

TWINE

2007 SPRING/SUMMER EDITION VOL.29/NO.2

CSI: Lake Erie

Using DNA Analysis to
Monitor Fish Populations



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TWINE LINE

OHIO SEA GRANT

The Ohio State University
1314 Kinnear Rd.
Columbus, OH
43212-1156

Phone: 614.292.8949

Fax: 614.292.4364

ohioseagrant.osu.edu

OHIO SEA GRANT STAFF

Dr. Jeffrey M. Reutter, Director
reutter.1@osu.edu

Dr. Rosanne W. Fortner,
Education Coordinator
fortner.2@osu.edu

Jill Jentes Banicki,
Assistant Director
jentes.1@osu.edu

Eugene Braig, Assistant Director
braig.1@osu.edu

Greg Aylsworth, Graphic Designer
aylsworth.2@osu.edu

George Oommen, System Engineer
oommen.6@osu.edu

Nancy Cruickshank,
Publications Manager
cruickshank.3@osu.edu

Davin Riley, Office Associate
riley.235@osu.edu

John Tripp, Fiscal Manager
tripp.3@osu.edu

Daniella Nordin, Intern
nordin.7@osu.edu

EXTENSION AGENTS

Frank R. Lichtkoppler*,
Lake & Ashtabula Counties
440.350.2582
lichtkoppler.1@osu.edu

Fred L. Snyder*, Ottawa County
419.635.1022
snyder.8@osu.edu
*Program Co-Coordinators

Gary L. Comer, Jr.,
Ohio Clean Marinas Program
419.609.4120
comer.29@osu.edu

John R. Hageman, Jr.,
Ottawa County
614.247.6500
hageman.2@osu.edu

Melinda Huntley, Tourism Director
419.609.0399
huntley@coastalohio.com

David O. Kelch,
Erie & Lorain Counties
440.326.5851
kelch.3@osu.edu

Joe Lucente, Lucas County
419.213.4254
lucente.6@osu.edu

Kelly Riesen,
Lake Erie Nature & Science Center
440.808.5627
riesen.4@osu.edu

Walter D. Williams,
Cuyahoga County
216.621.3300
williams@gcpartnership.com

Gathering Great Lakes Data



Anyone needing information about the Great Lakes now has a new resource available to them. A bi-national network, the Great Lakes Observing System (GLOS) is compiling and providing historical and current Great Lakes data to scientists, educators, recreational boaters, the shipping industry, and many others. GLOS provides real-time data about the lakes region for forecasting, resource management, modeling, and teaching purposes.

Currently, data about the lakes is collected by a variety of organizations and institutions from sources such as buoys, satellites, deep water and meteorological sensors, as well as land field stations. GLOS will work toward increasing the existing data gathering tools by placing additional instruments in the field to create a denser data gathering system. This data will improve the ability to forecast things like floods, droughts, fisheries, bacterial outbreak dispersions, and climate changes.

In addition to gathering these various data sets, GLOS will produce new graphical versions of the information for public use. "We'd like GLOS to become a clearinghouse for all Great Lakes data," says Dr. Jeff Reutter, Director of Ohio Sea Grant. "The collected data can be used for a variety of purposes, from weather forecasting to Dead Zone formation, from homeland security to educational tools."

With GLOS translating complex scientific data into pictorial representations such as charts and illustrations, it will be easier for educators to integrate Great Lakes information into their teaching. Ohio Sea Grant's Frank Lichtkoppler serves as Co-Chair of the GLOS Education & Outreach Committee. "We want to help teachers get their students excited about the Great Lakes," he states. "Most kids know more about the rainforests than they do about the Great Lakes. We hope to change that."

The Great Lakes are the largest source of freshwater on the planet. Lake data helps to predict water currents, which can be crucial when an oil or chemical spill occurs near

a drinking water intake. Gathering information on natural and human-made threats to the health of the lakes' ecosystem is especially important to the 24 million residents who rely on the lakes for their drinking water. Providing more data to the public will also help educate a new generation of residents about the value of the Great Lakes and how important it is to protect them.

Coordinated by the Great Lakes Commission, GLOS is a cooperative project among U.S. federal and state agencies, including all programs within the Great Lakes Sea Grant Network, academic institutions, private industry, and Canadian agencies. Created in 2003, GLOS is one of 11 Regional Associations (RAs) of the International Ocean Observing System (IOOS), a system of data gathering networks that monitor the Great Lakes and the world's oceans. Beyond the Great Lakes region, other RAs are located on the east and west coasts of the U.S., as well as in Alaska, the Gulf of Mexico, the Caribbean and the Pacific. For more information on IOOS, visit www.ocean.us.

If you're interested in obtaining further information about GLOS, email owner-glos-rig@great-lakes.net to join the GLOS Regional Interest Group to receive periodic updates. **TL**

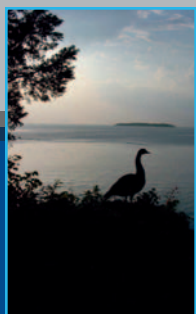
For more information about GLOS, visit www.glos.us



CSI: Lake Erie

Using DNA Analysis to Monitor Fish Populations

by Daniella Nordin, Ohio Sea Grant Communications



If you saw Ohio Sea Grant researcher Dr. Carol Stepien of the University of Toledo in her research lab, sporting her white lab coat, hovering over samples, and splicing DNA, you would wonder if you were catching an episode of *CSI*. But Stepien, one of the Great Lakes' leaders in DNA analysis, isn't analyzing the life of a human. Rather, she's tracking the life of a fish.

