

Okoboji Murmurations

News for Lakeside Lab Alumni and Friends



IOWA LAKESIDE
LABORATORY

Back to Where We Once Belonged

The year 2015 marks the 100th anniversary of The Ecological Society of America, and to celebrate the occasion, ESA historian Frank Egerton published *A Centennial History of the Ecological Society of America* (CRC Press). Lakeside is featured at length in the opening paragraph of Chapter 1 (Origins), as follows:

“In 1880, a botanist at Lenox College, Iowa, Thomas H. Macbride, persuaded the University of Iowa Alumni Association to buy land for a biology field station on the shore of the West Branch of

Lake Okoboji, which opened in 1909. Macbride commented: “the factors of ecology and distribution are all here.” It was and is a center for both summer courses and research, and during its first decade, almost 50 biological papers were published on research performed there.”

And with that, Egerton kicks off the rest of his book. Lakeside is the first field station mentioned by name.

Academic Courses

A total of 92 students took university-level courses at Lakeside during the summer of 2015. Professors Mark Edlund and Sylvia Lee taught Ecology and Systematics of Diatoms; Professor Neil Bernstein taught Ecology and Ornithology; Professor John Doershuk taught Archeology; Professors Paul Weihe and Chris Filstrup covered Ecology of Wetlands and Streams, and Limnology, respectively, for the Aquatic Ecology course; Professor Kalina Manoylov covered Ecology and Systematics of Algae; Professor Joe Eastman taught Ichthyology, and Professor Mike Mossman covered Mammalogy.



One of Okoboji's ermines considering how to weasel its way out of its current predicament. Photo courtesy of the Mammalogy course.

Fall 2015

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Nearly every course offered was at capacity. Specific comments made by university students about their 2015 experiences:

“Food was great!” (Thanks Dianna!) “Eating accommodations were great!”

“It was challenging and I learned so much.”

“I enjoyed the “do then ask questions” feel of the course.”

“I really enjoyed how Professor _____ was available to explain things to us when we were out in the field and how the hands-on learning was immediately applicable to my major and future career.”

“I felt like I worked hard and really learned a lot.”

“I liked the informal lectures so we could easily ask questions.”



Ichthyology Student Owen Tazelaar setting traps for Iowa darters



The Mammalogy class in full field regalia. Tanner Bouchard, Brittany Baumhover, Samantha Moser, Jordan Young, Shea Stobaugh, Anna Pienta, Megan Churchill, Leah Greteman, Crystal Krapfl, and Lisa Hartman. Photo by Meredith Heath.



The Algae class hosts our Writers-in-Residence: Leah Greteman, Adam Blake Wright, Alysia Berns, Anna Pienta, Sam Collier, and Professor Kalina Manoylov



New Campus Assistants and Earn to Learn Interns

In 2015, Lakeside implemented two new programs to give opportunities to students and to help us meet both our internal and external obligations. We brought on Al Alder and Leisha Neumann to be our campus assistants. Their responsibilities included a resident assistant role for the students, and to help Matt Fairchild and Mike Lannoo with all of the day-to-day issues that arise when a field station is going at full steam.

We also brought on Kelly Robinson, Alana Whitlock, Anna Pienta, Sara Anderson, Alysia Berns, and Dakota Keller to fulfill our obligations to the Iowa Department of Natural Resources and the Okoboji community at large by “manning” public boat ramps during busy weekends. The purpose of this program is to inspect boats for invasive species and educate boat own-

ers about responsible boating practices. Students received room and board, an hourly wage, and free tuition for the Lakeside course of their choosing. Alumni who are interested in applying for this program should contact Mike Lannoo (mlannoo@iupui.edu).



Matt Fairchild with Al Alder, Leisha Neumann, and Cameron Arnold

Seminar Speakers

Our Tuesday evening Faculty Seminar Series was a smashing success. Around 95 people crowded into Mahan Hall to hear Evelyn Gaiser, and an average of over 60 people, half of them from our community, came to hear our other speakers. The consensus was that it was over too soon.

