"We're All Residents of the Great Lakes"

July 19, 2008

During this past week, teachers participated in a variety of lectures and lessons, on topics including: history of the Great Lakes, the Buffalo River and the Erie and Welland Canals, Great Lakes fish and fishery, an overview of Lake Ontario, invasive species of the Great Lakes, botulism, VHSV and other environmental stressors, cormorants, Lakewide Management Plans and online resources, such as the Great Lakes Information Network's "TEACH Great Lakes" (pictured below, (2), by NYSG's Helen Domske)

Areas of Concern

Also discussed were the Great Lakes Areas of Concern, of which there are currently 40 in the Great Lakes (including, in Lake Ontario, the Buffalo River, St. Lawrence River, Rochester embayment and Eighteen Mile Creek; the Oswego River is one of three AOCs delisted over the years, meaning it is no longer of concern).

Nearly a decade after the revised 1978 Great Lakes Water Quality Agreement was signed by Canada and the United States to "restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem," the two nations agreed that the worst areas would be given priority attention. Subsequently, 43 such areas were designated as Areas of Concern because they contained contaminated sediment, inadequately treated wastewater, nonpoint source pollution, inland contaminated sites or degraded habitat to a greater degree than the rest of the Great Lakes. Twenty-six of these are solely in the United States, 10 are solely in Canada, and five are binational waterways.

The Teachers Teach Themselves

In addition to listening to classroom discussions, each teacher also presented a classroom activity to the group during his/her stay on the *Guardian*. Each presentation was based on a selection from "Greatest of the Great Lakes - A Medley of Model Lessons," a collection of 41

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By Event:

- 2010 Lake Ontario Exploration Workshop
- Shipboard and Shoreline Science on Lake Michigan
- 2009 Lake Erie Exploration Workshop
- Shipboard and Shoreline Science on Lake Superior
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- Lake Huron Exploration Workshop
- Lake Superior Exploration Workshop
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- Tropical Marine Ecology 2010 Workshop
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- Tropical Marine Ecology 2008 Workshop
- Tropical Marine Ecology 2007 Workshop
- Tropical Marine Ecology 2006 Workshop

innovative classroom activities, assembled by COSEE Great Lakes, that provide teachers and students (grades 4-10) with insights into the uniqueness of the Great Lakes and their influence on aquatic life and human populations.

One of the activities (pictured below, (1), as demonstrated on the *Guardian*'s outside deck) had the teachers sketch out the shape of each of the Great Lakes using pieces of yarn. Then, they had to figure out population ratios, both for human and other animal inhabitants. Over a dozen other lessons were discussed by the teachers on the ship's first deck through the week, as seen in picture (3), below.

A key concept driven home by John Arnold, a teacher from Williamsville, NY, was the importance of ocean literacy, quite simply, an ocean-oriented approach to teaching science standards. "Each of the seven essential principles of ocean literacy is supported by fundamental concepts comparable to those underlying the national science standards," said Arnold. For teaching tools and many other ocean literacy resources visit www.coexploration.org/oceanliteracy.

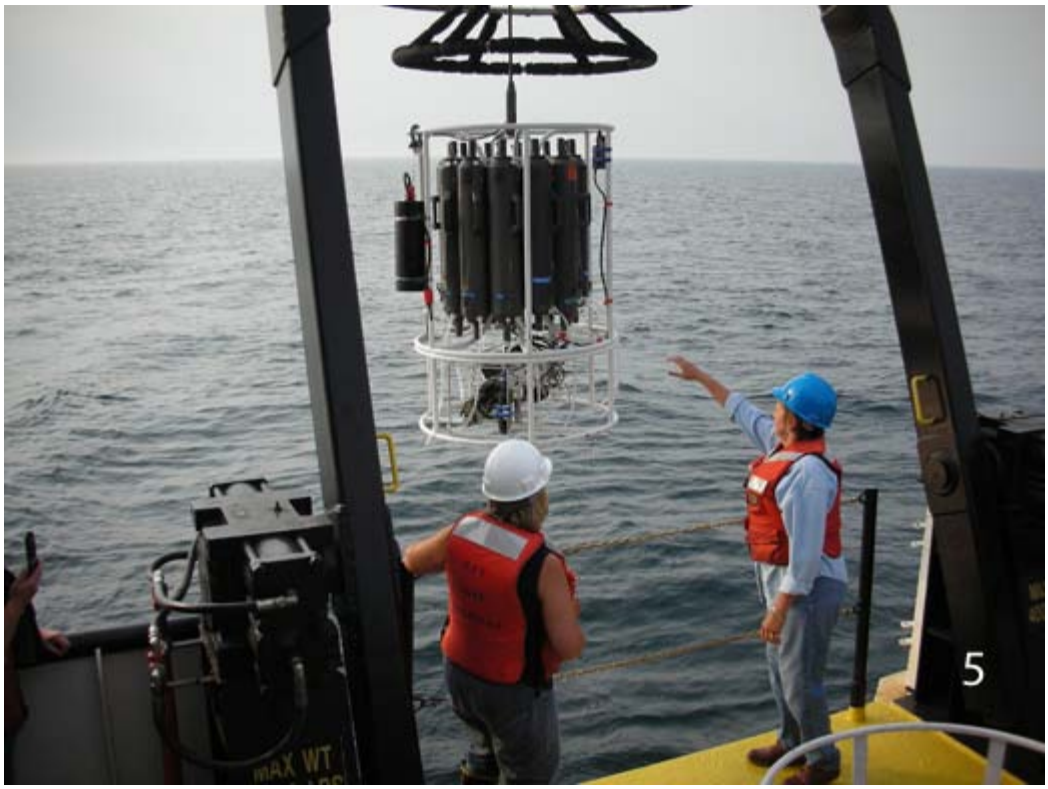
By Date:

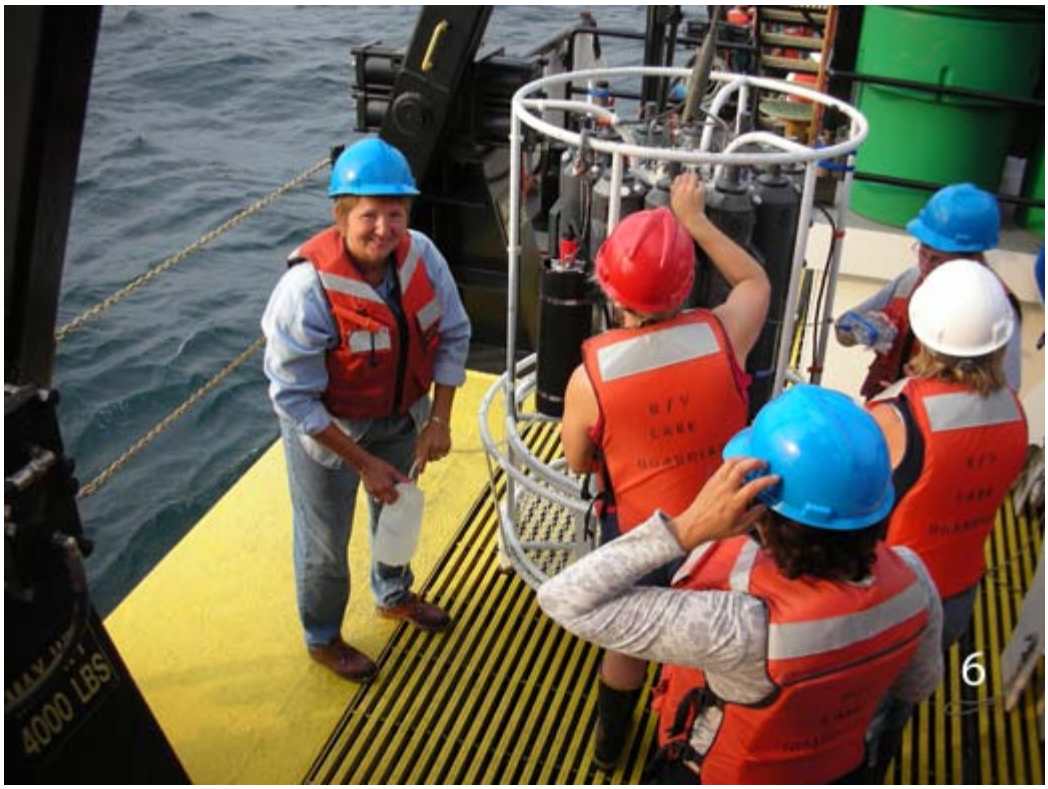
- August 2010
- July 2010
- June 2010
- August 2009
- July 2009
- August 2008
- July 2008
- August 2007
- September 2006
- August 2006
- July 2006
- June 2006

