



College of Letters & Science
UNIVERSITY OF WISCONSIN-MADISON



Trout Lake Station News

News for Alumni and Friends of the Center for Limnology

Summer 2023



Susan Knight and Erin Matula on Aurora Lake, Watercolor by Catherine Nelson



Photo: Riley Steinbrenner, Undergraduate Outreach Intern, Summer 2017



Renewal describes the past year for Trout Lake Station (TLS) and the Center for Limnology (CFL). During the summer of 2022, research returned to full capacity with students at TLS filling housing, designing new projects, tackling sampling two years delayed by COVID, and hosting 400 visitors at our annual [Open House](#). It is always inspiring when the students arrive in the spring but that feeling

was especially strong in 2022 since the arriving cohort were part of a generation whose in-person college learning experiences, like study abroad or internships, were limited in 2020 and 2021. Our 2023 summer is again running at full capacity with many new students enthusiastic to get their first hands-on experience learning about limnology and the incredible lakes and rivers of the region.

Renewal also comes from transitions. In recent years, we've celebrated, mourned and sometimes envied the retirement of five different Trout Lakers - individuals who cumulatively provided more than 150 years of service, experience, and knowledge to

our station. I am ever grateful for the knowledge, wisdom, and patient mentorship that our recent retirees provided as they passed the torch to new people. With Carol Warden seizing her role in [North Temperate Lakes Long Term Ecological Research](#); Amber Mrnak building new and innovative art, education, and outreach opportunities; and Jonathan Lytle joining as a mechanic to improve our marine fleet and ensure safe operations, we are excited by the new possibilities and strengths they bring to the CFL. And, by next year, we intend to create a Wisconsin Idea Researcher position at TLS to join the science team to further expand research partnerships and projects directly relevant to stewarding our local lakes.

With the growth and potential evident in our new and incoming staff, and the ever-inspiring young trainees that bring innovation and creativity to the program, I hope you join me in a renewed feeling of hope for all that is to come for the 2023 field season!

[Gretchen Gerrish](#), Director, Trout Lake Station
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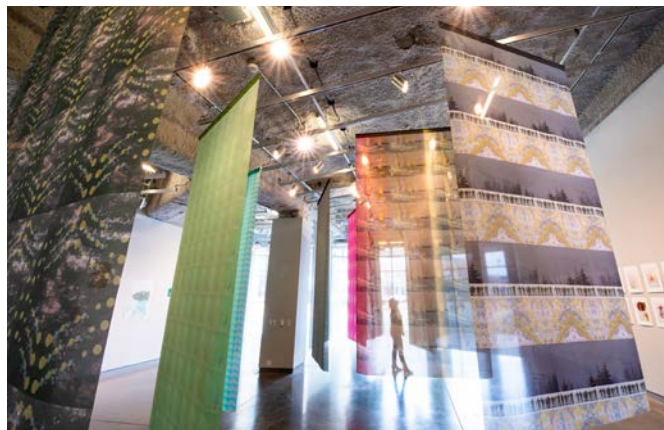
Better Late Than Never: Alice Hargrave Finally Arrives For Her 2020 Artist-In-Residency Stay

by Gretchen Gerrish

Thanks to COVID-19 protocols and international travel limitations, artist [Alice Hargrave](#) took an unusual route to her TLS artist-in-residence session. In fact, Alice arrived on station well after her limnology-inspired “Convention of the Lakes” exhibit was already on display!