Stepien's quest to solve the genetic mysteries of Lake Erie began more than 10 years ago when she identified genetic variations within walleye stocks in Lake Erie's three basins. In her later work, she traced the genetic origin of the invasive zebra mussel and its cousin, the quagga, back to their European roots, as well as predicted the future extended range of the round goby.

With her newest research, Stepien continues to track genetic diversity within fish species, in particular walleye and smallmouth bass. Genetic diversity is the variation in the genetic composition of individuals within a species. It enables a species to withstand environmental disturbances such as fishing pressure, habitat degradation, and competition from invading species—all of which pose serious threats to Great Lakes fish populations. Preserving this genetic variation is fundamental to a species' ability to adapt to changing and existing environmental conditions, thus ensuring their survival.

To find genetic variation within Great Lakes walleye and smallmouth bass populations, Stepien examined the makeup of their DNA, searching for what she identifies as a marker. "A marker is a private allele, a unique gene variant that occurs only at certain spawning sites," she explains. "It would be like saying that all people from Scandinavia have blue eyes and blue eyes are found only in that country. You would then be able to identify Scandinavians by that trait."

Recognizing these markers enables researchers not only to discover different genotypes, but also different spawning locations. "The markers are reflections of the genetic makeup of fish in spawning sites," says Stepien. "We use these markers to distinguish the genotypes and their variations among walleye and smallmouth bass, two of the most economically important fish species in Lake Erie."

Stepien isolated markers by collecting DNA samples from a small piece of fish tissue clipped from the pectoral fin during the walleye and smallmouth bass spawns. She pinpointed areas within the lake where fish populations had both high and low gene flow. Fish with high gene flow (shared genetic variation) strayed from their native spawning grounds more frequently and sometimes spawned elsewhere. Fish with low gene flow (unique genetic variation) strayed less and spawned mainly at their native spawning sites.

Although she identified both high and low gene flow for each fish species, her results somewhat varied depending on the genotype. Stepien found that some walleye were wanderers (especially in western Lake Erie), straying from their native spawning sites to other areas of the lake more frequently. Whereas, smallmouth bass were mostly stationary, straying from their native spawning sites very little, if at all.

Knowing which fish genotypes return to spawning locations has important implications for maintaining their survival. In the instance of low gene flow, fisheries managers could alter their harvest strategies for fish that spawn in those locations. They could place catch limits during spawning season to avoid over-fishing and loss of the genetic stock, and if a species is in dire straits, managers could even eliminate the harvest altogether and





better protect these fish for future generations.

“By protecting habitat and spawning sites, you ensure the genetic diversity within the stock,” Stepien emphasizes. “Another way to encourage genetic variation is to make sure these sites aren’t being over-exploited. When you fish the heck out of a species, they don’t have time to recover.”

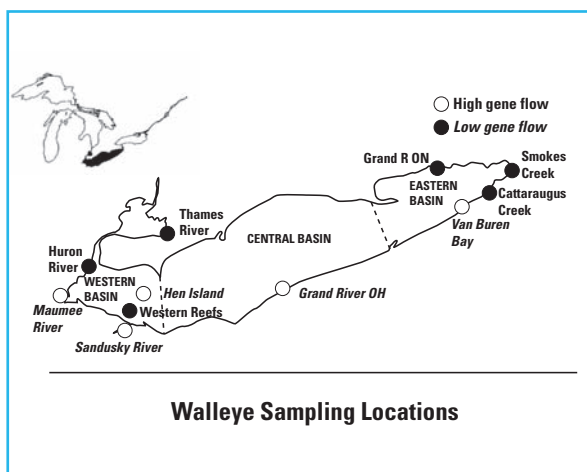
Some people think that stocking will ensure and even help fish populations grow, but Stepien believes that stocking a fishery with a different genotype than that naturally present, is one of the worst things we can do. Although stocking increases the number of potential catches, it also introduces a new genetic stock

and potentially destroys the native stock.

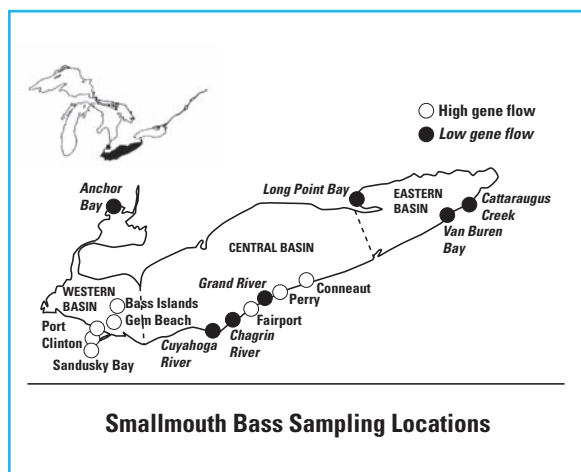
Stepien’s goal is to create a database for Great Lakes agencies to monitor walleye and smallmouth bass fish stocks via the Internet. “It’s important to know the genetic composition of an individual stock in order to better manage for its specific needs,” says Roger Knight, Lake Erie Fisheries Supervisor for the Ohio Department of Natural Resources Division of Wildlife. “The improved health of each individual stock improves the quality of the entire fishery. Stepien’s research is a great step toward improving that quality and protecting fisheries for the future.”