RSS FEED (?)

Getting the (Field) Work Done

Each teacher was part of the team that conducted water, mud and soil samples with researchers aboard the *Guardian*, as seen in picture (4), below. Even the educators, including NYSG's Helen Domske (pictured (5 -6), below), were part of the two crews set up to collect and analyze data.





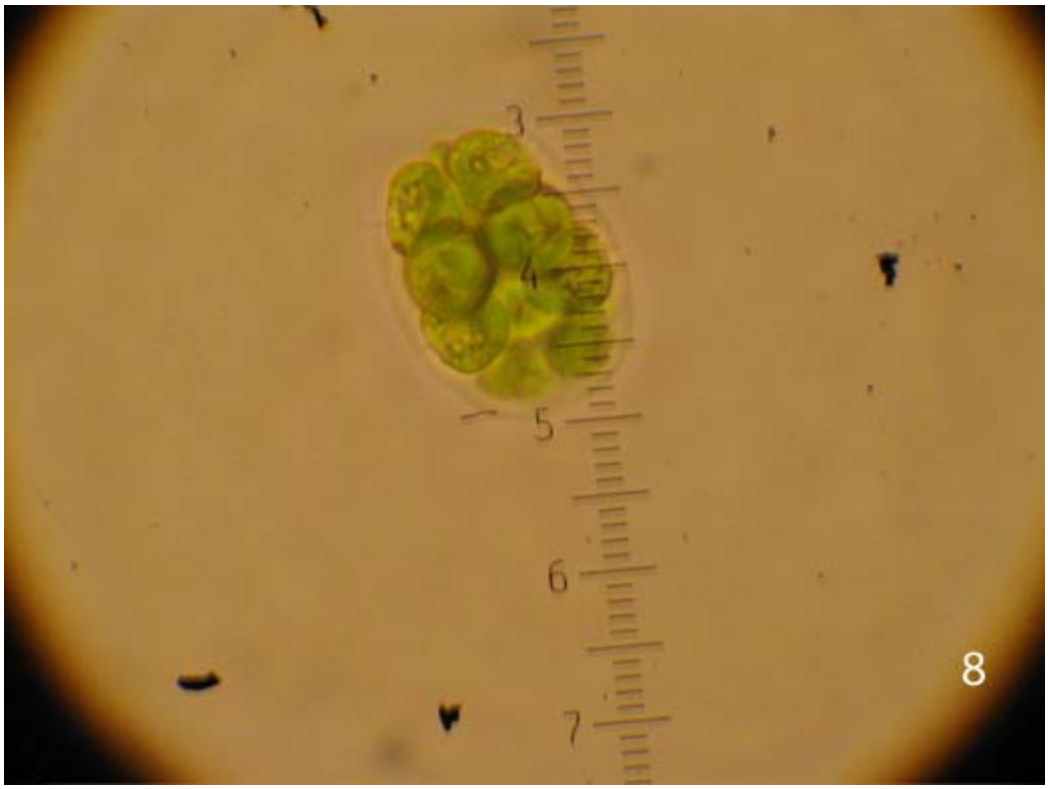
From Collecting Samples, to Collecting (and Analyzing) Data

Juliette Smith, a SUNY ESF graduate student of Dr. Greg Boyer (pictured (7), below), is part of the analysis team helping the teachers identify specimen in the lab. As mentioned in previous blog entries this week, teachers are measuring for a variety of factors in the samples they've collected at approximately 18 stations (or, sites) along the way. And

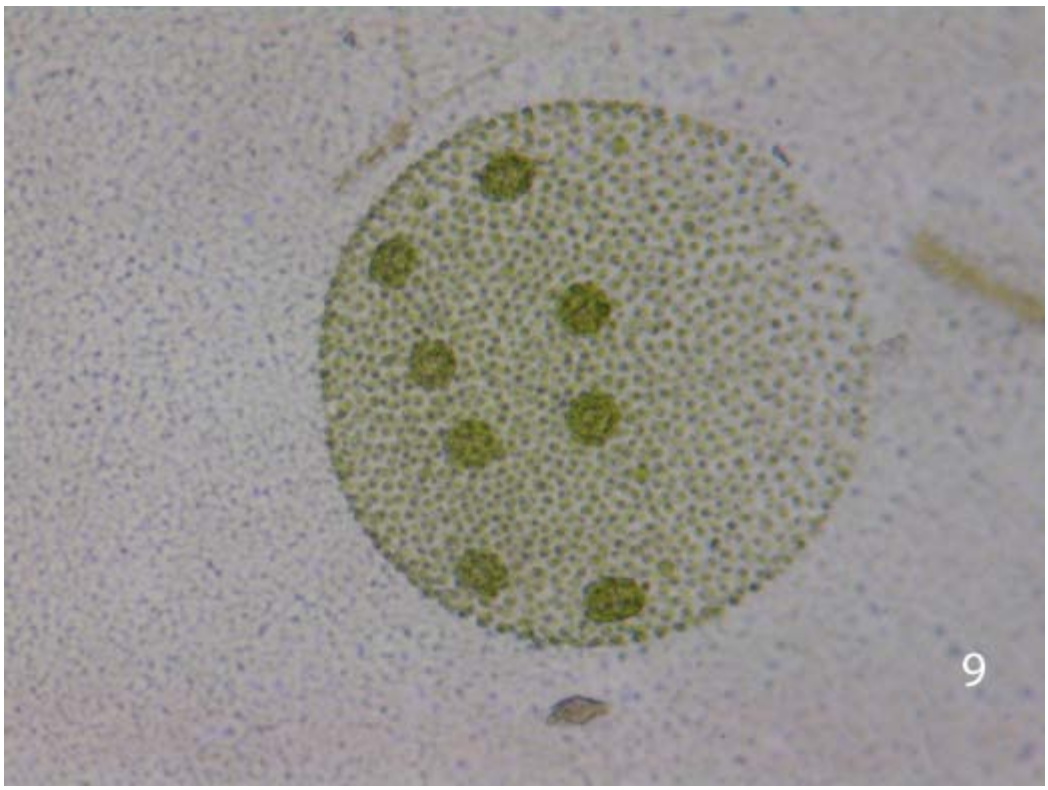
before they leave the Guardian this morning for good, they'll report out in two groups, as to differences in the data set - including nearshore versus offshore and eastern end versus western end of Lake Ontario. They'll also discuss their list of main "stressors" or drivers that affect each of the individual systems they're examining.

