

WHEN MARINE SCIENCE COMES ALIVE, TEACHERS BECOME STUDENTS AND STUDENTS BECOME TEACHERS



Story and photos by Judy Benson

Some of the best teachers share attributes with zookeepers. This isn't a sarcastic one-liner, meant to evoke the image of a classroom of unruly human animals. Quite the contrary.

Educators with some of the same passion for wildlife and nature that motivates others to pursue a career at the zoo often lead classrooms of some of the most engaged learners. Just ask Riley O'Hara, Peter Demasi and Ryan Jouanno, students in Eva Bartush's advanced marine science class at Brien McMahon High School in Norwalk.

"These guys were one and two inches long when I was a freshman," said O'Hara, peering into a tank of six-inch green spotted puffer fish, part of the extensive aquarium in Bartush's classroom. "I've watched them grow up."

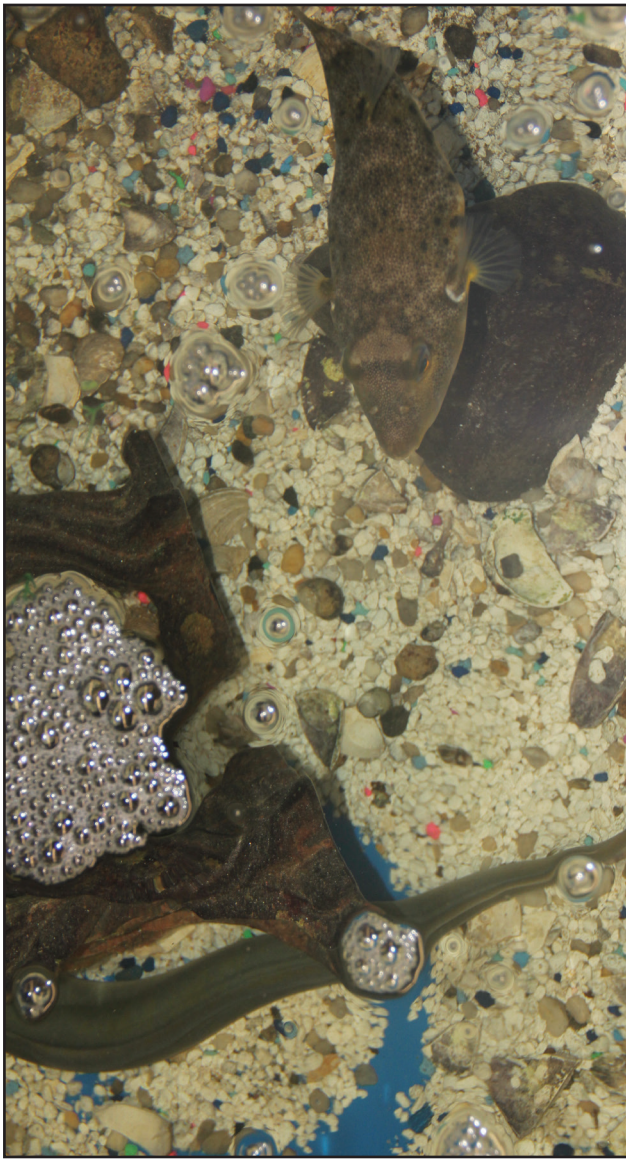
A few tanks away, Demasi leaned over another tank with local marine life. A well-known Long Island Sound species lay on the bottom, nearly camouflaged in the sand.

"The evolution of that fluke is so cool," he said. "They evolved to have both of their eyes on one side of their face."

Most of the 14 seniors in the class were looking toward future marine-, ecology- or environment-related careers, as oceanographers, marine engineers, with the Coast Guard or Navy. The classroom aquarium, which includes freshwater, tropical marine and local marine species as well as a hydroponics garden fed by nutrient-rich wastewater from a large goldfish tank, is the keystone of a four-year marine science program at the school that began in 2018.

"This used to be a garage for auto mechanics classes," Bartush explained. "We got a grant that paid for half the cost of creating this, and the city put in the other half. It opened in 2019, then we had to shut down for two years during COVID."

"The tough part of this is keeping it going on holidays,



Previous page: Brien McMahon High School students Riley O'Hara, left, and Peter Demasi check on fish recently placed in tanks of what they described as the "giant fish hotel" of the classroom aquarium.

Left: A puffer fish swims along the bottom of one of the tanks for Long Island Sound species.

weekends and in the summer," she continued. "But the kids maintain it all."

