochronology, Native Experiential Knowledge (NEK), and community engagement to uncover the intertwined ecological and cultural history of this Lake Superior coastal landscape.

Evan Larson, dendrochronologist and professor, University of Wisconsin-Platteville.

Nisogaabokwe Melonee Montano, Red Cliff Band of Lake Superior Chippewa project leader and University of Minnesota-Twin Cities Forestry Department graduate student.

The two-year Wisconsin Sea Grant-funded project, featured in a new video (go.wisc.edu/5c358x), confirmed something long known in Indigenous communities but rarely acknowledged in scientific literature: the beloved red pine forests on Wisconsin and Minnesota Points were not shaped by nature alone, but by people who used fire to care for the landscape. Red pine struggles to produce new generations without fire.

The exclusion of Indigenous perspectives and burning practices in the forest management has led to reduced ecosystem resiliency, biodiversity, and a drop in the pine tree population. In order to prove that people, and not natural phenomena like lightning, set fires to the landscape, the team looked for centuries-old fire scars from tree samples collected on the points. The data confirm what the team expected.

"The fires on both points ceased abruptly after the signing of the 1842 and 1854 treaties," said Evan Larson, professor at the University of Wisconsin-Platteville. "It is undeniable that the reason that we love the points and protected the pine forest is because of the fires that people were setting," Larson said. "That act of 'protecting' – moving people out of that space – is literally dooming the things that we're hoping to protect."

After two years of research, engagement, and outreach, the team has shown the importance of fire and NEK to Wisconsin and Minnesota Points. This has allowed them to take important steps to return cultural fire to the landscape.

Fire helps red pines, like the ones pictured here on Wisconsin Point, regenerate.

"One thing that has made this research extremely successful is the funding from Wisconsin Sea Grant, because that's been our starting point for all of this," says project and tribal leader Melonee Montano. Throughout the project, Larson, Montano, and their students talked to local residents about the history of fire and the possibility of returning it. "The funding made it possible for us to go out and actually build these relationships on the ground, in people's homes, at their kitchen tables, and at the city meetings."

Larson sands a wood sample to get it ready for the microscope.

A magnified tree ring sample showing a burn scar dated to 1804.

Larson and Montano have been surprised by the amount of support they've gotten from the community. "Through this work, we're seeing, in ways that I can't put into words, that it's time for fire to come back," says Montano. The city of Superior is now in advanced discussions with fire experts from the Fond du Lac Band of Lake Superior Chippewa about burning practices on Wisconsin Point.

"A lot of this really has only been possible because of this grant, which is really weird for my mind to process," reflects Montano. "It's strange to think that it took a grant – a piece of paper, some money – to bring these folks together to actually start tearing down through the layers of trauma to figure out what is at the base and what really happened."