Hypotheses will also be discussed for how they'd expect the two different ecosystems to vary in (a) water chemistry (ie., turbidity, pH, conductivity, alkalinity), (b) benthic biology - ponars and box cores, or lake sediment samples, (c) planktonic biology, the microscopic animals and plants found in the samples, respectively, zooplankton and phytoplankton), and, lastly, (d) physical parameters, such as secchi depth, temperature, latitude and longitude, maximum depth and depth of thermocline (the thin but distinct layer in the Lake where temperature changes more rapidly with depth than it does in the layers above or below).

Specifics from the two groups reporting out later this morning will be made available soon, most likely after the teachers have left the *Guardian*. In the meantime, here are a few specimen caught under the microscope from sample collected during the week at various stations across Lake Ontario. Thanks to Sam Roman, a teacher from Cleveland OH, for snapping the shots. And to Juliette Smith and Dr. Boyer for helping to identify the tiny critters.



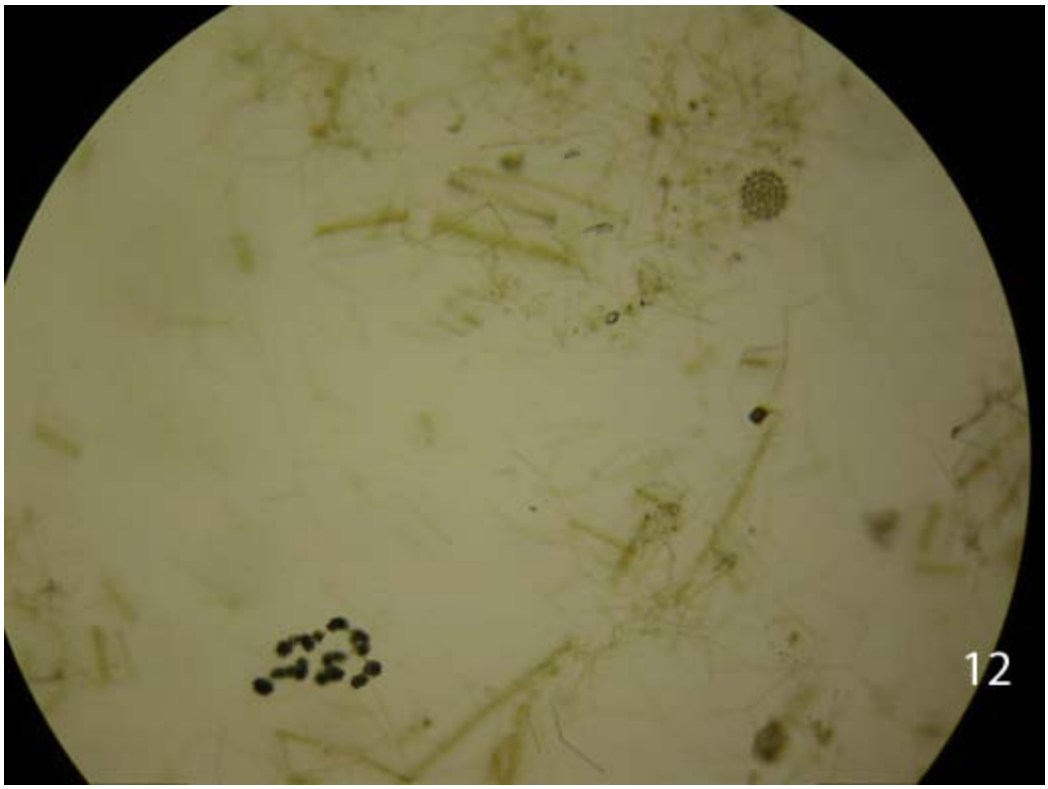
(as pictured (8), above) *Pandorina*, a phytoplankton



(as pictured (9), above) *Volvox* (a green algae), phytoplankton

(as pictured (10), above) *Cyclopoid* (copepod), a zooplankton

(as pictured (11), above) *Asplancha* (rotifer), a zooplankton



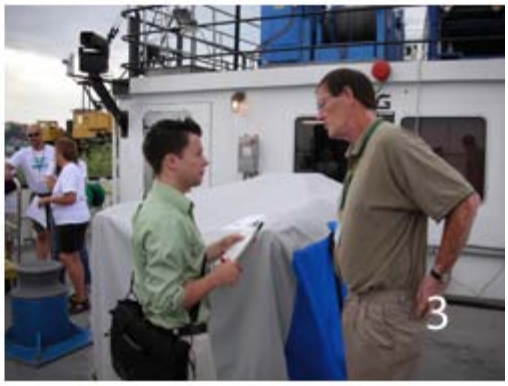
(as pictured (12), above) *Pediastrum* (upper right hand corner; green algae), *Microcystis* colony (the “black blobs”; cyanobacteria, aka, blue-green algae), *Fragillaria* (faint lines of orange; diatom), all phytoplankton species

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

Stewards, Salmon River and the Media Spotlight in Oswego

July 18, 2008

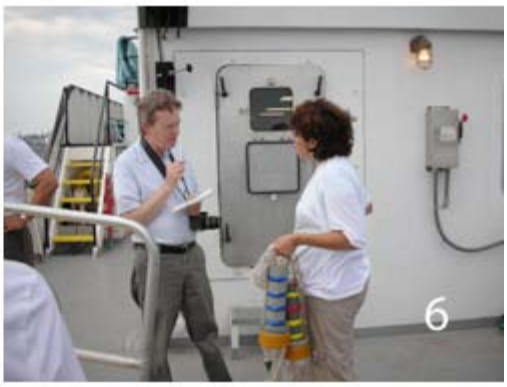
Media Event in Oswego



At Thursday morning's press event on the docks in Oswego, NY, local media had a chance to interact with teachers, researchers and educators aboard the *Guardian* and inquire about their experiences so far. Anneliese Bopp (pictured above, (1)), a teacher from Sodus, NY, talked with reporters from Oswego's *Palladium-Times* (in green) and *Fulton and Oswego Daily News* about the research sampling teachers have been doing from the outset of the trip. Bopp, who teaches sixth-grade science said, "There is so much I've learned that I can incorporate into my curriculum." Recalling how she first got involved into the project Bopp said, "It was one of those chance things … a great opportunity that looked like something that just couldn't be missed."

A photographer from Syracuse's *Post-Standard* (pictured above, (2)) snapped a few shots of teachers David Chizzonite, from Chittenango Middle School (left) and Patricia Burns from Dr. King School in Syracuse. Dr. Greg Boyer (pictured above, (3), at right) told the

Palladium-Times reporter that he was impressed by the teachers' capacity to learn and the fast rate at which they did. Said Boyer, "They are very good learners … by now, they're like a well-polished team, they can just crank through it."



Ken Huff (pictured above, (4), at left), a teacher from Williamsville, NY, set up a microscope in one of the *Guardian*'s labs for a communications specialist from Oswego County Department of Community Development, Tourism and Planning. He shows her some of the zooplankton and phytoplankton species the teachers have identified in recently-drawn Lake Ontario water samples.

NYSG's Web Content Manager Paul C. Focazio (pictured above, (5), at right) describes his observations as the on-board blogger for this COSEE Great Lakes research expedition. "The teachers have been all over Lake Ontario," Focazio said, "and have been doing a bunch of soil and water

samples throughout the lake. We're just trying to give them a sense of the well roundedness of Lake Ontario." Teacher Carmen Marquez (pictured above, (6), at right), from Chicago, IL, shows an *Oswego Daily News* reporter some of the water sampling equipment used onboard.

