



COSEE Great Lakes: Connecting Educators and Scientists throughout the Great Lakes

Fifteen educators from Pennsylvania, Michigan, and Ohio took to the waters of Lake Erie this summer for a week-long workshop onboard the U.S. Environmental Protection Agency's *Lake Guardian* research vessel. These environmental educators and teachers worked with scientists to collect and analyze water samples and explore classroom and field activities relating to the Great Lakes and ocean sciences. They discovered first-hand Lake Erie ecology and coastal geography, and discussed Great Lakes issues that parallel those of the world's oceans.

This professional development opportunity is part of the *Centers for Ocean Sciences Education Excellence (COSEE) Great Lakes* program, which is sponsored by the Great Lakes Sea Grant Network, a collaboration between the Michigan, Illinois, Indiana, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin Sea Grant programs. With the award of a five-year, \$2.5 million dollar competitive grant, COSEE Great Lakes became the newest of ten centers in the national COSEE network that are funded by the National Science Foundation and National

Oceanic and Atmospheric Administration.

Through COSEE Great Lakes, students and educators in the Great Lakes region will have unique opportunities to explore the lakes and discover their connection to the world's oceans. COSEE will also create connections between Great Lakes ocean researchers and educators while enhancing scientific literacy and environmental stewardship. The activities of COSEE will further provide a conduit for getting current research findings into the hands of educators for use in the classroom. Over the five-year period, more than 2,000 teachers and 350 researchers will take part in COSEE activities, which will include special events for schools and the public on inland seas science, and the development of ocean observation materials.



Scientists and teachers pose on deck ready to begin their week-long COSEE adventure. Photos courtesy of Anne Danielski.



For more information on the COSEE Great Lakes program or upcoming workshops please visit the COSEE Great Lakes Web site (coseegreatlakes.net) or contact Marti Martz at 814-217-9015 or mam60@psu.edu.



Above: COSEE summer workshop participants roll up their sleeves to examine a sample from the bottom of Lake Erie. Right: The research vessel Lake Guardian.

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Removing Obstacles to Improve Fourmile Creek

There's a story to tell as Fourmile Creek, east of the city of Erie, flows through Greene and Harborcreek Townships, Wesleyville Borough, and then finally Lawrence Park Township on its way to Lake Erie. In its headwaters, the stream has a healthy population of bottom-dwelling stream creatures (invertebrates) that indicate good quality habitat and water conditions. But by the time the stream reaches Lake Erie, the stream habitat becomes degraded and far fewer kinds of invertebrates are able to survive. In addition, barriers block fish from swimming upstream. In fact, the Pennsylvania Lake Erie Watershed Association (PLEWA) recently ranked Fourmile Creek as the fourth lowest quality of the twenty-two streams they monitor.

Why is lower Fourmile Creek degraded? While this urban creek measures only eight miles in length and its watershed encompasses twelve square miles, there are many obstacles that prevent the stream from flowing normally. Large obstructions that interrupt the natural water flow include two dams and a concrete-capped waterfall. Locomotive ballast also clogs the stream's lower reaches. These large chunks of concrete and metal may have been placed there many years ago to stop stream bank erosion or to fill swimming holes. Obstructions like these can be a problem when they prevent the passage of fish and dam the stream to create pond-like conditions that make the water too warm for some species.

With this diagnosis in mind, PLEWA decided to organize a team to restore the

creek to a more natural flow by removing stream impediments. The Fourmile stream improvement team includes representatives of the Pennsylvania Department of Environmental Protection

(DEP), Coastal Resources Management Program, the Wesleyville Conservation Club, Pennsylvania Sea Grant, and Penn State Behrend. PLEWA rallied community support for a number of stream restoration projects and served as a catalyst to set priorities and raise design and construction funds. Once completed, these improvements will allow fish to pass from Lake Erie to the upper reaches of the stream and convert pond areas back to stream habitat, which will support a larger variety of invertebrates.

The PLEWA team also has a hand in implementing some of the improvements that will be completed this year. The Iroquois School District is funding the removal of the dam near Station Road, and the concrete cap as part of a mitigation agreement with DEP. PLEWA has also initiated discussion with General Electric regarding the locomotive ballast removal project. Sea Grant has prepared grant applications on behalf of Lawrence Park Township and the Pennsylvania Fish and Boat Commission for funding which would design and construct fish ladders at the Lawrence Park Golf Club to modify the club's dam to allow fish passage.

