2018 issue 4

ASC
Aquatic Sciences Chronicle

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

INSIDE:

2018: Our Year in Photos

Marie Zhuikov/Wisconsin Sea Grant

Aquatic Sciences Chronicle

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FEATURED WEB

St. Louis River Restoration Progress

stlouisriverestuary.org

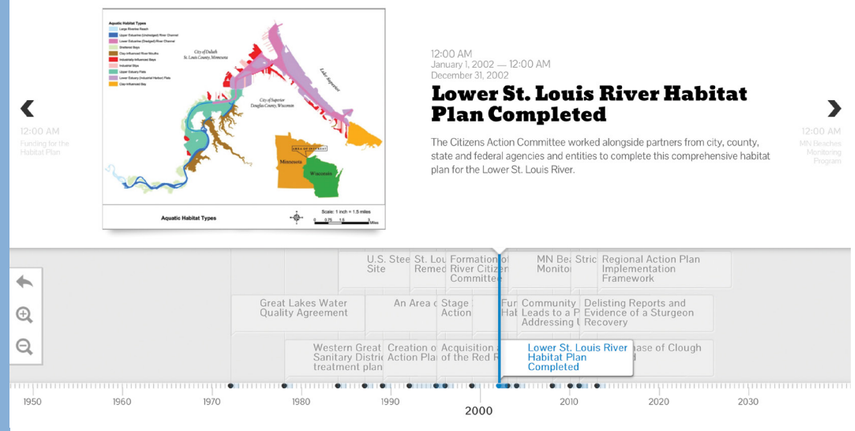
Healthier habitats are coming back to the St. Louis River, which forms the far northwest border between Minnesota and Wisconsin. Many natural resources agencies, researchers and nonprofit organizations are conducting the work.

This progress means that the Stories and Science of the St. Louis River Estuary website needs to keep pace with the progress. Thanks to the expertise of the people involved with habitat projects, the "Restoration" section of the site has been updated.

When you visit the website, you'll find an updated timeline of restoration progress and the latest information on projects such as the 21st Avenue West site in Duluth or Pickle Pond in Superior.

Other featured topics on the site include wild rice, fishing and recreation. Site visitors can challenge themselves with GeoQuests — iPhone-based games and geocaches that highlight key places and issues in the estuary, or they can use the deep map to explore the ecology and history of this special place.

The Stories and Science website was created by faculty and staff from the University of Minnesota Duluth and UW-Madison with help from many partners, and with funding by the Wisconsin and Minnesota Sea Grant programs and the Minnesota Pollution Control Agency. — MEZ



Public Comments Sought for Wisconsin Sea Grant Review

THE DEADLINE TO COMMENT IS COB MONDAY, MARCH 11, 2019.

The Wisconsin Sea Grant College Program will be reviewed on March 19-21, 2019, by a team convened by the National Sea Grant College Program. The review will be conducted in Madison, Wis., and will consider all aspects of the state program's management and organization, performance, stakeholder engagement and collaborative activities, including those with various offices of the National Oceanic and Atmospheric Administration.

This notice invites participation in the review by emailing comments about Wisconsin Sea Grant to oar.sg-feedback@noaa.gov on or before COB Monday, March 11, 2019. Please indicate "Wisconsin Sea Grant" in the subject line.

Our Year in Photos


Sara Stathas

Sara Stathas


Marie Zhuikov/Wisconsin Sea Grant

See pages 8, 9 and 14 for more best of the best images from 2018.

Jamey Ritter

River Talks Series

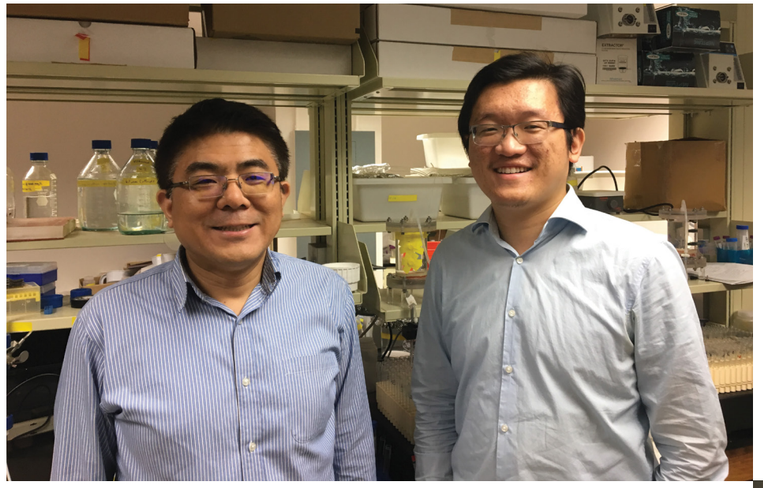
The Lake Superior National Estuarine Research Reserve and the Minnesota and Wisconsin Sea Grant programs started the sixth year of science café-type evening talks about the St. Louis River Estuary in October. These informal public talks will be held monthly through May 2019 at the Reserve's Lake Superior Estuarium on Barker's Island in Superior, Wis.