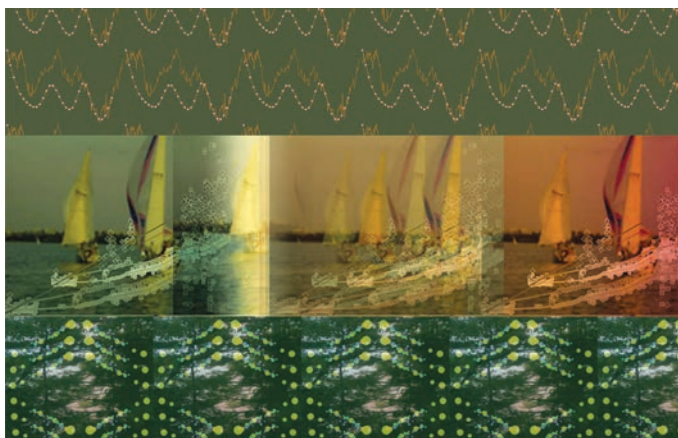
Alice learned about the long-running art residency program at TLS in the fall of 2019 at the Global Lakes Ecological Observatory Network ([GLEON](#)) meeting. Already in collaboration with Illinois State University Professor of Geology, [Catherine O'Reilly](#), Alice had developed the idea of tackling an art project to share lake data stories from around the world.

Her interest in a residency was both professional and personal. She has multigenerational connections to the area and its waters and describes the lake-rich Northwoods as her “spiritual home” where she built her “first memories of being in nature.” Alice, her grandmother, and mother grew up attending Camp Osoha, an all-girls summer camp formerly located on nearby Big Muskellunge Lake. She remembers family picnics at Cathedral Point on Trout Lake.



The fabric panels of Hargrave's Convention of the Lakes project allowed viewers to experience the work from multiple perspectives.

Inspired by both this place and the science, Alice began incorporating 20 global lake stories into her work. The following three Wisconsin lake stories were featured in her exhibit entitled Convention of the Lakes.



- Mercury concentrations in food chains of lakes tightly follows changes in lake water level. Higher lake levels correlate with more mercury in the fish we love to eat. ([Watras et al. 2020](#))

- Salt concentrations are increasing in the four big lakes around Madison over the last 50 years and road salts are the most likely driver of this change. ([Dugan et al. 2017](#))

- Ice off and ice duration are increasingly variable in Northern Wisconsin lakes and walleye are less successful in extremely early or late ice off years. ([Feiner et al. 2022](#))

In January of 2023, Alice finally arrived at Trout Lake Station for her residency, where she spent two wintry weeks in Halverson Cabin. With her Convention of the Lakes and Tracing Teal (a data and audio feature of bird calls) exhibits successfully installed and receiving visitors at the [University Galleries of Illinois State University](#), she spent her residency visualizing a new body of work celebrating the “fairy book” look of snow-whitened forests and lakes, reflecting on how these sights are “a luxury we don’t have in Chicago anymore.”



Whatever she comes up with next, we’re just happy we could help Alice continue her work, even if it was three years later than expected!



Susan Knight leans over the side of her "little baby jon boat" to identify plants in Allequash Lake. Photo: Adam Hinterthuer

After Four Decades Studying Northern Wisconsin Lakes, Susan Knight Calls it a Career

by Adam Hinterthuer

Anyone who has had even a passing experience with TLS has probably had the pleasure of meeting [Susan Knight](#). Perhaps they were a student living on station for the summer during one of her two stints as the interim director. Or maybe they were a spellbound visitor at our [annual Open House](#) watching her enthusiastically share her immense knowledge of aquatic plants. Or they might have heard her voice on the radio on WXPB's monthly "[Field Notes](#)" program, sharing stories with listeners about her adventures (and misadventures) on our Northwoods lakes.

Whatever their introduction, it's safe to say that they walked away sharing some of Susan's excitement about Wisconsin's invaluable freshwaters.

Which is why it is with great appreciation - and a little bit of sadness - that everyone at Trout Lake Station and the entire Center for Limnology community wishes Susan good luck on her retirement. After four decades conducting research on everything from Eurasian watermilfoil to wild rice to "[fairy rings](#)," Susan is calling it a career.

Susan first came to northern Wisconsin in 1981 when her husband, Tom Frost, was hired as director of TLS. "We were thrilled beyond belief to be embedded in this place with all these lakes," Susan recalls.

She began work on a graduate degree in botany studying jewelweed, also commonly called "touch-

me-nots," an orange-flowered plant that grows alongside many Wisconsin waterways. However, she soon found herself drawn more to the plants out in the lake rather than those on the shoreline. The carnivorous plant called [bladderwort](#) was her "gateway to aquatic plants," Susan says.

