

# STONE LABORATORY

*Ohio State's Island Campus on Lake Erie*



[stonelab.osu.edu](http://stonelab.osu.edu)



# MEET STONE LAB



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**T**wo and a half years. That's how long it takes for a single drop of water entering Lake Erie from the St. Clair River to make its way out to Lake Ontario by way of Niagara Falls. That's when that drop of water, completely unnoticed as it entered the lake, makes a huge splash.



One day. One week. Five weeks. That's how little time it could take for your whole life to change after experiencing Stone Laboratory, The Ohio State University's island campus on Lake Erie.

For more than 100 years, Stone Lab has been making its mark as a resource for freshwater biology research, science education and outreach. As the research station for the Ohio Sea Grant College Program, the lab is a base for professional scientists from all over the Midwest as they work to solve the most pressing issues facing the Great Lakes, such as invasive species and toxic algal blooms.

In addition to hosting college-credit courses and resume-building workshops, Stone Lab offers field trips, public tours of the Aquatic Visitors Center and South Bass Island Lighthouse, and conference and event center space, putting Lake Erie science and history within anyone's grasp. Stone Lab's Gibraltar Island, just off the coast of South Bass Island in Lake Erie, is a full-service campus with dormitories, a dining hall, classrooms, a library and a computer lab.



Thousands of Stone Lab alums are making waves all over the world in biological and environmental sciences and even in science, technology, engineering and math (STEM) education. Someone who takes a 2017 Stone Lab class could be the next generation's greatest scientist.

**WILL IT  
BE YOU?**



# *Gibraltar Island* SMALL ISLAND BIG IMPACT

Stone Lab is located on Gibraltar Island in Lake Erie, just north of South Bass Island's Put-in-Bay. The island is named for its resemblance to the famous British fortress at the western end of the Mediterranean Sea. Though it's no more than a few hundred yards from South Bass, the 6-acre island feels like a whole other world.



- 1 Bayview Office**
- 2 Peach Point Research Laboratory**  
Houses the Water Quality Laboratory and holding tanks for aquatic organisms
- 3 Aquatic Visitors Center**  
Open June through August, this former fish hatchery has educational displays, aquaria filled with fish and a public fishing dock.
- 4 Peach Point and Sycamore Cottage**  
Staff and faculty housing
- 5 Glacial Grooves**  
Deep striations, remnants of the last great North American glacier more than 10,000 years ago
- 6 Solar Pavilion**  
Forty-four 240-watt solar panels provide energy and shade a few picnic tables below.
- 7 Stone Laboratory**  
The main instruction building on the island. Contains laboratories, classrooms, office space, a meeting room for special lectures, a library, a computer lab and the Stone Lab bookstore. Forty solar panels were added to the roof in 2013.
- 8 Main Dock**
- 9 Dining Hall**  
Solar thermal installed on the roof in 2012 provides nearly all the hot water needed for the Dining Hall.
- 10 Gibraltar House**  
Staff housing
- 11 Research Buoy**  
Collects data including water temperature, pH and algae pigment and transmits it live to the Stone Lab website
- 12 Stone Cottage**  
Faculty housing
- 13 Harborview House**  
Student housing
- 14 Barney Cottage**  
Additional housing
- 15 Cooke Castle**  
Built in 1865 by Jay Cooke, a Civil War financier, this 15-room Victorian home is currently undergoing renovations.
- 16 Swimming Beach**



# SOMEONE IS DIGGING IN TO SCIENCE

It's a warm June day on Kelleys Island. Sand spills into students' shoes as they trudge along the beach.



They have to move fast to keep up with their professor, Dr. Lawrence Krissek. This is day three of Field-Based Introduction to Oceanography, and Krissek, an expert in sedimentary, marine and polar geology, doesn't want to waste a single minute. In just one week, his nine students – advanced high school and undergraduates alike – will earn 2 college credits. He has a lot of ground to cover, both figuratively and literally.

Krissek stops momentarily, though, and gestures to Long Point, the far eastern end of the island that juts out past North Bay. A vertical rock face rises out of the water, topped by what is called a wave-cut platform or bench. Those formed, he says, when the now-exposed flat platform was submerged under a few meters or less of water – the water depth where waves are very effective at eroding what's exposed on the bottom.

The class walks up from the beach through North Pond State Nature Preserve, then along a road in the hot sun until they reach an old quarry.

