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Sea Grant CONNECTICUT

WRACK LINES

Volume 25, Number 1, Spring/Summer 2025

WHERE CONNECTICUT MEETS THE SOUND

Finding their niche:

Unique ways of serving people and the environment

SHELLFISH PIONEER • INVASIVES WIZARD • KELP ON WHEELS • FORCE OF NATURE • CAN-DO DUO

Sea Grant
CONNECTICUT

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Editor
Judy Benson

Graphic Design
John Lucas

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Connecticut Sea Grant
Communications Office
University of Connecticut
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From the **EDITOR**

I ALMOST FELL OUT OF MY SEAT IN THE BUSHNELL PERFORMING ARTS CENTER ON THAT COLD SATURDAY EVENING IN JANUARY.

Yo-Yo Ma was on stage, giving a one-man show of music and conversation, when he told the audience that he didn't know he wanted to be a professional cellist until he was about 40 years old.

This was an astounding statement coming from one of the most beloved cellists the world has ever known, who began playing at age 4 and performing for audiences at age 5. Now 69, Ma would have been giving concerts and recording for decades by the time he was 40. But he didn't know he wanted to be a cellist? He explained the paradox this way: he had been wedded to the cello so young, and followed a track to Julliard, then Harvard, then the concert circuit to great accolades and honors. He felt like he was carried by strong currents into this life almost unconsciously. Curiosity about other pursuits nagged him—he was interested in archeology, anthropology, science, nature, literature, philosophy and so many other things. What if he had pursued one of those instead?

Then one day, he had an epiphany.

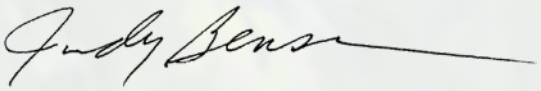
"I realized I could explore all these worlds through my cello," he said.

After that, he started the Silk Road Project of concerts and recordings with musicians from Eurasian cultures, and collaborations with an eclectic mix of singers and instrumentalists of bluegrass, jazz, Brazilian, Syrian and other genres. Recently, he began "Our Common Nature," a project described as "a cultural journey to celebrate the ways that nature can reunite us in pursuit of a shared future." Midway through the concert at the Bushnell, he had a Maya Angelou poem projected on a screen behind him and asked the audience to recite it with him. He ended the performance by showing a series of otherworldly images from the Hubbell Space Telescope projected on the screen behind as he played, discovered through his friendship with an astronomer.

As I thought about the show afterwards, I realized Ma was one whose unique niche had found him, but not until he fully embraced it—found it on his own terms—did he reach a new level of creativity and connection that touches his audiences deeply.

In this issue of *Wrack Lines*, we meet six individuals who have found their own special niches within the environmental sphere. Deb Abibou and Sarah Schechter are carving out new avenues for building resilience in Connecticut communities. Clayton McGoldrick is blazing a trail in seaweed aquaculture, Jim Carlton has made a distinguished career of tracking marine invasives, while Doreen Abubakar gives new meaning to the phrase "force of nature" in her native New Haven. And in an example from recent local history, Victor Loosanoff forged an unlikely path into groundbreaking aquaculture science that laid the foundation for today's shellfish industry. The common thread in their stories, and that of Ma, is that harnessing your passions for the greater good —whether to spread beauty, improve the environment, enrich lives, help the economy or some combination—yields personal satisfaction and fulfillment at the same time.

One of the quotes from Ma I found on his website summed it up best:
"We're not born creative or destructive. Each one of us has the ability to create or destroy, to leave the world better than we found it, or worse."



Judy Benson
judy.benson@uconn.edu

Above: Yo-Yo Ma Photo: Jason Bell, courtesy of the Bushnell Performing Art Center

Cover: Zachary Gordon, CT Sea Grant assistant extension educator, holds up a blade of kelp with sorus reproductive tissue found while diving in Long Island Sound. Photo: Clayton McGoldrick

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About OUR CONTRIBUTORS

MEGAN BARD

Megan Bard was a municipal and breaking news reporter in Connecticut and Massachusetts for print and online news organizations for 15 years. About a decade ago, she transitioned to higher education communications, sharing stories of cutting-edge research from a public medical university and highlighting the value of a liberal arts undergraduate education from a private college. She is a freelance writer and editor and, since 2024, an instructor for the UConn Department of Journalism.

RONALD GOLDBERG

Ronald Goldberg began his career at the NOAA Northeast Fisheries Science Center's Milford Laboratory in 1973 as a co-op student and retired as acting director in 2015. As a researcher he developed methods for aquaculture of juvenile surf clams and investigated coastal habitat use by young-of-the-year winter flounder. With the cooperation of commercial shellfish farmers, he conducted field experiments on the ecological effects of shellfish dredging on benthic organisms, showing generally minor effects from well-managed leased beds such as those found in Long Island Sound.

CLAYTON MCGOLDRICK

Clayton McGoldrick is the mobile seaweed lab technician with Connecticut Sea Grant. His work focuses on seaweed aquaculture research and operation of the mobile lab as a kelp nursery system along with developing and disseminating educational resources. He is interested in the future of regenerative aquaculture as a sustainable food source that supports coastal ecosystems and local working waterfronts. Clayton joined Connecticut Sea Grant in 2023 after earning a bachelor's degree in Marine Sciences from Stony Brook University.

JUDY BENSON

Judy Benson has been communications coordinator at Connecticut Sea Grant and editor of *Wrack Lines* since 2017. Before that, she was a newspaper reporter and editor, concluding her journalism career at *The Day* of New London covering health and the environment. She is the author of two books, the latest titled, *The Book of Todd*, a collaboration with her late husband published in cooperation with New London Librarium (nllibrarium.com). She earned both a bachelor's degree in journalism and a Master of Science in natural resources from UConn.

Victor Loosanoff: from czarist Russia to groundbreaking shellfish scientist in Connecticut

By Ronald Goldberg

In 1916, a young Victor Lyon Loosanoff, graduate of the Emperor Alexander First Cadet Corps in Russia, never could have imagined his future. Born into a family of noblemen, his immediate fate would be to continue in his family's military service tradition and defend Czar Nicholas' rule against the Bolsheviks during the Russian Revolution. As an officer in the Russian Royal Army, he fought in a brutal campaign, retreating eastward across Asia, and eventually reaching Harbin, China, in 1921.