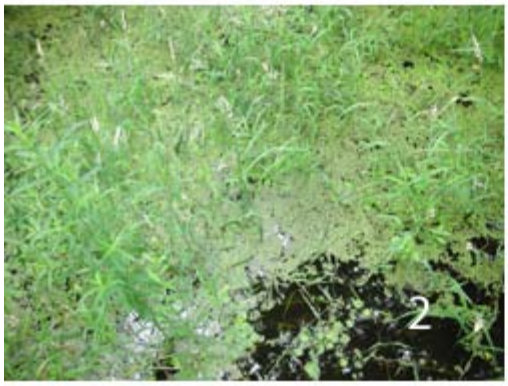
A Visit to Eastern Lake Ontario's Dunes and the Salmon River Fish Hatchery

Guided by NYSG's Mary Penney and the Dune and Salmon River Stewards

Along Lake Ontario's Eastern shore is a 17-mile stretch of sand dunes, wetlands, woodlands, ponds and creeks known as the Eastern Lake Ontario Dunes and Wetlands Area. Reaching from the mouth of the Salmon River north to the outlet of Black Pond, the area supports a diversity of plants and wildlife. Seven properties are open to the public for outdoor recreation: Deer Creek Wildlife Management Area (WMA), Sandy Island Beach State Park, Sandy Pond Beach Natural Area, Lakeview WMA, Southwick Beach State Park, Black Pond WMA and El Dorado Nature Preserve.

NYSG's Helen Domske (pictured above, (1), left) holds up a shell for teachers (left to right) Sam Roman (Cleveland, OH) and Scott Foley (Silver Creek, NY) to decipher - "Is it a Zebra or a Quagga Mussel?" she asked. The teachers are identifying native grasses, like Williamsville, NY teacher Lisa Matthies (pictured below, (3) in black, with NYSG's Mary

Penney), as well as invasives like the mussels and European frog-bit (pictured below, lower right hand corner (2); also see related NYSG fact sheet, pdf) on the beaches of the 526-acre Black Pond WMA. Purple loosetrife (pictured below, (6); also see related NYSG fact sheet, pdf) is another common invasive in the area.



NYSG's Domske (pictured above, (4), left, and Penney talk with Irene Mazzocchi, Land Manager for Black Pond and Lakeview WMAs. Mazzocchi, a Region 6 NYSDEC Wildlife Biologist, was coming ashore during the teachers' visit to check on the area's snowfencing (seen in the background), which protects and maintains the dunes. Penney is seen (5) with dune steward Liz Wolf (far right) talking about the importance of snow fencing in this and other dune areas along Lake Ontario's eastern shore.

NYSG's Mary Penney (pictured above, (7), center, flanked on both sides by her Eastern Lake Ontario Dune and Salmon River stewards for summer and fall 2008. Stewards are on the beaches and along the Salmon River corridor not as enforcers, but rather educators. "Their job is to promote responsible use of the areas," said Penney. The dune and river stewards program is a partnership of New York State Parks, the Nature Conservancy, NYSDEC and NYSG.

For more on eastern Lake Ontario's dunes, check out NYSG's series of *Coastlines* articles (click here - look under "Dune Habitat/Education" section)

Teachers, stewards and educators on the COSEE Great Lakes tour of the eastern Lake Ontario region found their way next to the Salmon River Fish Hatchery (pictured above, (8), with teacher Ken Huff at the center, holding a steelhead fish mount). Located in Altmar, NY, the hatchery serves an 11-county area and supplies fish for more than 100 public waters including Lake Ontario. Each year, the hatchery stocks 3.5 million trout and salmon, and nine million walleye fry. "The hatchery opened in 1981 and, at the time, was the most modern of its kind in all of North America for raising Pacific salmon," said Salmon River Program Coordinator Fran Verdoliva.

Some mounts (pictured above, (9)) of considerably large sportfish catches of the day (clockwise, from top): Chinook salmon, steelhead, Atlantic salmon, brown trout, Coho salmon and (in the center) lake trout. (10) The fry being raised at the hatchery know its feeding time. (11 - 12) Teachers check out the fish ladders to see if they can spot any fish sunning themselves in the warmth of the mid-day sun.

For more on the Salmon River, check out the pdf of NYSG's Fall 2006 *Coastlines* article (click here) or a printable pdf of the "Fishing on the Salmon River" map (click here).

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

Clayton Welcomes the Guardian

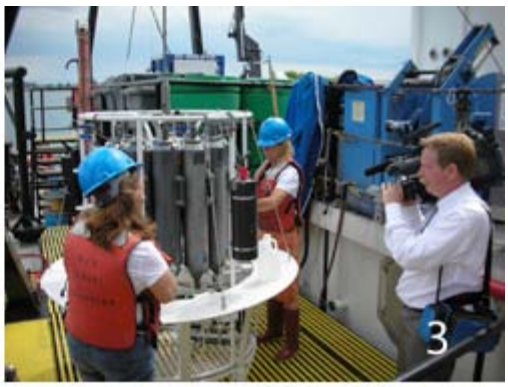
July 17, 2008

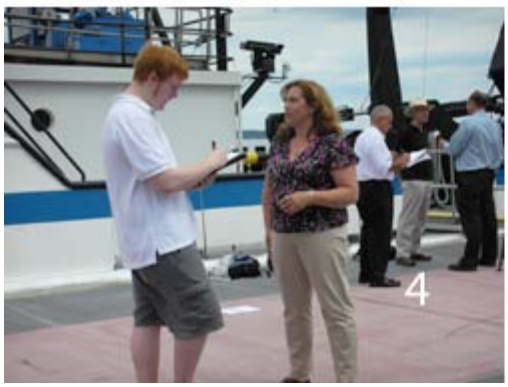
EPA Press Conference in Clayton

The EPA's Wednesday morning press conference (pictured below, (1)) held on the docks at Clayton, NY, gave the media an opportunity to ask teachers, researchers and educators what their experiences are like aboard the Guardian.

Interviews included (pictured below): (2) SUNY Environmental Science and Forestry (ESF) researcher Dr. Greg Boyer, for Oswego's News Channel 7. Boyer told the reporter, "The teachers are actively taking part in the cruise, both to help provide data to the international field, but also to learn about life on a science ship and actually doing science in the field."; (3) Teachers Carol Gutteridge (far left), from Grand Blanc, MI, and Pennsylvania Sea Grant's Marti Martz, analyzed waters of the St. Lawrence River using the a Rosette sampler, for Newswatch Channel 50 WWTI; (4) Jana Lantry, a NYS Department of Environmental Conservation Aquatic Biologist with the Cape Vincent Fisheries Station, for the *Thousand Island Sun*'s Brian Wincott; (5) Fred Luckey, an Environmenal Scientist with US Environmental Protection Agency,

Region 2, for News 10 Now TV.





(6) Save the River's Executive Director Jennifer Caddick (pictured below, in green) shares with reporters the presentation she gave to teachers just prior to the press conference. Save the River is a non-profit, member-based environmental organization whose mission is to preserve and protect the ecological integrity of the Thousand Islands Region of

the St. Lawrence River through advocacy, education and research.

