

TEACHER MAGAZINE

\$4.00 NOVEMBER/DECEMBER 2004

www.teachermagazine.org

Fantastic VOYAGE

As crew members aboard a replica 19th century sloop, 4th graders sail through Hudson River history



ISOLATION THERAPY
Helping troubled teens acquire survival skills on a remote island

RISKY BUSINESS
Colorado educators push an aggressive merit-pay proposal

Published: November 1, 2004

Hudson River School

Two 4th grade classes sail on a replica 19th century sloop that, for 35 years, has been serving New York state students as a link to both local history and the environment.

By Patrick J. McCloskey

"Ready on the peak halyard?" the first mate yelled.

"Guacamole," responded the crew—the "crew" being 20 4th graders getting ready to set sail on the *Clearwater*, a full-size working replica of a 19th century Hudson River cargo sloop.

The 9- and 10-year-olds, after shouting the signal they'd chosen earlier, stood on the boat's port side in single file holding the halyard, a rope running to the top spar, fastened along the uppermost edge of the mainsail.



Students board the *Clearwater*, first launched in 1969. The replica is the brainchild of songwriter-activist Pete Seeger, who wanted to raise awareness of a then-heavily polluted Hudson River.— Photograph by David

"Ready on the throat?" the first mate asked, ducking under the boom, the pole attached to the bottom of the mainsail. On the starboard side were 20 more 4th graders, yet another class from Lakeview Elementary School in Mahopac, New York, about 60 miles north of New York City.

"Pick up the fuzzy fishes," they answered with a laugh. Their rope was also connected to the top spar. Many of the 40 youngsters wiped sweat from their foreheads as much in anticipation of raising the 80-foot mainsail as in response to the oppressive mid-June sun. Half an hour earlier, the students and their teachers had boarded the ship in Peekskill at one of

the many harbors from which the *Clearwater* takes students on three- or five-hour cruises from April through October.

Now, as the sloop's engine was cut, the Lakeview students pondered their task. The *Clearwater* drifted on the surface of the river awaiting the winglike metamorphosis that would occur after its sails unfurled in the wind. But how could elementary school kids leverage a 2,000-pound boom and raise a 400-pound top spar attached to an equally heavy mainsail?

Ariana Milazzo tightened her grip on the halyard and stared straight ahead with her characteristic unwavering concentration. Her best friend, Jackie Lee, smiled nervously behind her. Every summer, Jackie's family goes on a fishing trip off Long Island. She's familiar with boats, but not the kind that rely on muscle power to get going.

On a boat for the first time, John Ferrara was trying not to worry about falling into the river. "My mother let me go, but she was very nervous, too," he said later. "I tried to forget about the water and have a good time."

The moment to raise the sail arrived. "Heave-ho, heave-ho, heave-ho ..." trumpeted 21-year-old Katie Martyniuk, a crew volunteer. She demonstrated the correct hand-over-hand rope-pulling motion, which the 4th graders imitated.

Gabrielle Fernandes swept back her waist-length, jet-black braids with a toss of her head, then tugged hard on the rope as she and her classmates struggled to keep up with the pace a brawny sailor set at the mast. The boom jerked upward in fractions of an inch while the top spar climbed incrementally. The separation of the two wooden logs pushed the mainsail skyward.

About halfway up the 108-foot mast, the mainsail could have tumbled back onto the boom as gravity took hold. But the *Clearwater's* adult crew—which included nine interns, apprentices, and volunteers, as well as eight professional sailors and the captain—was on hand to take up any slack.

If the students were high schoolers, the exercise would have included a physics tutorial on pulleys and levers. But aboard the *Clearwater*, which has been in operation and serving New York public and private schools since 1969, lessons for elementary school students are more hands-on, with the adventure of sailing a tall ship providing the thrilling context for visits to the on-board environmental education stations.

"Hold the line!" Martyniuk shrieked as the youngsters showed signs of tiring. They froze in place, with the ropes straining in their hands. Martyniuk let them catch their breath, then bellowed, "Two-six heave." She'd rehearsed this traditional command earlier, and the students responded by yanking hard with both hands at once. After eight more of these double-handed maneuvers, the boom and top spar reached their proper positions. The crew secured the ropes, and the kids were ordered to drop their lines.

They breathed sighs of relief and beamed proudly at the 2,910-square-foot sail stretching overhead as the crew raised the topsail and the jib. Unfortunately the morning's gentle breeze had grown increasingly listless in the heat. Instead of generating momentum, the *Clearwater's* sails hardly fluttered, and the ship seemed suspended between a cerulean firmament and liquid pewter.