Victor Loosanoff as a young solider in czarist Russia. Photo: Loosanoff family collection

At 22, as part of a displaced White Russian community in China, his early formal education in military science, mathematics, engineering, swordsmanship and history provided no apparent occupational opportunity in this foreign environment. He worked as a railroad detective, chasing thieves from the rail yards. Russian elders in Harbin's expatriate community sought to establish a "new Russia" in America, by providing transit for Loosanoff and others considered their "best and brightest." Arriving in Seattle in 1922 with 47 cents in Chinese coins in his pocket and speaking no English, he took on physically demanding and dangerous jobs to make a living.

But an obscure life of physical labor would not be his destiny. Within a few years, he would find himself on the East Coast on his way to establishing himself in a very different kind of occupation. Eventually, he distinguished himself internationally in the nascent field of shellfish biology as the founding director of what would become the National Oceanic and Atmospheric Administration's (NOAA) Milford Laboratory.

"The part of Dr. Loosanoff's legacy we most embrace today," said Gary Wikfors, Loosanoff's heir as current director of the Milford Lab, "is innovation—bringing knowledge and methods from outside the field of marine biology to scientific challenges constraining the expansion of sustainable shellfish aquaculture."

Loosanoff started on his unlikely path to becoming a prominent scientist with a detour through the rough-and-tumble world of the logging and fishing industries in the Pacific Northwest. The robust six-footer's physical strength served him well in logging camps and afforded him opportunities to wrestle and box for prize money. According to one anecdote, Loosanoff signed on to a fishing vessel for a few months at sea, motivated to learn English from the crew. At the end of the trip, he proudly tried out his new language skills on the docks, only to learn that he was speaking Norwegian.

While pondering prospects for a better life, a friend suggested that he pursue his education at the University of Washington. Initially interested in forestry, a meeting with Professor Trevor Kincaid in 1924 spurred an interest in fisheries. In only three years he earned a bachelor's degree with honors in Fisheries Science.

He accepted a position with Washington Department of Fisheries and Health and was later hired by the state of Virginia as a shellfish biologist. In 1931 the then U.S. Bureau of Fisheries was actively striving to improve and expand the country's oyster industry, and hired Loosanoff to work in Milford, the beginning of what would be a long and distinguished career there.

Loosanoff's tenure as a biologist in Milford began in temporary quarters along the Wepawaug River, then shifted to a small wooden building provided by a local oyster company. The commercial oyster fishery in Long Island Sound (LIS) was in decline and industry leaders had sought assistance from the government. Connecticut, at the time, played a major role in the region's oyster production. Loosanoff's arrival marked the start of what would become an enduring institution. Equipped with only an "oyster knife and a microscope," as he once

Victor Loosanoff, (right), examines oysters harvested by a shellfisherman aboard a working boat in Long Island Sound. Photo: NEFSC,Milford Laboratory photo archive

The Milford Lab as it appeared in 1935, early in Loosanoff's career in Milford. Photo: NEFSC, Milford Laboratory photo archive

recalled, he energetically embraced a mission of improving oyster industry productivity.

At the time, the LIS oyster industry was entirely dependent on naturally occurring "seed," which results when adults spawn and free-swimming larvae attach as spat to hard substrates such as old shell. Seed oysters were then moved to underwater shellfish beds leased from the state. On these beds the oysters grew to a harvestable size. Shellfishermen could either collect natural seed from estuaries or actively place clean shell in areas where spatfall was expected. For the latter method to be successful, timing was essential. If shell was placed too early, it could become fouled with other organisms and the oyster larvae would fail to set. If the shell was placed too late, the seasonal spatfall was missed. Solving this dilemma was one of the first problems Loosanoff addressed.

Loosanoff and fellow scientist James B. Engle published results of early studies in a comprehensive scientific paper titled: "Spawning and Setting of Oysters in Long Island Sound in 1937, and Discussion of the Method for Predicting the Intensity and Time of Oyster Setting." Loosanoff had devised a clever way to determine when and where oysters were setting by deploying small bags of shell in different locations and concurrently measuring a wide range of environmental conditions.

Loosanoff frequently spent time collecting data aboard the *Shellfish*, the vessel of Connecticut's Shellfish Commission (precursor to the state Department of Agriculture Bureau of Aquaculture) and routinely engaged those working in the industry. During spawning season, Loosanoff released real-time bulletins to growers with timing advice on shell planting.

Another research focus was on oyster predators. Starfish can decimate a crop of oysters; growers would spend countless hours "mopping" their beds to prevent this. Large fabric mops were dragged over the beds, capturing clinging starfish. The mops were then raised onto a vessel and submerged in a vat of boiling water to kill the starfish. These measures were often necessary to prevent loss of an entire harvest.

Loosanoff addressed this major industry concern by documenting variations in timing and intensity of starfish presence, as he had done with setting oysters. In one study he dyed 12,000 starfish bright blue to determine their movements. Oystermen observed their presence for a nine-month period, enabling Loosanoff to conclude that the greatest distance starfish migrate was only about 5,000 feet. This information informed the shellfishers where to focus their predator control efforts.

Countless hours in the lab peering through a microscope enabled Loosanoff to better understand the early life history

Loosanoff conducted many types of research on oysters that was beneficial to commercial oyster farmers. Photo: NEFSC, Milford Laboratory photo archive

of oysters and many other molluscan bivalves. He was an experimentalist, devising methods to measure filtration rates and responses to environmental variables. He sought to answer questions about what oysters feed on. Importantly, Loosanoff envisioned a process to farm shellfish in the manner of livestock or land crops. Although not fully developed in the 1930s, his future research would directly lead to the hatchery-based shellfish aquaculture that is practiced widely today.