Talks will be held on Jan. 9, Feb. 13, March 5, April 10 and May 8, 2019. The March 5 talk will be held in conjunction with the St. Louis River Summit.

For more information, visit bit.ly/1PmfFEX.

SPECIFIC TO SPECIES

Treating arsenic in well water depends on speciation



According the Wisconsin Department of Natural Resources (DNR), about a quarter of Wisconsinites depend on water drawn from more than 800,000 private wells around the state. While private wells can be safe and dependable sources of water, the DNR recommends testing them annually for contaminants.

Arsenic is one of the troublesome substances that can be present in well water. Although a naturally occurring element, it can cause severe negative health impacts in high enough concentrations.

The Water Resources Institute is funding research that will ultimately help protect public health by filling critical gaps in knowledge relating to arsenic in Wisconsin.

Two UW-Milwaukee researchers, Shangping Xu and Yin Wang, are conducting the study. Together, Xu and Wang will gain a better understanding of arsenic concentrations and speciation (the specific type of arsenic present in a certain case) under normal pumping conditions.

The work is funded through WRI's State of Groundwater Research and Monitoring program.

Xu is an associate professor of geosciences whose research focuses on the protection and sustainable use of groundwater resources. Wang is an assistant professor of civil and environmental engineering with interests in environmental geochemistry and water quality control.

Said Xu, "In Wisconsin, we know we have this arsenic issue, but when we looked at the (scientific) literature, we could not find much about speciation, so we decided to write this research proposal."

Xu and Wang bring a unique, holistic approach to the issue of arsenic, having worked for the last several years on designing filters that can remove it.

"We can work on both the contamination side and the treatment side," Xu said. "What we found is that, if you want to remove arsenic, you need to care about the speciation. For example, the removal mechanisms and techniques are different."

The research is currently getting under way. Right now, the pair is working on identifying wells that are representative of Wisconsin's arsenic situation across the state.

A significant number of private wells in the Fox River Valley region have shown arsenic concentrations that exceed the standard for drinking water, and there have been problems in southeast Wisconsin and other parts of the state as well.

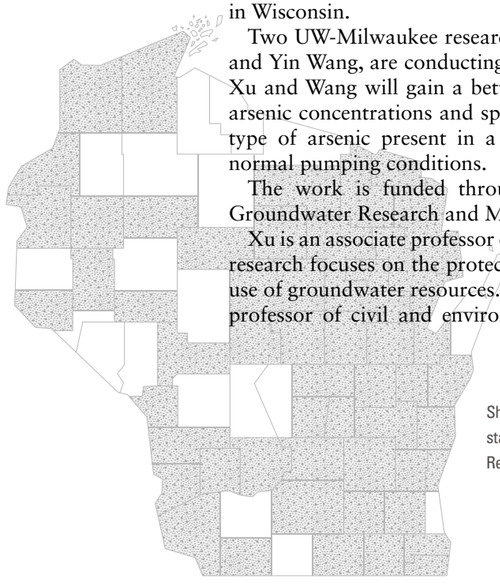
As they undertake this research, Xu and Wang will collaborate with county health departments.

As Xu put it, "They know the arsenic concentration situation (in their areas) already. They'll say, for example, in Cedarburg 28% of wells are contaminated by arsenic, and so we'll try to work with them and identify the wells of highest concern, and our results will be conveyed to the health departments."

Xu and Wang's work holds promise to make private well water safer for Wisconsinites, particularly through a better understanding of arsenic speciation.

"You need very different techniques to treat arsenic III and arsenic V, so it's really important to know the speciation of arsenic to determine the optimal treatment techniques," said Xu.