Stepien’s data are a result of a continuing research project funded by Ohio Sea Grant and conducted at the Great Lakes Genetic Laboratory of the University of Toledo Lake Erie Center. Her previous work with walleye DNA analysis and zebra mussel genetic lineage have also been featured in *Twine Line* (January 2000, July 2001, September 2003, and Summer 2005). To read these publications visit ohioseagrant.osu.edu/twinline. **TL**

For more information about Stepien’s DNA research and the Great Lakes Genetic Laboratory, visit lakeerie.utoledo.edu/html/glg/ or contact her at carol.stepien@utoledo.edu



Stepien’s Sea Grant research identified walleye spawning groups with both high and low gene flow in Lake Erie. When walleye stray from their native spawning grounds and mate with other genetic stocks, genetic mixing occurs.



According to Stepien’s research, smallmouth bass exhibit mainly low gene flow (little genetic variation). Smallmouth bass strayed less and spawned mostly at their native spawning grounds, causing genetic diversity to vary minimally, if at all.

Nerodio Kids Day 2007

Educating the Next Generation

by Jill Jentes Banicki, Ohio Sea Grant Communications



When Stone Lab's Kristin Stanford started Nerodio in 2002, it was a way to collect as many Lake Erie water snakes as possible. "We needed to track the number of these federally threatened, state-endangered snakes around the Lake Erie islands to determine if the species was rebounding," says Stanford. She got a group of volunteers together, named it "Nerodio," and a two-week tradition of snake wrangling began.

The word, Nerodio, itself is a clever combination of the snake's genus name, "Nerodia" and the word "rodeo" since as Kristin points out, they're roundin' up snakes. "Just because we're fulfilling a part of the U.S. Fish and Wildlife Service's recovery plan for the snake with this annual population census, doesn't mean it can't be fun," states Stanford. Over the years, her Nerodio crew has grown to more than 30 loyal volunteers who, within a

two-week period every May, scour the nine U.S. Lake Erie islands to track, catch, and tag more than 1,500 water snakes.

With her recent exposure on Discovery Channel's *Dirty Jobs*, however, Stanford realized her snake audience not only got bigger, but also much younger. "I had kids 3, 7, 12-years old over the last year come up to me completely enthralled with what we did on the show," says Stanford. "They knew every minute (of the episode) by the dozens of times they watched it and they still wanted to learn more about the snakes. We thought why not broaden Nerodio to include the next generation of snake conservationists?" And so a new tradition, Nerodio Kids Day, began.

Sponsored by Ohio State's Stone Laboratory and Ohio Sea Grant, Northern Illinois University, Cincinnati's Herpetology Club, and Northern Ohio Association of Herpetologists, Stanford and her Nerodio crew took 18 kids ages 10 to 13 to Middle Bass Island for a day to do the same type of snake catching, tagging, and releasing that Mike Rowe, the *Dirty Jobs* host, had done.

Equipped with their snake-catching gloves and pillowcases to hold their slithering treasures, the kids hiked from one snake mat to another, hoping to snag a few snakes and help add to the snake consensus count. After catching more than 20 snakes, Stanford showed the kids how to determine the snakes' sex, weigh them, and scan them. "If the scanner beeps, we know the snake has already been tagged," explains 11-year old Arthur Wolf. If no tag existed on the snake, the group would insert an electronic tag under the snake's skin and mark all the snakes with chalk so later Nerodio participants would know not to catch them again.

While one group of kids peeked under rocks for snakes by the shoreline, the other group

took their turn learning how to track snakes using radio telemetry. "Each snake's tag has a specific number that we can input into the tracker and follow the snake's tag," explains Meg Crary, Nerodio volunteer and Stone Lab student. "The closer you are to that snake, the closer and louder the beep."

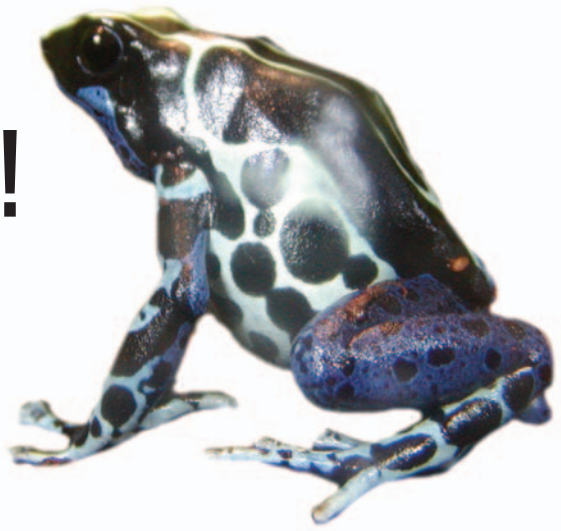
As the morning wound down, the Nerodio Kids joined the rest of the public at the Stone Lab Herpetology Lab Open House, where they helped process the snakes and had the opportunity to see and hold more than 30 different species of amphibians and reptiles brought in by the event sponsors.