Soon, the students are hunched over, eyes squinting as they examine the quarry's



*“I love the research that we’re able to do. The field trips gave me the opportunity to be out in the field and have hands-on experience and use tools and methods which scientists practice daily.”*

**Laura Kunas**  
 Junior, geology major,  
 University of Dayton

 Watch [go.osu.edu/intro](https://go.osu.edu/intro)

## INTRODUCTORY COURSES – 2 credits

*Sunday-Saturday, open to advanced high school students and current college students.*

**Need help paying for a class?**

*See page 14 for info on scholarships.*

### **June 11-17**

Ecology and Conservation of Birds  
 Field-Based Introduction to Oceanography  
 Intro to Biological Studies – Aquatic Biology  
 Lake Erie Sport Fishing

### **July 23-29**

Intro to Biological Studies – Aquatic Biology  
 Intro to Biological Studies – Birds

### **July 30-August 5**

Intro to Biological Studies – Aquatic Biology  
 Intro to Biological Studies – Local Plants  
 Introductory Insect Field Biology

limestone ridges in the midday sun. Amid the “tink, tink” sounds of rock hammers, occasional shouts of “Come look at this!” and “I found one!” rise up in the heat.

Down in the bottom of the quarry, Krissek gathers the group to talk about how, 400 million years ago, this land was south of the equator.

“Did these critters die peaceably in the night or did they go screaming and thrashing?” he asks, of the fossilized finds. His point? Something dramatic happened to kill them – likely waves crashing in the warm, shallow sea that covered this area at the time.

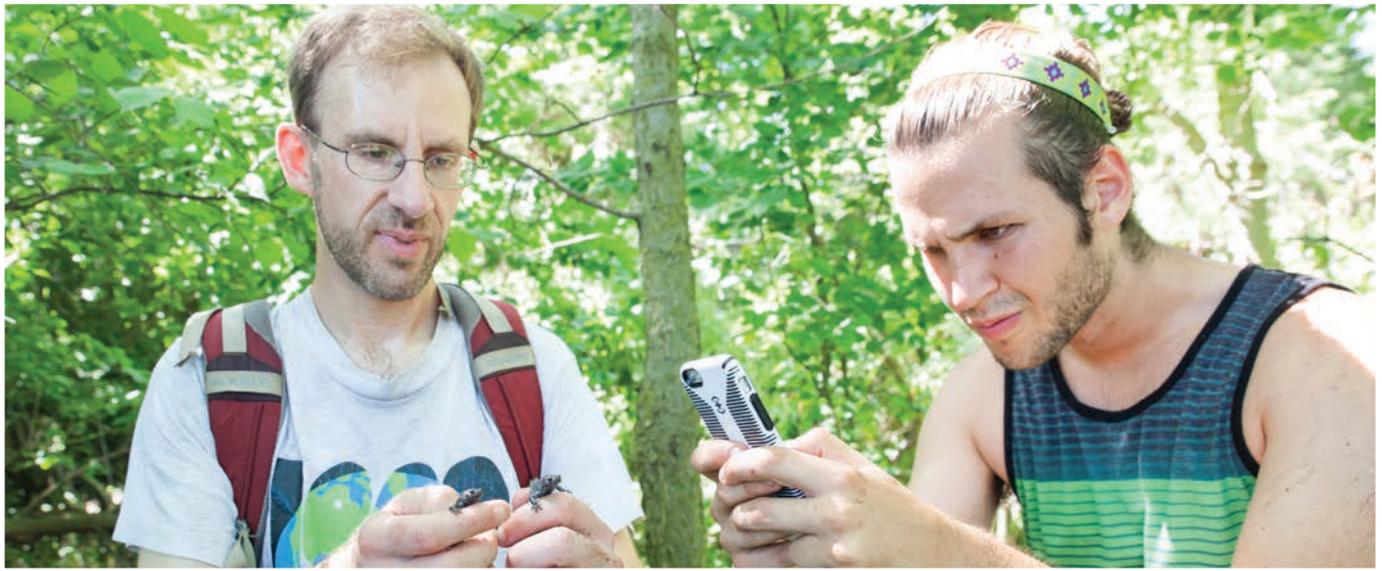
Students gather their fossils, some still embedded in large chunks of rock.

The students are sweating and breathless as they make the trek back from the quarry. By the end of their trip to Kelleys, (including eating a packed lunch and a trip to the Glacial Grooves) they’ll have hiked about three miles.

