Eelgrass blades seen in an underwater meadow. Photo: Zachary Lane

Cayla Sullivan of the Environmental Protection Agency holds eelgrass blades harvested while diving in Long Island Sound. Photo courtesy of Cayla Sullivan

An eelgrass renaissance takes hold in Long Island Sound

By Judy Benson

Picture a lush green meadow. Blooming amid the swaying grass are lavender bee balm, pumpkin-hued butterfly weed and purple milkweed, offering nectar to passing monarchs, dragonflies and damselflies. A goldfinch lights on a nearby tree branch.

Now imagine a similar scene underwater. Sinuous emerald stalks swing with the tide. Baby flounder and striped bass swim through. A seahorse, pipefish and a bay scallop slink between the blades. Such eelgrass meadows exist, unseen by most, at several spots in Eastern Long Island Sound—Pine Island and Mumford Cove in Groton, DuBois Beach in Stonington and the Niantic River among them—but are not as common Sound-wide as they once were. This keystone species is now, however, the focus of multiple projects to protect and expand its presence.

“I am ecstatic,” said Cayla Sullivan in response to a question about the current state of eelgrass in the Sound.

Sullivan is an Environmental Protection Agency watershed management specialist who serves as habitat and reporting coordinator for the Long Island Sound Partnership, a network of collaborators including Connecticut Sea Grant that focus on the estuary shared by Connecticut and New York.

“We’ve come a long way since we first started in 2021,” Sullivan said.

Expanding eelgrass habitat, she explained, has long been a priority for the Partnership. But for most of that time, the conditions weren’t right. A few attempts were made, but failed. Improvements in the Sound’s water quality over the last three decades, thanks largely to reductions in nutrient loading from sewage plant discharges, have set the stage for the current infusion of funding, energy and enthusiasm for eelgrass restoration. Early signs are promising.

Sullivan is the lead author of the document guiding much of that work, the 2022 “Long Island Sound Eelgrass Management and Restoration Strategy.” But many others have contributed to laying the foundation for that strategy, and to the progress made since. Among them is Jamie Vaudrey, UConn marine science research professor and research coordinator at the CT National Estuarine Research Reserve (CT NERR), based at the Avery Point campus.

“I consider myself an ecosystems ecologist, and I’ve been interested in eelgrass as an indicator of water quality since I was a graduate student,” she said. “There’s been work on improving water quality in the Sound for the last 20 to 30 years, and now we’re at the point where it makes sense to start doing eelgrass restoration.”

Vaudrey’s long-term involvement with eelgrass intensified this summer, when a restoration project she is overseeing

Divers from the CT National Estuarine Research Reserve board a skiff to harvest seed-bearing eelgrass blades offshore from the UConn Avery Point campus for a restoration project.
Photo: Judy Benson

got into full swing, and she led two educational boat tours for the public focusing on the aquatic plant.

“Eelgrass is found where the water is clean and the light can reach the bottom,” she told the passengers, as the vessel’s captain, Rob Grove, steered out of the mouth of the Thames River. They headed towards Pine Island, part of the UConn Avery Point campus where a healthy eelgrass bed grows just offshore. “It means it’s a good place to swim.”

A short environmental history lesson followed. Passengers heard how eelgrass was once widespread throughout Long Island Sound, until a wasting disease in the 1930s nearly wiped it out. Surviving patches struggled to regrow, due to excessive nutrients coming from sewage discharges that continued through the 1970s.

“Then we have what we call the environmental awakening, when there was much more focus on improving the air and water quality, and states started to invest in sewage plant upgrades. Now, eelgrass is doing well in eastern Long Island Sound.”

Vaudrey told of one recent success story: in Mumford Cove, where the eelgrass *Zostera marina* returned after waste discharges were removed from the waterway. A second story from Smith Cove in the Niantic River showed early indications of a second eelgrass species, *Ruppia maritima*, returning following conversion of septic systems to a sewer system.

Like a green necklace, eelgrass grows in a narrow band along the coast and around islands in shallow water, typically no more than 10 feet deep depending on water clarity. It now covers about 2,000 acres of near-shore waters, and restoration advocates are looking to double that within the next decade.

Lauren Barrett, associate research scientist at the CT NERR, is leading an ambitious eelgrass restoration project that builds on the foundation laid by Sullivan, Vaudrey and others. It requires a team of divers and snorkelers who swim into healthy eelgrass beds to collect seed-bearing shoots, then separate out the seeds for mass broadcast planting at carefully selected sites in the fall. She and her team are learning and adapting as the project progresses, and anticipate there will be some trial-and-error along the way as they develop their skills and capacity.