At the end of the day, the kids left sporting their new Nerodio Day t-shirt, a Stone Lab backpack, and a "Respect the Snake" temporary tattoo. With the success of this year's event, plans are already in the works for a Nerodio Kids Day 2008! **T**



Frogs, Turtles, and Snakes . . . Oh My!

by James Proffitt, Ohio Sea Grant Communications



Put-in-Bay was crawling with reptiles and amphibians Saturday, June 9th, as Ohio State's Stone Lab hosted the first ever Herpetology Lab Open House. The Open House, led by the Island Snake Lady, Kristin Stanford, and her research team along with volunteers from the Greater Cincinnati Herpetological Society (GCHS), and the Northern Ohio Association of Herpetologists, invited children of all ages to learn about reptiles and amphibians from around the world, including the federally threatened, state-endangered Lake Erie water snake.

"Lake Erie water snakes are the nastiest, dirtiest, and smelliest snakes out there," explains Stanford. "But it's important for the public to see the recovery of this species. This Open House is a great way to educate people by using hands-on conservation activities."

The lab, located in a long, high-ceiling room in a century-old building overlooking the bay, was crowded with small glass tanks, large aquariums, giant fish-filled tanks, jars filled with formaldehyde-preserved specimens, laptops, and scientific equipment. Throughout the day, visitors wandered through the doors and were able to witness a firsthand glimpse of scientific research. Undeterred by the snake-filled pillowcases lying on workbenches and on the floor, or the peculiar odor of the Lake Erie water snake (when it feels threatened it sprays musk and feces as a defense) visitors were fascinated. Among the scaly creatures on display were California king snakes, Pueblan milk snakes, plated lizards, yellow water snakes, Honduran milk snakes, blue-tongued skinks, and bearded dragons.

"I'm very happy with the turnout," says Todd Rosenhoffer, one of four members of the GCHS who volunteered to help at the Open House. "I'd estimate that we had well over 500 people come through." Rosenhoffer and other GCHS members staffed the upper floor of the lab while curious folks came and went throughout the day. Among the snakes and amphibians on display were more than 30 species from Australia, Africa, and

South America. Visitors as young as three years old came through to look at, ask questions about, and even handle the snakes.

Downstairs with another GCHS member, 16-year old Mike Schornak, visitors helped research staff process the Lake Erie water snakes that Nerodio Kids Day participants located and captured in a morning field trip to Middle Bass Island. The lab processed more than 160 of the snakes throughout the day. "We had people helping us take scientific notes and weighing the snakes," describes Schornak. "We got a lot of people involved in the process throughout the day."

Guests downstairs were also treated to a different array of creatures including tiger salamanders, eastern garter snakes, and a rare leopard frog. Visitors were able to watch researchers inject snakes with pit-tags, or microchips. "Each pit-tag gives off a unique serial number," Schornak explained to onlookers. "When scanned, it gives us all the information about this particular snake. When and where it was first caught, information about its weight, movements, and health."

Later that afternoon, the Nerodio Kids Day participants spent the last few hours fishing off the Stone Lab docks. "Right now I'm fishing for the program, for gobies," states 10-year old Elise Torrence from Bexley, Ohio. "They're a favorite of the Lake Erie water snake. We're going to take them and feed them to the snakes," she says, explaining another scientific experiment about digestion rates that Stanford and her team would conduct later that week.

"These kids really stepped up to the plate," Stanford emphasizes, during the afternoon fishing. "It's important because these kids are our next generation. Our work won't matter unless they embrace what we're doing now."

Will there be another Open House and Nerodio Kids Day? Absolutely. "It's building the foundation of good conservation," concludes Stanford. All the 2007 participants have already been invited back for the Herpetology Open House 2008! **TL**



Ten-year old Elise Torrence shows off her catch at the Herpetology Open House hosted by OSU's Stone Lab.



OHIO SEA GRANT *STAFF NEWS*

Sea Grant Researcher Honored by U.S. Fish and Wildlife Service

Ohio Sea Grant researcher Dr. Roy Stein recently received the prestigious *Silver Eagle Award* from the U.S. Fish and Wildlife Service. Stein, Director of The Ohio State University's Aquatic Ecology Laboratory, accepted the award in January during the Ohio Department of Natural Resources Division of Wildlife's Lake Erie and Inland Waters Annual Research Review. Recognizing impressive contributions to wildlife conservation and management, the *Silver Eagle Award* is the highest honor given by the Fish and Wildlife Service's Great Lakes-Big Rivers Region. Stein's previous Sea Grant research has included work on smallmouth bass consumption of round goby and the movement of environmental contaminants through the aquatic food web.



Ohio Sea Grant Researcher Dr. Roy Stein (far left) receives the prestigious *Silver Eagle Award* from the U.S. Fish and Wildlife Service.



