



UPSTREAM

News from Itasca Biological Station and Laboratories



A bluebird in one of Sarah Knutie's nesting boxes near IBSL.

Bluebird friends

Research on bluebirds and their parasites at Itasca inspires a scientific collaboration across the birds' range.

To some people living near the Itasca Biological Station and Laboratories, Sarah Knutie is known as the “Bluebird Girl.” That’s because Knutie, an associate professor at the University of Connecticut, has installed and monitored nest boxes for eastern bluebirds and tree swallows in the area since 2014. Every year, she adds more boxes, which now number more than 200. Many are located in backyards and sometimes when Knutie can’t observe what’s happening with the nests the ever-enthusiastic property owners check and report back.

The nestlings and their parents are not alone in the boxes. They are accompanied by blowflies, parasitic insects that, as

larvae, bite and suck blood from the birds. Knutie investigates how environmental factors like temperature impact the relationship between these parasites and their hosts. The work requires persistent observations during the nesting season, often every other day. This is considerable given that it takes two full days to make a complete round of the boxes. The team collects body measurements, drop-sized blood samples and other data.

For a recent publication in *Oecologia*, the researchers manipulated the temperature in a portion of the boxes by lifting each nest with a metal spatula and placing a heat pack underneath. They replaced the packs every other day

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DIRECTOR'S MESSAGE



And so it begins

I hope you are all well and visions of flowers, flip-flops and field research have replaced memories of one of the snowiest winters in recorded history.

Here comes 2023 field season! Here at Itasca we are anticipating an incoming wave of visitors (7,000+) that continues getting bigger each year since those Covid-19 quarantine days.

Right now, other field stations like Itasca of similar size (we are a big field station!) and similar focus on student experiences are preparing to surf their own seasonal waves. Flathead Station at U. Montana, the U. Michigan “bug camp,” UVA Mountain Lake, and SUNY-ESF Cranberry Lake in the Adirondacks – each field station holds its own history, natural setting, leadership, facility capacity and student body. These are biological stations with place-based programming and long-distance relationships with home institutions. We all must continue to build relationships with college and University leadership, as well as stay connected with one another, as we continue to support critical research and educational missions that are grounded in a place, not a concept.

This networking is something that the Organization for Biological Field Stations enables, as does the NSF Field Station and Marine Laboratory program. Take a look at these stations and programs if you feel like you want a better perspective on Itasca. We may love our institutional rivalries and how we measure up, but with a shared mission to protect nature, most field stations are in it together.



Betsy Swanner holds up a practice ice core from Lake Itasca before hauling the ice corer to Deming Lake.

A methane mystery, revisited

Dr. Betsy Swanner and her team return to Itasca for another season of ice core sampling.

It should come as no surprise that plentiful lakes draw many researchers to the Itasca region. Some are drawn to lakes that resemble iron-rich oceans of a bygone era. This trait is what attracted Dr. Betsy Swanner, a faculty member at Iowa State University, to Itasca to study lakes near IBSL, including Deming, Budd, Arco and Josephine for just this reason. She and her team returned this winter to conduct field work.

Because of their stratified layers, the biogeochemistry of the lakes resembles iron-rich oceans from 500-million years ago. Swanner aims to disentangle how carbon and oxygen move through the system and sort out what microbes are involved. Higher iron levels might promote the production of methane – a potent greenhouse gas – by reducing oxygen levels.

From left: Chadlin Ostrander and Andy Heard from Woods Hole Oceanographic Institute take readings of temperature, oxygen and conductance. Swanner takes light measurements. Base camp for two days of fieldwork on Deming Lake.



What's to love about winter?

A lot as it turns out! Station Biologist Daniel Brumm offers a handful of reasons researchers and students brave the cold and head north.

The station is peaceful. Both IBSL and the park have much less activity in the winter. With the blankets of snow, staying at the station can feel very cozy. It is almost as if the station is resting, so that it's ready to take care of us all summer.

There's a long history of winter research at Itasca. Winter is a time to collect lake sediment cores for paleolimnology reconstructions. In the past, an annual beaver lodge census was also conducted during our coldest season. Researchers visited in the winter for limnology and small-mammal research. An important long-term dataset developed by station staff is a record extending to the late 1980s of the date of ice in and ice out on 10 lakes and ponds in Itasca State Park. This generally leads to a lot of discussion among station staff about ice conditions throughout the winter.