To learn more about the PLEWA team and find out how you can help improve Fourmile Creek, contact Dave Skellie at 814-217-9014 or dus18@psu.edu.



Sea Grant is helping to remove this concrete which will restore fish passage and natural flow to lower Fourmile Creek.



The Nacopoulos dam is also slated for removal in order to restore stream flow.

And More to the Story...

Sea Grant Helps Penn State Behrend Correct Soil Erosion along Fourmile Creek

Soil that washes into tributaries during storms creates a major source of nonpoint pollution for Lake Erie. When muddy sediment runs off the land, it carries extra nutrients into streams, scours the bottom of algal food, and can clog the gills of aquatic insects and fish.

On the Penn State Behrend campus there is a major source of sediment to Fourmile Creek. The force of water exiting three stormwater pipes has carved large gullies exposing tree roots and washing an estimated seventy-eight tons of sediment per year downstream into Trout Run, a tributary of Fourmile Creek, and then into Lake Erie. The total length of the eroding gullies is about 450 feet. While the erosion began about fifteen years ago, the rate at one location has recently accelerated.

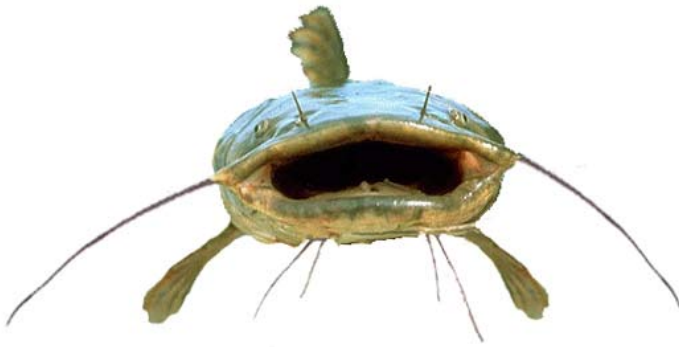
To implement best management practices to correct some of these problems, Penn State Behrend and Pennsylvania Sea Grant teamed up to secure a restoration grant of \$75,000 from the Great Lakes Basin Program for Soil Erosion and Sediment Control and \$25,000 from Penn State. Construction techniques will be used which will dissipate the water's energy, thereby reducing erosion and sedimentation. Once the stormwater is slowed, the badly eroded slopes can be restored and stabilized using matting and new plantings. Construction is scheduled to take place in 2007.

Contact Dave Skellie at 814-217-9014 or dus18@psu.edu

So What's the Big Deal About Flathead Catfish? New Web Site Has the Answers Eastern Pennsylvania Needs

So what's the big deal about flathead catfish (*Pylodictes olivaris*)? In a word, flathead catfish introduced in the Delaware and Susquehanna River watersheds can grow to be very BIG, perhaps as large as 80 pounds! With such a large appetite, flat-heads compete with and eat lots of fish and are expected to cause

declines in native fish populations. While the flathead is native to western Pennsylvania, it has become an invasive species after being introduced to the Delaware and Susquehanna drainages in eastern Pennsylvania.



Find out the big deal about flathead catfish at the new Web site <http://seagrant.psu.edu/research/flathead.htm>.

Pennsylvania Sea Grant developed the Web site *Introduced Flathead Catfish of Eastern Pennsylvania* (<http://seagrant.psu.edu/research/flathead.htm>) as a one-stop resource for everything you need to know about *Pylodictes olivaris* in the Delaware and Susquehanna River drainages. The development of boat stickers and a traveling display entitled *So What's the Big Deal about Flathead Catfish?* are also part of the introduced flathead research and outreach effort partially funded by the Pennsylvania Department of Environmental Protection, Coastal Resource Management Program.

Boat stickers and the table-top display *So What's the Big Deal About Flathead Catfish?* are available for your educational group's use. If you're interested in stickers or want to learn how to borrow the display, visit the Web site or contact Ann Faulds at 215-806-0894 or afulds@psu.edu.

Have a Bilge in Your Boat? Make Sure You Use a Bilge Sock!

Pennsylvania Sea Grant is teaming up with the *Smart Boating Clean Waters* campaign to provide 3,500 free bilge socks to recreational boaters in southeastern Pennsylvania.