“For every 100 seeds we plant, we expect one to five plants to grow,” she said.

The project’s long-term goal, she said, is to establish a seed bank for eelgrass restoration projects Sound-wide.

“We want to become the hardware store for eelgrass seed,” she said. “We’re trying to do something big.”

Another part of the project is educating boaters about the importance of eelgrass and their role in protecting it. Outreach messages to power boat operators will urge them not to anchor in eelgrass meadows, to slow down in shallow water, and to avoid running propellors through eelgrass beds, which uproots the plants.

A few miles from Barrett’s base at the docks and labs of UConn Avery Point, Connecticut College Biology Professor Maria Rosa leads another eelgrass restoration project. While she and UConn doctoral student Zachary Lane dove through an eelgrass meadow at a public beach in Stonington to collect reproductive shoots, Connecticut College students Sasha Jansujwicz and Sadie Joseph snorkeled through with equipment to measure the beds.

“This is one of our donor meadows,” Rosa said of the site. “We’re looking to do restoration at three sites.”

One is on the Indian River in Clinton and Madison, another is at Duck Island in Westbrook and the third is on the Thames River, just offshore from Connecticut College’s Athletic Center. She and her crew will use three different techniques, and evaluate which works best: broadcast seeding, launching “seed bombs”—clusters of seeds wrapped in rice paper—or using clams as farmers. In this method, biodegradable glue is used to apply seeds to live clams, which are tossed into the water and plant the seeds as they settle sthemselves into the sediment.

“Eelgrass restoration is very site-specific,” she said. Timing of seed production, optimal planting time and water temperature is unique for each bed.

Rosa and her crew filled a cooler with eelgrass shoots that day. Later, they were delivered to Mystic Aquarium, where volunteers would sift through them to extract the seeds.

“So many people are getting involved in this,” she said. “It’s been great.”

Dozens of volunteers are also working with the nonprofit Save the Sound on its four-year-old eelgrass restoration

Zachary Lane, a UConn doctoral student, dove with Connecticut College Professor Maria Rosa to harvest seed-bearing eelgrass shoots for a restoration project. Photo: Judy Benson

project focusing on Duck Island and Clinton Harbor. The volunteers gather for what are likened to "big arts and crafts parties," where they sit at long tables glueing seeds to clamshells.

"It's become really popular for our volunteers," said David Seigerman, communications specialist with Save the Sound. "It's hands-on, personal action."

Soundkeeper Bill Lucey, Save the Sound's hands, eyes and ears on the estuary, distributes the seeded clams in the fall from his 25-foot patrol boat after the gluing at the Cedar Island Marine Lab.

"We planted almost 300,000 seeds and 40,000 clams last fall, and when we flew a drone over those areas in the spring the sparse eelgrass areas were almost completely filled in," Lucey said. "At Duck Island, the size of the eelgrass bed had increased 178% over the previous year." (He added that these are preliminary results.)

Lucey has set his sights on locations in Branford and Greenwich for future plantings, after determining their suitability based on water quality and other factors. But he knows the kind of success he saw at Duck Island isn't a certainty.

"There are so many variables that can cause eelgrass plantings to fail," he said.

He, Barrett and Rosa also agree that eelgrass restoration work will never be finished. Existing beds need to be monitored and protected so they stay healthy. Warming water, changing water chemistry and severe storms all pose ongoing threats.

"We want to have self-sustaining meadows, and catch any that are in decline and work to build up the density," said Rosa.

Benefits of eelgrass:

- Provides nursery habitat for finfish and shellfish
- Traps sediments and nutrients
- Sequesters carbon, mitigates acidification
- Improves oxygen concentration in the water
- Prevents shoreline erosion

More Information:

"Diving into Long Island Sound's Seagrass Meadows" StoryMap:

https://storymaps.arcgis.com/stories/232ad1570c3f4f2cabbb6a8ea8440f55

Long Island Sound Eelgrass Restoration Strategy:

https://lispartnership.org/long-island-sound-eelgrass-strategy/

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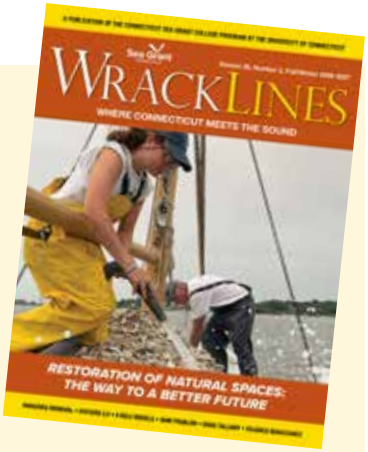
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