Dr. Evelyn Gaiser: GLEON Buoy—Advancing the Study of Inland Lakes World Wide

Dr. Adam Heathcote: Carbon Cycling in Northern Lakes

Dr. Kim Moss and Danette Pratt: Art in the Service of Science

Dr. Diane Debinski: Grassland Management for Pollinators

Dr.-to-be Mindy Morales: Using GLEON Buoy Data to Understand Causes of Algae Blooms

Dr. Alisa Gallant: Monitoring Landscape Change with Remote Sensing Technology

Dr. Diane Larson: Improving Prairie Restorations and Reconstructions

Dr. Joe Eastman: Antarctic Fishes From Evolutionary Obscurity to Gourmet Grub

Adam Blake Wright and Sam Collier: Selected Readings



Silent Sports

Lakeside has always been about working hard and playing hard, and through our Silent Sports Initiative we have been providing students healthy options for playing hard. We offer bikes, kayaks, canoes, wave boards, and a paddleboat for student and faculty use. As well we string a slack line and offer competitions.



Dakota Keller, Tanner Hallenstein, and Owen Tazelaar working up a pre-dinner appetite.

New Student Lounge

To accommodate Lakeside's expanding mission, and the variety of students that take advantage of Lakeside's programming, in 2015 we converted the Mess Hall loft, a storage area, to a second student lounge. This lounge is spacious, with the north side set aside for studying and the south side set up for more kickback activities. Students gave the new lounge two thumbs up.



Kelly Robinson, Sara Anderson, Alana Whitlock, Dana Norton, and Alysia Berns help Matt Fairchild assemble a TV stand in the Loft Student Lounge.

Young Investigators: Teacher Professional Development

Since 2008, ILLRRC has facilitated Nature Connections, a collaborative of early childhood professionals dedicated to connecting children to nature while meeting their cognitive, social, emotional and physical developmental needs. In 2012, the Nature Connections team initiated a high quality, innovative teacher professional development program titled "Young Investigators: Connecting Children with Nature through Pro-

ject Approach" (YI). YI is a three-year training program emphasizing a nature based, student centered teaching method. Teachers receive seven days of training over a three-year period and follow up classroom coaching. In 2014–15, the YI impacted over 150 teachers, associates and administrators from nineteen Northwest Iowa school districts and nearly 1500 young learners—Jane Shuttleworth.



Lakeside Joins Global Nutrient Network

Under Iowa State University faculty member Lori Biederman's direction, Lakeside has joined the Nutrient Network (NutNet). From the NutNet website (<http://www.nutnet.umn.edu>): Two of the most pervasive human impacts on ecosystems are alteration of global nutrient budgets and changes in the abundance and identity of consumers. Fossil fuel combustion and agricultural fertilization have doubled and quintupled, respectively, global pools of nitrogen and phosphorus relative to pre-industrial levels.

Concurrently, habitat loss and degradation and selective hunting and fishing disproportionately remove consumers from food webs. At the same time, humans are adding consumers to food webs for endpoints such as conservation, recreation, and agriculture, as well as accidental introductions of invasive consumer species.

In spite of the global impacts of these human activities, there have been no globally coordinated experiments to quantify the general impacts on ecological systems. The Nutrient Network (NutNet) is a grassroots research effort to address these questions within a coordinated research network comprised of

more than 40 grassland sites worldwide.

NutNet focal research questions:

How general is our current understanding of productivity-diversity relationships?

To what extent are plant production and diversity co-limited by multiple nutrients in herbaceous-dominated communities?

Under what conditions do grazers or fertilization control plant biomass, diversity, and composition?

NutNet goals:

To collect data from a broad range of sites in a consistent manner to allow direct comparisons of environment-productivity-diversity relationships among systems around the world. This is currently occurring at each site in the network and, when these data are compiled, will allow us to provide new insights into several important, unanswered questions in ecology.

To implement a cross-site experiment requiring only nominal investment of time and resources by each investigator, but quantifying community and ecosystem responses in a wide range of herbaceous-dominated ecosystems (i.e., desert grasslands to arctic tundra).

