



UPSTREAM

News from Itasca Biological Station and Laboratories

Student participants in the Find Your Field workshop learning how to catch fish with a seine net on Lake Itasca's shoreline.

Photo: Stephanie Xenos

First timers in the field

Students try field biology and learn about career opportunities at Itasca's inaugural 'Find Your Field' workshop.

It's one thing to learn about birds in a classroom. It's another to learn how to set up a mist net, safely handle wild birds, and collect samples that contribute to real research. During the recent Find Your Field weekend at the Itasca Biological Station and Laboratories (IBSL), students in Professor Keith Barker's ornithology module helped gather saliva samples from birds and test for salivary amylase – an enzyme that breaks down starches. Their work contributed to an ongoing study exploring how birds digest food and adapt to their diets.

"Field experiences bring science to life for students, reminding them that even the most seemingly esoteric biology is rooted in the nature that surrounds us," says Barker, a professor of Ecology,

Evolution, and Behavior in the University of Minnesota's College of Biological Sciences. He was one of six instructors who led field biology modules as part of this new program hosted by IBSL in early October. Nearly 40 students attended the free three-day experience, which for most was their first opportunity to engage in hands-on field biology.

Removing the intimidation factor

The workshop was designed to lower the perceived barriers to entry into field science and introduce University of Minnesota undergraduates to career paths in the field. The program's core goals were to allow students to try out different types of field

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DIRECTOR'S MESSAGE



Director Jonathan Schilling

Greetings from Itasca!

I hope this note from the North finds you well. We are winding down another record-breaking year. Things went smoothly, except for some disruptions that were reliably unique. We appreciate consistency but are experts in improvising.

By working with artists over the years, including our Big River Continuum projects, I have grown appreciation for this word “disruption.” To be clear, I do not mean “destruction.” Art can be many things, including disruptive. When art confronts our habits and conventions, it can clear the cobwebs and open new possibilities. But disruptions threaten our control, and control is the goal of science, so scientists often suppress disruptions out of habit.

If you look at Itasca’s natural history, there is a lesson in disruption versus suppression. The goal of early 20th-century forestry at Itasca, and elsewhere, was to have a “climax forest” that maximized tree crop yields. Fires were suppressed at Itasca, despite centuries of Ojibwe people living with and setting fires. In 1954, Stephen Spurr, a Yale forestry graduate and new faculty member at the University of Michigan, published a landmark paper in *Ecology* on the forest fire history of Itasca. This paper outlined how fire disturbances were key to the success of Itasca’s pine-dominant forests. Although fire suppression saved some mature trees, pine seedlings needed understory-clearing fire to flourish. Itasca-based research became a global contribution to fire ecology that continued with Sidney Frissell, Herb Wright, and Myron “Bud” Heinselman, who themselves did disruptive things like protecting the Boundary Waters.

Disruption can be healthy if you’re adapted to it. This winter, I’m thinking like the pines.

Enjoy reading *Upstream*, and thank you all for supporting Itasca. -Jonathan

Itasca named We Are Water site

Itasca Biological Station and Itasca State Park chosen to co-host statewide initiative exploring Minnesotans’ connections to water.

Itasca Station has been selected as a 2026 co-host with Itasca State Park of We Are Water Minnesota. This interdisciplinary, collaborative effort, led by the Minnesota Humanities Center and the Minnesota Pollution Control Agency, features a traveling exhibit that invites communities across the state to explore how human activities affect – and are affected by – water.



As co-hosts, the station and the park will offer programs and events that spark dialogue about the water issues that matter most in the Mississippi Headwaters region. Station Associate Director Emily Schilling has previous experience with the program, teaching a course by the same name and collaborating with We Are Water staff to integrate its approaches and content into the course. Building on this experience, she proposed that the station and park apply as co-hosts and worked with park naturalists to apply. Schilling recently participated in a two-day training with Department of Natural Resources (DNR) colleagues from Itasca State Park and others in the We Are Water 2026 cohort. The sessions included revealing absent narratives, exploring art as a medium for engagement, and a behind-the-scenes look at the design studio and warehouse for the traveling exhibit.

Schilling and her DNR collaborators are primed to develop an engaging, meaningful experience for station and park visitors during Itasca’s hosting period from June to August. Visitors and community members will be able to engage with the physical exhibit in the Lakeside Museum near the Mississippi Headwaters.