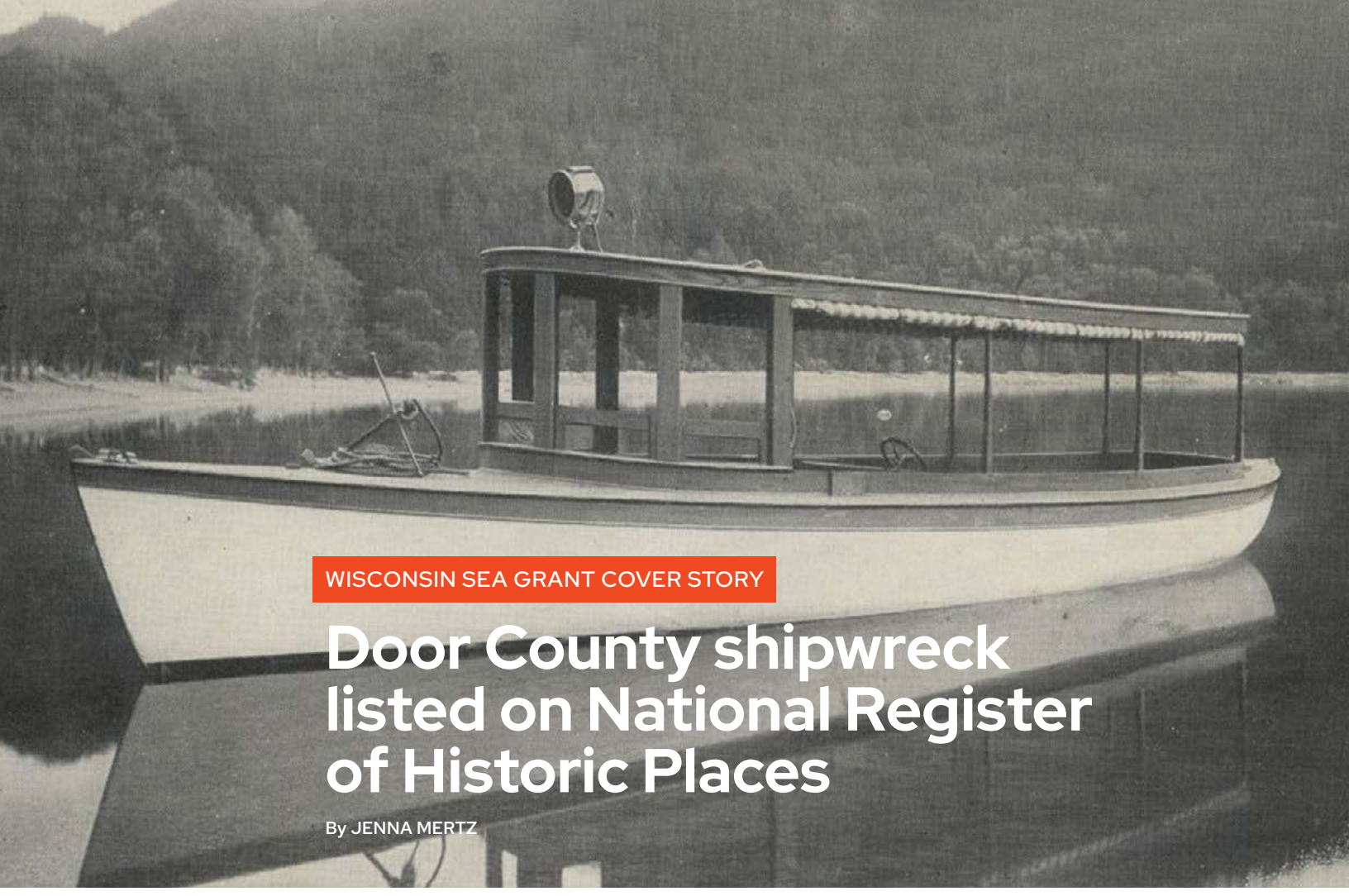
While the Sea Grant funding has come to a close, the team continues their work supported by a grant from the National Science Foundation. They will be broadening their research to encompass the whole Great Lakes region. ■

WATCH THE VIDEO ▶

How tree rings and community conversations are bringing fire back to Lake Superior's coast.

go.wisc.edu/5c358x

Above: Wisconsin and Minnesota Points are Lake Superior coastal peninsulas off the shores of Duluth, Minnesota, and Superior, Wisconsin.



WISCONSIN SEA GRANT COVER STORY

Door County shipwreck listed on National Register of Historic Places

By JENNA MERTZ

Tamara Thomsen, maritime archaeologist, Wisconsin Historical Society.

Above: The Little Harbor boat launch would have looked like this 30-foot, gasoline-powered launch built by the Racine Boat Company. Credit: Manuscript Collection, Wisconsin Maritime Museum.

The Little Harbor launch wasn't a muscular ship. Measuring nearly 30 feet in length, the boat paled in comparison to the hundred-foot steam-powered vessels ferrying lumber and coal across Lake Michigan in the late 19th and early 20th centuries. But this little boat, wrecked off the coast of Door County and newly listed on the National Register of Historic Places, can tell us a lot about the history of one of Wisconsin's favorite vacation spots.

Marine archaeologist Tamara Thomsen led the effort to survey and register the vessel as part of her Sea Grant-funded research on shipwrecks in the bay of Green Bay. Her team was the first to visit and document the launch, which was uncovered during a NOAA coastal survey in 2021.

"Being able to be the first there helps give the full story, or as much of the story, as we can gather from the shipwreck," Thomsen said. "It's our first chance to look at it and do the archeological examination before others come and may end up inadvertently damaging the site."