One of the greatest contributions Loosanoff and his team made was the development of methods to artificially spawn and rear shellfish. Research had revealed the secrets of laboratory manipulation of seawater temperature to induce gamete production out of season, stimulate release of egg and sperm, and to culture the embryos and larvae. Methods were devised to grow large quantities of microalgal cells, necessary to feed the growing larvae. Additionally, problems were solved to enable nurturing of the free-swimming larvae through a metamorphosis when they settle on a shell cultch substrate as tiny versions of the adults they will grow into. Loosanoff was able to build on previous science and advance it with innovative ideas to demonstrate a hatchery for shellfish. Much of the entire process is practiced in aquaculture facilities worldwide today, referred to as the "Milford Method."

Since Loosanoff's time, an alternative approach to shellfish cultivation has been developed which relies solely on hatchery produced seed. Growers obtain the seed from hatcheries, grow them to a larger size in "nurseries," then plant them in natural waters, protected from predators in cages or by netting. This method of shellfish farming has expanded rapidly in all coastal waters of this country and the world. Much of the recent resurgence of availability and popularity of oysters are through these intensive aquaculture practices. Coastal aquaculture of shellfish is also favored as an environmentally friendly endeavor, in which shellfish help remove excess nutrients from seawater, which contribute to eutrophication. Eating shellfish, a protein source low on the food chain, also presents an ecologically sound alternative to more energy consumptive types of food production.

While he was director, Loosanoff continued his formal education at Yale University, earning a doctorate in zoology in 1936. By then the shellfish industry was clearly impressed with this young productive scientist. Famed Connecticut decoy-carver, legislator, and early environmentalist Charles "Shang" Wheeler and Howard Beach, member of the Connecticut Shellfish Commission and president of the Oyster Dealers and Growers' Association of North America, lobbied Congress to establish a permanent research laboratory in Milford with Loosanoff as director.

Construction of the lab was approved in 1938 (in the midst of the Depression!) and a substantial well-equipped two-story brick building was completed in 1940. The small laboratory staff was expanded to include additional researchers and scientific productivity grew. In 1951 a 50-foot research vessel was built in New Haven for the laboratory and named the *R/V Shang Wheeler.*

As director of Milford Laboratory, Loosanoff was a formidable presence. He expected his staff to abide by his rigorous work ethic and could be a demanding taskmaster. Some said that he thought of himself as an orchestra conductor with his staff as the musicians. In a Russian-accented booming voice he demanded steady progress and results from his subordinate scientists. To his credit, Victor had a remarkable ability to identify the pertinent scientific questions that needed to be answered to attain his goal of advancing shellfish propagation.

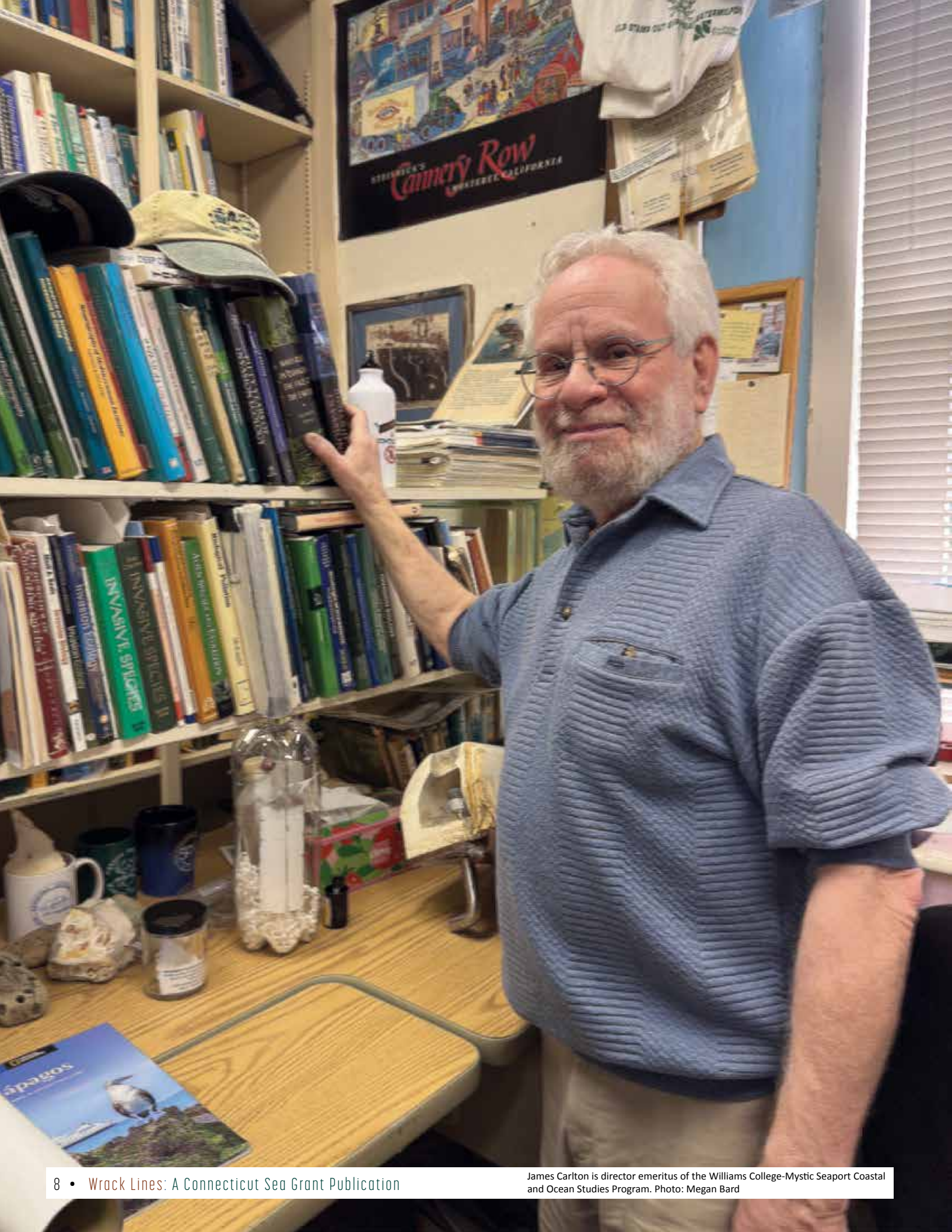
In a 1951 article in the *Saturday Evening Post*, writer Robert Yoder recounted several days spent interviewing Loosanoff in Milford. At this time Loosanoff was "a man in full" (a phrase coined by author Tom Wolfe), having achieved the recognition of scientific peers both nationally and internationally. Aboard the *R/V Shang Wheeler*, Loosanoff hosted the author and described oyster farming practices on the Sound. A photo in the article shows Loosanoff eating a raw oyster with a caption saying that after 20 years of researching oysters he had eaten his first only the year before.