Fred Snyder, Ohio Sea Grant Extension Specialist and Program Co-Leader, was recently awarded the ODNR Division of Wildlife *Distinguished Service in Conservation Award* in March 2007.

Extension Agent's Work Recognized with State Award

The Ohio Department of Natural Resources Division of Wildlife *Distinguished Service in Conservation Award* was given to Fred Snyder, Ohio Sea Grant Extension Specialist and Program Co-Leader. At the 2007 Charter Captains Conference in March, Steve Gray, Division of Wildlife Chief, noted Fred's passion for teaching people about Lake Erie's fishing opportunities. As an outstanding ambassador for sport fishing in Lake Erie, Snyder, who has worked for Ohio Sea Grant since 1978, has organized and conducted the annual conference for fishing guides for over 25 years. He was inducted into the Lake Erie Charter Boat Association Hall of Fame and is a past president of the Outdoor Writers of Ohio, Inc. Snyder serves on a number of Lake Erie-related committees including the Portage River Basin Council's Recreation and Wildlife Committee (chair), the Port Clinton Transient/Safe Harbor Core Team, the Lake Erie Buffer Team, The Lake Erie Coastal Ohio Board of Trustees, and the Assembly of Sea Grant Program Leaders.

Stone Lab Instructor Receives Presidential Fellowship

Joe Conroy, Stone Laboratory instructor and Ohio State graduate student in Evolution, Ecology, and Organismal Biology, has been chosen as a 2007 Mary S. Muellhaupt Presidential Fellow. He will receive one year of financial support which will enable him to focus solely on the completion of his dissertation. This competitive fellowship recognizes the exceptional scholarly work and potential of graduate students who are beginning the final phase of their dissertation research.



Stone Lab instructor Joe Conroy has been chosen as a 2007 Mary S. Muellhaupt Presidential Fellow.

Ohio Sea Grant Student Wins University Award

Daniella Nordin, Ohio Sea Grant Communications Intern and Ohio State senior, was runner-up in the annual *Ohio State Student Employee of the Year* competition. Nordin was recognized for her work for Ohio Sea Grant and Stone Laboratory. Presented by Ohio State Administration, the award honors the top .5% of all Ohio State student employees.



Daniella Nordin, Ohio Sea Grant Communications Intern and the *Student Employee of the Year* Runner-up

Ohio Sea Grant Communications Earns Awards

Ohio Sea Grant Communications recently earned a first place award from the Association of Communications Excellence (ACE), an international association for agricultural communications. Stone Laboratory's promotional 8-page brochure, tri-fold flyer, and three-part postcard series received a 2007 ACE Gold Award in the *Publishing Direct Mail* category. The Communications team was also honored in the 19th Annual Awards for Publications Excellence (APEX) Competition. *Twine Line's* Research Reviews, a series of brief articles highlighting current research topics



Twine Line Research Briefs and Stone Lab promotional material receive ACE and APEX communications awards.

around the Lake Erie region, won a 2007 Award of Excellence in *Feature Series Writing*. The APEX Awards are an international competition that recognizes outstanding publications and web sites in professional communications. Congratulations go out to the project developers: Graphics Designer Greg Aylsworth, Associate Editor Abbie Basile, Communications Intern Daniella Nordin, and Assistant Director Jill Jentes Banicki. To view Sea Grant's winning entries, visit stonelab.osu.edu/about/?show=awards.

Stone Lab Bloggers Win Cedar Point Tickets

Last summer marked the beginning of a new Stone Lab Communications project: student blogs. More than 10 students created online journals to document their experiences while they took a course on Ohio State University's Island Campus. Participating bloggers earned a free Stone Lab drawstring backpack and were entered in a raffle for a pair of Cedar Point tickets as a reward for their hard work on writing and maintaining their blogs all summer. Congratulations to Amy Rether and Jennifer Yi, last year's Cedar Point ticket winners!

The Lake Erie Discussion Board

Ohio Sea Grant Extension developed a Lake Erie Discussion Board in 2002 to provide an online venue for questions about Lake Erie and its resources. Over the years, Extension agents have fielded questions about such topics as the dead zone, current fishing techniques and regulations, and Lake Erie water levels.

The online discussion board has proven to be very popular, averaging 60,000 hits per month. To celebrate its success as one of the top Ohio Sea Grant web pages, Extension would like to share questions posed and their answers.

Lake Storms and Rogue Waves

I was on Lake Erie when it was glass calm. Fifteen minutes later, we were in a storm with five-foot waves. Every 20th wave or so was much bigger. The storm came out of the northwest, so it had a lot of fetch to build. Winds conservatively were at 30-40 mph. Why does this happen so suddenly?

Answer from Dave Kelch

Storms and high wind events can quickly turn a nice day on the lake into a life-threatening experience. Lake Erie can experience drastic changes in wave height.

Lake Erie is the shallowest Great Lake. This allows waves to kick up faster and have a shorter wavelength. Wavelength is the distance between the crest of one wave and the crest of the next. On Lake Superior, or in the ocean, waves may get very large, but they are often spaced far apart. In Lake Erie, your stern may be on the crest of one wave, while the next one is washing over your bow.

In storms and wind events, rogue waves form when two waves cross each other and combine to make a bigger wave. This is probably what you experienced with the periodic larger waves.