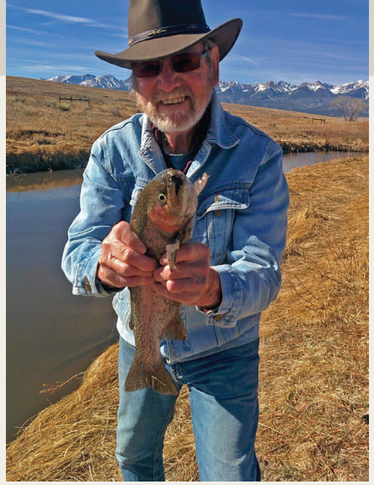
Ultimately, while safe water is something many people take for granted, "Most people are unaware of what's in their water," said Xu. "That being said, it doesn't mean they're not concerned." — JAS



Shaded areas on the map indicate counties with wells that exceed the arsenic drinking water standard of 10 parts per billion (ppb). Map courtesy of the Wisconsin Department of Natural Resources Bureau of Drinking Water and Groundwater.

University of Wisconsin-Milwaukee Photo Service

Top photo: UW-Milwaukee researchers Shangping Xu (left) and Yin Wang (right) are working to identify different species of arsenic in order to protect well quality throughout Wisconsin. Shangping Xu constructs a biosand filter (right).



Hallett J. "Bud" Harris, a co-author of a recent Green Bay journal article, is enthusiastic about fish in his home state, as well as farther afield.

New research review details the "Green Bay saga"

The story of the Green Bay watershed, which constitutes roughly a third of the Lake Michigan drainage, is complex and ever-evolving. Those searching for a concise yet detailed summary of the past century-plus, focused on research and remediation efforts, now have somewhere to turn — a new research review published in the Journal of Great Lakes Research.

The four authors of "The Green Bay Saga: Environmental Change, Scientific Investigation and Watershed Management" are Hallett J. ("Bud") Harris, Robert B. Wenger, Paul E. Sager and J. Val Klump.

Major environmental changes, including potentially irreversible eutrophication in lower Green Bay, came about relatively rapidly due to industries like timber harvesting, papermaking and agriculture in the late 19th and early 20th centuries. It was not until the mid-20th century that serious research on the bay began, largely with support from Wisconsin Sea Grant, UW-Milwaukee and UW-Green Bay.

While scientific research provided important underpinnings for government-led programs like the Green Bay Remedial Action Program and the PCB clean up program, the authors conclude that "a fuller rehabilitation of this large-scale ecosystem remains an elusive goal."

To access the article, visit the Journal of Great Lakes Research online at www.journals.elsevier.com/journal-of-great-lakes-research. — JAS

Emma Wiermaa

"Walleye and saugeye have several attributes that make them a good candidate fish species for Wisconsin and the Midwest fish food market."

GREG FISCHER, UWSP NADF FACILITIES OPERATION MANAGER

From left to right: Logan Mueller, Greg Fischer, Tyler Firkus, Mike Engel, Kendall Holmes, Josh Siebert and Emma Wiermaa.

UW Sea Grant Supports Walleye for Sustainable Food Fish Production

Through the University of Wisconsin-Stevens Point Northern Aquaculture Demonstration Facility (UWSP NADF), Sea Grant has funded two research projects to intensively raise both walleye and saugeye (hybrid walleye) sustainably as food fish.

Walleye is a species with substantial aquaculture potential because of its high market value and limited supply from traditional commercial sources. Although walleye are one of the most valued food fish species in Wisconsin, most are imported from Canada and caught from wild sources. The saugeye is a naturally occurring cross between a female walleye and a male sauger that has nearly identical properties to the walleye as a food fish. Previous studies have shown that saugeye may exhibit a hybrid vigor, growing more quickly than their walleye cousin. Raising walleye and saugeye on commercial feed in land-based, closed containment systems such as recirculating aquaculture systems or aquaponics enables optimum growth with increased biosecurity. These systems also have limited impact on the environment and wild fish populations.

Because walleye are piscivorous (fish eaters) and highly carnivorous, there are specific techniques, management and equipment required to train these fish to consume commercial fish feed from hatch. UWSP NADF is currently the leading facility in investigating the commercial production of intensively reared walleye and saugeye for food fish. Over the past seven years, UWSP NADF has experienced substantial success in raising this species on formulated feeds using specific culture and management techniques.