Loosanoff's legacy endures today. He and colleagues published more than 200 scientific papers and articles. A leader among his scientific peers, he received many awards and honors for his achievements. In 1962 he stepped down as Milford Laboratory Director, moved to the West Coast and took a teaching position at a university.

The Milford Laboratory that Loosanoff helped found on the shore of the Wepawaug River over 90 years ago still exists. A new laboratory facility was completed in 1967, and today it is part of NOAA's Northeast Fisheries Science Center. In addition to continuing his vision of conducting research to advance shellfish aquaculture, laboratory scientists study contemporary environmental concerns such as ocean acidification.

"There are none in the Milford Lab today who met Dr. Loosanoff in person," said Wikfors, "but some of us were mentored by scientists who worked under his direction. The profile we heard about is a strong, driven personality who was equally demanding of himself and those around him. Dr. Loosanoff looked to agricultural and biomedical sciences for solutions to research needs in his day, and we continue this approach nearly 100 years later."

Known as the Milford Lab, the National Marine Fisheries Northeast Fisheries Science Center invites the public to visit its facility and learn about its work at an annual open house. Photo: Kristen Jabanoski



James Carlton is director emeritus of the Williams College-Mystic Seaport Coastal and Ocean Studies Program. Photo: Megan Bard

He's a passionate scientist, 'wizard of bioinvasions' and mentor to many worldwide

By Megan Bard

James Carlton couldn't help himself, even on this crisp February afternoon.

He had to explore the crevices of the stone walls at a small beach within the Mystic Seaport Museum. The visit was intended to be a brief stop for a photo. Instead, Carlton crouched at the edge of the Mystic River, searched between the stones and collected ribbed marsh mussels and Atlantic oyster shells from the beach.

"It's a great time to be a barnacle when the river hardens," he said, referring to sediment accumulation on the riverbed while rolling the shells around in his hands and looking out over the water.

Carlton, 77, professor of marine sciences emeritus at Williams College and director emeritus of the Williams College-Mystic Seaport Coastal and Ocean Studies Program, has been researching marine bioinvasions in some capacity—from hobby to leading global projects as a principal investigator—since he was 14 years old. Today, emerging marine scientists and established colleagues consider him the father of marine bioinvasions.

"Through his training and mentorship, he's essentially raised generations of marine scientists," said Laura Meyerson, professor of habitat restoration ecology at the University of Rhode Island and co-editor-in-chief of *Biological Invasions*. "When you work with him on a project, he makes you feel like you're discovering it right there with him."

In the years since he accidentally stepped on a tube worm in Lake Merritt, a small brackish lagoon within the San Francisco Bay estuary, and learned that it likely came from the South Seas, Carlton has become one of the world's premier researchers of marine invasive species.

"I still have his dissertation, a two-volume tome, on my desk. It's a resource for understanding Pacific Northwest marine invasions," said Marjorie Wonham, associate teaching professor at the University of Washington School of Aquatic and Fishery Sciences and the marine biology department at the Friday Harbor Laboratories.

Since the mid-1970s, Carlton's work has appeared in nearly 300 scientific journals and publications, and he helped author eight books. He has also embarked on hundreds of trips to various ports worldwide, collected more non-native species and marine debris than can be housed in his office and collections area, and boosted the careers of dozens upon dozens of up-and-coming marine biologists.

An advocate for marine biodiversity and conservation, Carlton has testified before Congress nine times, helped draft national policy on ballast water, and confirmed that marine invasive species can survive the journey across the high seas if attached to an appropriate vector, such as plastic. A few years later, Carlton and his colleagues' research on marine debris released after the March 2011 tsunami that devastated the eastern coast of Japan sparked a new understanding of how species can travel. He now organizes teams of novice and expert researchers each summer for a week of intensive collection and analysis of invasive species in coastal waterways.

Claire Goodwin of Hunts Marine Science Center in New Brunswick, Canada, one of 20 researchers who joined Carlton on a rapid bioassessment survey for marine invasives in Long Island Sound last summer, tries to determine whether a sponge she had just found was an invasive or native species. Photo: Judy Benson

Since his initial tube worm discovery, Carlton's focus has evolved to include projects on coastal areas from Alaska to Mexico, Maine to the Chesapeake Bay, the Hawaiian Islands, Chile, Argentina, the Galapagos Islands, South Africa and Europe.

"He will travel anywhere. He's passionate about his work and knowledgeable about so many things," said Evangelina Schwindt,

principal researcher at BIOMAR-CONICET in Argentina and co-editor-in-chief of *Biological Invasions*, the journal Carlton founded.

"We don't have a replacement for Jim. That worries me," she said. "So we worked on the manual where he shares 50 to 60 years of knowledge stored in his head and gives researchers the steps to create accurate lists of species and determine which are native and non-native."

BALLAST WATER

Carlton's early research focused on ballast water—fresh or salt water held in tanks and cargo holds of ships to provide the stability needed while traversing rough seas or weigh them down to pass under a bridge. For centuries, Carlton noted, humans unknowingly transported non-native, invasive species as they crossed the oceans on large ships. Little concern was given to these invasive creatures in the United States until the late 1980s.

Zebra mussels, native to Eastern Europe, were discovered after ships traveling down the St. Lawrence Seaway released their ballast water into the Great Lakes. Beachgoers' feet were sliced on their razor-sharp shells. They clogged pipes, disrupting water flow to thousands of people in Michigan for three days. Congress suddenly noticed.