It's also the first time this type of story is being told. Not much is written about small, powered watercraft in Great Lakes maritime history.

"We've spent a lot of time in this office looking at large commercial vessels – you know, schooners and steamers. They were this major part of the transportation network on the Great Lakes," said Thomsen. "But we haven't had the opportunity to study these small, what are called 'vernacular' craft."

Unlike schooners and steamers, launches were everyday boats for everyday people. They were used for pleasure boating and fishing, and they also transported both vacationers and fruit pickers around the oft-visited Door County peninsula.

> "Every one of the little resorts along Door County had a launch," Thomsen said. "When folks would come into Sturgeon Bay, the small resort would go and pick them up with the launch. Cherry pickers were moved around the peninsula by launch. You have to remember that the trains really didn't get to the northern part of Door County until the 1920s."

Often these launches were built locally. Tim Pranke, a seasoned diver and engine enthusiast who volunteers on Thomsen's dives, helped identify the Little Harbor's gasoline engine as one built by Straubel Machine Company in Green Bay. That's not a surprise given the vibrant boat-building industry in the state. In the early

1900s, Wisconsin was the third largest manufacturer of non-steam-powered launches in the country.

Some things still remain a mystery, though, like the identity of the launch and why it sank. Thomsen and team pored through local papers looking for news of a boat matching the description of the launch, but to no avail. It's unusual for a place like turn-of-the-century Door County where, Thomsen said, if someone in the boat business so much as "sneezed, it showed up in the newspaper."

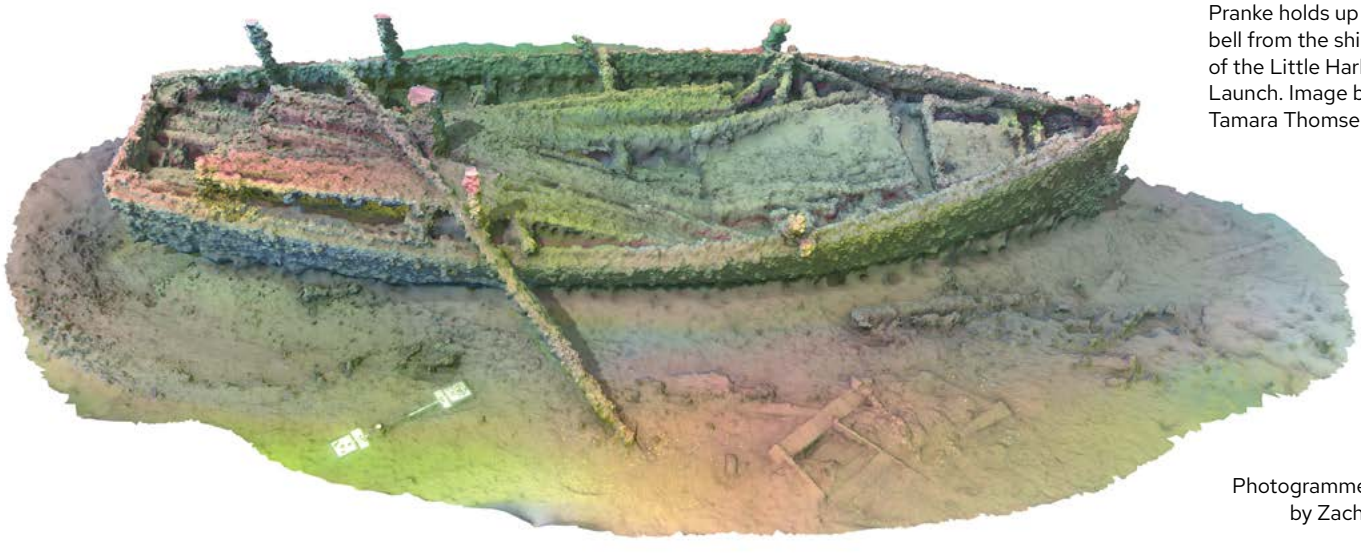
The boat may remain anonymous, but that doesn't mean it's unimportant. Big ships can tell us about trade and tycoons, but boats like the Little Harbor launch can tell us about everyday folks – the ones picking cherries or casting a line.

