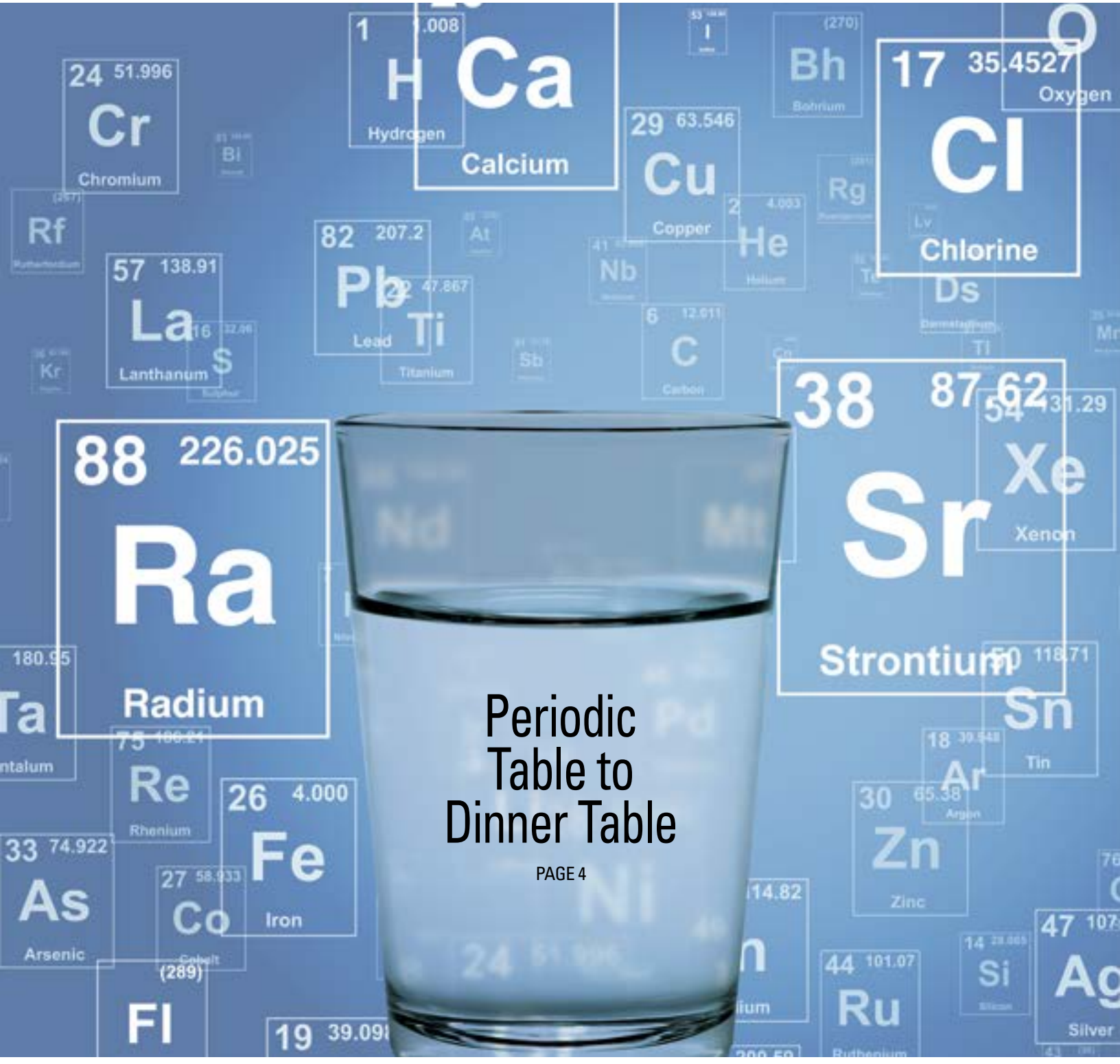
2022 issue 1

ASC
AQUATIC SCIENCES CHRONICLE



Aquatic Sciences Chronicle

University of Wisconsin Aquatic Sciences Center
1975 Willow Drive
Madison, WI 53706-1177
608-263-3259
Email: **chronicle@aqua.wisc.edu**
Web: **seagrant.wisc.edu**, **wri.wisc.edu**