The season is ideal for some types of fieldwork. Though Wilderness Drive and the South Entrance Road are both closed in the winter, other areas in the park become more accessible!

If the snow is deep, snowshoes make it possible to traverse the forest. If there is little snow early in the winter, you can walk across the frozen lakes to shores that would require a boat to reach during the summer. It becomes much easier to see and walk through the forest when the vegetation is dormant and there is no snow.

Visitors get to see Itasca at a time when most visitors do not. Season change is one of Minnesota's greatest features and seeing familiar places during different seasons can be fun. Plus, no need to plan for bugs or poison ivy in the winter!



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Field guide

IBSL instructor Brian Wisenden’s animal behavior course at Itasca gives students a deeper perspective on field research.

Working in a lab setting offers scientists a measure of control. That’s often a plus as they try to connect cause and effect. But for animal behaviorists like Brian Wisenden, those constraints can often lead to a whole new set of problems.

“Lab studies always carry the risk that behaviors observed are an artifact of captivity,” he says. “An analogy might be that you can’t learn about wolves by studying miniature poodles that spend most of their time being carried in the purse of a rich person. It is very important to study animals in the context of where the animal evolved.”

For Wisenden, a professor of biosciences at Minnesota State University, Moorhead, this pursuit comes to life at Itasca Biological Station and Laboratories. He has led a field biology course on animal behavior at the field station every summer since 2000 except during the pandemic. During the five-week class, Wisenden spends less than an hour each day lecturing students on animal behaviors ranging from habitat selection to courtship or foraging. Most of the day focuses on getting students to discover and explore within a different context.

“I not only teach them about animal behavior, I teach them how to be animal behaviorists,” he says. “Each day is an experiment. Students collect data for most of the day, we then pool class data, draw conclusions from statistical inference, and write a formal report in standard scientific format citing primary literature. That’s the full package of what it is to be a field biologist. Learning biology in a field setting is a completely different experience from classroom learning. It is an apprenticeship.”

This chance to get a hands-on look at what life looks like as a field biologist not only gives students the chance to find new insights on the behavior of animals in Minnesota’s northwoods, but also potential career paths.

“At the Itasca station students can visualize, often for the first time in their career as a student, themselves being a biologist,” Wisenden says. “The small class sizes and full days of 1:1 interaction with a faculty person doing cool biology is transformative.” – Lance Janssen

“At the Itasca station students can visualize, often for the first time in their career as a student, themselves being a biologist.”

Meet Jake Sauer

The new maintenance staff member shares his thoughts on joining the field station.

What interested you in the job?

I joined the team at Itasca for a few reasons. First, the location. Living less than three miles from the station made for a convenient location to work. I was also interested in joining the team in Itasca from past experiences as a young kid. Growing up, I not only lived near the park but was friends with a former University employee's kid and spent time at the station.

Any projects you are particularly excited about?

One of the projects I am most excited about is seeing the completion of Building 43. I've spent quite a bit of time on that and I look forward to seeing the finished project. I've enjoyed maintaining the grounds and the carpentry that the job has entailed. I like the diversity that comes with the job. Every day I am doing something different.

What's a unique part of working at Itasca?

Working in Itasca State Park is unique to say the least. In my previous jobs I was on the road a lot. I thoroughly enjoy my five-mile round-trip drive to work every day. Being able to drive through the park and enjoy the wilderness and wildlife is great.



Nature of Life turns 20

For two decades, incoming students in the College of Biological Sciences have come to Itasca Biological Station and Laboratories the summer before they start their first year on campus for Nature of Life (NOL). Part science bootcamp, part summer camp, students participate in field biology and lab work and meet their faculty and peers over the course of four days. They leave with newly minted friendships and the signature maroon-and-gold tie-dye T-shirt. NOL peer mentors develop a new design each year. The shirts serve as a memento and as a sort of beacon, making students easily recognizable to one another back on campus.