"Walleye and saugeye have several attributes that make them a good candidate fish species for Wisconsin and the Midwest fish food market," states Greg Fischer, UWSP NADF facilities operation manager. "We are able to rear them intensively on commercially available feed from the larval stage, they exhibit good performance and growth with our indoor recirculating systems reaching market size in 12-14 months, and they demand a high market value and already have a large market acceptance in Wisconsin," he adds.

There remains a limited number of bottlenecks for commercial walleye and saugeye industry production in Wisconsin. More research is needed on growth and survival rates of fry, commercial grow-out data and economic studies. With support from Sea Grant, UWSP NADF is working to evaluate and provide further information regarding these topics.

INVESTIGATING MICRO-DIETS

A critical phase in fry production is the early stages of feeding, where fry digestive capabilities are limited and, traditionally, only live feeds have been used. However, live feeds are expensive and difficult to manage. For the past few years, the main commercially available larval feed used for larval walleye rearing is imported from overseas. UWSP NADF is currently working to investigate other available larval feed options comparing fry attributes such as growth and survival. The second year of this project will investigate various rearing densities at this larval stage using the best feeds identified in year one.

INVESTIGATING OPTIMUM GROW-OUT REARING DENSITY AND NUTRIENT RECYCLING IN WATER REUSE SYSTEMS

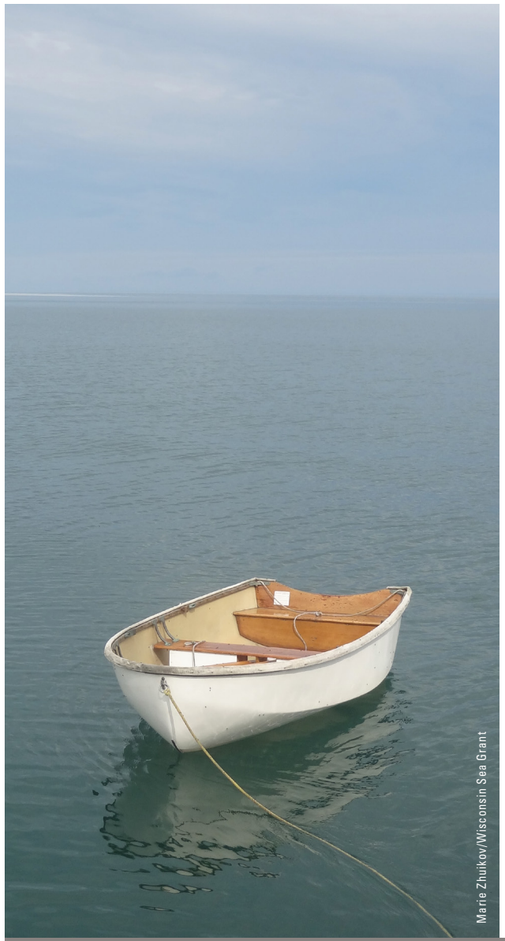
While a variety of species have been researched and reared in traditional recirculating aquaculture systems, or RAS, tilapia is the only species for which production methods have been optimized in aquaponics systems. Preliminary research performed at the UWSP Aquaponics Innovation Center (UWSP AIC) has shown walleye to be a good candidate for aquaponics systems—the rearing temperature of walleye compares well with the optimum temperature for most plants raised in aquaponics, such as lettuce.

Although UWSP NADF and UWSP AIC have raised walleye in both RAS and aquaponics systems, further research is needed to optimize the biological parameters and develop economic models to successfully raise this species in commercial production systems.

To address these needs, Sea Grant has funded the investigation of raising both walleye and saugeye at various grow-out densities while conducting key commercial production evaluations in RAS and aquaponics systems. This research is also comparing water quality dynamics between both systems. The outcomes gathered will be used to develop biological and economic models for producers to evaluate the introduction of a new fish type into their traditional RAS and aquaponic production systems.