What is a bilge sock? It's a fabric tube filled with absorbent material designed to soak up oil and gas that may leak into the bilge of a boat. When a petroleum product comes in contact with the material inside the bilge sock, it becomes trapped as a solid.

How do bilge socks help protect water quality? They keep gasoline, engine oil, and diesel fuel that are toxic to plants and animals from being released into the water. Small amounts of oil and fuel that collect in your boat's bilge can be pumped into a waterway when the bilge is emptied. A bilge sock will remove petroleum products mixed with the bilge water before it has a chance to reach a lake, river, or stream. If your engine is well maintained, one bilge sock should last through the entire boating season.

There are other steps boaters can take to keep Pennsylvania's waters clean. Keeping the boat engine well tuned will prevent unburned fuel and oil from escaping in the exhaust water. Boaters should take care when fueling to avoid spills, and should not top off the fuel tanks; as fuel tanks heat up, the expanding fuel can overflow.

The *Smart Boating Clean Waters* campaign offers recreational boaters and marina operators information to protect the quality of Pennsylvania rivers and water bodies. Funding for the bilge sock project was provided by the Pennsylvania Department of Environmental

Protection, Coastal Resource Management Program, and the Philadelphia Water Department. Additional project partners include the Pennsylvania Fish and Boat Commission, Montgomery County Conservation District, Delaware County Conservation District, and the Bucks County Conservation District. Contact any of the project partners or Sarah Whitney at 610-304-8753 or swhitney@psu.edu to find out more about the bilge sock program.



Bilge socks like the ones pictured can help reduce pollution and are available through Pennsylvania Sea Grant.

Invasive Species Management Workshop Proceedings Now Available Online

Proceedings from *Setting the Road Map: A Workshop to Begin Developing an Invasive Species Management Plan for Pennsylvania*, held October 26-27, 2005, in State College, Pennsylvania, are now available online at <http://seagrant.psu.edu>.

This event gathered input from sixty-five participants representing state and federal agencies, environmental non-profits, and the private sector. The purpose of *Setting the Roadmap* was to help the Pennsylvania Invasive Species Council develop an invasive species management plan for the Commonwealth. Partial funding for the workshop was provided by the Great Lakes Commission and NOAA Sea Grant.

Contact Sarah Whitney at 610-304-8753 or swhitney@psu.edu.

Youth Boating and Fishing Programs Begin with Donation from Friends of Fish Foundation

Pennsylvania Sea Grant received a \$10,000 donation from the Friends of Fish Foundation to implement boating and fishing programs to serve inner city youths from the Erie and Philadelphia areas.

The Friends of Fish Foundation promotes youth fishing and environmental education programs that help keep teens out of trouble. "The contribution took us totally by surprise," commented Sea Grant Extension Program Director, Eric Obert. "We are happy to partner with groups like the Friends of Fish Foundation to provide an opportunity for young people to get out on the water and learn about the outdoors."



The funds were used to develop a program called Project FLY (Fishing and Learning Youth) to serve at-risk students from the Erie and Philadelphia areas. In Erie, support from the Foundation provided the equipment and supplies for more than eighty students from the Perseus House Charter School of Excellence Maritime Center. Project FLY introduced recreational fish-

Educational Opportunities at the Regional Science Consortium

The Regional Science Consortium at the Tom Ridge Environmental Center in Erie, Pennsylvania is pleased to offer a series of lectures open to the general public entitled the *Visiting Scientist Speaker Series*. These lectures are held at the Tom Ridge Environmental Center (TREC) in Erie, Pennsylvania on the second Tuesday of every month at 7:00 p.m. Upcoming topics include: Pennsylvania Fish; the Ecology of Map and Sawback Turtles; Lyme Disease and Presque Isle Mammals; *E.coli* Modeling on a Presque Isle Beach; and Bats.

For more information about the *Visiting Scientist Speaker Series* and other consortium offerings, please visit the Web site (RegSciConsort.com) or contact Marti Martz at 814-217-9015 or mam60@psu.edu.



ing and conservation ethics during a half-day classroom session and a full-day field trip to Presque Isle State Park where students learned to cast and fish. Project FLY partners include the Pennsylvania Fish and Boat Commission's Aquatic Resources Education Program, Save Our Native Species of Lake Erie, Presque Isle State Park staff, and Trout Unlimited. Additional plans are underway for these same students to try their hand at ice fishing and fly tying; in the spring, they will put their flies to the test fishing for trout at Presque Isle State Park.