After the ride back to Gibraltar, they’ll head inside the classroom building to work on laboratory exercises about ocean circulation. Dinner in the dining hall, then they’ll study until twilight dims the sky.



**WILL IT  
 BE YOU?**

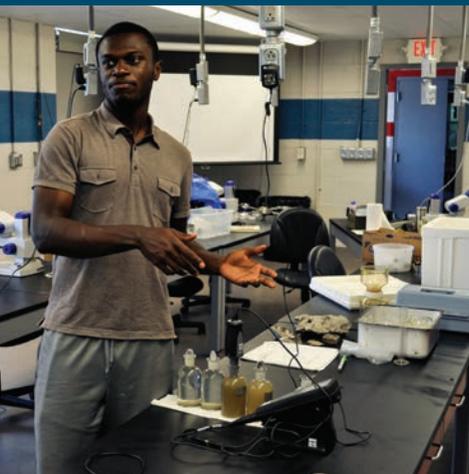


# SOMEONE IS EVOLVING

**T**he definition of evolution in biology is a change in the gene pool of a population over time. Another definition is the process of formation, growth or development.

To students in Dr. James Marshall's class at Stone Lab, the true definition is both. The class spends five weeks studying birds, salamanders and fossils in the field and delving into Darwin's theory of evolution by natural selection, Mendelian genetics and recent developments in evolutionary biology. After that, none of the students will ever be the same.

Each summer, the class works with Marshall on a long-term project on trait variation in birds among the Lake Erie Islands. That means long hours setting up mist nets – which is difficult, physical work – and banding birds. Other trips involve hikes to just the right spot to search for hybrid salamanders. And just like any class,



## LIFE ON THE ISLAND

A canopy of green leaves rises overhead as the wind rustles leaves of hackberry, maple and chinkapin oak trees. Gulls and songbirds provide the soundtrack of a quiet morning on Gibraltar Island – students drinking coffee on Adirondack chairs on the patio outside the dining hall, some heading into the classroom building for lab work or lecture, others waiting down by the dock for a boat that will take them on a field trip.

Stone Lab's five-week courses are held three days a week (either Monday, Wednesday and Friday or Tuesday,

Thursday and Saturday). Some students choose to take two classes during the term on alternating days. Others take just one and apply for a work-study position at the lab to cover their room and meals costs or find part-time jobs on South Bass Island.

On off-days and in the evenings, you can find students scattered across the island, studying in hammocks slung between trees, swimming at

the rocky beach on the eastern end of Gibraltar or laughing around a campfire near the shore.

As dusk settles, the beat of drums and bass guitar float across the water from Put-in-Bay, where bands play as vacationers relax. A water taxi full of students, returning from a dinner outing, arrives in the dimming light. Tomorrow, the cycle will start again.



## UPPER LEVEL COURSES

*Open to college students studying biological sciences, education and natural resources, as well as science teachers.*

**Want to come to Stone Lab? We want to help.**

*Read about scholarships on page 14.*

### **Five-Week Courses – 4 credits**

Aquatic Ecosystems – Ecology of Inland Waters  
Behavioral Ecology  
Ecology  
Evolution  
Field Zoology  
Ichthyology

### **One-Week Courses – 2 credits**

**Sunday-Saturday**  
**May 21-27**  
Field Herpetology

**July 23-29**  
Field Ecology

**July 30-August 5**  
Spider Biology



Visit [go.osu.edu/upper](http://go.osu.edu/upper) to learn more.

there are projects, quizzes and tests to make sure they've mastered the knowledge.

But students such as Adam Cupito, a junior at The Ohio State University, will tell you it's worth the work. Cupito's experience cemented his resolve to pursue a master's degree, hopefully at a university where he can work in an avian ecology laboratory.

"The great thing about being up here is that we have all of these resources at our disposal. We can take a boat out to Middle Bass Island and look at birds all day. It really is a great place to see evolution in action," he says. "This is the kind of experience you can't get in the classroom."



**WILL IT  
BE YOU?**

# SOMEONE IS MAKING A BREAKTHROUGH



Caroline McElwain is hot and tired. It's been a long day in the Research Building on South Bass Island's Peach Point, and she's not finished yet. She measures out green sludge into a dropper and empties it into a glass vase that sits on top of a spinning record turntable.

