Marine education in Long Island Sound continues to innovate as educators adapt to meet the specific needs of local students. In the first wave of teaching in the Sound, the focus was on creating stewards who would learn about, care about and then protect the environment. The emphasis was discovery: school groups took field trips to the shore, combing the beach and turning over rocks looking for crabs or holding sea stars caught in a trawl net. In the second wave, educators layered this concept with rigorous, in-depth science. Students learned, for example, how to measure temperature and salinity, hypothesize about how changes in water quality affect the ecosystems of the marine environment. Now, innovators are taking nature-based education on Long Island Sound to a third phase.

In this third wave, selected educators are creating programs designed especially for students from families with limited resources. They draw upon the marine environment as a tool for transforming students’ lives. While many organizations in the Long Island Sound region open their programs to all children, this is a story of three organizations that created programs to target specific academic issues that strengthen students’ fundamental science, math and literacy skills; train them for new careers and success in higher education; and challenge them toward personal growth.

SoundWaters (Stamford) partnered with the public schools to identify underperforming students whose lack of access to real experiences in the natural world translated to a loss of academic gain, requiring intensive reinforcement of basic skills in reading, counting and measuring. The Bridgeport Regional Aquaculture and Science Technology Education Center (Bridgeport) draws upon aquaculture career opportunities to enhance science and math readiness for those who need it. Rocking the Boat (Bronx) entices students who build boats, sail their boats, and participate in hands-on river restoration, while learning marketable skills, confronting social issues, and strengthening academics.

SoundWaters is a recognized innovator of marine education: its advanced and rigorous marine science and STEM curriculum are integrated into over 175 schools throughout the Long Island Sound region. This past summer SoundWaters piloted a unique, place-based program for underperforming students. The goal was to combat the “summer slide,” the well-documented dynamic where, during the summer months, children without learning opportunities fall behind on measures of academic achievement. Studies have shown that, by the end of 5th grade, low-income children have lost two months in reading achievement, while their student peers from wealthier backgrounds actually make improvements and can be as much as three grade levels ahead by middle school.³

“At SoundWaters, we know about teaching science through the study of the Sound. Our challenge with the Summer STEM Academy was to use the natural world as a true springboard for success in reading, writing and math,” said Leigh Shemitz, President of SoundWaters. “Traditional summer school is a sad and tired concept, but summer learning is more vital than ever. Our goal was to stop the slide in performance and propel these students ahead.” Shemitz adds.

The SoundWaters Summer STEM Academy, a month-long program conducted in partnership with the Stamford Public Schools, attracted 30 rising 5th graders. Teachers selected the students, who were significantly behind their peers in all key academic areas.

The Academy combined intensive, core study of math and reading with outdoor experiences that offered practice and mastery. For example, collecting and identifying marine species for a population study reinforced lessons in arithmetic, measurement, patterns and comparison. With each lesson, the tangible, accessible Long Island Sound environment elicited opportunities for students to reinforce new skills, and to delight in the joy of connecting with their environment.

The success of this program depended in part on a small educator-student ratio, a rigorous curriculum during the four-week, full-day schedule, and equally important, the partnership with parents, many of whom did not speak English, but who recognized that their children’s future achievement depended upon their success in school.

“The program served as an important part of stopping summer slide and accelerated students on a positive trajectory,” said Cheryl Poltrack, Director for Grants and Funded Programs for the Stamford Public Schools. “I had the opportunity to personally see the rigorous program and intensity of the students as they experienced, experimented and enjoyed learning at an absolutely pivotal point in their academic journey.”

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SoundWaters students sample a shallow area and learn the connection of species and habitats to the Sound.
A similar philosophy of learning in the natural world informs the Bridgeport Regional Aquaculture and Science Technology Education Center, where self-selected high school students spend part of their school day enrolled in applying science and technology in a real-world way, said Director Lea Catherman, a former biology teacher. “We use the same curriculum as the city schools, but they get to use it in application to the marine environment. That’s the hook that gets them in, and out doing stuff. They’re not just listening to a lecture but applying what they know on a regular basis.”