Said Thomsen, "It fills out the story of people's use of the waterway." ■

Top left: Plan view of the Little Harbor launch inside the hull at the bow. The chain locker, ship's bell, and fuel tank with filler neck are visible. Image by Zach Whitrock

Bottom left: The Little Harbor launch's stern deck, steerage hatch, and transom. View from the exhaust stack looking aft. Image by Zach Whitrock

Top right: Diver Tim Pranke holds up the bell from the shipwreck of the Little Harbor Launch. Image by Tamara Thomsen



Photogrammetry model by Zach Whitrock.

Reviving wild rice in Lake Winnebago: Collaborative effort wraps up year two

By BONNIE WILLISON

Jessica Skeesuck, vice chair, Brothertown Indian Nation.

Jessie Conaway, Indigenous arts and sciences research coordinator, UW–Madison.

The waters of Lake Winnebago, Wisconsin's largest inland lake, were once teeming with wild rice – so abundant that historical accounts describe boats struggling to pass through the beds.

This native aquatic plant, known as "mayom" in the Mohegan language and "manoomin" in the Ojibwe language, has deep cultural and ecological significance, supporting fish, waterfowl, and overall ecosystem health.

Over the last 200-plus years, increased populations, shoreline development, and dams have stripped much of Lake Winnebago of this treasured resource. But through research initially funded by Wisconsin Sea Grant, the InterTribal Lake Winnebago Wild Rice Revitalization Project aims to restore this vital resource, bringing together tribal nations, researchers, and conservationists in a project that bridges history, science, and community collaboration.

The InterTribal Lake Winnebago Wild Rice Revitalization Project (**wildricerevitalization.wordpress.com**) is a multi-year effort focused on reestablishing wild rice beds to harvestable levels. Co-led by the Brothertown Indian Nation and Jessie Conaway, Indigenous arts and sciences research coordinator at UW–Madison, the team seeks to answer critical questions: Where did the rice go? What conditions are needed to bring it back? And how can restoration efforts honor both traditional ecological knowledge and modern science?

For members of the Brothertown Indian Nation, whose ancestors were relocated to the eastern shores of Lake Winnebago in the 1800s, this work is deeply personal. "These waters are our responsibility," says Vice Chair of the Brothertown Indian Nation Jessica Skeesuck, one of the project leaders. The restoration effort is not just about bringing back a plant – it's about strengthening tribal nations, supporting wildlife, and fostering a healthier watershed for all fishers, hunters, harvesters, and Lake Winnebago communities.

The project team has assembled a wide-ranging partnership with groups such as the Wisconsin Department of Natural Resources, U.S. Fish and Wildlife Service, the Wisconsin Tribal Conservation Advisory Council and more. They gather for an annual on-water meeting every summer, where they share updates and often reseed rice by hand.

Alex Mixtli, environmental specialist with the project, surveys wild rice from a boat on Pawāhan-Sīpiah (Pine River), which means "wild rice gathering river" in the Menominee language. By studying water depth, sediment, and competition from other plants, researchers are learning where and why wild rice thrives.

Since receiving funding from Wisconsin Sea Grant in 2022, the team has had a number of successes. University students and agency partners have helped gather water quality data and monitor plant growth, creating a new baseline of wild rice data in the Lake Winnebago watershed. This information, as well as Indigenous knowledge, has helped the team to begin reseeding portions of the watershed.

Community engagement has also grown, with more volunteers, tribal members, and local residents actively participating in restoration efforts. For the Brothertown Indian Nation, this work has been an opportunity for nation-building, strengthening their connections to tribal conservation networks, and providing the small nation with their first paid full-time staff members.

The project is also supported by the U.S. Fish and Wildlife Service Natural Resources Damage and Assessment Program, the Daybreak Fund, and the Fund for Lake Michigan.

"It's pretty powerful to be at this place in the journey where we found some rice, we know what's going good with it. We're learning how to help it do better, and we've continued to build really good relationships with our partners, both tribal and non-tribal," says Skeesuck. "When we look out and see more rice here than there was last year – that just gives me so much hope." ■

Skeesuck showing a water staff that was used in the tribe's water walk around Lake Winnebago.