After testifying before Congressional committees, Carlton helped draft policy requiring ships to release ballast water before entering their ports-of-call to reduce the chances of introducing bioinvaders into coastal ecosystems. The resulting legislation now requires ship captains to inform a division within the Smithsonian Environmental Research Center (SERC) how they treat and release the ballast water to minimize the potential for introducing non-native species.

Carlton said any invasive species introduced to an ecosystem could become the dominant organism, replacing and displacing native species. From an economic and human health perspective, this can limit biodiversity and disrupt local industries, from factories and fisheries to tourism.

"It's a challenge," he said. "In an area like Long Island Sound, where we have a major oyster industry, one parasite, one pathogen, one disease could wipe it out."

Ballast water isn't the only way marine invasive species cross oceans, however.

MARINE RAFTING

Historically, when ships traveling from the open ocean entered freshwater harbors, most experts assumed that any invasive

Aly Putnam, left, doctoral student at UMass Amherst, examines an invasive orange striped anemone from Japan that she an another researcher found during the rapid bioassessment survey last summer. Photo: Judy Benson

species accumulated at sea and affixed to the side of a ship, a process called biofouling, would not survive the change in salinity or water temperature.

Then came the March 2011 earthquake and subsequent tsunami that ravaged Japan's East Coast to challenge that earlier presumption.

Marine models suggested that Japanese tsunami debris would reach North America in the spring of 2013. So, in late spring 2012 marine researchers were surprised to see remnants of a large dock floating just off the coast of Oregon. As luck would have it for the researchers, it was spotted just a few miles from a marine biology lab staffed by Carlton's colleague, John Chapman.

"We knew it was from the tsunami because four very large docks had been lost, and the piece we recovered had the name still legible on the side," Carlton said.

More surprisingly, roughly 100 organisms were alive on the dock section, surviving despite being cast out into the high seas with little food, ultraviolet rays, cold water and predators. Then, more debris arrived, including boats, buoys, large pieces of metal and Styrofoam. All carried non-native species that survived–a phenomenon called marine rafting–with some being at sea for nearly a decade. Today, Carlton said thousands of non-native species are likely to have survived the passage, with a fair number "getting off the train" somewhere in the open ocean. Curious to see what else could be offshore, Carlton and colleagues took a boat out to look. That quest revealed that some species continued to thrive on vast amounts of floating plastic, creating a novel habitat.

"We've hardened the surface of the ocean with millions of pieces of non-biodegradable plastic that has given them a substrate to live on," Carlton said. "It's really one of the last untouched places on Earth, the high seas and the vast ocean. This was a profound modification."

Carlton continues to work with colleagues, collecting data and searching for new non-native species. He intends to publish an update soon to a 2017 paper he co-authored with eight colleagues on "transoceanic species dispersal and implications for marine biogeography." The original paper appeared on the cover of the journal *Science.*

RAPID ASSESSMENT SURVEY

Marine rafting, ballast water and warming oceans have all contributed to the changing ecosystem along the coastlines, particularly within Long Island Sound. Carlton now leads teams of novice and experienced researchers on an intense week-long survey of the Sound during the summer to understand better how it is changing, including one last summer funded by Connecticut Sea Grant.

Called Rapid Bioassessment Surveys, the initiative requires the team to collect samples of native and non-native species

Botrylloides violaceus, commonly called "chain tunicate" or "orange sheath tunicate" is a species from Japan that was found during the rapid bioassessment survey. Photo: Judy Benson

on a defined stretch of coastline from Maine to New York. Researchers spend an hour at each site, usually at marinas and along floating docks known for their rich biofouling communities.

"Long Island Sound is a model system for understanding historic change in coastal environments," Carlton said. "It's a great spot because it includes some iconic places…and has large human and fisheries populations along the shore."

Because of warming waters, he notes, "the invasive species are thriving."

He said the Sound is an ideal place for the assessment because data on the species of fish, molluscs, crustaceans, invertebrates and seaweed have been well documented over the past century.

Through the assessment and by talking with local fishers and residents, the team can track the steadily shifting populations of species migrating north from the Chesapeake Bay that normally would not survive.

THE WIZARD OF INVASIONS

Throughout his 40 years of teaching and 26 years as the director of the Williams-Mystic program, Carlton worked with or sponsored thesis research for more than 100 undergraduate, graduate and postdoctoral students worldwide. They have joined him in his laboratories, for bioassessment summer research programs and in remote locations collecting and logging new native and non-native marine species.

When colleagues and current and former students are asked about Carlton by someone unfamiliar with his work, they certainly talk about his research, but they share a common theme of admiration about who he is as a person.

"He's an amazing teacher who is passionate about his research and in love with life," said Diamela De Veer Pueyo, a postdoctoral researcher at SERC.

He's been called the godfather or father of marine invasion biology. Aria Lupo, a biological technician at SERC, prefers the title of "Wizard of Bioinvasions."

"He's been everywhere, knows everyone and he just seems to make things happen," said Lupo, who worked with him over college summer breaks. "My exposure to marine science and the realities of field work were through him."

His colleagues and students appreciate the support he gives them to develop their own projects and follow their instincts.

Katie Brandler, a sophomore marine science and conservation major at Duke University, first worked with Carlton as a sophomore in high school. Searching for a mentor, she emailed Carlton out of the blue. He responded immediately.

"He spoke to me for an hour about the research, job openings in the field and about his studies," she said. When they hung up, Brandler had secured a chance to work with Carlton on his new research in Long Island Sound.

WHY CARE?

Across the street from the James T. Carlton Marine Science Center of the Williams College—Mystic Seaport Maritime Studies Program building, on the museum's main campus, new educational boards are displayed for the public about marine invasive species. Carlton believes in educating the public about what's in their waterways to help them understand why they should care.

"I can answer that question in a scientific way, but so much of it is cultural, social and philosophical," he said. "The appreciation of the diversity and beauty of nature, can I teach that? Or does that come from within?"

In the last four or five decades, there have been significant changes in American fisheries, yet most people are unaware.

"When they go to Legal Seafood and look at the menu they wouldn't notice," he said. Replacement species and a global supply chain can mask the scale of the change.

When the public, politicians and well-meaning environmental groups seek to restore an area, the issues that arise can be tricky, Carlton said.