Not long after earning her degree, Susan was hired by the Wisconsin Department of Natural Resources (WI DNR) to conduct surveys of Wisconsin lakes and look for endangered aquatic plants. She spent her days in what she calls her "little baby jon boat" paddling around with a snorkeling mask strapped to her face so that she could stick her head underwater and look for plants. "I was sort of self-taught and had a couple of guides from the 1930's or 40's and would spend hours and hours keying stuff out," she says.

That DIY education in aquatic plant identification was the best job she ever had, Susan says, and it led to a long career in plant identification, resulting in her "pride and joy" - an assortment of 1,500 aquatic plant specimens that she collected, identified and preserved.

Susan hopes that the [Wisconsin State Herbarium](#), which is run out of the UW-Madison botany department, will add her aquatic collection to its current catalog of 1.37 million mostly terrestrial specimens.

But that collection of pressed plants is just a small part of Susan's amazing legacy. She has mentored countless students and colleagues, taught thousands of Wisconsin residents to better appreciate their aquatic plants and shepherded TLS through many changes, including the transition to new director, [Gretchen Gerrish](#).

Gretchen arrived on station just in time for the COVID-19 pandemic to upend everything. Having someone like Susan on hand was invaluable. "Susan has probably spent more time in person connected to the facility than anyone in its history," Gretchen says. "She is always the first to volunteer and will readily drop everything when someone needs help. Her humble and kind approach to mentoring and leadership are evident in the multigenerational connections she has maintained with people in agencies and academic institutions throughout the United States."

[Steve Carpenter](#), who worked with Susan for decades as a professor and director of the CFL agrees. "Susan has given us an exemplary career, tremendous public service, and leadership at a time we needed it," he says. "Someone once told me that our jobs as scientists have three components: truth, compassion, and responsibility. By these criteria, Susan Knight has shown us how to be scientists."

The good news is that Susan isn't actually leaving TLS. "I'll still be going out in my little baby jon boat [and pitching in on all sorts of projects]," she promises.

Which begs the question - what does retirement mean if you're still coming into work? Perhaps, we suggested, she can at least find more time for her two favorite hobbies - biking in the summer and cross country skiing in the winter? "Well," Susan says, "you got that right!"



Susan Knight and her legendary impersonation of a carnivorous bladderwort plant. *Photo: Kelly O'Ferrell*

2022 Gillum Award for Outstanding Graduate Achievement by Adam Hinterthuer

In 2021, Sandy Gillum generously worked with TLS to implement the annual Gillum Award for Outstanding Graduate Achievement. Sandy knew that graduate students are at the heart of the TLS community, serving as undergraduate student mentors, driving cutting-edge research and working to chart their future path in the freshwater sciences. With her award, Sandy helped ensure that we are able to foster the careers of these young scientists and recognize achievements in both research and publication in scientific journals. [Holly Embke](#) received the first ever Gillum award in 2021 for her deep involvement on station and research on how recreational fishing can impact species of fish, like the Northwood's iconic walleye.



Joe Mrnak on Sparkling Lake.
Photo: Cassie Gauthier

Northern Wisconsin fisheries continued to be a focus in 2022, as the Gillum award went to support [Joe Mrnak](#), a graduate student working with both the CFL and the WI DNR. Joe is researching the role that a lake's food web structure might play in tipping the balance between native and invasive fishes. One of his recent studies involved stocking Sparkling Lake with a native species

of fish called cisco to see if they could help control populations of invasive rainbow smelt and encourage the production of more walleye in the lake. Joe hopes his work can show the importance of a more "whole ecosystem" approach to fisheries management and provide more tools for maintaining healthy fisheries.

"I am very grateful for Sandy and her support," Joe says. He adds that the award helps him continue to be a mentor to the undergraduate students that work with him. "Mentorship has always been important to me," Joe says. "The famous quote by Sir Issac Newton always stuck with me, 'If I have seen further, it is by standing on the shoulders of giants.' I would not be where I am without my countless mentors [and] I try to 'pay-it-forward' every chance I get."