McMahon High isn't the only school in the state with an aquarium, and there are three high schools in the state with a marine focus—the Sound School in New Haven, the Bridgeport Regional Vocational Aquaculture School and the Marine Science High School of Southeastern Connecticut in Groton. But Bartush isn't content just being a high school teacher with an aquarium. Instead, she wants to take what she's learned over 31 years of teaching to inspire other teachers to follow her example not just in the classroom, but in hands-on learning experiences on Long Island Sound.

"Sherwood Island is a great environment for field lessons," she told a group of teachers in a teacher development workshop last summer, after handing out "goodie bags" filled with lesson plans, salinity testers, minnow traps, plankton nets and other equipment to use with their students. "It's sandy on one side, on another side there's a salt marsh, and there's rocky shore and a wooded area. You can walk the entire island shoreline below high tide and do beach sampling, lessons about water quality and food webs, have a beach scavenger hunt."

Her introduction to Sherwood Island, a preserve in Norwalk Harbor, came just before the group boarded a boat to spend several hours there learning how to use the environment as an outdoor school. The program was offered through the Long Island Sound Mentor Teacher program, run by Connecticut Sea Grant with support from the Long Island Sound Study, to train educators in experiential and classroom lessons about Long Island Sound that are aligned with the Next Generation Science Standards. These are the science content expectations that guide curriculum in kindergarten through 12th grade in Connecticut and many other states.

"I created the Long Island Sound Mentor Teacher program in 2002 to fill a gap in

what was then the Connecticut Science Standards," recalled Diana Payne, education coordinator at Connecticut Sea Grant. "There was almost nothing on biodiversity, ecology, the environment—and only one mention of Long Island Sound in the 6th grade. A great way to fill the gap was to encourage teachers who already incorporate Long Island Sound into their curriculum to show other teachers how to do it. Our Mentor Teachers are outstanding. Many have also added multiple subject areas, including language arts, social studies, and art."

Once the boat reached Sherwood Island, Bartush began by showing the teachers how to use a refractometer to measure salinity, and a plankton net, a small, handled device. Depending on the mesh size of the net, she explained, the yield could include crab larvae, fish larvae, diatoms, zooplankton and copepods that could be seen under a microscope.

Next came the seine net. Orders of magnitude larger than the plankton net, it requires two people to wade into the water dragging the net toward shore. After a few tries James Longcoy and Kate McDonald, middle school science teachers in Norwalk, had a successful haul.



Participants in the Long Island Sound Mentor Teacher workshop arrive on the dock at Sheffield Island on July 28.



Students in Eva Bartush's marine science class work on posters about plastic pollution to display at the Discover Boats Norwalk Boat Show.

Below, from top: Teachers at the Long Island Sound Mentor Teacher workshop explore tide pools at Sheffield Island; Students in Eva Bartush's marine science class feed scup in one of the classroom tanks; and teachers at the workshop learn how to use a salinity tester.

"That was a great little seine," Bartush said, as she examined the Atlantic silversides, grass shrimp and other creatures from the net. "One lesson you can do is to have the students do the seining at locations farther and closer to the dock and do a comparison of the diversity. There's so much data collection you can do."

Then she led them to a rocky area to explore different types of seaweed and look for creatures hiding underneath, and then the tide pools between the rocks.

"Have the kids come out and just walk and explore and they're going to find all kinds of stuff," Bartush said.

In mid-September, a few weeks into the school year, Longcoy reflected on how he's using what he learned in the workshop in his classroom.

"I've shared my experiences with the kids, mostly with my seventh graders in lessons about ecosystems and biodiversity," he said. "We talk about the ecosystem and how fragile it can be and how important it is to preserve it for our quality of life on this planet."

A teacher for 34 years, Longcoy said the workshop rekindled his passion about teaching students about the local environment. He'd like to lead students on a trip to Sherwood Island one day.



"That workshop was an amazing experience," he said. "I'm all about experiential education."

Back in Bartush's classroom, the same pay-it-forward ethic was guiding students in an assignment. At the upcoming Discover Boating Norwalk Boat Show, the students would be manning a touch tank for young visitors. It would be filled with creatures collected at Sherwood Island. The students were to choose one, identify and write up some facts to teach children about their animal. Jouanno and his two partners chose a green crab.

"I'm a huge fan of green crabs," he said, smiling as he held one between his thumb and pointer finger.

The students will also be setting up an aquarium in the classroom of a nearby elementary school, and leading marine science lessons at another.

"Our kids teach their kids," Bartush said.