"It's a shifting baseline, but you tend to lament the world you knew as a child," he said.

In his office, hundreds of books line multiple bookcases, desktops, and windowsills. Species samples are stacked on shelves, and "the largest collection of invasive species T-shirts" hang on the wall near his desk.

"I don't consider myself a hoarder, but as a collector. That's a fine line," he said.

James Carlton has an extensive collection of invasive species in his office from over 40 years of teaching and research. Photo: Megan Bard

'He's been everywhere, knows everyone and he just seems to make things happen.'

Doreen Abubakar stands beside the sign for the public fishing dock at Beaver Ponds Park that the organization she founded, CPEN, helped build. Photo: Judy Benson

She's a force of nature and community in her hometown of New Haven

By Judy Benson

Doreen Abubakar is building a legacy of connections in her native city of New Haven.

In her tireless organizing and leadership of educational events and projects to enhance urban outdoor spaces, she's connecting people to the environment, and people to people through the environment. People she works with say she's "amazing," "really committed," and has "more energy and ideas than anyone." She describes herself as an urban environmentalist, a social entrepreneur and a science educator.

"I graduated in 1981 from an alternative high school, the High School in the Community," she recalled. "Many of the teachers there were hikers and kayakers. With them I learned to canoe and hiked the Appalachian Trail. I realized that if this is a 'wow' for me, it'll be a 'wow' for other people, so it became a lifelong quest to try to get minority communities engaged in the environment.

"I'm not doing this for me," she continued. "I believe there are nurturing and mental health benefits and a comfort you can get if you understand the systems of nature. It all starts with giving people that experience, inviting them in a way that is inclusive."

Geordie Elkins, executive director of Highstead, a regional conservation and ecological stewardship nonprofit group

based in Redding, spoke about one of the first activities he and his organization worked on with her. It was an "All Things Pollinator" event at a reclaimed brownfield site in the Newhallville neighborhood, one of the city's poorest. As part of the event, he and others from Highstead worked alongside neighborhood youth and adults to build a greenhouse to grow native plants for the community.

Shortly after he and others arrived at 10 a.m. on a Saturday, Abubaker called the group together for a pancake breakfast. Elkins was eager to start work on the greenhouse, so he didn't understand why she wanted to interrupt them so soon.

"Then I realized that her objective was not just to get the greenhouse built, but also building the community and the relationships," he said. "Stopping us to eat pancakes was her way. She set up a tent there and cooked pancakes, and we all had pancakes and syrup right next to the construction site."

Abubakar has been on this mission in her hometown for more than two decades, after raising five children and working as a 4-H environmental educator in New York. She's done it mainly through the non-profits she founded, CPEN (Community Placemaking Engagement Network,) and the West River Watershed Partnership, in collaboration with other community groups.

Consider just a few of the highlights on this one-woman dynamo's resume as an urban environmentalist: the 13-year-old annual West River Water Festival; canoe lessons for New Haven youth; transformation of the blighted lot in Newhallville into an urban garden, apiary, event space and outdoor classroom for craft projects, urban gardening classes, bicycle repair and fostering youth entrepreneurs. Then there's drug prevention and literacy programs, park clean-ups and projects that built floating docks for fishing at waterways accessible to city residents; fishing education events; and the Conservation Work Crew that has employed New Haven teens and young adults in cleaning up a neglected city park and teaching other youth about fishing and environmental science. How does she do it all?

"My mother was a community worker," she said, "so I always went with her on her projects. That's how I learned I could juggle things.

"I remember one time she wanted to buy a bus for our church for youth field trips," she continued. "So we started collecting bottles and cans and she was able to buy the bus. I learned that instead of waiting for handouts, we can put our minds together and find ways to bring in the money we need."

In 2022, she received a Lifetime Achievement Award for Environmental Leadership from the Greenwich Audubon Society.

Top, student workers and volunteers plant seedlings; work in the greenhouse (middle); and enjoy a pizza lunch together at the Learning Corridor garden last summer.
Photos: Georgie Elkins

The Learning Corridor garden and community space was created out of an abandoned corner lot once known as the 'mud hole' in the Newhallville section of New Haven. Photo: Geordie Elkins

"Doreen combines her passion for native plant gardening with community development and youth empowerment in powerful ways," the organization said in announcing the award. "Doreen is a true visionary who has created a powerful and unique urban development model."

On a chilly February morning in the Manjares restaurant on West Rock Avenue, Abubakar gave an overview of her work over a cup of coffee. She started with her core motivation—transforming urban areas and building connections to nature—then touched on the many events and projects she's initiated over the years. But she wasn't content to sit for long. She wanted to go to some of the places she's impacted.

The first stop was Beaver Pond Park, recently improved with a fishing dock and native plantings thanks in large part to the work of Abubakar and CPEN. Next came the formerly blighted public lot in Newhallville, about a mile and half away. Abubakar had begun her work in the neighborhood where she lives near the West River, then realized Newhallville was a neglected area in need of attention. She recalled the day she first visited the empty, trash-strewn lot straddling an intersection and crossed by the Farmington Canal Trail, popular with cyclists, runners and walkers. Local residents had dubbed the lot the "mud hole," but Abubakar imagined it becoming a community asset.

"I had a vision," she said.

CPEN secured a grant that enabled the city to install benches, an outdoor gym, a water fountain and a pollinator garden on one side, and across the street an urban garden, greenhouse and event space. A sign at one end designates it as the "Learning Corridor."

Dennis Riordan is president of the Menunkatuck Audubon Society. Its 750 members come mostly from the suburban towns from Madison to the Naugatuck River Valley, but the group wanted to become more involved in the city.

"Twelve years ago she invited us to table at the West River Watershed Festival, and I said, 'why not?'" he said. "Since then we've been working on several projects with her, including a native plant nursery and native plant sale at the Newhallville site. She got some of the local kids to work with us. She's really committed to people in the neighborhood and making things better for them."

The native plant nursery has raised 150 different species and has thus far sold more than 4,000 plants to schools, land trusts, Audubon groups and individuals from as far as Providence, Riordan said. The plants sell for $12 to $25 each, bringing in a steady source of income to keep the project going. This winter, Riordan was already looking forward to being back at the Newhallville lot working with neighborhood youth to start new plants for the spring and summer sales.