In the Philadelphia area, Project FLY is working with three organizations, Karing Living Together, Big Brothers Big Sisters, and the Police Athletic League, to offer a canoeing and fishing day camp during spring vacation. This program for inner city youths will take place at the John Heinz National Wildlife Refuge. Plans are also in the works to develop additional summer aquatic education opportunities.

Contact Ann Faulds at 215-806-0894 or afaulds@psu.edu.

Erie's Tom Ridge Environmental Center Now Open

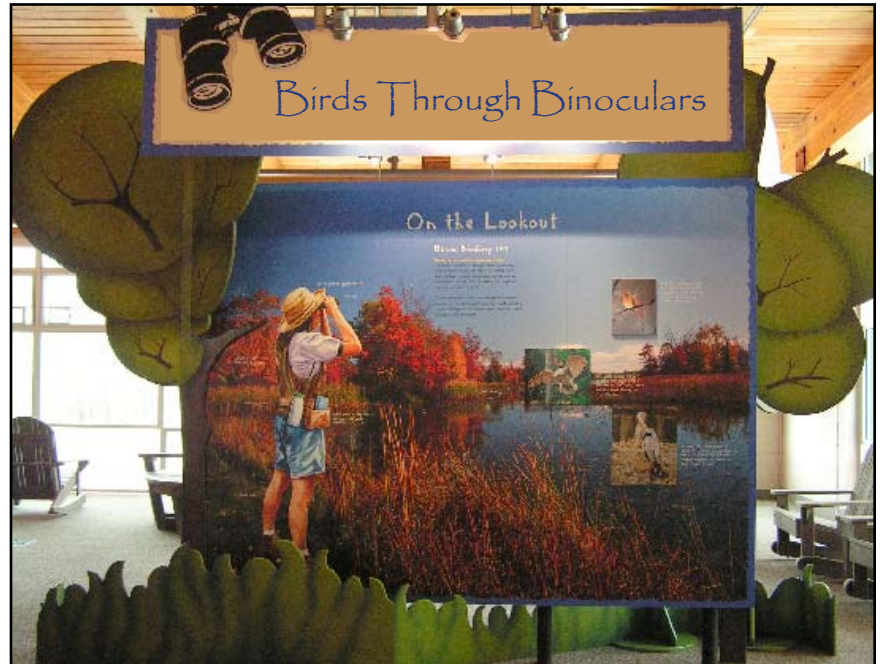
Despite a steady rain requiring the ribbon cutting to be held indoors, several hundred people helped celebrate a monumental day for the state park system on May 26, 2006, with the grand opening of the Tom Ridge Environmental Center (TREC) at Presque Isle State Park in Erie.

"This one-of-a-kind center offers a unique blend of education and research facility, tourist destination, and one-stop-shop for Presque Isle State Park administration," Governor Rendell said. "Presque Isle is one of our most spectacular and visited parks in the state, and this center will serve as its gateway, connecting the public—residents, school children, researchers, visitors—to nature in exciting and different ways."

The center also provides office space for a number of natural resource organizations, including Pennsylvania Sea Grant, Pennsylvania Department of Conservation and Natural Resources, the Regional Science Consortium, Pennsylvania Audubon, Lake Erie-Allegheny Earth Force, Pennsylvania Department of Environmental Protection's Office of the Great Lakes, and the Purple Martin Conservation Association.

The center is a "green building" designed to achieve a silver LEED (Leadership in Energy and Environmental Design) rating from the U.S. Green Building Council. Incorporated into its design and function are environmental features such as natural ventilation, an inverted roof to collect rainwater, materials made from recycled content, native landscaping, renewable energy usage and a porous asphalt parking area. Panels throughout the center explain the green features.

TREC was named in December 2002 as a tribute to former Governor Tom Ridge, who grew up in Erie, worked at the park as a young man, and provided funding for the center and numerous Presque Isle projects during his administration.



Educational display at the Tom Ridge Educational Center.

More than 100,000 people have visited TREC from May thru September 2006. General admission to TREC is free. For more information about TREC, visit www.trecpi.org.