Nature of Life (NOL) started with a bang – literally. Instead of buses arriving for session 1, a severe storm crushed the region and the station lost power for three days (see “Storm recovery” on page 3). Session 1 was canceled while station staff worked to restore operations. The NOL team pivoted, and sessions 2-7 went off without a hitch!

Facilities improvements, inside and out

Station facilities improvements are a group effort.

With saws, sewing needles, and secondhand finds, station staff put their resourcefulness to work. Jonathan routed a new wooden station entrance map. Dawn purchased a chilled buffet bar. Emily and Eric initiated a composting program, collaborating with State Park friends to share collection services. But the big buzz was the Cabin 51 (Scout's Cabin) remodel. Eric, Jake, and Rick put love into the craftsmanship, using reclaimed wood and creating beautiful (and cheap!) concrete countertops. Emily and Heather turned thrifting into an art form, pairing furniture repurposed from other cabins with secondhand finds to furnish it in sustainable style. Dylan and Emily (Cloutier) even made new curtains before they cleaned the cabin for incoming guests.



Storm recovery

Before dawn on June 21, with 63 researchers and Nature of Life staff on site, a severe thunderstorm warning was issued at Itasca. Just three minutes later, a beast roared through, clocking 87 miles per hour wind gusts. The Schillings in Cabin 4 watched a massive spruce tree fall across Faculty Row, and about 50 trees, many old-growth giants, toppled around campus within minutes. Some buildings were hit. The storm then raced north, with winds gusting along Lake Bemidji to 125 miles per hour, equivalent to an EF2 tornado or a Category 3 hurricane.

First, and most importantly, nobody at the station was hurt. Second, after three days without power and sewer, while listening to generators and smelling chainsaw oil and sawdust, we were back online. We witnessed Eric Sather's leadership, and the crew made ordinary what was truly extraordinary. Eric celebrated his last major chainsaw cut (a "hung up" 31-inch diameter pine) by sharing smoked chickens in a celebratory staff lunch. This is your Itasca Station.



Field biology courses were a wonderful success! Enrollments grew again. Across six offerings, 56 students were on site in May and June (with a total enrollment of 87). Student energy was high during seminars, classes, and activities, and the long-standing, "athletic" dominance by faculty and staff volleyballers finally ended.



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Decoding drought vulnerability in Minnesota trees

Itasca Seed-to-Root research fellow Moab Andrade is setting the stage for critical insights into tree survival under stress.

Trees employ different strategies for weathering dry conditions. Understanding what's happening at a structural level could provide important clues about tree survival in a changing climate. Moab Andrade, a postdoctoral researcher in the lab of Chris Smith-Martin, spent six weeks at Itasca Biological Station this summer setting up a multi-year experiment to do just that.

To launch this ambitious effort, Andrade and Smith-Martin, an assistant professor in the Department of Plant and Microbial Biology, selected 15 representative native tree species. Focusing on abundant trees like maple, oak, and pine, Andrade's work creates a crucial physiological layer of data atop existing growth and mortality records.

An expert in plant hydraulics, Andrade looks at the water-conducting tissue in a tree, or xylem, to understand its drought vulnerability. One of the metrics he focuses on is P50. This is the water potential at which a tree loses 50% of its hydraulic transport capacity, indicating its inherent drought vulnerability.

"Coming from a background in restoration, I know we can't restore what we don't fully understand," says Andrade. "Our goal here is to take those fundamental hydraulic measurements,

like P50, and use them to predict which species can truly weather the climate shifts ahead."

To capture a complete picture of drought resilience, Andrade is using multiple high-resolution techniques. Beyond P50, he measured the Turgor Loss Point (the moment leaf cells lose firmness, signaling stomata to shut down water loss) and minimal leaf conductance (the tiny amount of water lost through the leaf's skin, even when stomata are fully closed).

Andrade also installed tiny, sophisticated instruments called point dendrometers on tree trunks that track the daily variation in a stem's growth and shrinkage.

"The point dendrometers are the game-changer," explains Andrade. "We are seeing a tree's daily stress level – its tiny, rapid movements – in near real-time. By coupling this with the soil moisture data, we're moving beyond simple growth to predict future risk with unprecedented detail."

This combined data set will ultimately help predict which species are best positioned to withstand the warming temperatures and episodic droughts of the future. -Stephanie Xenos

Quiet Work, Big Impact

A team of College of Biological Sciences staff works behind the scenes to ensure the Nature of Life program runs smoothly at Itasca.

Come November, the busy days of the previous summer's Nature of Life (NOL) sessions at Itasca are in the rear view, but preparation for the next round is already in motion. A team of supportive staff, both at the station and back on the Twin Cities campus, is already hard at work preparing for the following year.