The vision at the Aquaculture Center is that all students have access to unique opportunities and are put in a position to succeed. Two crucial factors contribute to its success: All the programs consciously enroll students from both city and neighboring suburban school districts, and all the classes are project-based. Working side-by-side with peers from different communities, students learn from each other as they solve problems together, create exhibitions, or study aboard research vessels.

“We choose students based on interest, with a short essay from students describing why they want to come here,” Catherman said. The school offers two pathways for all students: one is exploratory for careers in aquaculture, seafood and restaurant work with coursework that meets state standards. The other focuses on higher education and careers in science and technology in the marine environment with access to college-level courses in oceanology, national science competitions, and sophisticated equipment not available in traditional high schools. Students with a range of abilities apply and are accepted, and for those students insecure in math and science, the school offers courses for students to give them “a leg up when they are ready to do chemistry,” she said.

The dramatic change from their first day to senior year is evident both academically and socially. This transformation reveals itself each morning as students arrive to class. Where they once walked in with eyes cast downward and headphones in their ears, they now smile, make eye contact and engage with teachers and peers. Some students require greater intervention. Rocking the Boat, a highly structured youth-development program in the South Bronx, N.Y., fulfills that need with a specialized marine education program infused with comprehensive social-emotional support from social workers who strategize with students on how to deal with social-emotional issues, family issues, and getting through high school and into college. Students are drawn from the South Bronx neighborhood, primarily the Hunts Point Section, representing Latino, African-American, Caucasian, West Indian, Indian, Asian, South American, and African cultures.

SoundWaters educator and students count fish breaths in an experiment to determine how dissolved oxygen levels affect fish respiration.
By building boats, learning to row and sail their boats, and restoring the Bronx River and bringing it back to life, students develop valuable skills and experiences during their tenure at Rocking the Boat. But that’s not the whole story. “As magical as our activities are, it’s not enough to make the impact and change. It’s the excuse, the medium,” said Executive Director Adam Green. “These are crucial, but these are just tools to do the real work, which is to build kids. In order to do that we need social workers to help put all that our students learn at Rocking the Boat into practice in their lives off the River and outside the shop.”

Similar to Bridgeport, Rocking the Boat students participate through a self-selection process. The organization puts the word out to schools and neighborhoods but students decide on their own to commit to participating in both after-school and summer programs for multiple semesters. The goal is for students to stay involved for a minimum of two years. Students begin in grades 9 and 10, working one-on-one with social workers on life skills and youth development as they learn to build boats, row, sail, and do environmental science. They move into more challenging technical projects in boatbuilding and environmental science in grades 11 and 12, while focusing on graduating high school and getting into college or trade school; and maintain involvement after high school graduation as paid Program Assistants or as part of the broader alumni body, still receiving services from Rocking the Boat’s social work staff.

That long-term engagement strategy is the main reason why Rocking the Boat can have such an impact, Green said. This strategy is critical for kids whose neighborhoods are located in the poorest congressional district in the nation. At the same time, Rocking the Boat is not just a social service agency designed to help kids feel good about themselves, he said. The social-emotional support Rocking the Boat provides is the foundation for its students to achieve both academic success and technical competency in wooden boatbuilding, sailing, and environmental science.

Long Island Sound is rightly celebrated throughout the region as a rich natural resource for students of all ages to discover and learn about its varied marine life. But the Sound and its watershed can also offer significant, life-altering experiences for many students in the region who lack key academic skills. Real experiences in the natural world, which are often presumed as part of growing up, do not happen for many children from low-income families. “There is not one approach or a single action that transforms students’ lives,” notes Shemitz. “It is many pivotal elements: from family to school to community. What we have seen with the SoundWaters STEM Academy is that marine education, learning in the natural world, is a crucial element of academic success.”

Environmental education here in Long Island Sound is not only about creating future stewards. It is not only about teaching rigorous science. It is also about creating authentic learning experiences for underperforming students. Long Island Sound offers an ideal environment for learning and success.

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SoundWaters is a nonprofit organization dedicated to protecting Long Island Sound through education.