WATCH THE VIDEO

To learn more about the InterTribal Lake Winnebago Wild Rice Revitalization Project and its innovative weaving of western science and Indigenous knowledge, watch our video documenting the project and hear directly from those leading the charge.

Restoring wild rice in the Lake Winnebago watershed: Wisconsin Sea Grant-funded research.

go.wisc.edu/rt6yqz

Low levels of PFAS found in maple syrup

By WISCONSIN SEA GRANT

Gavin Dehnert, emerging contaminants specialist, Wisconsin Sea Grant.

A joint project with the Voigt Intertribal Task Force – a group composed of 10 of the 11 Ojibwe tribes that harvest from the Ceded Territories in parts of Minnesota, Wisconsin, and Michigan – and Aquatic Sciences Center staff has released its initial findings about polyfluoroalkyl substances (PFAS) levels found in maple syrup. The tribally driven project, "Quantifying PFAS bioaccumulation and health impacts on economically important plants and animals associated with aquatic ecosystems in Ceded Territories," was funded by the US Geological Survey's Water Resources Research Act Program. For more information about the origins of the project, see **go.wisc.edu/fvzuhs**.

The Voigt task force ensures safe harvest limits and is advised by the Great Lakes Indian Fish and Wildlife Commission.

The findings were released in an article (**go.wisc.edu/a983e8**) in "Environmental Science and Pollution Research," in which the researchers outlined their findings regarding PFAS in maple sap and syrup. They found two types of PFAS in maple sap and 10 types in maple syrup. They are the first to report the detection of PFAS in maple sap and syrup.

"The good news is that we detected very low levels of PFAS," said Gavin Dehnert, emerging contaminants scientist with Wisconsin Sea Grant. "They are levels that are below drinking water standards and do not pose an immediate health risk to people."

Dehnert suspects there are more types of PFAS in maple syrup than in the sap because the boiling process concentrates previously undetectable levels from the sap. He also noted that the PFAS could have come from equipment used during the syrup-making process.

The Voigt Intertribal Task Force has asked Dehnert's team to expand the study by sampling maple sugar – a concentrated form of maple syrup – for PFAS and to try to determine where the PFAS contamination originated. It could be coming from the soil, groundwater, or precipitation.

In addition to Dehnert, the project involves Jonathan Gilbert with the Great Lakes Indian Fish and Wildlife Commission, Emily Cornelius Ruhs with the University of Chicago, Sean Strom with the Wisconsin Department of Natural Resources, and Christine Custer and Robert Flynn with the U.S. Geological Survey. The maple sugar and PFAS source study is being funded by a Baldwin Wisconsin Idea grant. ■

continued from page 2

Remucal in her lab analyzing water samples for PFAS.

Remucal places a special focus on groundwater, which is the source of most drinking water in Wisconsin, as well as inputs to the Great Lakes.

In her lab, Remucal advises several graduate students, undergraduate students and a postdoc. In addition to her research on PFAS, her team studies ways to remove chemicals like pharmaceuticals and pesticides from water using sunlight and manganese oxides. They also apply high-resolution mass spectrometry to investigate the reactivity of dissolved organic matter, which is important for biogeochemical cycling and for disinfection byproduct formation.

"What motivates a lot of my students is that they want to take their fundamental knowledge and work on problems that they really care about," Remucal says. "That's what drives me, also. We are doing basic science that makes an impact by conducting actionable research. It's the Wisconsin Idea and at the heart of what we do."

As a researcher, Remucal says that she has first-hand benefited from ASC support.

"I've been funded by its programs, and they helped me get started and grow my own research portfolio," she says. "Now, it's exciting to think about empowering other researchers and helping them develop their own research."

Remucal loves being outside hiking, running, skiing, biking and is a year-round bike commuter.

And it doesn't hurt that as a water researcher her office is located on the shores of one of the most studied lakes in the world – Lake Mendota.

"UW–Madison is a great place to do water research," Remucal says. "I see my new role as an opportunity to give back to the water research community and to have an impact in Wisconsin and beyond. I want to explore ways to increase the visibility of our center and our footprint at UW–Madison. I'm hoping to unite water resources on campus around the center. And we are starting at a really great place." ■

WISCONSIN WATER LIBRARY

Summertime!