“One of the biggest challenges for [a remote field station like Itasca] is not having access to all of the lab supplies and equipment that we have on campus,” says Sandy Mand, director of the College of Biological Sciences (CBS) Instructional Labs. “So I work with Itasca staff through winter and early spring to figure out what we can and can't do to support classes. By April, we're already packing.”

Getting ready for NOL at Itasca is a true team effort. The CBS Labs staff coordinate with station staff and course instructors several months in advance to ensure that the tools and materials needed for hands-on learning are in place for next year's visiting students. While the CBS Labs staff are busy on campus organizing lists and packing supplies, the Itasca Station team is making sure everything on site is ready to go.

Come summer, CBS Labs staff are ready to pack vans to stock Itasca's laboratories with standard equipment like pipettors, dissecting scopes, and microfuges. They also travel with specialized equipment, like nanophotometers and fluorescent microscopes with cameras and computers. With a four-hour drive between Itasca Station and the Twin Cities campus, there's no room for error. Everything is meticulously planned and executed by CBS Labs staffers who dedicate part of their summers to assist with NOL setup. “During Nature of Life, we

go through every lab building and get all of the supplies for each instructor in each of the classrooms, and do another check to make sure we have everything,” says Mand.

Station Scientist Victoria Simons preps equipment and materials stored at the station and handles logistics for instructors teaching field-based modules. “I coordinate with CBS Labs on equipment distribution, and work with the DNR and Itasca State Park to make sure all activities meet our state and federal permit requirements,” says Simons. In June, when the CBS Labs team arrives, Simons and the station's student interns pitch in to unpack, sort, and set up both lab and field materials so everything is in place for a smooth start to the program.

Much of the preparation by CBS Labs and station staff happens out of sight, from stocking labs to readying field equipment and boats – all completed by the time students and instructors arrive. “That just means that we're doing our job really well, and nobody's concerned about what's happening,” says Mand.

–Emily Schilling and Adara Taylor



ORGANISM SPOTLIGHT

Snapping turtle

Snapping turtles (*Chelydra serpentina*) lay their eggs in May or June, and a female typically lays between 20-30 eggs. However, the majority of eggs are depredated by raccoons and foxes. After an incubation period lasting between 55 and 125 days, the surviving eggs hatch in the early fall. Once hatched, babies make their way downhill in efforts to find water. They will not eat during this time, but instead spend their energy finding a safe place to overwinter in the muddy lake bottom. By lowering their heart rate and body temperature, these turtles survive until spring, when they begin foraging for food. –Victoria Simons



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work, and spark interest in returning in the spring for the station's three- and five-week courses. Participants spent the weekend engaging in hands-on field biology experiences spanning limnology to mammalogy, exploring Itasca State Park, and learning about professional opportunities in the field.

"We recognize that enrolling in a multi-week residential course can feel like an intimidating leap, especially for students without prior field exposure," explained IBSL Associate Director Emily Schilling, a key organizer and instructor. "To lower that barrier, we designed this opportunity at Itasca as a supportive, exploratory entry point."

Students responded with enthusiasm. Nearly 80 students applied. The workshop was open to students regardless of major, drawing a diverse cohort from 15 majors across three colleges, from Biology to American Indian Studies.

Immersed in a living laboratory

For Gail Wery, a sophomore majoring in Fisheries, Wildlife, and Conservation Biology, learning new techniques in the fisheries module was a highlight. "It was so much fun. I remember getting back and telling my friends and family what I was doing out there, and they were so excited for me. My favorite part was seine netting in the fisheries course." For his part, module instructor Mark Hove, a research scientist and advisor to the Fisheries, Wildlife, and Conservation Biology Club, considers field stations an ideal setting. "As an instructor, I can only offer students a limited number of insights," he says. "Being in a natural setting like that, at the field station, expands learning opportunities tremendously!"

Longtime IBSL field biology instructor Brian Wisenden, a faculty member at Minnesota State University Moorhead, echoes

the sentiment. "'Find Your Field' was a great way to introduce students to the rich, immersive learning environment at Itasca. Active learning in natural field conditions is a completely different experience compared to courses taught in a campus-based setting." Wisenden, who led the animal behavior module, adds: "Students were able to sample the field courses that are offered each summer and interact directly with the instructors who teach them."