Iowa State Researchers Make Lakeside Home

Master's student Joe Lambert, from Dr. Robert Klaver's lab at Iowa State, and his two field assistants made Lakeside home while they studied the responses of grassland birds to the vast prairie restorations

that have been conducted in the Okoboji region. Joe is planning on continuing his studies during the summer of 2016, and we look forward to his return.



(Modified and corrected from an article by Daniel Kelly published on July 6, 2015, in the Environmental Monitor)

Located in the Okoboji region, it sits at the center of a string of lakes that are unusual because of their location so close to the Great Plains. It is somewhat remarkable that they're there at all given the drier regions nearby. The crown jewel of these is West Okoboji Lake, a large, deep lake with good, clear water and plenty of activity around it.

For more than a century, the Lakeside Lab has offered courses and research opportunities for students interested in studying West Okoboji and other lakes nearby. These include activities like sampling diatoms and algae, taking Secchi disk measurements or tracking dissolved oxygen levels in the water.

With such an extensive record in place, it didn't take long for researchers with the Global Lake Ecological Observatory Network, or GLEON, to realize the potential of West Okoboji Lake as a new member site. There was just one thing missing – a buoy.

“Since our lake has been well studied—Birge and Juday (legendary limnologists) came here in the 1920s—this lake has been a focus of limnology,” said Dr. Michael Lannoo, Director of Research and Academics at the Iowa Lakeside Laboratory. “Lakeside faculty familiar with GLEON approached us about the possibility of putting a buoy in.”

Soon after the idea was put forth, Sarah Spaulding, an ecologist with the U.S. Geo-

logical Survey and former visiting professor at Lakeside Lab, joined with Mindy Morales, a doctoral student at Iowa State University, to put together a white paper and a prototype proposal for the buoy. Lannoo began taking those to meetings with citizen groups around the lake to gain their support.

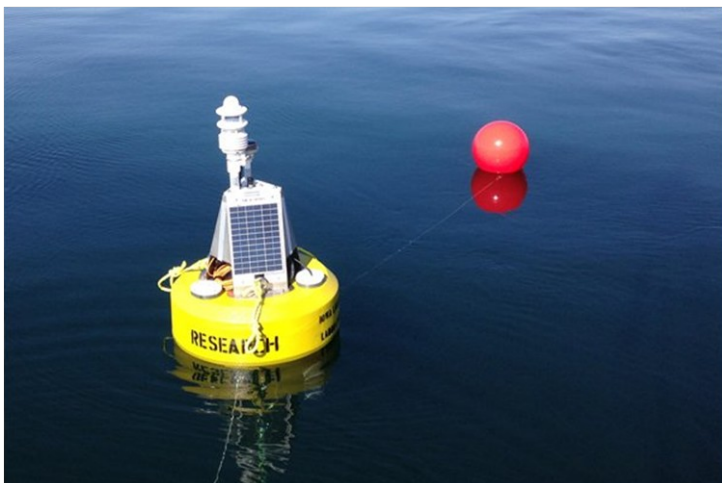
It wasn't hard to sell the project to the groups, as most everyone would benefit from it. The lab, as well as the lake's health, would benefit scientifically from its data, while boaters and fishermen would benefit because it could let them know when conditions were safe to go out on the water. And researchers around the world gain access to data on West Okoboji Lake.

Community groups that Lannoo presented to include the Dickenson County Clean Water Alliance, Friends of Lakeside Lab, Okoboji Foundation and the Okoboji Protective Association. Additional funding came from the State of Iowa Hygienic Lab and the University of Iowa Research and Economic Development Group. Within 10 months, the project



Members of the Iowa Lakeside Laboratory help deploy a new data buoy in West Okoboji Lake. (Credit: Doug Nguyen / NexSens Technology)

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A new data buoy serves as the core of the monitoring system in West Okoboji Lake. (Credit: Doug Nguyen / NexSens Technology)

had gone from idea to reality, which is remarkably fast.