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

ASSISTANT DIRECTOR FOR COMMUNICATIONS
Moira Harrington

EDITOR
Elizabeth A. White

WRITERS
Moira Harrington, Anne Moser, Jennifer A. Smith, Elizabeth White and Marie Zhuikov

ART DIRECTOR
Yael Gen

DESIGNER
Yael Gen

CIRCULATION MANAGER
Linda Campbell

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Step Back in Time With Sea Grant's 50th Anniversary Timeline

At the start of 2022, Sea Grant embarked on its 50th anniversary year. The program celebrates a vision: 50 years of thriving Great Lakes ecosystems and communities.

A new online feature **go.wisc.edu/x39wtc** goes back in time to review that vision, along with the good and ills visited upon the lakes. There are notations on things like passage of the Clean Water Act (1972), but also a recollection of one of the times (1969) when the Cuyahoga River near Cleveland and a tributary to Lake Erie caught on fire, offering a dramatic example of Great Lakes pollution.

There are short stories about Sea Grant's past research and outreach accomplishments, as well as the creative accomplishments of those connected to the water, such as singer Gordon Lightfoot recording "The Wreck of the Edmund Fitzgerald" (1976) or the first Dairyland Surf Classic on a Sheboygan, Wisconsin, Lake Michigan beach (1988).

Sea Grant's New Strategic Directions

In 2022, Sea Grant will undertake a strategic planning process to chart a four-year path ending on Dec. 31, 2027. It is an important process and eventual plan, and one that, among other things, sets priorities for the 2024-26 call for research proposals.

Remaining constant will be focus areas under which Sea Grant organizes its work — healthy coastal ecosystems, resilient communities and economies, sustainable fisheries and aquaculture, and environmental literacy and workforce development. These are broad focus areas, of course, allowing for many Great Lakes research, outreach and education directions.

Chronicle readers are invited to provide feedback on the strategic directions by emailing **chronicle@aqua.wisc.edu**.

Plenty of Podcasts

seagrant.wisc.edu/audio

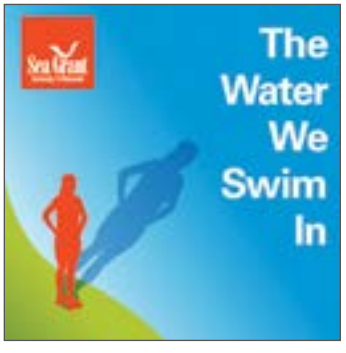
Looking for a podcast? We've got several to consider. Wisconsin Sea Grant and Water Resources Institute podcasts, and episode extras, can be found at seagrant.wisc.edu/audio. Subscribe for free through Google Play, Spotify and iTunes.

The Fish Dish

For the latest "dish" about Great Lakes fish, you'll want to listen to "The Fish Dish." The podcast, co-hosted by longtime coworkers and friends Sharon Moen and Marie Zhuikov, introduces you to the people behind Wisconsin's fishing and aquaculture industries. Each episode includes a "Fish-o-licious" section where Moen and Zhuikov cook a new fish recipe.

Introduced, seasons one and two

Created and produced by Bonnie Willison and Sydney Widell, "Introduced" is a podcast that explores the captivating stories around the cultural, political and economic fringes of invasive species science. Join Willison and Widell as they go on field trips, tangents and accidentally buy prohibited plants online. Along the way, they examine the norms around "belonging" and "native-ness" that



travel with introduced species, and the assumptions about the past and future tied up in invasive species science. Highlights from the second season include authors of the Tribal Climate Adaptation Menu sharing their understandings of *bakaan ingogi ga-ondaadag* (nonlocal beings); a feature on the Midwest Conservation Dogs and their handlers, who use canine scent detection for invasive species efforts; bow fishing for invasive carp with the Peoria Carp Hunters; and more.