A collaborative effort

The workshop was a collaborative undertaking, led by IBSL staff working directly with student leaders from four student groups, including the Ecology, Evolution, and Behavior Club, Fisheries, Wildlife, and Conservation Biology Club, Insect Club, and Marine Biology Club.

Henry Rosato, president of the Ecology, Evolution, and Behavior Club, helped secure a \$2,000 grant from the Ecological Society of America's SEEDS Program, an initiative dedicated to diversifying the field of ecology.

For Rosato, the value of "Find Your Field" extended beyond the science. "You could see how people were starting to build this kind of community. I hope they can take that sense of belonging back with them to the Twin Cities."

For their part, participants described the experience as both illuminating and inspiring. "Being here helped me see what field work at a station would be like." Many emphasized the value of hands-on field work, noting that performing the same sampling techniques used by professional researchers helped bring classroom learning to life and piqued their interest in field science. As one student reflected, "The modules were really interactive and brought presentations into reality." Another



Students participated in field course modules and experienced what it is like to live and study at a biological field station.

shared: “Participating in field work, seeing what it is really like, helped solidify future career aspirations.”

Students also praised the sense of community, sharing that interacting with peers and instructors who were equally passionate about ecology was a highlight. One noted, “Everyone that I met was so nice and equally excited to be here and doing field ecology. It was really fun to be in that environment,” capturing the widespread appreciation for the collaborative, immersive experience.

For Schilling, it’s all about sparking curiosity and instilling confidence. “We hope students leave with a stronger sense of belonging in the field sciences, and greater confidence in their ability to participate in field-based courses and research,” says Schilling. “We want the experience to ignite curiosity, encouraging students to seek out further opportunities to learn, explore, and grow in field settings at Itasca and beyond.”
-Stephanie Xenos

Where craft meets curiosity

Science of Craft returned to Itasca Biological Station and Laboratories (IBSL) this summer, inviting participants to explore the connections between science, practice, and nature. Dozens of participants immersed themselves hands-on in nature journaling, fly fishing, and nature writing. Modeled on folk school offerings with a science-y twist, IBSL introduced the short courses last year. “We wanted to offer the community an opportunity to explore creativity and craft within the context of nature and science,” says IBSL Associate Director Emily Schilling. “It’s something we are uniquely positioned to do as a biological field station located in one of the country’s most iconic state parks.” The Science of Craft series is designed to blend field-based science with reflective and skill-based practices, offering accessible short courses open to the public.

Learn more about Science of Craft at z.umn.edu/scienceofcraft



Staff spotlight: Dawn Wannebo

Dawn Wannebo has been the lead cook at Itasca Biological Station since 2006. She leads a crew of six food service employees who produce thousands of meals each year. She shares some of her favorite things about working at the station.



Can you share a little bit about your background and what inspired you to get a job working at the station?

Former Resident Biologist Jon Ross was a friend, and he asked me to apply because of my restaurant background. I didn’t get hired! The cook at the time picked someone else. Later that season, the new hire had a conflict with a co-worker who left in a huff and was released! Lucky me, I got the phone call and started work the following week. I have always enjoyed cooking and have worked in several restaurants since my late teens.

What is one of your favorite memories from your time as a cook?

The 100th anniversary of the station was by far my favorite memory. It was scheduled to be catered, and I was quite vocal about us preparing the sit-down meal for the event. It was a great success and our first standing ovation.

What’s your favorite dish to prepare?

I can’t say I have a favorite dish, but I love to use fresh vegetables cooked properly. I really enjoy making soups and foods with ethnic diversity.

What’s your favorite thing about the station?

It is just a beautiful place to work. I love the beauty at 4:30 a.m. as well as 8 p.m. I work with a wonderful group of people, co-workers, and bosses! I get to do something I love every day.



The importance of place

A new fund aims to ensure Itasca continues to thrive as a destination for students, researchers, and the community.

Itasca Biological Station and Laboratories is a touchstone for generations of students. Through field biology courses, Nature of Life, and other programs, it has served as a springboard for transformative, one-of-a-kind experiences. Longtime College of Biological Sciences supporters Mary Kemen and Brian Randall recently helped launch the Itasca Strategic Initiatives Fund to provide funds for Itasca staff to make timely investments in infrastructure, equipment, and programs.

“Students I’ve met volunteering at the CBS Conservatory give rave reviews of their time at Itasca. The staff and facilities are extraordinary. Brian and I wanted to help get this fund off the ground, and hope others will join us in supporting the great work happening there and ensuring students for many years to come can have their own Itasca experience.”

Learn more about the fund: z.umn.edu/ibslfund