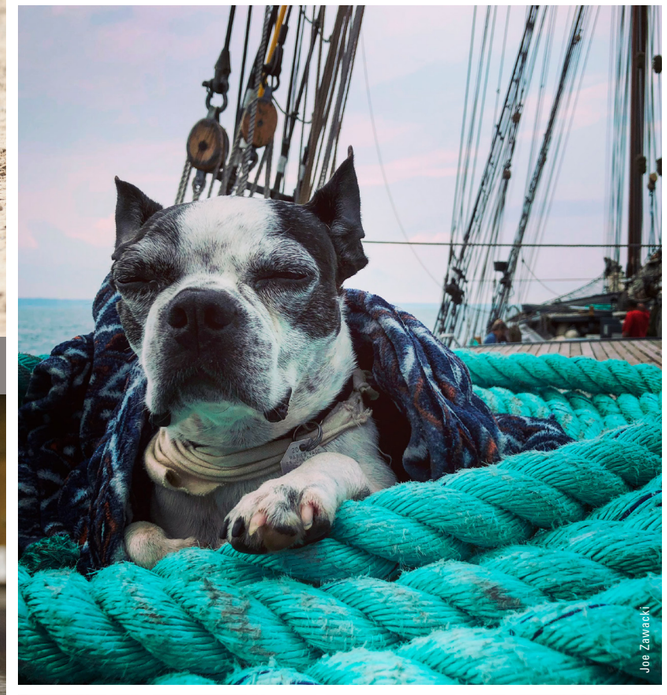
"Sea Grant has provided funding to allow us to conduct research at UWSP NADF and gain a better understanding of biological information on new species, such as walleye, for Wisconsin aquaculture. This research is allowing walleye to move closer to becoming a commercially reared fish for Wisconsin," Fischer states.

by Emma Wiermaa UWSP NADF Aquaculture Outreach Specialist


Marie Zhuikov/Wisconsin Sea Grant


Sara Stathas


Sara Stathas


Joe Zawacki


Sara Stathas


Sara Stathas


Sara Stathas

And the Student Becomes the Master
Kathy Kline

Although she started as a student, Kathy Kline left Sea Grant in September as a professional writer with an award-winning book and a long list of accomplishments resulting from a successful career as an education specialist.

Kline began her time at Wisconsin Sea Grant in 2000 as a graduate student working on the Earthwatch Radio program produced by Rich Hoops. After receiving her master's degree in life science communication, Kline headed east to New Hampshire Sea Grant, where she worked as a science writer from 2002 to 2004. The lure of her home state proved irresistible, and Kline returned to Wisconsin Sea Grant as a writer for six more years. She then joined the outreach team and became a part-time education specialist in 2012.

An enduring part of Kline's legacy will clearly be "People of the Sturgeon: Wisconsin's Love Affair with an Ancient Fish," co-written with Ronald Bruch and Fred Binkowski and including photographs by Bob Rashid. Published by the Wisconsin Historical Society Press in 2009, and winning 12 awards, the book examines the profound cultural impact of sturgeon in Wisconsin through interviews, stories and photographs. Due to its success, the book has recently been printed in a paperback edition.

Co-author Binkowski said, "When you look through the book, there are many pages describing experiences that Ron and I have lived. Kathy's science-writing skills brought those events to life and provided an opportunity for a wide audience of people to learn about the history of lake sturgeon on the Lake Winnebago system. Kathy's commitment to producing the book was sincere and enthusiastic, and her engagement with sturgeon conservation and the Lake Winnebago community continued long after the book's publication."

As an education specialist, Kline was a driving force behind the Eat Wisconsin Fish campaign, an effort to promote local fish consumption that included culinary events, public opinion research, industry collaborations and the informative website eatwisconsinfish.org.

One of Kline's collaborators on the project was Fisheries Outreach Specialist Titus Seilheimer: "Kathy's passion for educating and for local fish was the driving force behind raising awareness of Wisconsin's wild-caught and farm-raised fish through the Eat Wisconsin Fish program. Her passion and skill for education and communication will be greatly missed."

Kline's passion for education brought her to collaborate with Minnesota Sea Grant through the Center for Great Lakes Literacy to provide teachers real-world Great Lakes sailing and research experience during voyages aboard the S/V Denis Sullivan. After creating a hands-on underwater engineering activity for the University of Wisconsin-Madison Alumni Association Grandparents University program, she worked with middle-school science teacher Lynn Kurth to develop the ROVe pack, a complete underwater remotely operated vehicle curriculum kit. Her work also brought the Attack Packs, traveling AIS kits, back into relevance.

Connections with teachers and others also allowed Kline to influence the proposals Sea Grant receives for education outreach projects. According to Assistant Director for Extension David Hart, "Kathy helped shape and cultivate the education proposals we receive. We used to fund just one per cycle. Now we're up to three, and they're all high-quality, impactful projects."