It might seem a little ridiculous, but this is real science, she has learned. This is the meat of her ichthyology project in the Research Experience for Undergraduates (REU) Scholarship Program. McElwain, a senior at The Ohio State University, is measuring how well emerald shiners can see in water that's clouded by sediment or algae by watching to see if the fish follows a reference point, swimming in circles around the tank.

Except that green sludge she's dropping into the vase isn't algae.

"It's spinach that we blend up," she says. "But it's the same wavelength, so it works very well."

Emerald shiners are small fish that are very important to Lake Erie's fishery, McElwain explains. They're forage fish, schooling fish that are preyed on by larger fish – sport fish like walleye and yellow perch. If they can't see because water is too murky with algae, then they can't find their own food or mate, and that could cause problems that ripple up the food chain.

"They're pretty important to the ecology of Lake Erie," McElwain says. "It's really

important for them to be able to persist in the lake, because with them gone there will be less of a food source for the commercially important fish."

She's working with Ohio State's Dr. Suzanne Gray and PhD student Chelsey Neiman on the project, which is part of a larger effort to study the vision of several types of fish.

Beyond the experience conducting her own research project, one of the most important things her REU has taught her is how to work with the resources available to her. The turn table is hooked up to a voltage meter so that it spins at the correct rate. McElwain rigged a series of clamps to hold the vase in place.

"I had to figure out how to make it work. And now it's working," she says. "That's a skill that's good to have."





McElwain traveling between South Bass and Gibraltar Islands. To see more, watch [go.osu.edu/REU](http://go.osu.edu/REU)

**Application Deadline: FEBRUARY 6, 2017**

## FIVE REASONS TO APPLY FOR A STONE LAB REU

1

### Participate in hands-on research

In the lab or in the field, you're the one observing conditions, collecting data and interpreting your findings. You'll learn how to do it from experience, not from reading about it in a book.

2

### Learn from world-class scientists

Stone Lab REU supervisors are at the top of their fields. You'll be learning about birds, plants water quality, ecology or fisheries from highly respected researchers.

3

### Present your findings

At the end of the term, you'll present your research. Many REUs have also presented at other conferences and some have even been published in peer-reviewed journals.

4

### Stand out from the crowd

Get experience that looks great on a graduate school application or your resume. Stone Lab alums have gone on to graduate programs and are working scientists in a host of fields.

5

### Make the most of your time at Stone Lab

REUs get free tuition, room and meals. The program runs concurrently with our five-week term and is paired with one of the five-week upper level courses.

## 2017 REU TOPICS

- Botany
- Fisheries Research/Management
- Ichthyology
- Limnology
- Ornithology
- Ecology



For details, visit [go.osu.edu/REU](http://go.osu.edu/REU)



**WILL IT  
BE YOU?**

# SOMEONE IS SPREADING THE LOVE OF SCIENCE

**Y**ou became a teacher to share your own love of knowledge with your students. The light in their eyes and the smile on their face when they're learning something new is priceless.

It's the same look that teachers have during Stone Lab courses designed for educators of all stripes.

Earn continuing education units (CEUs) or credit hours toward your advanced degree as you participate in a fish trawl on Lake Erie, wade in rivers with dip nets or canoe through a maze of lotus flowers. On a science

cruise, you'll practice dropping different colored M&Ms into Lake Erie and timing how long it takes them to sink deep enough that they're no longer visible. Or you may take a trip to Old Woman Creek Estuary to study macroinvertebrates and practice identifying the tiny creatures.

At the end of the week, you'll return home, bag full of materials and head full of ideas for the coming year.



## EDUCATOR SCHOLARSHIPS

A variety of scholarships are available for those taking Stone Lab education courses. Educators are encouraged to apply for Alpha and Center for Great Lakes Literacy Scholarships. Ottawa County, Ohio residents may be eligible for a special scholarship.



Visit [go.osu.edu/slscholarships](https://go.osu.edu/slscholarships) for details.



Watch [go.osu.edu/educators](https://go.osu.edu/educators)

## Teachers say ...

“This was a fantastic experience! I have **learned so much** and can’t wait to start sharing what I’ve learned in my classroom.”

“My instructors were amazing! The whole week was an **unforgettable experience** that will allow me to be a better science teacher.”

“It was **inspiring, informative and teacher-friendly** to implement immediately!”

“The resources and accessibility to outdoor **experiences here are unprecedented.** The facilitators were top-notch.”