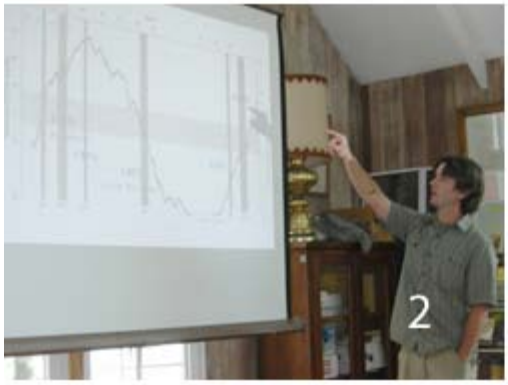
While with the teachers, Caddick discussed invasive species, a primary focus area for Save the River. She also touched on VHS, *viral hemorrhagic septicemia*, a disease that NYSG's Helen Domske added, "is having a devastating effect on fish populations."

In Fall 2007's *Coastlines* magazine, New York Sea Grant (NYSG)-funded researcher Dr. Paul Bowser, Professor of Aquatic Animal Medicine at Cornell University's College of Veterinary Medicine, told editor Barbara A. Branca, "The name describes what it does–VHSV [the virus that causes the VHS disease] creates hemorrhages. The virus destroys the cells that line various blood vessels in the fish and causes bleeding. Bleeding destroys internal organs, such as the heart, liver, spleen and kidneys, and eventually the fish dies … We've seen significant mortality events occur in several species: muskellunge [a kind of pike], round gobies, gizzard shad, smallmouth bass and freshwater drum." For a pdf of the full article, click here.

Other interviews at Wednesday's EPA press conference included (pictured below): (7) Teachers Larry Grisanti, of East Aurora, NY, and Steve Franklin, of Appleton, WI, for Watertown Daily Times; (8) Cleveland, OH teacher Sam Roman, in an immersion suit, for News Channel 7; (9) Carol Gutteridge, a teacher from Grand Blanc, MI, holding up a preserved Sea Lamprey, a Great Lakes invasive, for News 10 Now's Brian Dwyer; (10) And NYSG's Coastal Education Specialist

Helen Domske, describing the teachers' COSEE Great Lakes experiences aboard the *R/V Peter L. Wise Lake Guardian*, for *Watertown Daily Times* reporter Jaegon Lee.

SUNY Environmental Science and Forestry's
Thousand Island Biological Station
Hosted by Dr. John Farrell and students
with cooperation by Dr. Michael Twiss and Clarkson University students



Wednesday afternoon, SUNY ESF's Dr. John Farrell (pictured above, (1)) and students at the Thousand Island Biological Station (TIBS) gave presentations and engaged the *Guardian*'s teachers (as well as the eastern Lake Ontario dune and Salmon River stewards, supervised by NYSG's Mary Penney) with a variety of informative demonstrations. First, Farrell introduced the crowd (3) to TIBS, a research program on Governor's Island in Clayton focused on the aquatic ecology of the St. Lawrence River with an emphasis on, among other things, fisheries, wetlands and invasive species.

Geofrey Eckerlin (2), a TIBS graduate student, discussed his research (co-funded by NYSG) on how VHSV is affecting the round goby. Eckerlin's data covers three sites, from Cape Vincent (where goby densities appear highest) to Clayton and Alexandria Bay (the latter of which exhibit the lowest goby densities). A further concern is with smallmouth bass, which prey on the goby, moving the pathogen further up the food chain. So far Eckerlin has concluded that juvenile bass show the highest prevalence of VHSV. Also, behavior may drive the relationship between sex and VHSV incidence.

During some outdoor demonstrations of field work done at TIBS, Farrell (pictured above, (4)) talked about some local plant species, including the invasive European frog bit, a floating plant that resembles a small water-lily. The species often grows in stagnant, still ponds, canals or patchy marshland, intermingled with emergent plants. Although studies specifically on the impact of the species are not extensive, the European Frog-bit could reduce the local diversity of submersed subjacent plants through competition for resources, such as light (also see related NYSG fact sheet, pdf).

Farrell also talked about sedges (pictured above, (5)), a restoration plant species. TIBS research has shown considerable change in wetland structure and function associated with climate change, land use and water level management. For example, an increased dominance of monotypic cattails has made for a decline in sedge meadow habitats. “This poses a problem for nearshore wetland areas, which contain the

greatest fish diversity and where many lesser-known species survive," said Farrell. NYSG Fisheries Specialist Dave Mac Neill is currently working with Farrell on a series of wetland/habitat and fish identification fact sheets.

Other outside demonstration stations included (6) a viewmaster where teachers could see for themselves what life lies beneath the St. Lawrence River.

Dr. Michael Twiss - pictured above, (7), with NYSG's Domske (in green) and Mary Penney - and his Clarkson University students shuttled the teachers across to Governor's Island for the afternoon session. For a sampling of Twiss' recent research, check out NYSG's Fall 2005 *Coastlines* article, "Emerging Pathways" (click here).

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

Oh, How They Can Teach

July 16, 2008

We're only four days into the teachers' seven day intensive learning experience aboard the *Guardian* and they're already showing that all those hours in the classroom, on deck sampling and in the lab analyzing has more than sunk in. It's 4 o'clock on Tuesday, about three hours before we dock in Clayton, NY, a quaint Thousand Islands town set right on the St. Lawrence River. The sun is beaming down and the teachers

are soaking it in, as well as a wealth of knowledge. We're circled around in deck chairs as NYSG's Helen Domske leads a discussion on invasive species in the Great Lakes (see related NYSG fact sheet, pdf). I say "leads," because the teachers clearly are brining their "A game." Domske hands out preserved specimens and the teachers are quick to identify them. "That's a sea lamprey," said one. "There's the fishhook water flea," called out another. Sam Roman, a teacher from Cleveland, Ohio (pictured below, right (1), alongside Pennsylvania Sea Grant's Marti Martz) holds up a sample filled with the spiny water flea (as illustrated, (6)), a native of northern Europe that made its way into Lake Huron in 1984 and was present in all the Great Lakes three years later.

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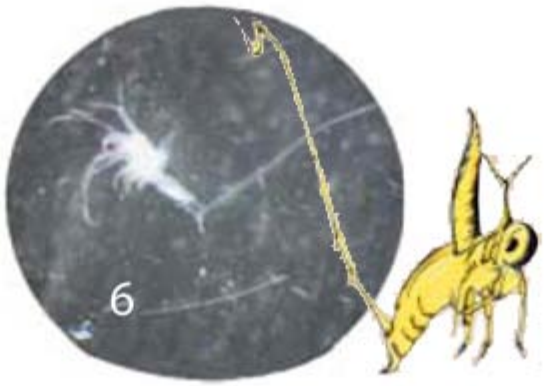

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Teresa Gable, a teacher from Seneca Fall, NY, (pictured above, right, (2)) examines the tiny *Hemimysis anomala*, the bloody-red mysid, a species of mysid shrimp about one-and-a-half inches in length and native to eastern European seas. NYSG's Domske (pictured above, far right, (3)) shows a Sea Lamprey to (also pictured, left to right) Steve Franklin, a teacher from Appleton, Wisconsin, and Ken Huff, a teacher from Williamsville, NY.

Sea Lamprey made their way from Lake Ontario into Lake Erie by swimming through the Erie or Welland Canals or attaching to the hulls of boats that traversed those canals. As illustrated (above, (4)) by Jan Porinchak for NYSG, one of the Sea Lamprey's favorite prey is Chinook Salmon, one of the prized sport fish attracting anglers in large numbers to the shores of Lake Ontario. Other species addressed included: River Ruffe, purple loostrife, Japanese Knotweed, Eurasian Water Milfoil and (5) the European water chestnut, an exotic plant with large floating leaves and hard, nut-like fruit with sharp spines that have displaced native species and choked open water areas.