New episodes drop every month or so. The conversations include interviews with people such as a sixth-generation commercial fisherman who harvests lake whitefish from Lake Superior, a tilapia farmer from Sheboygan and a researcher studying mercury in aquatic food webs. During the episodes Outreach Specialist Moen and Science Communicator Zhuikov share insights and food preparation tips relevant to the Eat Wisconsin Fish campaign. Their cooking ranges from Greek-style lake whitefish to sushi.

Wisconsin Water News

This podcast, created and produced by Marie Zhuikov, brings stories previously available only in print to dynamic new life with interviews and on-location ambient sound. In-person and phone interviews bring listeners closer to the people behind the news, be they staff members, community members or researchers funded by Sea Grant or the Water Resources Institute. The series is in its fourth season, with 31 episodes, each 4-11 minutes long.

The Water We Swim In

"The Water We Swim In" features stories about the Great Lakes and the people working toward equity. Created and produced by Bonnie Willison and Hali Jama, this podcast explores the connections between water, the systemic problems facing our society and resilience. Episodes about disability justice in the Great Lakes, distributive justice and swimming access, the next generation of water leaders and more are scheduled to drop in April.

WATER RESOURCES RESEARCH

Radium and Strontium

RESEARCHERS TAKE A SEAT AT THE TABLE

You take a seat at the table for a meal in Fond du Lac, Wisconsin, and may have a glass of water to accompany the entrée.

If you are University of Wisconsin-Madison Civil and Environmental Engineering Professor Matt Ginder-Vogel and graduate student Amy Plechacek, each with your tumbler full of water, you are turning to a different kind of table than a dinner table. You are at the periodic table of elements. You want to understand what's in your glass; how the interactions between water and rock in Fond du Lac County might result in naturally occurring contamination of public drinking water wells and nearby private wells.

As part of a currently funded project through the University of Wisconsin Water Resources Institute, the pair has looked at municipal and well drinking water pumped from the Cambrian-Ordovician Aquifer System underlying parts of the Midwest, including this region of Wisconsin. In some locations it contains elevated Ra and Sr and can be affected by salinity, due to high concentrations of ions such as Ca, Cl and SO_4^{2-}.

For those us of who just want to tuck into that dinner in Fond du Lac and not strain to recall what's on the periodic table, those initials stand for radium (Ra) and strontium (Sr). The Ca is calcium, Cl is chloride and SO_4^{2-} is sulfate.

Radium is regulated in drinking water by the U.S. Environmental Protection Agency (EPA) because long-term ingestion is associated with development of bone cancer. Strontium is on the U.S. EPA Contaminant Candidate List 3 and may be regulated in the future. Known health effects of elevated strontium consumption include tooth mottling and "strontium rickets," a musculoskeletal disease.

Why Fond du Lac? Ginder-Vogel explained, "They have really interesting geology in their aquifer. The very bottom surface of the aquifer is really uneven and parts of it are very deep where people get water, while other parts are much more shallow where they get water, so there's just a lot of interesting natural variability."

He continued, "It's kind of perfect. It's like someone set up an experiment for us already. We have all these variations in where the water comes from out of the aquifer and the environments where the water is coming from. So it lets us start to get a handle on all the factors that control naturally occurring contaminants in the water."

Ginder-Vogel said he's conducted radium-groundwater research for six years and has come to the realization that there's often a small amount of radium in most of the Cambrian-Ordovician Aquifer System. "There's a general background concentration of radium, then, depending on specific and unique factors at individual sites, you can end up

The interactions between water and rock in Fond du Lac County might result in naturally occurring contamination of drinking water.

17 35.45

Cl

Chlorine

above the maximum contaminant level for radium," he said. "When we, Madeline Gotkowitz (formerly with the Wisconsin Geological and Natural History Survey) and I, got started on this we expected there to be an answer for Wisconsin at least. But really, what we're discovering, is that it's an incredibly variable system and really dependent on both well construction and also local structures in the aquifer systems."