Ice and Reefs

When ice is piled sky high in the western basin of Lake Erie, how much "rearranging" occurs of the reefs off Locust point or the rock piles in Maumee Bay? It seems there would be enough power from the ice to do some real rock moving. At the very least, it seems it would scour the rocks clean.

Answer from Kelly Riesen

The ice does not rearrange the rocks or change the shape or size of the reefs in the western basin. However, reefs in more shallow water, such as Crib, Niagara, Kelleys Island Shoal, and Gull Island Shoal, will often get their tops scoured by ice.

Stone Lab Featured in New Lake Erie Documentary



Stone Laboratory, The Ohio State University's Island Campus on Lake Erie, was recently featured in the first of a new four-part series *Lake Erie: Beyond the Surface* produced by WKYC-TV3 in Cleveland, Ohio. The documentary, which focuses on Lake Erie's economic and ecological importance, tells the success story of the Lake from commercial and environmental points of view.

The first segment, which aired on Saturday, June 30th, provides an overview of the geophysical, political, and commercial history of Lake Erie and the surrounding region. "Lake Erie is by far Ohio's greatest natural resource," describes Melinda Huntley, OSU Sea Grant Extension and Coastal Ohio Director. "It's also a huge generator in the area for tourism. Over \$8.7 billion comes in as direct spending for tourism and related businesses alone."

The 30-minute documentary also summarizes the environmental rescue story of Lake Erie and highlights its recreational uses and importance to maritime history. Others interviewed include Dr. Charles Herdendorf, OSU Professor Emeritus and former

Ohio Sea Grant and Stone Laboratory Director, Chris Winslow, Stone Lab faculty, and Dr. Jeff Reutter, Director of Ohio Sea Grant and Stone Laboratory, who discusses the program's continued involvement with the Lake's recovery. "The many things we do on Lake Erie make it the most important lake in the world, there's no doubt about that," Reutter explains. "We're trying to be proactive to identify and address issues before they become problems."

The next three segments of *Lake Erie: Beyond the Surface* will cover everything from the importance of Lake Erie as a commercial resource, to determining a blueprint for its future. They are scheduled to air quarterly, beginning in October, continuing in January, and ending in May 2008.

For more about the documentary series, read interviews of the Ohio State and Stone Lab staff, or to view a previously-aired segment, go to www.wkyc.com/life/programming/shows/lake_erie/. For inquiries about purchasing *Lake Erie: Beyond the Surface*, contact Micki Byrnes at mbyrnes@wkyc.com.

Stone Lab's 2007 Guest Lecture Series

Learn about Lake Erie and Great Lakes environmental hot topics this summer at Stone Lab, The Ohio State University's Island Campus on Lake Erie. If you are unable to attend the Guest Lecture Series this summer at Stone Lab, they are available as streaming video and podcasts on the Stone Lab webpage stonelab.osu.edu/lectures.

- 6/14 **Dr. Charles E. Herdendorf**, Professor Emeritus, Ohio State University
"Geology of the Great Lakes: From Volcanoes to Glaciers—Three Billion Years of Spectacular Scenery in the Making"
- 6/21 **Dr. Stan Gehrt**, School of Environment and Natural Resources
"Urban Coyote Ecology: Separating Myths from Truths"
- 6/28 **Chris Korleski**, Director, Ohio Environmental Protection Agency
"Environmental Protection: Where do you fit in?"
- 7/5 **Dr. Larry Krissek**, School of Earth Sciences, Ohio State University
"Scientific Drilling in Antarctica: Records of Climate Change"
- 7/12 **Dr. R. Peter Richards**, National Center for Water Quality Research, Heidelberg College
"Thirty-Year Phosphorus Trends in Ohio Lake Erie Tributaries: What's Happening and Why?"
- 7/26 **Sean D. Logan**, Director, Ohio Department of Natural Resources
"Real Green: Jobs, Conservation and Public Policy"
- 8/2 **Roger Knight**, Lake Erie Fisheries Supervisor, Ohio Division of Wildlife
"Walleye Capital of the World: Lake Erie Fisheries"
- 8/9 **Dr. Bobby D. Moser**, Vice President of Agriculture and Outreach, Ohio State University
"Agriculture and the Environment"

Come join us at the 10th Annual Friends of Stone Lab Open House!

Saturday, September 8, 2007 from 11:30 a.m. – 3:30 p.m.

Activities:

- Tour of Stone Lab, Gibraltar Island
- Free transportation to Gibraltar from Research Building
- Tour the 6.5-acre island and view Cooke Castle
- Lectures and Laboratory sessions
- Tour ODNR Aquatic Visitors Center

Questions, call **614.292.8949**

Stone Laboratory Scholarships and Fellowships for 2007



The Stone Laboratory Scholarship Committee and the Research Experience for Undergraduate (REU) Scholarship Program Committee met in March to evaluate student applications. With the help of the Friends of Stone Laboratory, 33 college students and 10 high school students will receive approximately \$25,000 in summer scholarships for courses at Stone Laboratory, the Island Campus of The Ohio State University. Additionally, over \$37,000 in REU scholarships was given to 11 undergraduate students who will complete a five-week course at the Laboratory and conduct research in herpetology, limnology, fisheries, or entomology. Three classroom teacher fellowships valued at more than \$12,000 were also awarded.