Domske is quick to point out an example where a clash of invasives has had as much a negative impact as a displacement of a native species. The Round Goby is known to eat Quagga and Zebra mussels. You might consider that a good thing, considering how omnipresent these mussels have shown themselves to be in certain areas (Just check out yesterday's blog entry on collecting mud and sediment samples). But,

Quagga and Zebra mussels are filter-feeders, so, as they clean the water, they are also holding onto contaminants found in the ecosystem. By consuming these mussels, the goby is bringing toxins further up the food chain.

Following the invasives discussion, teachers prepared for a session using the EPA's new videoconferencing system with another COSEE Great Lakes (GL) group at Stone Lab on Ohio's Gibraltar Island, commonly referred to as the "Gem of Lake Erie." Dr. Rosanne Fortner, Director of COSEE GL, is leader of the group, which is studying "real time aquatic date for science teaching." Fortner addressed those on the *Guardian*, saying of the COSEE GL connection, "What a great opportunity to talk from one Lake to another."

During the 20-minute educational exchange, the *Guardian*'s teachers talked about, among other things, the water, mud and soil data they have been and will continue to collect over the next few days. And, as several teachers told me after the live feed ended, the learning will continue on in the classroom.

Diane Podgornik, a teacher from Duluth, Minnesota, said instead of having her students do a unit on graphing using standard data, she'll use what she collected aboard the *Guardian*. And Ken Huff, a teacher from Williamsville, NY, plans to use Secchi disc readings to facilitate lessons on spreadsheets, decimals and fractions for his sixth graders. "It's important to make a math-science technology connection for kids

at that age, because they're starting to become career-minded," he said.

Today proves to be a rather active day for the teachers as well. They will visit with Dr. Michael Twiss and other researchers at the SUNY ESF's St. Lawrence biological field station and will also hear from representatives from the Save the River organization. Then, mid-morning, the EPA has planned a networking event at the dock in Clayton to link up teachers with members of the local media. And so, the learning continues.

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

Stewardship and Sampling on Lake Ontario

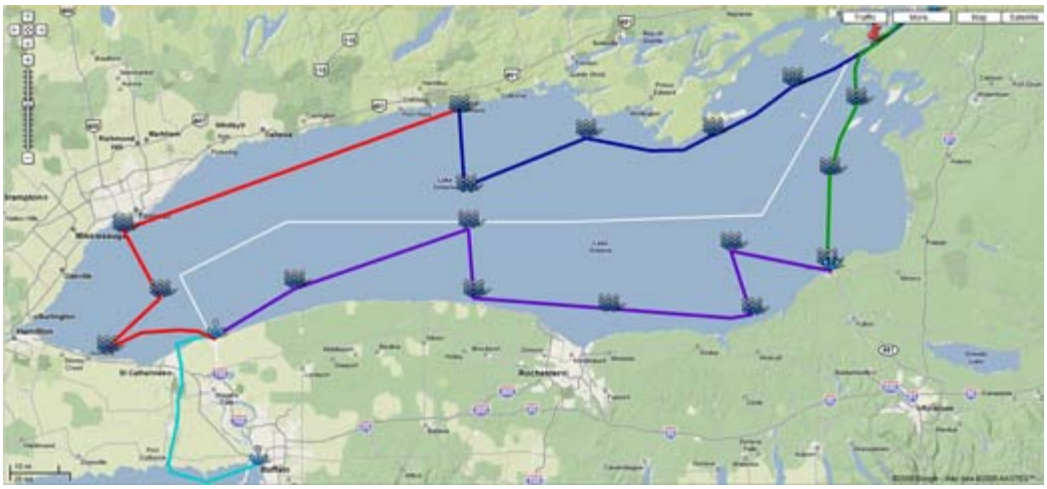
July 15, 2008

Before leaving dock yesterday afternoon at the Coast Guard Station in Youngstown, NY, teachers aboard the *R/V Peter L. Wise Lake Guardian* welcomed guest speaker Rene' Rickard, Tuscarora Environment Office Administrator, who augmented her informative talk about Tuscarora environmental beliefs with artifacts including porcupine quills and a feathered headpiece that are used in cultural activities.

The teachers were impressed by the genuine concern and appreciation that the Tuscarora have concerning the plants and animals in the environment. Rickard encouraged the group to empower their students

to become better stewards, through concepts such as “reduce, reuse, recycle” and minimizing our carbon footprint. “Be thankful that our natural world still provides for us,” Rickard said, “and think about what we are leaving for future generations.” As a Tuscarora, part of New York’s Oneida territory since around 1722, she added, “We are very thankful that Mother Earth still provides for us.”

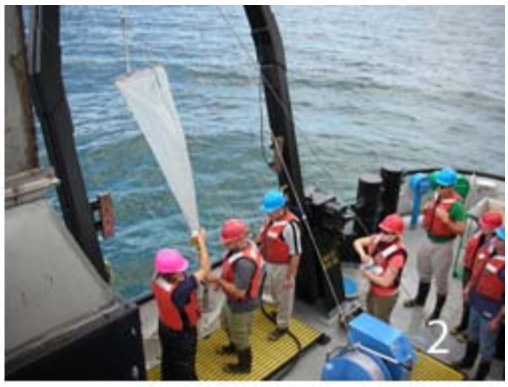
From Mother Earth to Google Earth, visitors to our blog can now follow the *Guardian* as it charts a course around Lake Ontario. Click the map image below to launch a real-time Google Map outlining the *Guardian*’s route. (Courtesy of Lisa Matthies, GIS Instructor in Social Sciences at New York’s Erie Community College’s North Campus)

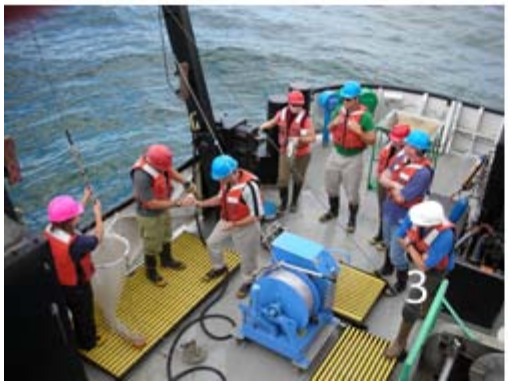


Also included on the map are the numerous field stations where water, mud and bottom sediment samples are being drawn by teachers with assistance from SUNY Environmental Science and Forestry researcher Dr. Greg Boyer and NYSG’s Coastal Education Specialist Helen Domske. Stations range from offshore to nearshore locales including Toronto, Oswego and Rochester. Samples drawn at the variety of stops will help the team of teachers and investigators to make some assessments, such as: What is the difference between the eastern and western Lake Ontario basin? And, how does the nearshore compare with offshore waters?

Water samples are drawn (using a Rosette sampler, as seen, below, in images 1-6) at the various “stations” along the lake (and at different depths - surface, thermocline and one meter off the lake bottom) to analyze chemistry and water quality - factors such as surface temperature, dissolved oxygen, pH, and fluorescence (a measure of algae abundance). Biological studies of the water column involve counts of microscopic phytoplankton - photosynthetic organisms like green algae, cyanobacteria, diatoms and dinoflagellates - and zooplankton, a primary food source for Great Lake sportfish such as walleye and yellow

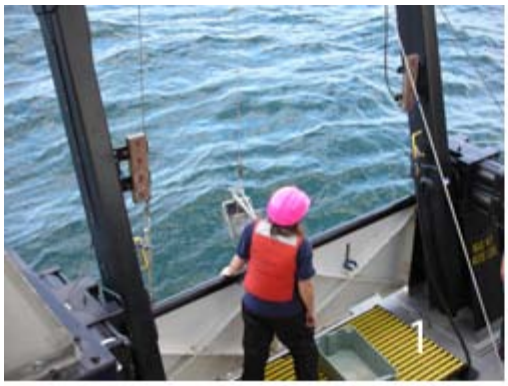
perch.