### EDUCATOR COURSES – 2 credits

*Open to both formal and informal educators and college students studying education.*

**June 11-17**

Water and Wildlife Training for Educators

**July 15-21**

Field Geology for Educators: Geologic Setting of Lake Erie

**July 23-29**

Field Ecology



WILL IT  
BE YOU?



# IT'S POSSIBLE

Because the opportunities at Stone Lab are so valuable, our network of alumni, donors and partners give generously to allow as many students as possible to experience a Stone Lab education.

More than 40 scholarships are awarded each year to those with superior academic records and financial need. Anyone taking a for-credit class (and some taking workshops) is eligible to apply.

You'll indicate your interest in scholarships as you complete the online Stone Lab application. Deadlines vary, but most are in early to mid-March. Initial recipients will be notified in early April.

Those taking five-week courses also have the option to apply for a part-time

position as a student lab assistant to cover housing and meals costs. On the days you aren't in class, you'll work with researchers, help run the Stone Lab bookstore, cook and serve meals in the dining hall or assist with programming at the Aquatic Visitors Center and South Bass Island Lighthouse.

Applications for student positions must be received **by 5 p.m. EST March 2, 2017**. Interviews will be held **March 7-9, 2017** at the Stone Lab Columbus office.



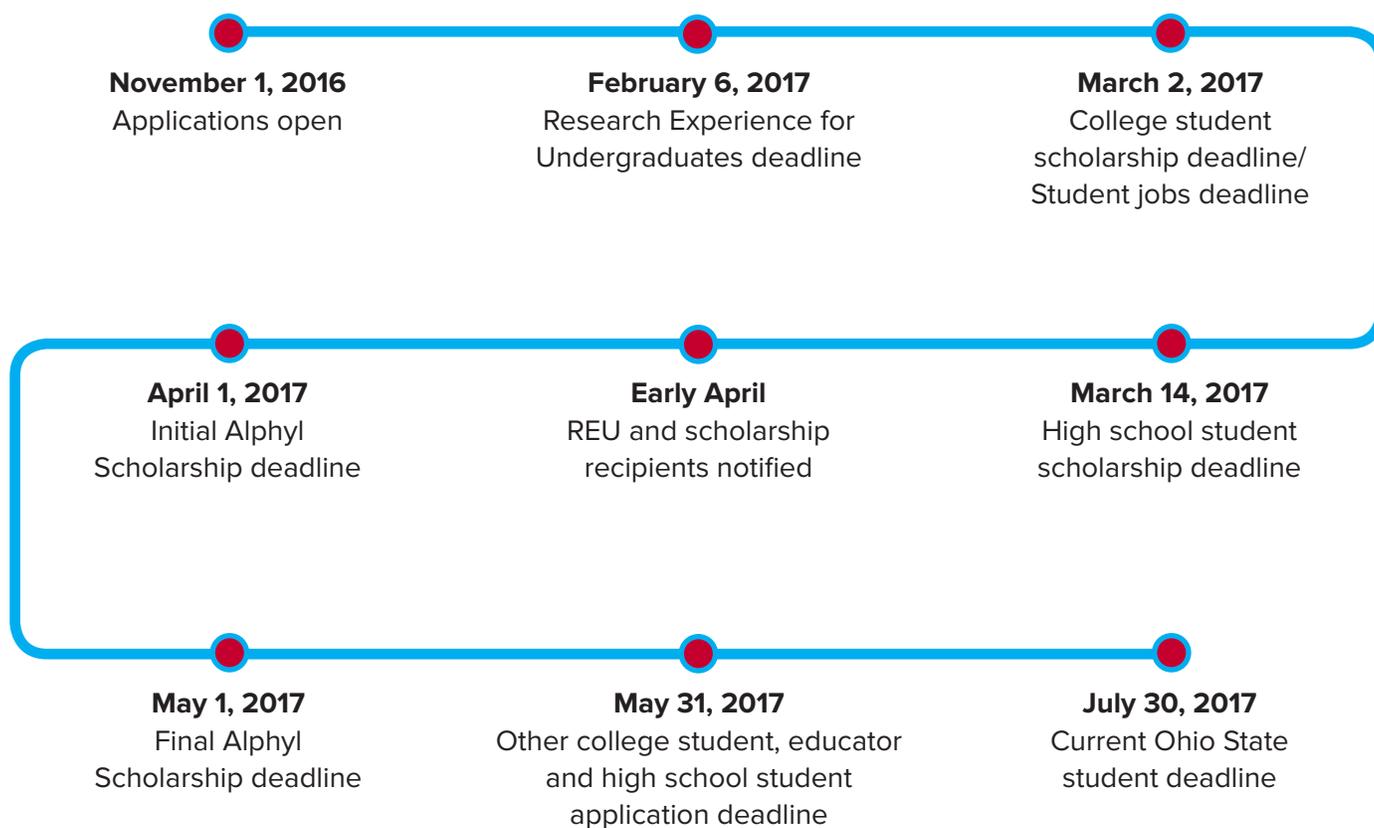
For scholarship information, visit [go.osu.edu/slscholarships](http://go.osu.edu/slscholarships) and for job opportunities, visit [go.osu.edu/studentjobs](http://go.osu.edu/studentjobs) to learn more.