Stone Lab, located on Gibraltar Island on Lake Erie's Put-in-Bay, has been Ohio's Lake Erie Laboratory since 1895, making it the oldest freshwater field station in the country. Each summer, Ohio State offers more than 30 science courses at the Lab, in one- or five-week sessions. Classes are offered at the introductory through graduate level. Overall, the scholarship students come from 12 different colleges and universities and 10 different high schools. Congratulations to all of the students!

Support for these programs comes from donations and endowments created by the Friends of Stone Laboratory, an organization of individuals and businesses supporting research, education, and outreach efforts that enhance science education, the coastal economy, and the Lake Erie ecosystem. To donate, visit ohioseagrant.osu.edu/donate, or contact Dr. Jeffrey M. Reutter at **614.292.8949**.

Stone Lab would also like to congratulate the recipients of the Ohio Aquatic Science Scholarship: John Tallman of Maumee (\$1,500) and Matthew Williams of Columbus (\$1,000). The Ohio Chapter of the American Fisheries Society, along with several other groups, contributed to these scholarships including the Ohio BASS Federation, the Cleveland Chapter of Muskies, Inc., the Ohio Central Basin Steelheaders, and the Ohio Smallmouth Alliance. Additional funds were provided by the Polish Fisherman's Club and the Friends of Stone Laboratory. Each scholarship will be applied toward room and meal fees for summer courses at Stone Lab. We thank all of the sponsoring organizations for providing a great opportunity to these deserving students. Organizations wishing to contribute, please contact Mike Wilkerson, ODNR Division of Wildlife, at Mike.Wilkerson@dnr.state.oh.us.

For more information on these and other opportunities offered at Stone Laboratory, visit

stonelab.osu.edu

Student Spotlight

Discovering Your Inner Researcher



Stone Lab can be a place to study science while enjoying the lake's beauty. It can also serve as the setting where a student pushes herself to work harder than she ever has before. That's what Stone Lab was for Mindy Beam.

Before the summer of 2005, Mindy Beam had never been to Gibraltar Island and she didn't know anything about limnology, the study of inland waters. But by the end of the season, she had completed an intensive research project about the hypolimnion, the deep, cold layer of water in Lake Erie. Working closely with researchers for several weeks, she not only expanded her knowledge about the lake, but she discovered things about her work ethic and ability to perform hands-on research.

A Zoology major, Beam, registered for Stone Lab's summer 2005 Field Zoology course based on recommendations from her fellow Ohio State University students. In addition, she participated in the Research Experience for Undergraduates (REU) Scholarship Program that summer. As an REU student, she worked closely with limnologist Joe Conroy, a Stone Lab instructor and current Graduate Fellow at Ohio State.

"My REU experience was definitely challenging," says Beam. "I had collected zebra mussels before, but otherwise, the whole topic of limnology was new to me." She spent hours reading up on the subject and during her first week on the island developed a research topic dealing with the study of chlorophyll in the hypolimnion and its effect on dissolved oxygen. To pursue her hypothesis, Beam and Conroy took water samples from the lake's Sandusky sub-basin twice a week.

Conroy enjoyed overseeing Beam's research experience. "She was willing to push herself to learn and master areas with which she wasn't familiar. To me, that is really is a crucial part of

the REU Program," he observes. For most students, the REU Program is their first real experience as a researcher. "These students come into the program and want to do research and we help them see all aspects of that. They identify a hypothesis, review the scientific literature, conduct field and lab work, analyze data, and, finally, they write and present their papers," adds Conroy. "It can be hard work, but Mindy jumped right in."

The experience was both enjoyable and intense for Beam, who graduated from Ohio State in winter 2006 with a Bachelor's degree in Biological Sciences. "I loved waking up on an island and spending an entire day out on a boat on Lake Erie doing field research, with the wind in my hair and sun on my face," she recalls. With less than five weeks to complete her research, she also worked hard and put in long hours. "Academically, Joe Conroy forced me to push myself beyond what I thought I could accomplish. I never would have thought I could write the research paper I handed in. Being pushed to study more and work harder, that was a good thing."

Having participated in other hands-on research experiences, such as studying coral reefs in Belize, Beam feels Stone Lab's REU Program is by far the most rigorous she has come across. "Anyone considering graduate school should definitely participate in the Lab's REU Program. It's challenging and will prepare you for what is involved in graduate work," she explains. Working hand-in-hand with a seasoned researcher gave Beam a greater appreciation for research. "I gained a much better understanding of the scientific process. Now, when I read a journal article, I understand how much work—in both the lab and the field—goes into a scientific experiment."

When she went beyond her own perceived limits, Beam discovered personal strengths and abilities that she didn't realize she possessed. "I learned I was capable of doing research and that was rewarding. I learned I could push myself when there's a goal to attain," she says. She hopes other students will take advantage of what Gibraltar has to offer. "Stone Lab's REU Program is an experience you will not get anywhere else." **TL**



Mindy Beam performed research on chlorophyll and dissolved oxygen levels in Lake Erie as part of the Research Experience for Undergraduates Scholarship Program.