Get out and explore

Biodiversity is defined as the variety of life in the world or a particular habitat or ecosystem. In the ecosystem of the Upper Midwest, we are blessed with a rich and beautiful variety of plants, animals, fungi, and even microorganisms. Bring along a field guide and learn what lives in the world around you.

Amphibians & Reptiles of Minnesota, Wisconsin & Michigan by Allen Blake Sheldon. First edition, Kollath+Stensaas Publishing, 2022.

Animal Tracks of the Great Lakes by Ian Sheldon. Renton, Washington; Vancouver, B.C.: Lone Pine, 1997.

Aquatic Plants of the Upper Midwest: A Photographic Field Guide to Our Underwater Forests by Paul M. Skawinski. Third edition, Paul M. Skawinski, 2018.

Fish of Wisconsin Field Guide by Dave Bosanko. Cambridge, Minnesota: Adventure Publications, Inc., 2007.

Great Lakes Nature Guide by Jim McCormac and Krista Kagume. [n.p.]: Lone Pine Pub, 2009.

Insects of the Great Lakes Region by Gary A. Dunn. Ann Arbor, Michigan: University of Michigan Press, 1996.

Invaders of the Great Lakes: Invasive Species and Their Impact on You by Karen R. Hollingsworth. Cambridge, Minnesota: Adventure Publications, 2017.

Scats and Tracks of the Great Lakes: A Field Guide to the Signs of Seventy Wildlife Species by James C. Halfpenny. Guilford, Connecticut; Helena, Montana: Falcon Guides, 2015.

Wildflowers of Wisconsin and the Great Lakes Region: A Comprehensive Field Guide by Merel R. Black. Madison, Wisconsin: University of Wisconsin Press, 2009.

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Email askwater@aqua.wisc.edu.

Getting kids hooked on fish farming

By JENNA MERTZ

Sharon Moen, food-fish outreach coordinator, Wisconsin Sea Grant.

Emma Hauser, aquaculture outreach and education specialist, Wisconsin Sea Grant.

Dong-Fang Deng, aquaculture outreach and extension specialist, Wisconsin Sea Grant.

Top right: Middle school students Ava and Liam with the guppy tank in Dan Widiker's classroom.

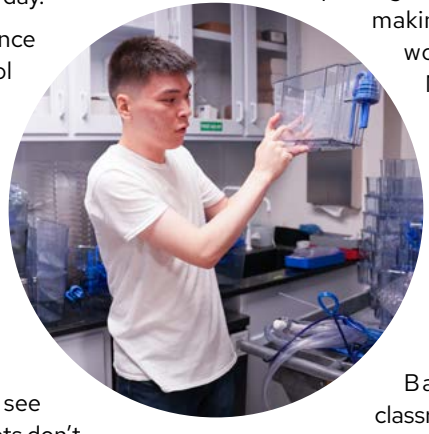
Center: Aquaculture intern and UW–Madison student Raatbek Baizakov explains how he takes care of zebrafish used for research at the Morgridge Institute for Research.

Ask a kid what they want to be when they grow up, and chances are they'll rattle off a list of the usual suspects: doctor, firefighter, artist, astronaut. Sharon Moen, Wisconsin Sea Grant's food-fish outreach coordinator, hopes to add "fish farmer" to that list.

Moen and Wisconsin Sea Grant aquaculture outreach specialists Emma Hauser and Dong-Fang Deng are partnering on a project to build awareness of fish farming and boost training opportunities for young people. The project, funded by the Freshwater Collaborative of Wisconsin, is a step towards developing an aquaculture workforce in the state.

"When I speak with our farmers producing rainbow trout, Atlantic salmon, tilapia and other fish for food, one of the biggest hurdles they report is that there are not enough workers. They need help. Meanwhile, many students don't know working on a fish farm is a real job they can have," Moen said.

One way to build awareness is to get more fish in front of more kids. As part of the project, the Wisconsin Sea Grant team invited educators to apply for $500 grants to set up, reboot, or improve systems that allow students to grow fish as part of their school day.