# APPLICATION TIMELINE

## How to Apply:

SUBMIT YOUR ONLINE APPLICATION AT  
[stonelab.osu.edu/applynow](http://stonelab.osu.edu/applynow).



*Workshop deadlines are typically 4 weeks before the workshop date*

## Find us on social media



[facebook.com/stonelaboratory](https://www.facebook.com/stonelaboratory)



[@stonelab](https://www.instagram.com/stonelab)



[@stonelab](https://twitter.com/stonelab)

## HOW MUCH DOES IT COST?

Tuition is charged per credit hour and is based on Ohio State University tuition. Most courses charge an additional lab fee per course. All costs are subject to change. For fees, room and meal costs and updated information, visit [go.osu.edu/costs](http://go.osu.edu/costs).

# NEVER STOP GROWING

Visit [go.osu.edu/workshops](http://go.osu.edu/workshops) to learn more.



Not all Stone Lab students are in college. Many are working professionals or those hoping to develop resume-building skills.

Workshop facilitators include professionals from state agencies such as the Ohio Department of Natural Resources Division of Wildlife and the Ohio Environmental Protection Agency and the activities are specifically designed to help job seekers get the basic

knowledge of techniques that are used in the field.

"It's part networking and part gaining skills," says Matthew Sarver, a 2012 Ohio State University graduate who attended the Fish Sampling Techniques workshop. He's now a research associate at the Midwest Biodiversity Institute and takes five to six fish sampling trips each year.

A water treatment plant operator who attended one

of our algae workshops in 2014 put his knowledge to use within one week, correctly identifying a harmful algal bloom in the reservoir at the Norwalk, Ohio water plant and averting a potential drinking water crisis.

In addition to the offerings listed here, nearly any of our for-credit courses can be taken as a non-credit workshop with the permission of the instructor.



## WORKSHOPS

- Fish Aging
- Larval Fish Identification
- Fisheries Fundamentals
- Algae Identification
- Dealing with Cyanobacteria, Algal Toxins and Taste & Odor Compounds
- Aquatic Invasive Species – Hazard Analysis and Critical Control Point (AIS-HACCP)
- Outdoor Photography
- Lake Erie Sport Fishing
- Fish-Sampling Techniques





# HANDS-ON LEARNING

Students in grades 5-12 or groups of adults (up to 80 people) can make reservations for Field Trips in April, May, August, September and October.

Each group spends two hours aboard a Lake Erie research vessel, collecting environmental and biological data. Afterward, they return to Gibraltar, where they don lab coats to dissect fish and examine the lake's microorganisms through microscopes.

Groups can choose from up to 10 additional specialized activities to create a one-day trip lasting up to eight hours or a two-day overnight trip, including a stay at the island dormitory and meals at the dining hall.

## ACTIVITIES

- Invertebrate Collection Walk
- Exotic Species Slide Show
- Insect Collecting
- Island Geology Tour
- Herpetology Overview
- Ornithology Hike
- Fish Seining
- Climate Expedition
- Aquatic Visitors Center Tour



## AVC ADVENTURES

These half-day field trips available during the summer are shorter, but no less sweet. AVC Adventures are four-hour summer field trips for up to 30 people and are held at the Aquatic Visitors Center (AVC), just a short walk from downtown Put-in-Bay on South Bass Island. Choose up to four, one-hour activities from the following: Erie Island Cruise, AVC Tour & Fishing Fun, Birds for Beginners, Water Quality Walk, Ins and Outs of Lake Erie, Reptiles & Amphibians.



Plan your field trip at [go.osu.edu/fieldtrips](http://go.osu.edu/fieldtrips).