Since 2009, Kline has also been hard at work caring for a growing family, and her departure from Sea Grant will allow her more time for that project. — EAW

OUTREACH

Milwaukee River Race Proceeds Swimmingly

After first-place finisher James Biles crossed the finish line in the Cream City Classic on August 11, he swam back out and grabbed a plastic water bottle that was floating in the Milwaukee River. He said, "We've got to leave it cleaner than we found it."

Deidre Peroff / Wisconsin Sea Grant

His action reflects the philosophy behind the race and made the organizers and sponsors proud. It made the partners proud, too. Wisconsin Sea Grant doesn't often, if ever, help organize sporting events. But this was one we couldn't pass up.

In the first swim held in the river in potentially 100 years, 68 people entered the water for a mile-and-a-half race. All but one finished, and nobody got sick.

Kirsten Shead, co-executive director of the Milwaukee Water Commons, the main organizer for the event, explained the idea for the event arose from a survey of residents in the Milwaukee area. They were asked about ways the city could be better known as a "water city."

"The idea was to highlight how far the Milwaukee River has come in terms of water quality," said Shead. "It's so much cleaner than it has been in the last 100 years, but there's still a lot of work to be done. It's going to take all of us to get that waterway to a place where it's fishable, swimmable and drinkable on a regular basis."

Deidre Peroff, Wisconsin Sea Grant's social scientist who helped with the race, said the idea of a race in a river that has had pollution problems raised a few eyebrows. "At first, everyone was like, 'Oh this is crazy, who would want to swim in the river?' But then it changed to being this inspiring story. There's all the pictures of swimmers hugging and smiling, and excited that they got to do it."

Shead concurs on the success of the race. "The images of the event are just so iconic – seeing people swimming up into the city along former industry sites, current industry, condos, apartments and restaurants. The beauty of that was not lost on the crowd. We had spectators along the whole route, cheering."

"Overall, the swimmers gave really good reviews on the water. They said it was comfortable, it was enjoyable, it felt clean, it didn't stink, it wasn't gross – all those things that we were hoping for ... Everything went swimmingly," Shead said.

The organizers, which also included Milwaukee Riverkeeper and the Milwaukee Harbor District, did their homework to ensure a healthy experience for the swimmers. They picked a section of the river that's historically the cleanest because of water that mixes in from Lake Michigan. They also paddled the route and had a test-swim to ensure no harmful structures were lurking beneath the surface. Water quality tests conducted beforehand showed no problems.

It is currently illegal to swim in the river, so they obtained a special permit to hold the race. They also worked with the police and fire departments. A skimmer removed debris the night beforehand. During the event, the Coast Guard shut down the river to boat traffic, kayakers patrolled for safety and eight lifeguards lined the route, ready to jump in if needed.

Peroff staffed the registration table and was able to question a few racers on why they participated.

"I talked to this father-son team. The son said, 'No I never thought I would do this. No way' while the dad said he'd always wanted to swim in the river since he was a kid. He grew up close to the river. It was always so polluted and with all the trash, looked disgusting. He was told to stay away from the river, so he was happy to see how far we've come with cleaning it up and the fact that we could even think about doing something like this."

Will there be a Second Annual Cream City Classic? Both Peroff and Shead say yes.

"It's a quirky event, it's a cool location, and we think we can continue to highlight some important issues in Milwaukee such as water quality and water access," Shead said. — MEZ

Brenda Coley, co-executive director of Milwaukee Water Commons, and Deidre Peroff, social scientist at Wisconsin Sea Grant (left); Female swimmers waiting for the swim to start (right).

Meridith Berghauer

Anne Moser/Wisconsin Sea Grant

Meridith Berghauer

SAILING FOR SCIENCE

Educators Learn on Lake Michigan

Sixteen educators from Wisconsin and Minnesota immersed themselves in Lake Michigan science last August, and learned more about the communities along it as well as new technologies for use in their classrooms.

They departed from the Port of Milwaukee aboard the replica three-masted wooden schooner S/V Denis Sullivan for five days as part of a unique professional development workshop offered by the Great Lakes Sea Grant Network's Center for Great Lakes Literacy with financial support from the Great Lakes Restoration Initiative and the Wisconsin Coastal Management Program.

"I've never been on anything like this before, it's been an extraordinary experience, really an experience of a lifetime. What an important opportunity for educators to learn about the Great Lakes watershed, especially Lake Michigan watershed and how it impacts the communities and all coastal communities," said Brian Henrickson, a seventh-grade life science teacher in Two Rivers, during an interview with WBAY television.