A NexSens CB-450 Data Buoy is the core of the monitoring platform, supporting a NexSens iSIC-CB Data Logger equipped with cellular telemetry. Connected to this on the topside is a Lufft WS600 Multi-Parameter Weather Sensor that collects measurements on air temperature, humidity, barometric pressure, wind speed and direction and rainfall. Sitting next to it is a solar marine light that acts as a beacon to let boaters know its location on the water when the sun goes down.

On the buoy's bottom side is a YSI EXO2 Multi-Parameter Water Quality Sonde that measures West Okoboji Lake's water temperature, conductivity, pH and dissolved oxygen levels. There is also a Vaisala GMT222 Carbon Dioxide Transmitter fitted with a special membrane to let it collect data on CO2 levels underwater, which is a pretty rare sensor for a buoy. The whole platform was deployed on April 30.

"We got it in the water a lot quicker than we thought we would," said Lannoo, noting that his team is still learning its ins and outs. "It's like having a new computer that you've owned for a few days, but not quite having all the software installed."

Part of getting used to the buoy is using the WQData LIVE Web Datacenter where its data, refreshed every 10 minutes, are displayed online. It partners with the LIVE Datacenter smartphone app (search WQData for the app, and download) to show the buoy's data in a mobile format. That's something the residents living around the lake have been intrigued by as well, says Lannoo, who has been making rounds making presentations on the new buoy to community groups. "I've asked at meetings – 'You want to know what you got for your money?'" said Lannoo. "Well, pull out your smartphones, download this app and use it."

Support for the new buoy has been quite good, says Lannoo. He adds that it has infused a lot of energy into the field station and

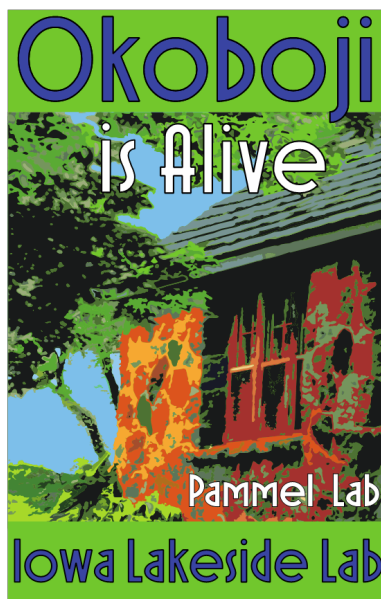
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Danette Pratt

Lakeside hosted an old friend, Danette Pratt, this past summer. Danette illustrated *Okoboji Wetlands* and designed and drew the banners we now have hanging along the bike trail. While at Lakeside, Danette designed several new banners, and sketched the prototype for a potential new outdoor learning laboratory.

LEFT: One of the banners designed by Danette Pratt, now displayed along the bike trail on the west side of campus.



Outreach (contributed by Jane Shuttleworth)

Internships: Bruce McWilliams worked with Dennis Heimdal in the Bovbjerg Water Chemistry Lab and also helped with the CLAMP program. Ben Mendering and Dana Norton were outstanding teachers, leading and assisting with library programs, summer camps, and Wild Wednesdays. Paige Ellensohn did an outstanding job as Lakeside public relations intern and published the weekly Lakeside Community calendar and email blasts. The PR position is also partially supported by the Okoboji Protective Association to run the Lakeside Science Minutes on KUOO jointly sponsored by the OPA and Friends, and to promote and plan the annual OPA Clean Water Concert held August 8th at the Preservation Plaza in Arnolds Park, where Lakeside education staff provided hands on displays and information about the GLEON Buoy, CLAMP and other topics.

Pre K- 12 School Year Programs: In 2014–15, ILLRRC drew 1,190 pre-K through 12 students from nearly a dozen school districts across northwest Iowa for school programs emphasizing STEM and hands on inquiry in the environmental sciences.