Trout Lakers Get Involved In American Fisheries Society

by Amber Mrnak



Summer 2022 TLS students gather at the 52nd Annual Meeting of the Wisconsin Chapter of the American Fisheries Society held 2022. Pictured: Quinn Smith, Elise Bass, Elle Krellwitz, Max Monfort, Max Wilkinson, Austin Mannigel, and Joe Mrnak

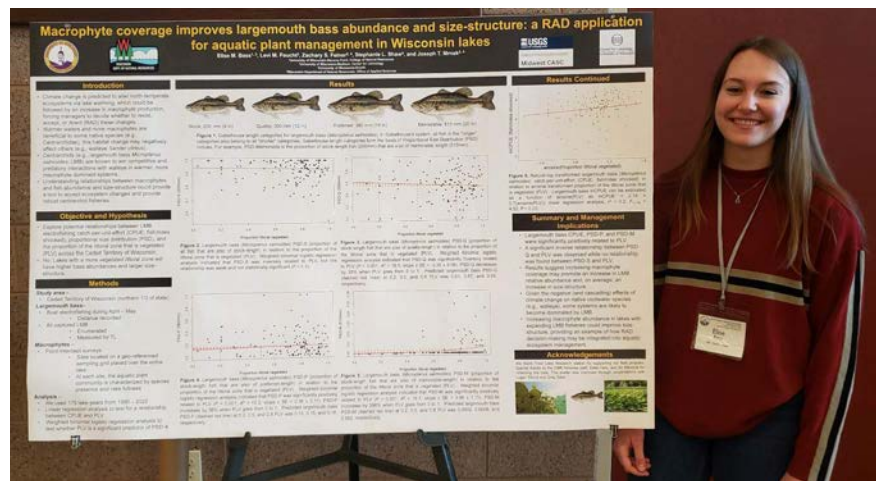
This past February, many current and former TLS students and scientists gathered in Stevens Point for the 52nd Annual Meeting of the [Wisconsin Chapter of the American Fisheries Society](#) (WI AFS). AFS bills itself as “the world’s oldest and largest organization dedicated to strengthening the fisheries profession” and participating graduate students, undergraduates, and professionals had opportunities to network and share their research with other fisheries researchers from across the state.

PhD candidates [Joe Mrnak](#) and [Quinn Smith](#) have been WI AFS members for years and encourage students they mentor to become involved. This year, that meant taking all five

of their 2022 summer undergraduate students to the conference. When asked what they gained from the opportunity, Joe answered “What didn’t they gain?” Professional societies offer a safe and nurturing environment for students at any stage in their careers and “provide opportunities to network, collaborate, learn science, generate new ideas, and sit in on talks,” he says.

One experience that was new to many of the undergraduates was presenting their research during a scientific poster session at the conference. “It was incredibly rewarding to watch students progress through the different parts of science,” Quinn says, “from forming questions and a hypothesis, conducting field work, analyzing the data and then communicating [their] results.”

Joe notes that “until you start publishing papers, presentations [at conferences like this] are the currency in our field.” Whether presenting or not, everyone made connections with many established professionals, had conversations with people pursuing similar research, talked to prospective graduate advisors and employers, and attended professional development workshops- one of which was co-led by Joe called Tips and Tricks to Become a Successful Researcher. Why is getting students involved in AFS so important? “AFS has done so much for me, it got me to where I am,” Joe says. “Pay it forward.”



Elise Bass shares her research at the poster session. Her poster is titled Macrophyte Coverage improves largemouth bass abundance and size structure: a RAD application for aquatic plant management in WI lakes

Collaborations Between Trout Lake Station and Lac du Flambeau Tribe

“Just Makes Sense” by Adam Hinterthuer

For nearly one hundred years, TLS has helped facilitate research to better understand, manage and protect northern Wisconsin lakes. But for the members of the Lac du Flambeau Band of Lake Superior Chippewa Indians, knowledge about these amazing freshwaters goes back to long before University of Wisconsin researchers drove up from Madison in the early 1900's.