The educators visited the ports of Sheboygan, Port Washington and Two Rivers to study degraded water quality, coastal erosion, environmental restoration and commercial fishing history. They even took part in the dedication of a new park in Two Rivers.

"I think so often our students don't even realize the effect that this lake has on our everyday life and I want to bring that to life for them. I want them to understand, I want them to love this lake, I want them to become caretakers of it and to really want to preserve it and keep it as best we can," said Jody Henseler, a seventh-grade science teacher in Manitowoc.

The cruise was organized by staff members from the Wisconsin and Minnesota Sea Grant programs and the Denis Sullivan. — MEZ

Meridith Berghauer

From left: Brian Henrickson, Perry Smith and Sea Grant Librarian Anne Moser examine leaf packs from the Sheboygan River to discover what different types of macroinvertebrates are found there.

EDUCATION

programpeoplenews

A Career Solving Great Lakes Coastal Engineering Problems

Gene Clark

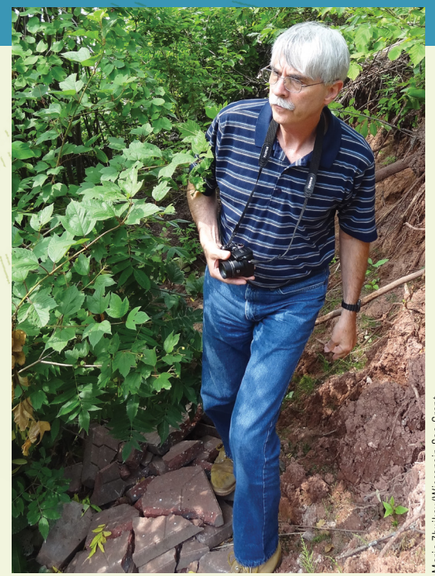
Wisconsin Sea Grant Coastal Engineer Gene Clark's last day in the office will be at the end of January. During his 15 years with the program, he has helped solve major problems plaguing coasts and landowners on lakes Michigan and Superior.

His standout accomplishments include the Sea Caves Watch Project, which is a boater safety effort in the Apostle Islands National Lakeshore, the freshwater steel corrosion issue in Lake Superior and the beneficial reuse of material dredged from Great Lakes harbors.

Clark's work on the steel corrosion project earned him Sea Grant's highest honor in 2014, the Sea Grant Association's Research to Application Award. Clark's work ethic and efforts earned him a 2015 staff excellence award from the University of Wisconsin System Board of Regents.

Ever the team player, Clark summed up his career with this: "Of the many projects I've worked on, the ones I feel best about were ones that were collaborative efforts with other partners. It was never just my work alone. That's what I'll always remember as one of the best things about this position."

A more detailed story about Gene's accomplishments and plans for after retirement is available on our website at go.wisc.edu/62sp46. — MEZ



Marie Zhuikov/Wisconsin Sea Grant

Gene Clark inspecting eroded properties along the St. Louis River after the 2012 flood.

Legends and Lore of the Great Lakes

Many people are fascinated by tales of the extraordinary and the unknown, so it makes sense that the mysterious Great Lakes and other large bodies of water have inspired far-fetched tall tales over the years. The library has a collection of folklore, legends and creation stories about water and the Great Lakes.

THE LEGEND OF SLEEPING BEAR

By Kathy-Jo Wargin. Chelsea, Mich.: Sleeping Bear Press, 1998.
In this retelling of an Ojibwe Indian tale, a mother bear loses sight of her two cubs as they all attempt to escape a forest fire by swimming across Lake Michigan.

SHIPWRECKS AND LOST TREASURES, GREAT LAKES: LEGENDS AND LORE, PIRATES AND MORE!

By Michael J. Varhola. Guilford, Conn.: Globe Pequot, 2008.
Twenty-one riveting stories and illustrations about ships that met their end in the treacherous waters of the Great Lakes.

THE SECRET OF BLACK ROCK

By Joe Todd-Stanton. London: Flying Eye Books, 2017.
This surreal modern folktale tells the story of an adventurous young girl who must protect a peaceful living creature.

A MILLION FISH… MORE OR LESS

By Patricia C. McKissack. New York: Knopf, 1992.
During an outing on the mysterious Bayou Clapateaux, Hugh Thomas claims to catch a million fish. Somehow, he arrives home with only enough fish for breakfast. What happened to all of Hugh's fish?