Highlights of the 65,000-square-foot center include:

- interactive exhibits that highlight Presque Isle's natural and cultural history, and unique flora and fauna
- five indoor classrooms for educational and interpretive programming and a special hands-on place for pre-school children
- a research wing with seven laboratories and three aquariums with fish of Lake Erie and its tributaries
- a 75-foot, glass-enclosed tower that resembles a light house with a deck offering a dramatic view of the vastness of Lake Erie
- a 175-seat, large-format theater featuring environmental and adventure films
- the Sunset Café, where visitors can get a meal or a box lunch to take to the park

Looking down into the interactive exhibit area. Photos courtesy of Ann DiTullio.

Gaining Consensus at the Third Fish Tumor Workshop

Pennsylvania Sea Grant, EPA's Great Lakes National Program Office, and the Pennsylvania Department of Environmental Protection hosted *The Development of Standardized Criteria for the Assessment of Brown Bullhead Lesions and Deformities in Areas of Concern* workshop at the Stull Interpretive Center in Erie, Pennsylvania. This February meeting marked the third in a series focused on helping the Great Lakes Areas of Concern (AOC) establish consistent methods to use in assessing fish tumors and deformities as indicators of ecological impacts.

Presque Isle Bay is one of the forty Areas of Concern currently listed by the International Joint Commission and the United States Department of State. Impairment is based on fourteen criteria that reflect both human health – such as eating fish, drinking water, and swimming in local waterways – and ecological impacts, such as degraded benthic communities, loss of fish and wildlife habitat, and animal deformities. Presque Isle Bay was listed due to two impairments: the presence of fish tumors or deformities and restrictions placed on dredging (to prevent contaminants locked in the sediment from being released into the water).

Several years ago, Pennsylvania Sea Grant's Extension Program Director, Eric Obert, convened the first tumor workshop in recognition of the need to develop standard methods for sampling and

monitoring this impairment so that data from reference sites and different AOCs could be compared. Standard methods will also help objectively measure change over time.

"Before we began talking at these workshops, each Area of Concern measured and reported things a little differently," commented Obert.

During the workshop, more than thirty fishery and wildlife biologists, pathologists, and agency representatives debated questions about how liver, skin, and mouth abnormalities could be consistently reported, what locations should be used as reference sites, and how to establish uniform methods to dissect and examine abnormal internal fish organs.

As a result of the workshop, participants refined many standard protocols, established reference criteria, and identified some targets for removing Presque Isle Bay from the list of AOCs. Now that Presque Isle Bay is showing signs of recovery, more discussion will be needed to further standardize methods and identify additional criteria to remove the bay from the AOC list. Workshop proceedings will be available soon at the Pennsylvania Sea Grant Web site.

Contact Sean Rafferty at 814-217-9013 or sdr138@psu.edu.

Pennsylvania Sea Grant Staff Directory

Robert W. Light, Ph.D.

Director
Penn State Erie, The Behrend College
5091 Station Road
Erie, PA 16563
Phone: 814-898-6160
E-mail: rwl2@psu.edu

Eric Obert

Extension Director &
Associate Director for Lake Erie
301 Peninsula Drive, Suite 3
Erie, PA 16505
Phone: 814-217-9018
E-mail: eco1@psu.edu

Ann Faulds

Associate Director for Delaware Estuary
1450 Edgmont Avenue, Suite 150
Chester, PA 19013
Phone: 215-806-0894
E-mail: afaulds@psu.edu

Sara Grise

Coastal Outreach Specialist
301 Peninsula Drive, Suite 3
Erie, PA 16505
Phone: 814-217-9011
E-mail: sng121@psu.edu

Marti Martz

Coastal Outreach Specialist
301 Peninsula Drive, Suite 3
Erie, PA 16505
Phone: 814-217-9015
E-mail: mam60@psu.edu

Sean Rafferty

Coastal Outreach Specialist
301 Peninsula Drive, Suite 3
Erie, PA 16505
Phone: 814-217-9013
E-mail: sdr138@psu.edu

Dave Skellie

Coastal Land Use & Economic Specialist
301 Peninsula Drive, Suite 3
Erie, PA 16505
Phone: 814-217-9014
E-mail: dus18@psu.edu

Sarah Whitney

Senior Coastal Outreach Specialist
1450 Edgmont Avenue, Suite 150
Chester, PA 19013
Phone: 610-304-8753
E-mail: swhitney@psu.edu

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