Sharing the love

Field bio alum Jessica Jahn wants to get others up to Itasca and out in the field

After taking field biology classes at the Itasca Biological Station and Laboratories as an undergraduate, Jessica Jahn was hooked. She fell in love with the classes, the students, the professors, the environment, pretty much everything except the insects! She emerged from the experience motivated to spread the word. Jahn and her good friend and fellow IBSL enthusiast Madie Cloutier decided to form the Itasca Booster Club.

“Working in the field gives scientists the chance to observe and test behavior in a way that can’t be done in a lab setting,” says Jahn. “Field work keeps you on your toes, and I love the challenge of solving problems and adapting to unexpected events – like a hedgehog stuck in a trap meant for a mouse.”



What’s in your backpack?

Camera - “I love taking photos when I’m in the field, especially of animals!”

Water bottle - “Bonus points if it’s an insulated water bottle, but being dehydrated in the field is not fun.”

Fanny pack - “It’s super helpful to carry small things that you use a lot, and it’s not as heavy as a backpack.”

Tick remover - “I seem to be a tick magnet sometimes, and it’s good to remove them as quickly as possible.”

Book - “There’s often some down time in the field and it’s also good for entertainment on the way to and from field sites, although I’m careful to only bring books that I own.”

ITASCA INSIDER

Field, then feast

The kitchen staff at Itasca Biological Station and Laboratories prepares thousands of meals each field season (more than 16,000 meals one season!). According to Dawn Wannebo, longtime head cook at the station, the biggest challenge is keeping the meals interesting and healthy no matter the numbers. She’s also particular about the ingredients.

“Locally grown is a pet project of mine,” says Wannebo. “Starting in May with asparagus and rhubarb, June micro greens and lettuces. We really emphasize local strawberries in July! End of July through August sweet corn, peppers, lots of tomatoes, green beans, zucchini and potatoes. Every fall we get enough local wild rice to last for the following year. We use local beef and pork when we can get it.”



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to maintain the target temperature. The paper's lead author was Lauren Albert, a former undergraduate student in Knutie's lab. Their findings revealed that tree swallows had fewer parasites in heated nests than in unheated ones. Meanwhile, bluebirds had more parasites in heated nests. Trends for survival rate and body measurements also varied between the species. The differences suggest that in a changing climate, some species will benefit while others will not.

Knutie first came to Itasca Biological Station and Laboratories in 2004 as an undergraduate student majoring in Ecology, Evolution and Behavior. She took summer field courses in animal behavior and ornithology and, with instructor encouragement, came to recognize her knack for identifying bird songs and calls. "I guess the rest is history," she laughs.

After collecting data from the Itasca nest boxes for four seasons, Knutie launched a larger bluebird

project in 2018: the Nest Parasite Community Science Program. The program involves around 150 backyard volunteers who monitor 3,000 nest boxes across the eastern United States. Now, with support from the National Science Foundation, Knutie has coordinated a group of professors who will work with undergraduates to conduct temperature experiments at these far-flung sites. "We're trying to explain why we see differences in parasite communities and abundance across the range of the hosts," Knutie says.

When Knutie returned to Itasca this spring, she began preparations for the large collaborative project, which officially commences next year. She swapped out old boxes, added new ones, and tracked the returning birds. Of course, she also spent time catching up with the property owners, among her first bluebird friends.

– Jonathan Damery



PHOTOS COURTESY OF SARAH KNUTIE - TOP RIGHT PHOTO: ASHLEY LOVE

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IBSL DIRECTOR JONATHAN SCHILLING'S
TRUCK PACKED FOR THE TRIP NORTH.

The drive

Every May, I pack up the house plants from my office, my bikes, canoes, teaching materials, mushroom specimens and everything else. It all goes into a truck, and I tuck in for a four-hour drive as if I am headed back to college after summer break. If you make this drive to Itasca, you have favorite routes and favorite stops. If it is just me driving – I go up Route 10 to Motley, grab some smoked salmon spread at Morey's, and then drive 64 north to the station. If I am shuttling kids (that is often!), I have another route up that I call the "Amish Portal" through Todd County north of Sauk Center. There are plenty of chances to get out, shop jams, jellies, cedar chests and quilts, and see how lives can be lived differently. That route can't be detailed here. It is too complicated, which makes it all the more special. —Jonathan Schilling