Dan Widiker, an eighth grade science teacher at Superior Middle School in Superior, Wisconsin, received one the seven grants distributed so far. This spring he set up a fish tank and mounted a PVC-pipe system to circulate water and grow buttercrunch lettuce. The sprouting seeds provide not only proof of concept but also serve as effective learning tools.

"With eighth graders, if they can't see it and touch it, the abstract concepts don't always land," said Widiker. "[Now] they have something a little bit more concrete. And if they can interact with it and see value with it, then it's a lot more meaningful."

Widiker and his fellow science teachers recently revamped their curriculum to be more place-based – that is, to focus on the local environment rather than far-flung locales across the globe. He hopes the fish-and-plant aquaponic system will encourage students to think

about the ways humans intersect with the environment, particularly when it comes to food, which is often shipped across the country and world.

That's especially true when it comes to seafood. The National Oceanic and Atmospheric Administration estimates that 70% to 85% of seafood consumed in the United States is imported from abroad, and more than half of those imports are produced via aquaculture. What if, instead of transporting food thousands of miles across the globe, it could be raised locally?

For that vision to become a reality, the industry needs to cultivate a workforce. To that end, in addition to putting fish in schools, the project team is making it possible for eight interns to work in aquaculture facilities near Milwaukee, Madison, and Bayfield this summer. Some of the interns are producing fish in laboratories while others are learning the nuances of raising yellow perch alongside commercial fish farmers. All are pursuing outreach opportunities to share information about locally produced fish.

Back in Widiker's eighth grade classroom, students Ava and Liam await the introduction of fish into the tank. Both are fans of their teacher's dynamic approach to science.

"I personally think it's going to be great because it's hands-on and more like you can see it. You can see the effects," Ava said. "It's cooler to see, and it makes me pay attention more."

Added Liam, "There's always something we don't know that we learn each day." ■

Educators interested in setting up an aquaculture system in their classroom can email Sharon Moen at **smoen@aqua.wisc.edu**.

Top: Interns and Morgridge Institute for Research and Wisconsin Sea Grant staff gather in June. From left: Hallie Schroeter, Digby Meister, Linda Hang, Wyatt Slack, Erin Ross, Rachel Virnig, Jack Patterson, Peter Shep, Kyle Freimuth, Emma Hauser, Jenna Mertz, and Mackenzie Klemek. Bottom row: Titus Seilheimer, Sharon Moen, and Raatbek Baizakov.

Bottom left: Wyatt Slack is assisting staff in various research projects on aquaculture species including lake trout (shown) at UW-Stevens Point Northern Aquaculture Demonstration Facility.

Bottom right: Aquaculture intern Rachel Virnig moves yellow perch from a tank at Coolwater Farms in Deerfield, Wis.

Spreading Aquaculture Education Around Wisconsin

Thanks to the Freshwater Collaborative of Wisconsin, Sea Grant was able to distribute $3,500 to seven schools to support aquaculture studies.

SUPERIOR MIDDLE SCHOOL
Set up and maintain two aquaponic systems to pursue research questions.

WASHBURN SCHOOL DISTRICT
Conduct biocontrol of a thrips infestation destroying the plants in an aquaponic system.

PULASKI COMMUNITY SCHOOL DISTRICT
Improve the filtration system in a 400-gallon aquarium used for raising about 200 rainbow trout for the "Trout in the Classroom" program.

GREEN BAY PUBLIC SCHOOLS
Build and maintain a mini-aquaponic system as a model for students wanting to create a home-based system.

FARNSWORTH MIDDLE SCHOOL
Improve the filtration system in an aquarium used for raising about 40 rainbow trout for the "Trout in the Classroom" program.

POYNETTE MIDDLE SCHOOL
Set up a 55-gallon aquarium in order to participate in the "Trout in the Classroom" program.

EDGERTON MIDDLE SCHOOL
Set up, maintain, and monitor a 29-gallon aquaponic system.

Locations of schools receiving an aquaculture mini grant

Locations of the 2025 aquaculture intern cohort

Aquatic Sciences Center
UNIVERSITY OF WISCONSIN–MADISON

University of Wisconsin Aquatic Sciences Center
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a joint newsletter from UW Sea Grant and Water Resources Institutes

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