"I remember working with one young man," Riordan said. "He was 14 years old and had never done anything like this before."

When he first started, Riordan said, the youth was difficult to work with, unenthused about plants and gardening. But after a few weeks, he changed.

"Now he's one of the best workers," Riordan said. "He sees things that need to be done and he does them. He put in a new garden on his own. It's very rewarding to see that."

Abubakar said she finds great joy in shepherding youth into positive outlets. In an age when cell phones, TikTok and other technology consume so much of their attention, she believes they have a huge need to be connected to their neighborhoods and other people through experiential, tangible actions.

"It is very satisfying to be able to say to then, 'Look. You kids built that,'" she said.

This winter, Abubakar was gearing up for a busy spring and summer. Last August, CPEN received a $250,000 grant from the state Department of Agriculture to purchase a cargo container to house a hydroponic garden to grow food year-round. The container will be parked at Booker T. Washington Academy Middle School in Hamden and an educator hired to work with students to raise leafy greens that will be served in the school cafeteria and sold to local residents.

Some of the greens will be offered for sale at a new farmer's market set to open in June at the Learning Corridor. A $3,300 city grant is funding market startup costs. Abubakar also wants to start hydroponic gardening there.

"There's no economic development in Newhallville, and this is a food dessert," she said.

CPEN employees doing cleanup on March 15 in preparation for the spring planting at the Learning Corridor garden on Hazel Street in New Haven. Photo: Judy Benson

Doreen Abubakar gives a talk about climate change impacts in New Haven to a group at the New Haven Folk Festival in October 2022. Photo: Deb Abibou

Drew Devinack, researcher from Wheaton College, looks for shell-boring worms in oysters found during the rapid bioassessment survey led by Jim Carlton in Long Island Sound last summer. Photo: Judy Benson

TALK TO US

Send comments and questions about this issue to: judy.benson@uconn.edu

We'll share as many as possible, along with our responses, at: seagrant.uconn.edu

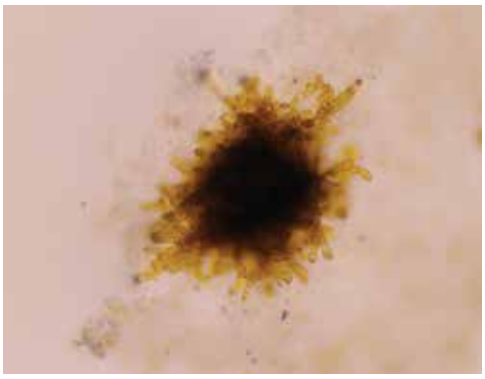
SHARING OUR STORIES
Connecticut Sea Grant

Growing kelp on wheels: 10 questions with Clayton McGoldrick

Editor's note: In April 2024, a mostly unfurnished 8-by-8-by-14-foot trailer arrived at the UConn Avery Point campus in Groton, basically a blank canvas that would soon be outfitted into a unique facility designed to nurture a fledgling aquaculture industry.

The mobile seaweed lab was purchased as part of a $200,000 grant from the U.S. Department of Agriculture, and over the next several months outfitted with the equipment for growing sugar kelp, a seaweed native to New England, and for training seaweed farmers. Anoushka Concepcion, a former Connecticut Sea Grant extension educator who specialized in seaweed aquaculture, conceived of the project and led it in partnership with a Maine-based company, Spartan Sea Farms.

Clayton McGoldrick was hired as the seaweed lab technician, and by the winter of 2024 successfully grew his first crop of kelp in tanks in the lab from kelp reproductive sorus tissue he harvested from Long Island Sound. His is a one-of-a-kind job in a one-of-a-kind facility. Curious to know more?



Left: Clayton McGoldrick on the deck of the mobile seaweed lab. Photo: Judy Benson

Top: McGoldrick shows some of the young kelp growing on spools in the mobile seaweed lab this winter. Photo: Judy Benson

Bottom: Juvenile sporophyte of kelp, left, and a male gametophyte, both shown under a microscope. Photos: Clayton McGoldrick

1. Suppose you're at a party and meet someone for the first time who asks what you do for a living. How do you respond, assuming this person knows nothing about marine science and aquaculture?

"I really like this question, because when people first ask me about my job, it can be a challenge to find the best way to answer. I think what makes it so hard is that my role is centered around a specific aspect of an industry that is already very niche.

Overall, my role as the CT Sea Grant's mobile seaweed lab technician is focused on conducting industry-applicable research and producing educational resources to support the local seaweed farming industry, specifically in the nursery cultivation stage of sugar kelp. Here in Connecticut seaweed farmers are growing sugar kelp mainly as a nutritious local food product. The industry is currently exploring other potential applications for this versatile crop including use in cosmetics, soil amendments, biopolymers, snacks and many other possibilities.

For some people, just hearing that there is a seaweed farming industry here in Connecticut comes as a surprise. The U.S. seaweed farming industry is still emerging but gaining traction as interest grows in its sustainability, nutritional value, versatility and ecological benefits. As for what I actually do, I am currently operating the mobile seaweed lab as a small-scale kelp nursery to inform the development of educational resources and in-person training workshops. In addition, the research aspect of my job is focused on exploring cryopreservation (freezing) techniques for long-term storage of sugar kelp reproductive structures to alleviate farmers' reliance on wild stocks and seasonal availability of this material to begin their farming season."

Kelp is grown on long lines during the winter months in Long Island Sound. Photo: Zach Gordon

2. Do you eat seaweed, and if so, how? Will the focus of the lab's work be on issues related to seaweed consumption, or on a broader array of potential uses?

"I do like to eat seaweed though I admit it is not a staple in my diet. Most often I eat seaweed in store-bought seaweed snacks but also use dried seaweed products such as pan-fried dulse in sandwiches, and kelp furikake (seasoning) on popcorn, rice and other foods to add salty-savory flavor. I really enjoy eating fresh kelp both right off the farm and added to macaroni and cheese, wrapped around seared scallops or in a relish. Availability of local kelp products is limited by seasonality. Shelf life is a bottleneck for industry. It is still considered a new crop in Connecticut and there is currently a lack of knowledge about how post-harvest processing may affect food safety standards. There are ongoing efforts in Connecticut to investigate these issues related to product development, but those do not currently involve the mobile lab. The focus of the mobile lab is now geared specifically to address issues related to kelp seed production and availability."