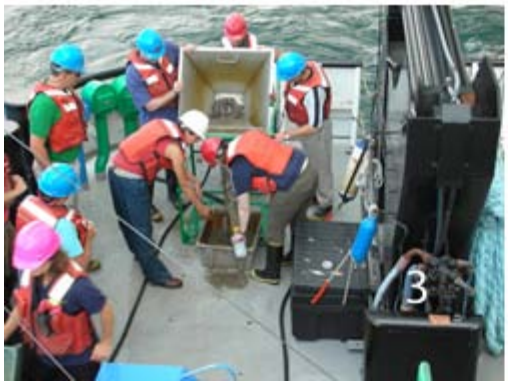




A Secchi disc, pictured below, is used to determine the water's turbidity, a measure of clarity.

A Ponar grab (below, in pictures 1-4) helps to pull up mud samples for biologial studies of the Lake's benthic animals, including worms, snails, crustaceans (shrimp-like creatures) and chironomids (midge fly larvae). But, as you'll also see below, in pictures 5-8, what comes up most are Zebra and Quagga mussels. SUNY ESF researcher Boyer is seen holding a tray of mussels from just one site sample (picture 5). Back in the classroom, Domske inspects the tray (picture 6) and looks to determine, with the help of Wisconsin Sea Grant's Jim Lubner (picture 7), which are which - Quagga or Zebra mussels (left to right, picture 8).

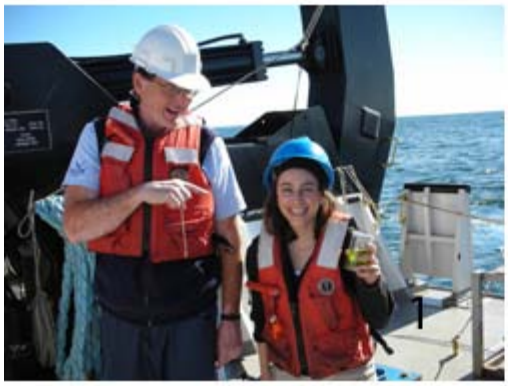


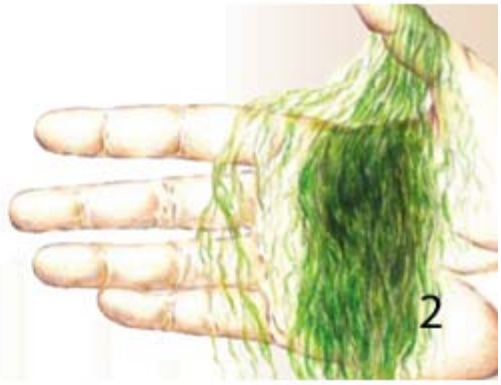


While filter-feeder activities of these exotic Quagga and Zebra mussel have helped to increase the Lakes' water clarity, that in itself has introduced more concerns. For example, clearer water allows more light to penetrate, which in turn makes it more conducive for algae, like the pervasive *Cladophora*, to thrive, especially in warmer temperatures.

"The problem with *Cladophora* in Lake Ontario and other coastal waters," says Domske, "is that when storms cause it to break off, dead sections of the plant pile up near the shore, where they rot and give off an offensive odor." While the sight of *Cladophora* may not be pleasant to visitors of the shoreline, it is not harmful to humans.

In the pictures below, (1) Boyer points to Michelle Tabone, a teacher, holding a glass jar with *Cladophora* and Zebra mussels. The sample was collected during a 6 a.m. field station sample. (2) *Cladophora*, a common filamentous algae, as illustrated by Cynthia Armstrong for NYSG's *Coastlines*.





At some of the field stations, Boyer and the teachers are also gathering box core samples, which provide a more in-depth study of Lake Ontario's bottom sediments. Boyer is seen below, right, with Domske, showing an example of a recently drawn core sample.

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

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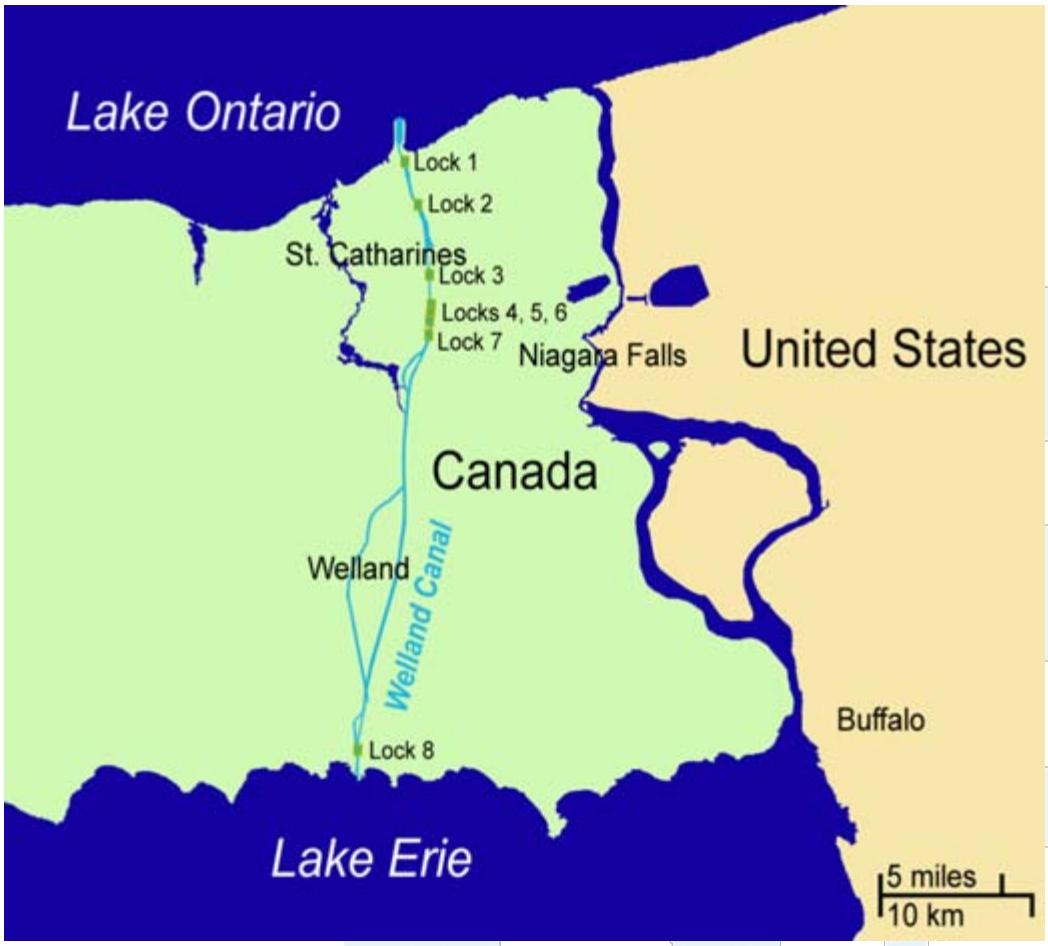
advancing ocean sciences education

Onward, to Youngstown, NY

July 14, 2008

After our departure from the Erie Canal and Buffalo River, we found our way early last night to the Welland Ship Canal. Now in its fourth configuration, the canal runs, in its entirety, 27 miles from Port Colborne, Ontario on Lake Erie to Port Weller, Ontario on Lake Ontario. As part of the St. Lawrence Seaway, the canal allows ships to avoid Niagara Falls by navigating the Niagara Escarpment.