The 4th graders' adventure, however, was far from over.

Though they didn't know it at the time, the Lakeview students were witnessing firsthand a problem that's plagued Hudson River traffic for centuries. Historically, the unusually

tall sails that characterized the distinctive sloops were designed precisely because summertime winds are often calm. Packet sloops carried mail, small parcels, and passengers in relative comfort; others were outfitted for heavy cargo, such as timber, quarried stone, and livestock. During “rush hour” in the mid-19th century, more than 200 sloops, in addition to schooners (tall ships with two masts), crowded port regions along the navigable half of the 315-mile river. The high sails guaranteed that except in dangerously bad weather, traffic would continue to circulate. It had to; the Hudson was the lifeline for commerce in the region, with sloops playing a crucial role in the development of New York City as a manufacturing and financial capital.

Today, of course, the *Clearwater* transports students. During the past 35 years, schools like Lakeview have put more than half a million kids in grades 3 through 12 on the boat for lessons on Hudson River history and environmental ed to supplement the state’s social studies and science curricula. Classroom of the Waves is part of a multipronged effort run by Hudson River Sloop Clearwater, a nonprofit that offers, among other programs, outreach activities for inner city students, full-day beach and marsh outings, and professional development courses for teachers.

If the “floating schools” concept sounds familiar, it’s because more than a dozen similar programs operate elsewhere in the country, in places like Puget Sound; Sarasota, Florida; and on Lake Michigan and the Ohio River. But in 1969, when folk singer and activist Pete Seeger rallied more than 2,000 people to help launch the sloop after several years of fund-raising, the *Clearwater* was the first boat of its kind—other than Jacques Cousteau’s *Calypso*, which raised public awareness of ocean ecology via television and movies.

Back in June, as the sloop slowly moved away from the dock, the *Clearwater*’s chief educator, Dan Kricheff, ushered the 40 Lakeview students to starboard. He told them that just a sliver of wind would be enough to fill the sails and send the boat skating effortlessly across the waves. He then asked them to sit quietly and listen to the river, partly to convey how yesteryear’s travelers would have experienced their journey without the rattle or stench of motor power. He also wanted to settle them down as they’d soon be engaging in various activities.

Gradually, the *Clearwater* eased into the wide bay between the Indian Point nuclear power plant and the gateway to the Hudson Highlands at Dunderberg Mountain, across the river. The plant’s impact is of continual concern to Clearwater and other environmental and land preservation groups. They claim that Indian Point, to cool its reactors, withdraws from the Hudson on an annual basis more than twice the water consumed by New York City. This process, they add, injures or kills small fish and larvae and raises the river’s temperature, resulting in the loss of billions of fish a year.



As junior members of the crew, the 9- and 10-year olds “heave ho” to help raise the mainsail.
—Photograph by David Kidd

The 26-year-old Kricheff got the students to their feet and chose four to throw a net overboard. After hauling it back in, they saw they'd caught just a few small specimens, which, Kricheff explained, isn't unusual so close to the plant. The fish were put in a tank to be used later for an anatomy and identification lesson.

The *Clearwater* picked up speed as it approached the middle of the Hudson, where Kricheff threw a plastic bucket overboard, then quickly retrieved it. "Is it all right if I stick my hand in?" he asked rhetorically. Then he did so.

"Ahhh!" he howled, faking an acid burn.

Kricheff, at 6 feet 2 inches tall, is thin and has the angular features of a natural mime. He grew up in Poughkeepsie and "always identified with the Hudson as part of the heritage and culture of the area," he says. After college, where he got a BA in modern European literature and fine art, and some world traveling, he remembered his own *Clearwater* trip in 4th grade and applied for an internship. He then worked his way up to a full-time position.

"What's in here?" Kricheff asked about the bucket's contents.

"PCBs," several students answered.

"What are they?"

"Polychlorinated biphenyls," said Michael Culhane, casually brushing dark-brown bangs from his forehead.

"You know the chemical name?" Kricheff declared with surprise.

Both of the Lakeview teachers, John Thomson and Terri DiMicco, were sitting behind their students atop the main cabin. They smiled, as if to say: "What'd you expect? We spent the past nine months prepping for the state's mandatory exams in English, math, and science." After the last test is given, at the end of May, "June becomes fun month," the 58-year-old Thomson said later with an impish glint in his eyes. Several outings and events are planned, with the *Clearwater* voyage as the perennial favorite for both students and teachers.