# DISCOVERY STARTS HERE

## AVAILABLE EQUIPMENT:

- High-speed centrifuge
- Spectrophotometer
- Fluorometer
- -80° C freezer
- Drying oven
- Temperature and light-controlled incubators
- 96-well plate reader
- Micropipettors ranging from 0.2 uL to 10 mL
- Filter manifolds
- Automated nutrient analyzer
- Flow-through microscope
- Walk-in environmental chamber
- Flow-through lake water
- Multi-sensor sondes
- Fisheries nets
- Water sampling equipment

Location, location, location. Stone Lab's position in the Western Basin of Lake Erie has made it an ideal spot for scientists conducting Great Lakes research for more than a century. As part of world-renowned research institution The Ohio State University, Stone Lab has the connections and well-stocked facilities needed for scientific discovery.

The Water Quality Laboratory, which opened in 2013, allows researchers to identify plankton, measure chlorophyll content and cyanobacteria toxins, analyze organic and inorganic suspended solids, and test for nutrients such as phosphorus and nitrogen. These tests enable scientists to tackle the issue of nutrient loading and harmful algal blooms in Lake Erie better than ever before.



In addition, the lab has several research boats:

- *R/V Gibraltar III*, a 42-foot research vessel for open-lake sampling and trawling
- *M/V BioLab*, a 37-foot trap-net style vessel for open-lake sampling and trawling
- *R/V ErieMonitor*, a 25-foot research vessel ideal for SCUBA, towing underwater equipment and light water sampling.
- *R/V GS-3*, a 28-foot research vessel ideal for SCUBA with an electric winch and davit for medium-sized bottom sampling equipment.

Two cottages near the research laboratory on South Bass Island are available for visiting researchers who are planning overnight stays. Housing is also available on Gibraltar Island and in the Aquatic Visitors Center.



To arrange use of the facility or equipment, contact Research Coordinator Dr. Justin Chaffin at [chaffin.46@osu.edu](mailto:chaffin.46@osu.edu).



# MEET ME AT THE LAKE



Hold your next event, retreat or meeting at Stone Laboratory.

Secluded meeting spaces on Gibraltar Island and at the South Bass Island Lighthouse offer spectacular views of Lake Erie. Stone Lab staff can help you incorporate field trip activities such as a sampling cruise on a research vessel, historical tours and other team-building activities.

Stone Lab can accommodate 50-75 people with a conference room that can be set in classroom, theater or U-shaped styles. We also offer indoor and outdoor reception facilities.

Dormitory-style double rooms accommodate up to 40 people for overnight stays. A full-service dining hall provides meals and breaks for guests, if desired.

The South Bass Island Lighthouse offers meeting space and reception facilities for groups of up to 10 people. A kitchen, living room and two porches provide comfortable living space for guests. The lighthouse grounds are available to rent on a limited basis.



#### Presentation support includes:

- Computer and projector with audio
- High-speed wireless internet
- Teleconferencing/web conferencing
- TV displays



For more information, visit [go.osu.edu/conferences](http://go.osu.edu/conferences).

To book, contact Kelly Dress at 419-285-1800 , or email [dress.3@osu.edu](mailto:dress.3@osu.edu) or Dr. Kristin Stanford at 419-285-1847 or [stanford.147@osu.edu](mailto:stanford.147@osu.edu).

# EXPERIENCE THE GREATNESS OF OUR GREAT LAKE

 Tours of Stone Lab facilities are available from mid-June through August/September. Visit [go.osu.edu/tours](https://go.osu.edu/tours) to learn more.



## AQUATIC VISITORS CENTER

Examine Lake Erie's ecosystem up close, including live fish. Children under 16 can borrow gear and bait and fish for free off our dock.

[go.osu.edu/aquatic](https://go.osu.edu/aquatic)



## SOUTH BASS ISLAND LIGHTHOUSE

Scheduled tours are available from April through November. Lighthouse grounds are open to the public daily from dawn to dusk.

[go.osu.edu/lighthouse](https://go.osu.edu/lighthouse)



## GIBRALTAR ISLAND TOURS

One tour is held each week for up to 70 people on a first-come, first-served basis. Groups tour the island, including Perry's Lookout, the glacial grooves and the outside of Cooke Castle before learning more about the research being conducted at Stone Lab.

[go.osu.edu/gibtours](https://go.osu.edu/gibtours)