So, understanding one system — Fond du Lac's — could inform other managers about water conditions and recommendations for where to drill in their own parts of the Badger State.

When Plechacek joined the effort to understand how radium and strontium levels change with the geology in Fond du Lac, she brought another important thing — a skill at engaging community members.

Plechacek composed a water-sampling request letter and distributed it to 40 or so well owners, eliciting a positive response from about half of the people. Those who agreed were private homeowners or folks managing places like parks, gas stations or hotels.

She termed it an "awesome" experience that enabled her "look at some shallower wells as of a contrasting type of groundwater to these deep municipal wells." The municipal well samples were collected through collaboration with the Ripon and Fond du Lac water utilities.

Through an analysis of the samples — pioneered by Sean Scott, assistant scientist at the Wisconsin State Laboratory of Hygiene and a person who Ginder-Vogel described as "incredibly critical" to the project — the team could get quite precise results from the different locations. Scott's method uses smaller-quantity water samples, allowing for less variability in results, providing a clearer picture of groundwater flow and geochemical conditions at the site.

The team ended up characterizing, Plechacek said, "Three distinct water chemistries. That's one of the things that water utilities have to consider, the pros and cons of using shallow versus deep groundwater. There's some contaminants that are likelier to be in shallower water, like nitrate is a big issue. But then with the deeper waters you tend to have more problems with things like radium. There's a lot of tradeoffs. But I think the study was exciting because it identified the zones of water chemistry in that area."

Water managers and private owners now have plenty of food for thought. The research will help determine how best to site wells to put the best possible glass of water on Fond du Lac tables and will offer insights on how to minimize these contaminants in drinking water throughout the state. — MH

Story Map Pairs Traditional Ecological Knowledge with Western Science

A new website is available that details what Indigenous communities in the Upper Midwest are doing to conserve and protect water. Named *Bimaadiziwin Nibi, Water is Life*, the story map is divided into sections, each centered around a different environmental issue. These include wild rice, fish, nonlocal beings (invasive species), mining, contaminants and beach sampling. Within each section are photos, reports and videos from tribal natural resource departments and a summary of interviews with scientists.

The project was created by Brenna DeNamur during her internship with Wisconsin Sea Grant in 2020. DeNamur, a recent University of Wisconsin-Madison graduate, partnered with the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) to develop the content in a culturally responsive manner.

"It's my hope that visitors to the site will gain a better understanding of the challenges faced in the intersection of conversation efforts and tribal culture, and that they be introduced to the diverse voices working in this area," DeNamur said.

For instance, in the nonlocal beings section, DeNamur writes, "Although Indigenous science teaches respect and consideration for all, these nonlocal beings still pose a threat to biodiversity

Great Lakes Indian Fish & Wildlife Commission assisant John Patrick tosses wild rice seed with wildlife biologist Peter David (rear) on the Jackson Box Flowage in Douglas County, Wisconsin, in 2009. Patrick is a member of the Bad River Band of the Lake Superior Chippewa.

and the individual species, such as *manoomin* (wild rice) and *ogaa* (walleye), that Native Americans have had deep relationships with for generations."

In response, GLIFWC has taken action against nonlocal beings. They conduct surveys, control actions and follow up monitoring for both terrestrial and aquatic species. The story map details how the commission divides its efforts into prevention, early detection and rapid response, control and management, research, and cooperation and coordination.

"This story map is a great tool for understanding how the collaboration of Traditional Ecological Knowledge and Western Science methodologies can produce strategic and respectful conservation efforts concerning water throughout the Ceded Territories and beyond," said Hannah Arbuckle, GLIFWC outreach coordinator.

Mark Hoffman / Hoffman@JournalSentinel.com

Anne Moser, Wisconsin Sea Grant senior special librarian/education coordinator and DeNamur's mentor, hopes to see the story map grow in the coming years. "I am grateful and honored to collaborate with GLIFWC on this project. It helped me gain a deeper understanding about Great Lakes literacy and how to incorporate Indigenous approaches into my work in education and outreach."