While the first configuration - which opened for a trial run in November 1829 - contained at least 40 locks, this newest one, completed in 1932, consists of eight locks, seven at the Niagara Escarpment and the eighth, a control lock, at Port Colborne to control the depth of the canal.



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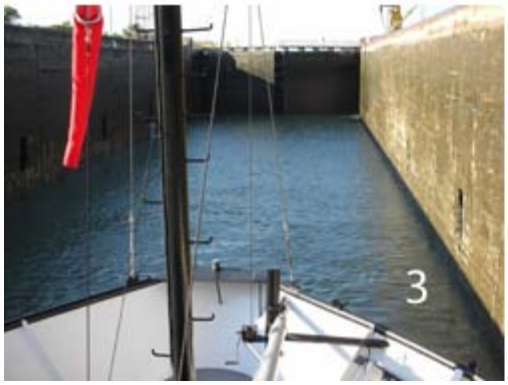
The *Guardian* entered into the system from Lake Erie, passing through locks 8-1, in that order. From the first to the last lock in the system (between Lakes Erie and Ontario), there is an elevation change of about 327 feet.

If you've never experienced going through a lock before, here's a visual snapshot of how it looks – think of it as going from the top to the bottom of a ladder, except with a lot of water in between.



And here are some video clips of the doors of a lock opening to let the *Guardian* through …

By Date:

- August 2010
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RSS FEED (?)

After finishing with the canal's locks late last evening, we made our way to Youngstown, NY. We moored at the Coast Guard Station, home to Old Fort Niagara, which played a significant part in the French and Indian War, and fell to the British in a 19 day siege in July 1759, called the Battle of Fort Niagara.

Today, the teachers briefly leave the *Guardian* to catch and study live fish, including bass, perch and carp. But, before they do, they were the students for a "Geology and the Niagara River" 101 crash course lead by Susan Diachun and Carol Rodgers from New York State Parks at a nearby Nature Center. The hope is that they'll later pass along this information to their own students via science curricula.

In addition to learning about the various sedimentary layers that make

up the rock beds of the Niagara area (dolomites, sandstones and shale), many were surprised to hear that up to 75% of the Niagara River's natural flow is used to produce hydro-electric power. Some teachers learned for the first time an array of interesting facts about the Great Lakes, incuding: Lake Ontario, the smallest in shoreline miles, is where all the other Great Lakes waters drain into. In fact, in the interconnected Great Lakes system, it takes an average of seven years for water from Lake Superior (which holds the largest and most volume of all the Lakes) to get to Niagara Falls. Lake Michigan is the only of the Great Lakes that's located fully in the U.S. And Lake Erie, the shallowest of the bunch, is connected to Lake Ontario via the Niagara River.

After the brief lesson on lakes and rivers, the group met with U.S. Fish and Wildlife (USFWS) biologists (lead by Dr. Kofi Fynn-Aikins and Mike Goehle) at the docks at Youngstown's Coast Guard Station for an electro-shocking display and discussion on Great Lakes contaminants.

First, Goehle and other USFWS technicians used equipment to shock fish species - including, pictured below, (1) red horse suckers, (2) small mouth bass and (3) yellow perch - then scoop them up in nets. Fish were placed in a cooler aboard a boat and identified for teachers and reporters from the *Buffalo News* and *Niagara Gazette* before being released back into the Niagara River.

During the demonstation, Michelle Tabone, a seventh-grade science teacher at Buffalo Public School No. 197, told the *Buffalo News* reporter that she was taking the program “to give my students a first-hand experience on [the study of the lake’s environment] through me. I want to show them all the work the government does” to study and help preserve the lake.

Finally, USFWS’s Fynn-Aikins (pictured below, left, with NYSG’s Helen Domske) addressed the group of teachers to discuss how contaminants affect fish and wildlife in the Great Lakes. “What do you do with your unwanted pharmaceuticals?” he asked. “Most people pour them down the drain.” Proper disposal of unwanted medicines is a growing concern that a number of Sea Grant programs, led by Illinois-Indiana Sea Grant, are raising the profile on (click here for more). Toxins like mercury and flame-retardant products are not the only ones that can have some noticable, severe impacts on fish species. Remnants from birth control products can reverse the sex of some fish. And that’s just one example. Says Fynn-Aikins, “It’s really an alphabet soup out there in these waters. And so, it’s a constant challenge to understand what’s exactly

happening."

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

The Guardian Sets Sail on Lake Ontario

July 13, 2008

For the next week, teachers aboard the U.S. Environmental Protection Agency's 180-foot *R/V Peter L. Wise Lake Guardian* will have a rare opportunity to study with researchers on Lake Ontario. The *Guardian*, the only self-contained non-polluting vessel on the Great Lakes, won't be back on the lake for about another five years, as it will rotate through the other Great Lakes, including Lakes Huron and Superior next summer. These and the U.S.'s other two "inland seas" - Lakes Michigan and Erie - form the largest group of freshwater lakes on Earth.

Around noon today, the *Guardian* began its week-long voyage at the Erie Canal Harbor's marina in downtown Buffalo. Just about a week and a half ago, on July 2, this harbor was the site of a press conference to spotlight recent restoration efforts. To commemorate the event, politicians, including Buffalo Mayor Byron W. Brown and New York Senators Hillary Rodham Clinton and Charles Schumer, lined up along the Harbor's "bowstring" pedestrian bridge, each carrying a little pail filled with a history-making brew of water from Gateway Harbor in North Tonawanda and the murky waters that flowed below their feet.

As the *Buffalo News* reported, Brown cheered at the event, saying, "We can finally proclaim that the 12-year, $53 million Erie Canal Harbor development project is finally complete," as he gestured with his hands to coax audience members into applauding, which they obliged.

And so, it seems fitting that the 16 fourth - tenth grade teachers aboard the *Guardian* today begin their own journeys of learning here, at the

harborfront. They will hopefully come away with more effective methods to coax (or, perhaps, entice) their students and colleagues to respect and enjoy downtown Buffalo's waterfront as well other points along Lake Ontario's shoreline.

This Center for Ocean Sciences Education Excellence (COSEE) Great Lakes cruise includes teachers from New York schools in Appleton, Buffalo, Chittenango, East Aurora, Silver Creek, Sodus, Syracuse and Williamsville, as well as from schools in Chicago, Michigan, Minnesota and Ohio.

Heading the educational expedition is New York Sea Grant (NYSG) Education Specialist Helen Domske, who has conducted similar workshops on Lake Erie as well as an excursion on Lake Ontario several years ago. Domske is working with teachers to develop journals and teaching tools to bring back to their classrooms. And teachers will have plenty of hands-on experience to draw from this week - from collecting and analyzing data to learning about the interactions of water, weather, aquatic life and parallels between Lake Ontario and the world's oceans.

Throughout the week, we'll be docking at ports in Youngstown, Clayton and Oswego, each with its own set of stops and experiences to share. We'll see you on the Lake and on shore as the week progresses. Fresh from our emergency safety lessons on deck of the *Lake Guardian* in my immersion suit, this is NYSG's Web Content Manager, Paul Focazio, signing off until tomorrow.

post by paul, from Shipboard and Shoreline Science on Lake Ontario — Comments (0)

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