Science Camps: The ILLRRC science camps nurture student's inborn curiosity about nature, and use outdoor explorations to stimulate and develop their intellectual, physical and emotional skills, including STEM (science, technology, engineering and math) preparedness. In 2015, 89 students from pre-K through middle school attended camps at ILLRRC.

Volunteer Opportunities: Since 1999, over 200 volunteers from the Okoboji community have participated in the Cooperative Lakes Area Monitoring Project (CLAMP) Coordinated by ILLRRC. Volunteers are

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Friends of Lakeside Lab

It goes without saying that most of the things we are able to do at Lakeside are facilitated by our community support organization, The Friends of Lakeside Lab. This past year The Friends sponsored 30 student room and board scholarships, contributed two kayaks to our Silent Sports Initiative, and supported all three of our missions: teaching, research, and outreach, in a wide variety of ways. THANK YOU—FRIENDS!!

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trained to collect water samples and collect field data from nine Dickinson County lakes, and collect data and samples twice a month during the summer. In 2014–15, 42 volunteers donated approximately 200 hours. All samples were processed at the State Hygienic Lab at Lakeside.

Community members also volunteered on a weekly basis during snow-free months to assist with ecological restoration projects on the ILLRRC campus, which is also managed as a nature preserve. Coffee-and-Grounds volunteers helped restore prairie, oak savanna and lakeshore habitats, and donate approximately 640 hours annually.

Family and Community Programs: Family and community programs ranged from weekly Wild Wednesday family science



Noah and Scarlett Fairchild enjoying the fruits (vegetables?) of an Iowa summer

programs in the summer, to self-guided nature investigations, to programs for Scouts, science literacy programs to regional libraries, and the annual Winter Games People Project held in conjunction with the Iowa Great Lakes Chamber of Commerce. Collectively, these programs impacted approximately 850 learners of all ages.

Student Researchers

During the summer of 2015, several undergraduate students conducted research projects at Lakeside. These include: Leisha Neumann's study of amphibians in Okoboji's wetlands, Mariah Manoylov's study of vegetative succession, Kelly Robinson's study of Blanding's Turtles, Alysia Berns' study of vegetation management, Sara Anderson's research on the Region's archeology, and Alana Whitlock's study of *E. coli* outbreaks in the Lakes area.



Writers in Residence Program

Lakeside hosted two exceptional young writers this past summer. The poet and playwright Sam Collier, from the University of Iowa joined us, as did the essayist Adam Blake Wright, from Iowa State. As with the artists, the interactions between these creative folks and our academic programs enriched both groups.

Artists in Residence Program

Under Lisa Johnson's fine direction, during the summer of 2015, Lakeside hosted four Artists-in-Residence, who really embraced the place. Amanda Brietbach, Alex Braidwood, Rachel Kauff, and Ellyn Hurst stayed for periods of two-to-three weeks, and added so very much to the Lakeside experience for all.



Artist-in-Residence Alex Braidwood (right) re-adjusting Campus Assistant Alex Alder's brain.

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surrounding community, which can't often be said of scientific equipment. "They (community members) really have adopted it," said Lannoo. "It's a point of pride." So far, the buoy's data have helped locals, as well as tourists, keep track of conditions on the water.

With a database going back almost a century, the buoy is adding real-time, high-resolution monitoring of lake conditions in advance of more short-term changes, says Lannoo. Some of those that scientists at Lakeside Lab are interested in include recent invasions of zebra mussels, and older invasions of Eurasian carp and curly-leaf pondweed; the effects of climate change; and more general questions concerning how the lake stratifies.

"We now have a temperature and DO (dissolved oxygen) string," said Lannoo, which allows us to study West Okoboji's turnovers. The sensors sit at 2-meter intervals and link all the way to the lake's bottom, a depth where the buoy sits of about 85 feet.



Editor's note: The summer of 2015 at Lakeside Lab went as smoothly as any summer in recent memory, and for that I thank Chet Rzonca, Matt Fairchild, Dianna Isder, Jane Shuttleworth, Dennis Heimdal, The Friends of Lakeside Lab, and all of our student assistants—Mike Lannoo.