Please visit the Wisconsin Water Library online at **waterlibrary.aqua.wisc.edu** for more information about the Great Lakes and their legends.

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


NASA/GSFC

Jamey Ritter


Marie Zhuikov/Wisconsin Sea Grant

Jamey Ritter

"I can truly say there are few people I have known in life who were more kind and caring. Plus, just plain busy! Busy in a good way. Always intellectually curious. Always wanting to do the best job he could. Always putting his all into connecting in a meaningful way with others."

Moira Harrington, assistant director for communications, Wisconsin Sea Grant

John R. Karl (1963-2018)

Sea Grant videographer John Karl passed away in August, leaving behind a legacy of unwavering efforts to build science literacy, intellectual curiosity and cheerful goodwill.

Karl began his 20 years at Sea Grant as a writer in March of 1998 and gradually took on more video projects until he became a full-time videographer. He was instrumental in the Wisconsin shipwrecks projects from the very beginning, working as a co-investigator on funded projects and even diving alongside the underwater archeologists.

Tamara Thomsen, maritime archaeologist with the Wisconsin Historical Society, said, "John stepped up to the challenge of making our message about shipwreck preservation clear and consistent — which I imagine wasn't so easy at first. I worked with him on our joint website wisconsinshipwrecks.org. We co-presented lectures on several occasions, put together scripts for museum exhibits and museum kiosks, wrote maritime history geocaches and created more than 40 Maritime Trails markers together."

She continued, "To have a more active understanding of our research, John decided to learn to scuba dive and he participated in field work with us and filmed during many of our archaeological surveys of shipwrecks and historic dock structures. Impact from all of this work is now seen and recognized in all corners of our state. When he came out on projects with us, he would always be the first one in the water and the last one out. He just exuded happiness whenever he was underwater."

As videographer, Karl produced numerous videos illustrating the work done by Sea Grant and Water Resources Institute researchers, highlighting staff members and helping with Sea Grant Network projects. (See go.wisc.edu/s6263o.) One of those projects, a video designed to highlight the many accomplishments of the Sea Grant program over its past 50 years, brought Karl into contact with many members of the network and many opinions. It was not a simple project.

Paul Focazio of New York Sea Grant said, "John continued to shine through the years, most recently when it came to helping out with the 50th anniversary video — that was quite the challenging task, as I recall the conference call discussions."

Yet the video was a success, with the Sea Grant Communications Network praising John's efforts as "superb."

No description of Karl's legacy would be complete without acknowledgement of his kindness and enthusiasm.

Sea Grant and Water Resources Institute Director Jim Hurley said, "I've always been so impressed with how John could start a conversation with anyone, under any conditions. Maybe that's the keen sense of a storyteller, but I think it more of a person with a huge heart. John truly cared about his friends, the people he worked with, the people he interviewed and the people he just met. We'll miss him dearly."— EAW


Tamara Thomsen/Wisconsin Historical Society

ASC

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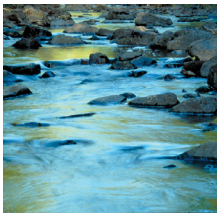
Aquatic Sciences Chronicle

a joint newsletter from UW Sea Grant and UW Water Resources



CALENDAR OF EVENTS

FEB. 2, 2019
Lake Sturgeon Bowl
Milwaukee
uwm.edu/freshwater/community-outreach/sturgeon-bowl

FEB. 14-16, 2019
Wisconsin Aquaculture Association Conference
Eau Claire, Wis.
www.wisconsinaquaculture.com

FEB. 19 - 21, 2019
Wisconsin Wetlands Association's Conference
Madison, Wis.
conference.wisconsinwetlands.org

FEB. 28 - MAR. 1, 2019
American Water Resources Association Wisconsin Section Annual Meeting
Delavan, Wis.
state.awra.org/wisconsin

MARCH 7 - 11, 2019
Aquaculture 2019
New Orleans
bit.ly/2M9gx00

Awash in Generosity

You are a generous person, and there's probably a list of organizations that hold meaning for you. As 2018 comes to a close, you are likely considering gifts to those organizations. Please consider adding Wisconsin Sea Grant and the University of Wisconsin Water Resources Institute to that list. You would be helping research, education and outreach to promote the sustainable use of Wisconsin's waters. Visit **go.wisc.edu/n6xjc2** for an online form or contact Moira Harrington at (608) 263-5371 or moira@wisc.edu to learn more.