"Ultimately, teaching Indigenous science is about understanding the world from different perspectives. If more people lived by this, we could sustain a healthier, more prosperous world," DeNamur said.

To access the story map, visit **go.wisc.edu/4n6n3n.**—MEZ

wisconsinwaterlibrary

Bimaadiziwin Nibi — Water Is Life

Indigenous cultures around the world have an accumulated body of knowledge — known as Traditional Ecological Knowledge (TEK) — that is heavily place based and concerned with the relationships of all living beings within an environment. Want to learn more?

Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants by Robin Wall Kimmerer. Minneapolis: Milkweed Editions, 2013.

Dibaginjigaadeg Anishinaabe Ezhitwaad: A Tribal Climate Adaptation Menu by the Great Lakes Indian Fish and Wildlife Commission (GLIFWC). Odanah, Wisconsin: GLIFWC, 2019.

Guidance Document on Traditional Ecological Knowledge Pursuant to the Great Lakes Water Quality Agreement prepared by the United States Caucus of the Traditional Ecological Knowledge Task Team Annex 10 Science Subcommittee, February 2021.

Sacred Ecology: Traditional Ecological Knowledge and Resource Management by Fikret Berkes. Philadelphia: Taylor & Francis, 1999.

Traditional Ecological Knowledge and Natural Resources Management edited by edited by Charles R. Menzies. Lincoln, Nebraska: University of Nebraska Press, 2006.

Traditional Ecological Knowledge: Learning From Indigenous Practices for Environmental Sustainability by Melissa K. Nelson and Dan Shilling. New York: Cambridge University Press, 2018.

Understanding and Respecting Other Ways of Thinking (2016) by Linda Black Elk. Rangelands 38 (1): 3-4.

Use of Traditional Ecological Knowledge in Marine Conservation (2005) by J.A. Drew. Conservation Biology 19(4):1286-1293.

What Kind of Ancestor Do You Want to Be? By John Hausdoerffer, Brooke Parry Hecht and Melissa K. Nelson. Chicago: University of Chicago Press 2021.

Anyone in Wisconsin can borrow the above books and more. Just email **askwater@aqua.wisc.edu.**

SEA GRANT RESEARCH

Cat Island Birds

INVESTIGATING THE IMPACT OF WATER BIRDS ON GREEN BAY

When Amy Wolf and Bob Howe with the University of Wisconsin-Green Bay bring new research partners or students out to the restored Cat Island chain in lower Green Bay on Lake Michigan, their reactions are memorable.

Amy Wolf/University of Wisconsin-Green Bay

"To see people's expressions when they enter the midst of thousands of loud, often smelly and sometimes defecating birds is pretty amazing and gratifying," said Wolf, biology professor with the Department of Natural and Applied Sciences.

This avian abundance is relatively new, made possible by habitat restoration projects in the bay coupled with pollution remediation and control. For instance, the number of American white pelicans nesting has increased from about 250 in 2005 (State of the Bay report), to more than 3,000 now.

Wolf and Howe are coordinating a small army of students and government agency researchers to count and observe the behavior of birds that eat fish (piscivorous birds) in the lower Green Bay area around Cat Island, an area that Howe likens to the "Serengeti of Lake Michigan" due to the sheer abundance of wildlife. With two years of funding through Wisconsin Sea Grant, they are working to gain basic information about populations of pelicans, cormorants, terns, egrets, herons and gulls in the lower bay, including information about what the birds eat and where they spend their time.

Howe, professor and director of the Cofrin Center for Biodiversity, explained, "We want to know what impact these large numbers of fish-eating birds have on the lower Green Bay ecosystem in general, and specifically on the fishery, which is so important for public recreation and commercial harvesting."