Trout Lake Station occupies ancestral Anishinaabe (Ojibwe) land and is located within the Ceded Territories of the Lake Superior Chippewa Tribes. It is also only a dozen miles from the sovereign nation of the [Lac du Flambeau Tribe](#). The Tribe has called the area home since 1745, when Chief Keeshkemun led them west from the east coast in search of the “food that grows on water.” That food was manoomin, or wild rice, and it is now one of several ways in which TLS and the Lac du Flambeau Tribal Natural Resources Department are connected.



Student artist Cameo Boyle practices her pastel skills with peer artist Cate Nelson during an en plein air work session. Photo: Terry Daulton

In fact, the Tribe and TLS are currently collaborating on a number of projects – from research on wild rice and walleye parasites, to projects on the intersection of science and art and workshops designed to connect Indigenous community members with the freshwater sciences.

These collaborations “just make sense,” says Celeste Hockings, Natural Resource Director for the Lac du Flambeau Tribe. “It’s how our department works,” she says. “We are very holistic in thinking about how what we’re doing informs or impacts other departments or projects.” Partnerships with TLS connect university scientists to the Tribe’s deep knowledge of Northwoods waters and give her department access to resources they may not have on hand.

TLS Director, [Gretchen Gerrish](#), agrees that the Tribe is a “natural” partner for much of the work being done on station. While Indigenous perspectives have been integrated into research projects “episodically” over the years, Gretchen says those initial relationships now appear to be leading to more formal collaborations.

For example, TLS and the Tribe are currently partnering on a WI DNR surface water grant to document wild rice declines in lakes both on the reservation and in the Ceded Territories. And the “[Drawing Water](#)” program, a science communication effort that connects student artists with scientist and artist mentors, was a good fit for collaboration on a grant. Not only is “art inherent in the Tribe’s interaction with the landscape,” Gretchen says, “but one goal of the project is to better connect with community members in the region.”

One of those community members is TLS postdoctoral researcher [Ray Allen](#). Ray grew up on the Lac du Flambeau reservation and was recently elected as a general council member for the Tribe. After receiving his Ph.D in biology from Duke University, he moved back home and began studying how climate change is impacting freshwater fishes.

During graduate school, Ray participated in a Summer Internships for Indigenous Peoples in Genomics workshop ([SING](#)). SING was designed to bring more Indigenous leadership and perspectives into the field. That experience “was my first time being in a room with so many other Indigenous researchers,” Ray says, and it enabled him to begin to “build a community.”

Inspired by that experience, Ray developed a successful proposal to create a similar program for the freshwater sciences here. Called [Phenological Workshops for Indigenous Peoples in Limnology](#), or PHIN for short, the project will connect Indigenous people from all different career stages and backgrounds to the basics of limnological research and create conversations about freshwater resources and important cultural and socio-economic impacts.

According to Celeste, this summer’s large number of collaborative projects raises one big question – “Why not?” “[Trout Lake Station] is only fifteen minutes away from us and species, in general, do not know boundaries,” she says. “Managing any resources, you have to think of the whole picture. In order to protect those resources, what better way than building relationships with TLS and other associations and groups throughout the Ceded Territories?”

Trout Lake Station - limnology.wisc.edu/trout-lake-station-welcome/

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CFL and TLS support webpage:
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or contact

Gretchen Gerrish at
ggerrish@wisc.edu (608-890-4763)

or

Jake Vander Zanden at
mjvanderzand@wisc.edu (608-262-3014)

Trout Lake Station Wins 2022 Business of the Year Award



A subset of TLS folks were around to received the award from Kathy Schmitz from the VCEDC

Trout Lake Station is globally recognized for its leadership in the field of freshwater research, and now it's locally recognized as well! We were honored to be named 2022 Business of the Year by the Vilas County Economic Development Corporation (VCEDC).

We are lucky to be located in a community that values our freshwater and all that it offers. We look forward to continuing to work toward our goals in research, education, and stewardship within our community and beyond and are thankful for all of our inspiring regional partnerships.

[Read full article.](#)