"It's the most relaxing trip for the teachers since the Clearwater educators take care of everything," Thomson added. This includes before-and-after curriculum packets, and slide shows and videos upon request. "And the kids get to learn while they blow off steam."

The trip is also well-deserved. Every year, more than 85 percent of Lakeview's students, most of whom live in middle- and upper-middle-class neighborhoods, exceed the state norm on all tests, according to school officials. So Kricheff found himself recalibrating his lesson to suit the audience. He's used to doing that, considering an estimated 225 schools—urban, rural, and suburban—take a *Clearwater* journey each year. But they all receive variations of the same message.

“Back in the 1940s, PCBs were used in things like refrigerators as a coolant, and a company 200 miles upriver was dumping them into the water,” Kricheff told the Lakeview students. “PCBs are heavier than water, so they sink to the bottom, then get passed through the food chain to humans and animals, where they cause health problems.”

By the 1960s, toxic waste had so poisoned the Hudson that Pete Seeger wrote “My Dirty Stream” as a tongue-in-cheek tribute. Seeger still lives near the river in Beacon, a town 20 miles north of Peekskill. A self-described “history nut,” at that time he was reading a book titled *The Sloops of the Hudson*. The authors, writing in 1908, describe their subjects as “the most beautiful boats we ever knew, and they will never be seen again”—because steamboats and railways were putting them out of business.

“I wrote a little poem about the sloops and put it on my wall with a picture and couldn’t get it out of my mind,” Seeger recalls. Four years later, in spring 1966, he began the campaign to construct the 106-foot *Clearwater*, which was launched on May 17, 1969, from a shipyard in South Bristol, Maine—the first such boat built anywhere in almost a century.

Clearwater’s chief educator, Dan Kricheff, asked the students to sit quietly and listen to the river, partly to convey how yesteryear’s travelers would have experienced their journey without the rattle or stench of motor power.

Clearwater’s chief educator, Dan Kricheff, asked the students to sit quietly and listen to the river, partly to convey how yesteryear’s travelers would have experienced their journey without the rattle or stench of motor power.

With several fellow musicians (including Don McLean, who later penned and recorded “American Pie”), Seeger sailed on the maiden voyage, stopping at towns and cities along the way to New York City to give concerts to pay off outstanding construction loans.

Although many were preoccupied with the Vietnam War, Seeger wrote in a 15th anniversary essay that “cleaning up a river was a cause worth fighting for” and that the *Clearwater*, which he called “everybody’s boat,” would focus attention on the neglected

Hudson. He was right: During the performances, thousands of state residents donated money to the cause, and later that year, Classroom of the Waves was born.

Clearwater is a grass-roots organization with about 7,000 members whose donations cover half the cost of each voyage. (Grants are sought for schools that can’t afford the usual \$950 rate.) The group also has a long history of what it calls “informed advocacy,” using the science it teaches as a basis for taking stands on issues. As the Hudson Valley became an early flash point in the environmental movement, Clearwater helped raise the public awareness that precipitated the Clean Water and Coastal Zone Management acts in the 1970s. As a result, tremendous progress has been made cleaning up the Hudson and other waterways across the country, and the *Clearwater* became a symbol of this national effort.

Still, the lingering presence of PCBs in the riverbed continues to taint the Hudson. *Clearwater* played an integral role in getting the Environmental Protection Agency to mandate the cleanup of PCBs in 2002, but various companies have fought compliance with this and earlier initiatives for more than a decade.

As the *Clearwater's* boom swung several degrees to starboard and its mainsail billowed with air, Kricheff performed an experiment for the students. Mixing salt- and freshwater in a Plexiglas tank, he pointed to the dense layer at the bottom, explaining that saltwater sinks because of its weight. This occurs, he said, at the mouth of the Hudson, where it meets the ocean. But upriver, he added, the two waters blend as the salinity decreases. “Do you know the name when salt- and freshwater meet?” Kricheff asked.

“An estuary,” the 4th graders answered in chorus. They’d spent the morning in class reading the *Clearwater* prep booklet aloud. The Hudson, they’d learned, was originally called *Muhheakantuc*, meaning “river that flows both ways,” by Algonquin Indians. Every day, the incoming tide pushes ocean water up the Hudson, reversing its natural flow, and this pulse is felt as far north as Troy, New York—half the river’s length.