During last summer, Howe, Wolf, UW-Green Bay Research Specialist Erin Giese, and a team of undergraduate and graduate students surveyed all the piscivorous birds from southern Door County down to the De Pere Dam on the Fox River, and then up the lakeshore to Oconto, Wisconsin. Graduate students Jacob Woulf and Brandon Byrne flew drones down the Cat Island causeway to count the thousands of birds there. Additionally, the students conducted firsthand observations of what the birds eat, where they catch fish and what other bird species they associate with.

In concert with the bird surveys, Howe said the U.S. Fish and Wildlife Service is conducting fish surveys in the lower bay.

"We're learning about what kinds of fish these birds are taking and where they're taking them," he said. "We're really excited about this information so far."

They are also tracking double-crested cormorants with two types of technologies — one uses the cellular phone network and the other uses radio telemetry. For the cellular tracking, the birds are fitted with a lightweight harness that contains a solar-powered transmitter. The device provides information about a bird's position every hour, even if it leaves Green Bay.

Birds with the radio transmitters are tracked through special towers stationed around Green Bay and in a growing network across eastern North America. They plan to track pelicans next year.

The researchers are only beginning to crunch numbers from their first season of data, but Howe and Wolf already have preliminary findings to share.

In terms of tracking, they've found that some of the cormorants move much farther than they anticipated. Wolf said, "They hang around Cat Island, they feed around Cat Island, but they definitely range widely; one bird flew 75 kilometers (46.6 miles) south to Lake Butte Des Morts and returned to Green Bay during the same day. Another went over 110 kilometers (68.3 miles) north toward Gills Rock, where it stayed for days before returning to lower Green Bay."

Their feeding observers have noted that the cormorants and pelicans are foraging with each other. Howe suspects their social nature might be why they are the dominant piscivorous species in the Green Bay system. "Social foraging behavior might give them a leg up on exploiting the fish in the lower bay."

Howe said their counting surveys have provided a good estimate of how many piscivorous birds are in lower Green Bay. By mid-summer 2021, well over 4,000 pelicans and 2,000 cormorants were present.

"We know that a pelican can eat up to three pounds of fish per day. A cormorant can eat about a pound of fish per day. You start doing the math and realize that these birds take tens of thousands of pounds of fish every week. They're significantly shifting the biomass from one place to another," Howe said.

They've also noted that pelicans, and cormorants to a lesser extent, have developed a relationship with recreational fishermen. The birds hang around the boats and feed on fish that the fisherman don't want and throw overboard.

"The pelicans have learned that there's free food there," Howe said. "We didn't anticipate this relationship and it's very obvious from the data that we're seeing."

They expect their research will be helpful for agencies working on management decisions about the abundance of piscivorous birds, including gulls.

Additional partner agencies aiding the project include the Wisconsin Department of Natural Resources, the U.S. Fish and Wildlife Service, Bird Studies Canada, the U.S. Army Corps of Engineers, the U.S. Department of Agriculture's Wildlife Services Program, Brown County Port Authority and Mississippi State University. The research team has also received cooperation and support from landowners and marinas along the shores of lower Green Bay.—MEZ

Double-crested cormorants and American white pelicans on Cat Island.

OUTREACH

Taking Coastal Engineering out of the Classroom

Seventh graders from Jerstad Agerholm K8 school in Racine, Wisconsin, recently visited North Beach on Lake Michigan and learned about erosion control, the importance of native beach plants, breakwall construction and more. Their visit was part of a Sea Grant project developed by Librarian Anne Moser, Coastal Engineer Adam Bechle and other partners that introduces coastal engineering concepts to middle-schoolers through hands-on learning on the Lake Michigan shore.

Students measured wind speed, tide distance and current speed, and studied methods being used to protect the beach.

David Olson / Racine Unified Schools

Collaborative Network for Recirculating Aquaculture Moves Into Next Phase

Over the past three years, Wisconsin Sea Grant has been part of an innovative public/private network that is dedicated to building capacity for the U.S. recirculating aquaculture industry.

