# A core publication of the Lilly Center for Lakes & Streams | Fall 2022

**Freshwater Jellies** 

Diving into the difference between invasive and exotic





#### CONTENTS

- 2 Meet the education and aquarium student teams
- 3 Meet the field and algae student teams
- 4 Toast & Jellyfish: The tea on freshwater jellies
- 5 15th Anniversary recap

## **FORGING A PATH**

Thank you for joyfully helping us celebrate 15 years of the Lilly Center this summer! Your support is the current beneath our fins as we work to make our lakes & streams clean, healthy, safe, and beautiful.

A word that comes to mind as we look to the next 15 years is sustainability. Students, many of whom you will meet in this edition of Headwaters, are an important way to develop sustainability. Their passion for the environment and our lakes shines through their words and actions.

Onboarding almost 40 student interns is a giant undertaking. We're thankful Jeremy Price joined our team this summer as associate director to ensure that the Lilly Center operates smoothly.

Jeremy grew up in Winamac and spent his youth fishing in the Tippecanoe River. Influenced by his love for the outdoors, he received his bachelor's of science from Purdue University and a master's of science from Michigan State University, both in Fisheries. Jeremy joins us after nearly 20 years as a fisheries biologist with Indiana DNR. •

#### Strategic research; local impact. Learn more about our efforts at lakes.grace.edu.



**Dr. Nate Bosch** Director

**Jeremy Price** Associate Director

**Amy Bloemendaal** Development Assistant Matt Burlingame Asst. Director of Research

**Jed Harvey** Research Technician

**Rusty Martinez** Asst. Director of Marketing

Sarah BaierGrace St. ClairEducation Program SpecialistLead Education Coordinator

**Ariel Wagner** Education Coordinator



#### CONTACT

**Email** lakes@grace.edu **Phone** 574-372-5100, ext. 6446 Website lakes.grace.edu

# **MEET THE 2022 TEAM**

Student interns are making a splash in Kosciusko County

The education team is responsible for helping to deliver our K-12 programs. They develop curriculum, teach in classrooms, plan for Lake Adventure Days, and so much more!

Emily Anderson is starting her second year at Grace College studying environmental science.

"I remember teaching 2nd graders at Leesburg Elementary about fish anatomy," Emily recalls. "They were so receptive and kept trying to give me their fish paintings. The kids were excited about learning which made me feel really awesome."

On Emily's bucket list is to visit every national park. This fall she is visiting Indiana Dunes, her 9th park! •



Not pictured: Kamryn, Morgan.



L-R: Madison, TJ, Ethan, Kevin, Chai (inset), Nate, Caleb, & Hope. Not pictured: Emma. Josh.

Maintaining over 80 aguariums and keeping our 400+ fish, a turtle, frog, and mudpuppy healthy is a giant undertaking! The aquarium team also installs fish tanks in classrooms, a vital part of our education programs!

Chai Spencer is a junior at Grace College and is completing a degree in environmental studies.

"One of the things I enjoy is doing school installs and talking to the kids about the fish," Chai says. "The kids ask what fish it is and I'll explain that it can be found in a river or lake nearby!"

Chai's dream job is to work with animals at the SEA Life Aquarium in Australia.



L-R: Jakob, Jackson, Elio, Rachel, Skip, Abby, Connor, Janet, Emma, Carter, Michael & Ethan (inset).

The research team members are our "boots on the ground." They sample 12 stream sites on a bi-weekly basis and, during the summer, 14 local lakes. When they aren't in the field, the students review data and take care of equipment.

Freshman **Ethan Smith** is also studying environmental science.

"My work at the Lilly Center will help me proceed to be a conservation officer or work with the DNR," Ethan says. "It'll help me grow in a research capacity other than a law enforcement capacity."

Ethan's favorite national park is Yellowstone National Park and he hopes to serve in national parks! •

The algae team takes the water samples the field team brings back from lake sampling and turns them into microscope slides. After **counting and identifying** the species in the slides, that data is added to the Lilly Center's catalog and used for scientific reports like Beneath the Surface.

Annalieze Crawford is a sophomore at Grace College. Though she now studies nursing, she enjoys her work at the Lilly Center.