FRIENDS OF STONE LABORATORY

Dear friends,

This issue of Twine Line is coming after a very productive Spring Work Weekend. I, of course, want to thank all of the participants for their investment of "sweat equity" in Stone Laboratory. The Work Weekend plays a crucial role in preparing the island for the soon-to-arrive students.

On the topic of students, the first-term students have arrived and classes are in full swing up at the Lab! Joining the students is a new crop of Research Experience for Undergraduates (REU) Scholarship Program students. The REU summer program provides supervised hands-on research in entomology, fisheries, herpetology, and limnology. The experience is an excellent way to prepare undergraduate students for graduate studies or professional careers, including the opportunity to publish their work. This valuable program is funded by FOSL and three endowments: F. T. Stone Research Endowment, the John L. Crites Research Endowment, and the Thomas H. Langlois Research Endowment.

Speaking of FOSL, the group's new logo has been designed and car window decals along with new FOSL water bottles are now available for purchase. Also, be on the lookout for the 2007 fundraising mailing. All donations directly support the programs and students at Stone Lab and are tax-deductible.

In closing, please don't forget to support the education and research programs of Ohio Sea Grant and Stone Laboratory by purchasing your "Fish Lake Erie" specialty license plate or by donating online at stonelab.osu.edu/donate (download the FOSL membership form and designate to which fund you wish to donate).

Sincerely,

Christopher J. Winslow cjwinsl@bgnet.bgsu.edu
FOSL President

Winter Program Update

The annual Ohio Sea Grant and Friends of Stone Laboratory (FOSL) Winter Program and Silent Auction, held on February 28th, raised over \$2,000 for Stone Laboratory scholarships and programs.

The Honorable Chris Redfern, Ohio House of Representatives, pledged his continued support of Stone Laboratory and the Ohio Sea Grant College Program, while also challenging everyone to contact their legislators regarding Lake Erie and environmental issues. Dr. Jeffrey Reutter, Director of Ohio Sea Grant and Stone Lab, presented Redfern with both the Stone Laboratory Superior Leadership Award and the Ohio Sea Grant Superior Leadership Award in recognition of his strong backing of the Lab. Redfern is the only person to have received both honors.

Keynote speaker Dr. Michael Hoggarth, Chair of Otterbein College's Life & Earth Sciences Department, presented a light-hearted retrospective of his 12 years teaching at Stone Lab. Many of his recent students were present to provide laughter and good natured jibes. Dr. Hoggarth has received the Stone Lab Outstanding Visiting Professor award six times during his tenure at the Lab.

Dr. Robert McGrath, Senior Vice President for Research at The Ohio State University, noted that the direct impact from each dollar invested into research and teaching at Stone Lab was probably the highest of any unit of the university. He added that the report from the 2005 Sea Grant Program Assessment Team was the most positive and unanimous support he had ever seen from a national review team at the university.

FOSL President Chris Winslow briefly highlighted accomplishments and news relating to Stone Lab and FOSL. Lyndsey Manzo, FOSL board member and Westerville North High School teacher, speaking on behalf of Dr. Rosanne Fortner, announced the 2007 Stone Laboratory Teacher Fellows, educators who receive full tuition, plus room and board, for three weeks during the summer at Stone Lab.

We wish to thank everyone who generously participated in the silent auction. Special recognition must be given to Nancy Cruickshank for her organization and diligence in setting up the auction. Without all of the volunteer and donor support, this special event would not be possible.



The Honorable Chris Redfern, Ohio House of Representatives, received both the Stone Lab and Ohio Sea Grant Superior Leadership awards.



Loretta Harvey, one of three new Stone Lab Teacher Fellows, and Ohio Sea Grant Director, Dr. Jeff Reutter.

The Friends of Stone Laboratory (FOSL) began in 1981 as a support group to "bring Stone Laboratory into the 21st century with the best possible facilities, equipment, and professors, and make this an unequaled learning experience available to all outstanding students." Members of the Friends provide a way for former students to support the facility by raising awareness and funds for scholarships, research, and equipment.

FOSL

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F.T. STONE LABORATORY FIELD STATION

The Ohio State University
PO Box 119, Put-in-Bay, OH 43456
419.285.1800, 614.247.6500, Fax 614.247.6578
stone@osu.edu

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Eugene Braig, Assistant Director (braig.1@osu.edu)
John Hageman, Laboratory Manager (hageman.2@osu.edu)
Matt Thomas, Asst. Lab. Manager (thomas.347@osu.edu)
Arleen Pineda, Program Coordinator (pineda.2@osu.edu)
Kelly Dress, Office Associate (dress.3@osu.edu)

Dates to Remember

Stone Lab Open House/FOSL Weekend, 9/8/07

Buckeye Island Hop, 9/29/07

Thank You for Your Support of Stone Laboratory!

We wish to express our gratitude to the following organizations and individuals who kindly donated items and services for this year's Winter Program & Silent Auction. Ohio Sea Grant and FOSL are fortunate to have so many people and businesses donate to and participate in our annual auction; you've helped to make each year's auction more successful than the last. Your generosity has helped fund Stone Laboratory scholarships and programs.

Individuals

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