Known as RAS-N, the Recirculating Aquaculture Salmon Network involves many partners, from the University of Wisconsin-Stevens Point Northern Aquaculture Demonstration Facility (NADF) in Bayfield, to the Maine and Maryland Sea Grant programs, to private companies in the United States and Europe, including Wisconsin-based Superior Fresh.

Recirculating aquaculture systems (RAS) are a water-efficient way of raising fish on land in a contained system; other positive attributes of this farming method include enhanced biosecurity and the ability to reduce the carbon footprint of food fish by building facilities close to markets.

The National Sea Grant Office announced funding for RAS-N in 2019. While that three-year grant is now winding down, the collaborative network it helped build is not going away. Rather, it is entering an exciting new phase with $10 million in funding from a U.S. Department Agriculture (USDA) program designed to enhance sustainability in agriculture.

The USDA support was awarded to the University of Maryland Baltimore County in collaboration with the University of Maine Aquaculture Research Institute. Wisconsin Sea Grant and NADF remain closely involved in this new phase of the work, dubbed SAS^2 for Sustainable Aquaculture Systems Supporting Atlantic Salmon.

Specifically, NADF will investigate out-of-season spawning of Atlantic salmon to develop procedures that can be used by industry to produce eggs year-round.

UWSP / NADF

Additionally, NADF staff, working with other aquaculture educators, will contribute their expertise in merging sustainable RAS science, community engagement and workforce development for the RAS industry.

This large vision encompasses a multitude of objectives involving technology transfer, incorporating RAS education at the high school and college levels and expanding NADF's current internship program. SAS^2 will also work to increase public awareness of this growing industry.

Said Chris Hartleb, NADF director and a professor of fisheries biology at the University of Wisconsin-Stevens Point, "Through our facility, Wisconsin has been a key collaborator on the RAS-N project with expertise in RAS and salmon culture. As a further expansion of that project, SAS^2 continues Wisconsin's pivotal role in the development and growth of Midwest recirculating aquaculture of the valuable and tasty Atlantic salmon."

SAS^2 continues Wisconsin's pivotal role in the development and growth of Midwest recirculating aquaculture of the valuable and tasty Atlantic salmon.

Indeed, Atlantic salmon remains one of the most popular choices for American seafood consumers, yet 96% of the salmon consumed here is imported, reflecting a dramatic trade deficit. By addressing bottlenecks and barriers affecting the growing salmon RAS industry, RAS-N and now SAS^2 are working to make the industry both economically feasible and environmentally sustainable.

To learn more about the RAS-N and SAS^2 networks, visit **ras-n.org**.—JAS

Left, Atlantic salmon are cultured in land-based water reuse systems. Tanks like the ones shown here provide an optimal environment for the fish to thrive.

Upper right, This Atlantic salmon was raised in water reuse systems at the University of Wisconsin-Stevens Point Northern Aquaculture Demonstration Facility in Bayfield.

Lower right, Public tours at the University of Wisconsin-Stevens Point Northern Aquaculture Demonstration Facility in Bayfield provide education on sustainable aquaculture.

UWSP / NADF

UWSP / NADF

Herbicide Lake Treatments Harm Young Fish

Wisconsin Sea Grant's emerging contaminants scientist, Gavin Dehnert, earned his Ph.D. by studying the effects of commercial 2,4-D herbicide exposure on the development and behavior of freshwater fish at different life stages. This past summer, he took his research out of the lab and into the natural environment, where 2,4-D herbicides are used to treat lakes for an invasive plant, Eurasian watermilfoil.

> How do we get rid of this invasive species but keep intact what we already have in the lake?

During his doctoral studies, Dehnert found that exposure to concentrations of 2,4-D similar to those allowed during application to lakes significantly decreased survival in fathead minnow larvae and also other young fish species such as walleye, yellow perch, largemouth bass, northern pike, white crappies and white suckers.