The ebb and flow of ocean and river water, with their complementary nutrients, makes the Hudson a prolific ecosystem; more than 200 species of fish, including striped bass, eel, and shad, inhabit the waters, Kricheff told the kids. In the 19th century, he added, it was common for sturgeon as long as 12 feet to leap into the air and land on a sloop’s deck. Later, John Ferrara said that when he was told (jokingly) that the same could still happen, he feared the fish “would shake the boat and we would go flying off.”

“Whoa,” several students exclaimed as the *Clearwater* rocked back and forth in the wake of a massive cargo ship that had just passed, heading swiftly downriver.

Kricheff dispersed the 4th graders into five groups of eight students each and sent them to the ship’s environmental ed stations. One was supervised by 26-year-old Eliza Collins, the ship’s boatswain (pronounced “bosun”), or maintenance foreman, who asked, “Do you guys know what constitutes water?”

“H-two-O,” Ariana said, shooting up her hand.

“Exactly,” Collins replied as she adjusted her round, rimless glasses and squinted under the shade offered by an orange baseball cap. “But do fish breathe that kind of oxygen?”

“Another form,” Ariana guessed. It was hard to hear her because of the laughter coming from the nearby plankton station, where Josh Marshall, an intern, was play-acting with his group. Marshall and a male student were pretending to be phytoplankton and zooplankton, respectively, floating on the river’s current like the terrible swimmers that plankton,



Crew member Liz Graves shows the 4th graders how to use a navigational chart of the river.
—Photograph by David Kidd

the basic elements of the aquatic food chain, ironically are. The hapless duo drifted into the clutches of other students who sat cross-legged, their arms waving like barnacles, which, after fastening themselves to rocks or the hulls of ships, comb the water for food. Meanwhile, Collins focused her group's attention by illustrating the difference between the two types of oxygen in water. She pressed her fists against her temples. "Pretend my head is an oxygen atom and my hands are hydrogen," she said with a grimace. "Now you're a fish and want to breathe, so try and remove one of my hands to get the oxygen." Three youngsters pulled on Collins' elbows but couldn't budge her fists.

"Fish breathe dissolved oxygen, not the oxygen that makes up water," Collins explained. "Otherwise fish would use up the entire river." Whereas humans need 21 parts out of 100 of breathable oxygen to live, she added, fish need only four parts per million.

Puzzled expressions on the students' faces revealed how their minds were grappling with the enormous shift in scale.

"What's your favorite kind of candy?" Collins posed in response.

"Starburst," John called out.

"Imagine your entire bedroom is filled with packing peanuts," Collins said, "and four Starburst are hidden among them. Then you have to swim through all the peanuts to find the candy." She mimed the laborious quest with her fingers, adding that this is what fish do "as they filter a lot of water quickly with their gills."

She then invited the 4th graders to help test the river water to determine the exact level of dissolved oxygen. She handed Ariana a vial of water treated earlier with a chemical cocktail that dyes the dissolved oxygen yellow. Gabrielle knelt over Ariana with an eyedropper and added one drop at a time of another solution, sodium thiosulfate, to strip the dye from the dissolved oxygen at a rate of one part per million.

After four drops, the river water retained some of its hue and proved it contains at least a minimal amount of dissolved oxygen. Gabrielle continued adding the thiosulfate as her classmates counted each droplet aloud until 10 clarified the water and demonstrated the Hudson's improving health—at least relative to the "dead zones" that haunted New York City's harbor when raw sewage depleted the dissolved oxygen several decades ago.

"Pull, you scabrous dogs!" Parks Marion, a sailing apprentice, yelled to four kids steering at the tiller. With his shoulder-length hair gathered in a ponytail and his bronzed arms flexing from a sleeveless T-shirt, Marion looked like a pirate, although he's really a junior at Guilford College, in North Carolina.

John and Gabrielle gripped the big wooden fist carved at the end of the tiller and put their weight into leveraging the rudder. Beside them, closer to the rudderpost, Victoria Russo and Paul Markaj helped out.

The 4th graders were trying to follow Captain Scott Cann's orders to alter the sloop's course in preparation for returning to the dock. The *Clearwater* was heading past Dunderberg Mountain and would have sailed as far north as Bear Mountain Bridge on a windier day. Instead, they swung the tiller to port, and the sloop leaned in the opposite direction.

"Which way are you going?" Marion asked.

"Right," the four answered in bewilderment, seeing as they were supposed to be heading left and, naturally, had pushed the tiller that way.