"I love using a microscope and looking at live slides," Annalieze explains. "You can see the algae actually moving. It makes you step back and appreciate how life is so complex. The fact that we have microscopes to use for this scale of science is such a blessing!" •

Student interns are integral to the Lil- rangers, zookeepers, and biologists. You ly Center's work and key to the future of can help launch them into their chosen our waterways. Students like Emily, Chai, fields by investing in student fellowships: Ethan, and Annalieze are future park lakes.grace.edu/give. •

LGAE

TEAM

 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •
 •

L-R: Joshua, Landon, Ethan, Austin, Tat'yanna, Keiko, & Annalieze (inset). Not pictured: Rachel, Mairwen.

## Toast and Jellyfish

## The tea on freshwater jellies

While it sounds like a myth, freshwater jellyfish do live in Indiana, though only the luckiest of lake lovers have laid eyes on them. Thanks to a Lilly Center friend who found freshwater jellyfish in his pond, we were able to study some of these pennysized creatures.

#### Of jellyfish biology

*Craspedacusta sowerbii* is a small, white, and mostlytransparent jellyfish that lives exclusively in calm bodies of fresh water like ponds, lakes, old quarries, and slow-moving streams. They are very small – they grow no larger than an inch in diameter and never more than 0.3 grams in body weight. They have a radial (circular) body layout and the tentacles form a ring



around the base of the body. They consume and excrete food from the mouth on the underside. Inside, four gonads are clearly visible.

C. sowerbii is not a 'true jellyfish'. It is a hydrozoan jellyfish that is more closely related to the Portuguese man-o'-war or the native hvdra than it is to the scyphozoan jellyfish (the 'true iellvfish'). Freshwater jellyfish have a muscular membrane on their body that sets them apart from true iellvfish. This membrane is called the velum which they use to move (imagine using your diaphragm for propulsion).



#### Can freshwater jellyfish sting?

No, C. sowerbii cannot sting humans. They do have stinging cells (called nematocysts) but they are too small to sting through our skin. They are small so that they can capture microscopic prey such as daphnia and other zooplankton, And, according to some scientists, their small stingers don't prevent them from becoming a meal for animals higher up the food chain. It is said that crayfish enjoy jellyfish, presumably with biscuits or English muffins.

# Why is it so hard to find freshwater jellyfish in Indiana?

Freshwater jellyfish seem to appear at random in different bodies of water, but rarely in the same place for multiple years in a row. This is because of *C. sowerbii's* elaborate life cycle. The jellyfish stage, also called the medusa stage, is the final step of that cycle. The main

goal of the medusa form is to reproduce sexually, though this form only lives for a few months at most. For most of a jellyfish's life (sometimes up to fifteen or more vears), it rests attached to the lakebed in a coral-like 'polyp' form. These polyps reproduce asexually by budding, creating a small army of clones that are genetically identical to the original polyp. When the conditions are right those polyps transform into the free-swimming medusa.

What conditions lead to the formation of a 'smack' (a name for a group of jellyfish)? Scientists are not entirely sure, though temperature seems to play a large role in the process.

The duplication ability means that it only takes one freshwater jellyfish to create a population. A single organism can multiply hundreds or thousands of times. The resulting swarm has one distinct problem: since they all have the same genetic 'identity' (and thus are the same sex), they can only reproduce by budding. As a result, freshwater jellyfish tend to only appear in medusa form every five to fifteen years.

#### Are freshwater jellyfish native?

*C. sowerbii* is originally from the Yangtze River region of China, though it has spread to every continent except for Antarctica. It is believed that it was first transported accidentally to the United States inside shipments of aquatic ornamental plants. As previously mentioned, it only takes one individual to make a colony. They spread through a variety of methods including the aquarium trade, fish stocking, boating and even clinging to the feathers of waterfowl, creating colonies wherever they end up.

This does not necessarily mean that freshwater iellvfish are a harmful invasive species. It is unknown exactly what impact they have on ecosystems once introduced and if that impact is detrimental or not. Unlike zebra mussels or starry stonewort, freshwater jellyfish do not destroy habitats or crowd out other species: they simply exist alongside other native creatures. Some scientists call non-native species like C. sowerbii 'exotic' instead of 'invasive' to make a distinction between species that do not cause harm to local ecosystems from those that do. •

## HERE'S TO 15 More years!

## Thank you, thank you, thank you!

It was important to us to celebrate 15 years of the Lilly Center by celebrating all that Kosciusko County has to offer - and you delivered! We hope you enjoy these photos taken as part of Lake Quest this summer.

Thanks to the following participants for sharing these photos: Alzaria, Chanks to the following participants for sharing these photos: Alzaria,

Erin