"We saw an increase in about 20 to 35% mortality of the young fish when exposed to 2,4-D," Dehnert said. "But we kept getting this big question: We know what happens in the laboratory, but what happens in the real world?"

With funding from the Wisconsin Department of Natural Resources, Dehnert designed two sets of experiments in lakes that were undergoing 2,4-D treatments. For the first, water was taken directly from a lake that had 2,4-D applied and then distributed to tanks where the fish were held.

The second employed an in-lake exposure system. Young fish were put in the lake in two-liter buckets with holes in them covered in mesh, which allowed water and food to pass through, but not the fish.

Dehnert explained, "This allowed us to see what goes on during an actual herbicide treatment. It's applied to the entire lake and we look at what goes on with the fish."

He anticipated a possible higher mortality rate in the lake setting because there are more variables at play. "I would expect more like a 35 to 45% decrease in survivorship because there are more stressors on the fish — temperature changes, storms, nutrient runoff, etcetera. That's why it's important to do this experiment in a natural lake setting, so we can get those real-world scenarios," Dehnert said.

Day of the Badger

Day of the Badger is almost here. For the second year in a row, we are participating in this University of Wisconsin-Madison-wide effort to advance the university's mission by celebrating its achievements and raising critical funds to help maintain excellence. The campaign takes place April 5-6 over a span of 1,848 minutes — a nod to the year the university was founded.

To stay in the know, follow us on social media — our handle is @UWiscSeaGrant on both Facebook and Twitter. If you choose to make a gift during Day of the Badger, you may designate your gift to the Wisconsin Sea Grant and Water Resources Institute Fund. We'll also have an exciting match opportunity to make your generous gift go further. We'd love to have your support during Day of the Badger to advance science for the Great Lakes and Wisconsin's precious water resources.

Learn more at **dayofthebadger.org**.

Dehnert is processing the data from his lake experiments and findings point to negative effects for fish in the natural setting similar to the effects observed in the lab.

Wisconsin lake associations are interested in Dehnert's work because they want to eradicate Eurasian watermilfoil. Besides the use of an herbicide, the invasive plant can be controlled by manually removing the plants or by introducing beetles that eat it.

"All of these lake associations want to make sure they're causing the least amount of impact to the other organisms in the lake," Dehnert said. "So, it's really exciting to work with them to determine the risks of the different control methods. How do we get rid of this invasive species but keep intact what we already have in the lake?

"Let's understand what could happen, so we can make an educated decision on whether the benefits outweigh the cons," he said. — MEZ

Dehnert is using two methods to evaluate mortality rates among young fish exposed to 2,4-D. The top photo shows an in-lake experiment, and the middle photo shows water taken from a lake after 2,4-D application. The bottom photo is from a two-minute video about the project: go.wisc.edu/sh0kwf.

ASC

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

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a joint newsletter from UW Sea Grant and Water Resources Institutes

Wisconsin Sea Grant and Chroma Press

Food That Grows on Water

An Ojibwe prophecy drew Indigenous people from the eastern U.S. to Wisconsin for the food that grows on the water. That is *manoomin*, also referred to as wild rice. In addition to its cultural significance, it's a keystone species that indicates the health of the water in which it grows throughout the Great Lakes basin.

Manoomin is actually a wild grass and can be distinguished from rice types such as white, jasmine or other varieties of the grain. A multi-year collaborative project of Native American nations and the Sea Grant programs from Wisconsin, Michigan and Minnesota fostered engagement and learning surrounding manoomin, documenting spiritual resonance and resulting in resources and literature reviews, as well as visually appealing posters documenting manoomin's life cycle. **go.wisc.edu/3h6dl2**

Check Online for Calendar Updates

Uncertainty surrounding transmission of COVID-19 due to variants means many large water-science meetings remain in flux.

Check the websites of organizations you are interested in for updates regarding scheduling. For the latest on Sea Grant and University of Wisconsin Water Resources Institute functions and other news, visit **seagrant.wisc.edu** or **wri.wisc.edu** or follow our social media channels.

Bonnie Willison