Below decks, the kids learn just how cramped the main cabin is and how few amenities it offers. But,

"Unlike a car, you don't steer in the direction you want to go," Marion explained. He then drilled the kids on how far to rotate the tiller to comply with the captain's commands: "amidships" being straight ahead, a "quarter" corresponding to a spot near the edge of the cabin, and so on.

The other students in the group, meanwhile, sat to the side with Liz Graves, a 20-year-old sailing apprentice, who'd moved them to the navigation station. She tutored those waiting for their turn at the tiller on reading a map marked with water depths

and symbols representing buoys and hazards.

Later, after everyone's turn at the helm, Kricheff led them into the crew's quarters, the last of the learning stations. At the bottom of the ladder, they passed the small galley where the cook prepares meals on a wood-burning stove. The 4th graders sat on benches around the dining table in the main cabin, which also functions as the crew's meeting and entertainment center.

Kricheff pulled back a curtain to expose a set of bunks, then chuckled at the students' incredulity as he told them the room sleeps 12. Another compartment, called the forecabin (pronounced "fo'c'sle"), accommodates five crew members. Only the captain has his or her own cabin.

"Anyone interested in living like this?" Kricheff asked. Kids 16 or older can volunteer, he said, and they spend a week on board living with the crew, swabbing the deck, and assisting the educators.

"I'd rather be in my own bed," Ben Raff said, voicing the majority opinion. Jackie pointed out that the main cabin was about the size of her sister's room.

"I remember coming here as a school kid," Kricheff said, "and thinking I could never work in a place like this." Living in such cramped quarters without the usual amenities—air conditioning, television, CD

'The trip gave the kids a sense of caring about the environment and helped them admire the beauty of the Hudson River Valley'

John Thomson,
Teacher, Lakeview Elementary
School,
Mahopac, New York

player—“must seem crazy in today’s society,” he added.

The students giggled their concurrence, especially after finding out that instead of indoor plumbing, they’d have to use a bucket filled with sawdust as a “head,” or toilet, and be expected to clean it out as part of morning chores.

“But I changed my mind when I got older,” Kricheff continued. “Any discomfort is offset by the positive energy and enthusiasm of the crew because they love what they do and want to be here.”

The students expressed their curiosity about the crew’s lifestyle. Gabrielle, for example, pointed an inquisitive finger at an acoustic instrument hanging on the back wall.

“That’s the house guitar,” Kricheff explained. “There are many musicians on board, and singing songs is what we do for fun.”

“No video games?” several voices cried in mock disbelief.

“Come along with me,” Kricheff sang as he strummed the guitar.

“Come along with me,” the 4th graders chanted back. They’d gathered round him on deck and, along with other crew members, were singing a Pete Seeger ballad titled “Broad Old River.”

“When we work together/ in all kinds of weather,” Kricheff sang, “there’s no telling what the power of the people and the river can do.”

During voyages, the crew sings traditional sea chanties, as well as Seeger’s folk songs about the Hudson to honor his legacy. In recognition of the *Clearwater*’s leading role in environmental ed, a role that grew out of Seeger’s vision, the sloop was placed on the National Register of Historic Places earlier this year.

“I’m convinced if there is a world in a hundred years, it’ll be because of small groups, schools, and communities doing things like the *Clearwater*,” Seeger says. “Big organizations attract power-hungry people who often do bad things.

“The idea of a beautiful sailboat representing our hopes for the future is catching on,” he adds, and it’s true that the *Clearwater* is a handsome craft, although it’s not painted in the bright colors many of its predecessors were. But the scenery it allows a glimpse of is still remarkable, harking back to the pristine waterway that inspired the Hudson River School, the country’s first internationally renowned painting movement, which flourished in the 19th century.

“The trip gave the kids a sense of caring about the environment and helped them admire the beauty of the Hudson River Valley—important lessons they bring back to the classroom,” Thomson said after the trip ended. It also, he continued, provided a much-needed balance to a rigorous academic year.

Regardless of whether the *Clearwater* approach helps save the world, as Seeger hopes, the on-board experience earned high praise from many of the 4th graders, including Ariana, who said, “It was both fun and educational.”

Patrick J. McCloskey is a freelance writer who lives in Canada.

PHOTO: Dan Kricheff talks about estuaries, where fresh- and saltwater meet, at one of several environmental ed stations used during the three-hour trip. Kricheff, 26, is the sloop's chief educator.

PHOTO: Steering the sloop, by using a tiller connected to the rudder, is another hands-on activity.

—Photographs by David Kidd

Vol. 16, Issue 03, Pages 31-35