3. What kinds of skills are required for this job, and how did you obtain them?

"This job requires general handiness, basic lab technique, and understanding of aquaculture systems and maintenance, to name a few tangible skills. I am learning a lot as I go, because the mobile lab is brand new and there is no set standard to follow. That has been a fun challenge. My education, both attending the Bridgeport Regional Aquaculture Science and Technology Education Center (BRASTEC) and studying Marine Sciences at Stony Brook University, along with my background working on the water, has provided me with strong foundational knowledge that has enabled me to take on this role. I really enjoy working with my hands, which has played to my strengths in putting the lab together and learning how to operate it. Being efficient with using a microscope and able to roughly identify different microorganisms is a huge part of operating the lab as a nursery, and my background has prepared me well for that."

4. How old are you? What does it mean to you to have this unique job to potentially do groundbreaking work so early in your career?

"I am 24 years old, and this is my first job in my field since graduating college with a degree in marine science. It has been an awesome experience. I am beyond grateful to have the opportunity to do interesting work that supports local industry in Long Island Sound, where I fell in love with the ocean. I have been working with Connecticut Sea Grant (CTSG) for a bit over a year now and really feel like I've grown into my role. I have to thank all my colleagues at CTSG for allowing me this opportunity and supporting and inspiring me along the way."

5. Part of getting started growing kelp required diving in Long Island Sound. When did you dive, what was that experience like, and what was the outcome?

"My first experience with diving was taking an introduction to SCUBA course in college. For my current role I have obtained scientific diver certification and have been using SCUBA to collect "starter material" for kelp nursery cultivation.
When environmental conditions become optimal in the fall and spring, sugar kelp begins to develop reproductive tissue known as sorus. During this time, I planned dives with Zachary Gordon, the CTSG assistant extension educator focusing on seaweed, to search for kelp beds ripe with sorus. Once found, it is cut from the blade and collected, leaving the remainder of the plant intact. This past fall was the first nursery season for the mobile lab. It was super rewarding to track the when and where of sorus development and successfully dive to collect some for the mobile lab's first nursery season. Kelp is commonly found in rocky subtidal zones, and when diving for sorus we encounter many different

critters living amongst these habitats. Diving in Long Island Sound is typically at its best in fall and spring if you can bear the cold, because the cooler water temperatures promote excellent visibility."

6. How will the seaweed lab be used?

"The lab is being used to test different approaches to small-scale kelp seed production to inform the development of educational resources. Currently, there are limited available resources for kelp nursery cultivation and many of them are outdated or most applicable to large-scale brick-and-mortar facilities. The size of the mobile lab's kelp nursery system is designed to be more affordable and achievable for small farms. The nursery phase of kelp farming is short, lasting only four to eight weeks, so it is not practical for farmers to invest heavily in infrastructure and equipment for such a short-term need. As we refine our systems and techniques the lab will be taken "on the road" to host workshops in the Southern New England and New York area. The goal of the mobile lab is to increase kelp seed production by broadening access to in-person training workshops, and removing barriers such as cost and inconvenience of travel that limit the ability for people to participate in these valuable learning opportunities."

7. What kinds of projects are on the horizon, and are you taking requests from industry, researchers, regulators and others? If so please explain.

"At this time, we are not taking requests from industry for future projects—we currently have our hands full with the seed string production project. But we are open to ideas for future research in the lab after this project ends in 2026. With the first nursery season behind us, we're focusing on refining the lab's nursery system, exploring ways to improve its functionality, and preparing for upcoming research. In the spring, when sorus tissue becomes available, we plan to begin cryopreservation research and continue kelp seed production. The development of educational resources and workshops will follow these efforts. The mobile lab was designed with a modular layout, allowing the interior to be adapted for future project needs."

8. Describe what you had to do to get from a basically empty trailer space to a fully functioning lab.

"The mobile lab was built by OpBox, a Maine-based company that specializes in constructing modular, eco-friendly structures. It was delivered to meet regulations as a road-legal trailer, along with all the necessary electrical wiring to power the equipment inside of the lab. Inside, the lab came equipped with lab benches, a hand washing sink, a wire storage rack, and temperature control equipment but was ultimately a blank canvas ready to be transformed into a kelp nursery space. I spent a lot of time reading through existing manuals, researching products and talking with folks who have experience operating nurseries to make decisions on products and design. Accessibility was a priority when selecting materials, because we wanted to ensure that the system could be easily replicated.
The main aspects of the nursery system include a water filtration system, grow lighting, temperature control and culture tanks. Basic plumbing was used to configure the water filtration system to allow raw seawater to be pumped through a series of mechanical filtration and UV sterilization units before entering a holding tank. The culture system was built using the wire rack to house an LED grow light and culture tanks. Once the basic assembly of the lab was complete, we began testing the capability of the lab to create optimal culture conditions, making necessary tweaks before using the space for nursery cultivation this past fall."

McGoldrick and Zach Gordon, CT Sea Grant assistant extension educator, dove in Long Island Sound to find kelp with reproductive sorus tissue to seed a new crop in the mobile lab. Photo: Clayton McGoldrick

9. What role do you hope the lab can play in developing the commercial seaweed industry?

"The lab has the potential to support the commercial seaweed industry by improving seed availability, refining kelp nursery techniques, and providing hands-on training opportunities. By creating resources that are accessible and user-friendly, we hope to make nursery operations more efficient and accessible to industry. As a mobile educational resource, the ability to bring the lab directly to farmers, researchers and coastal communities to provide training is a huge advancement in knowledge sharing. We hope this will help to demystify nursery operations, which have been considered too complex or difficult to replicate. As the industry continues to grow, the lab's modular design will enable it to adapt to explore future research and innovation needs as they emerge."

10. What are the experiences and interests throughout your life that have motivated you to want to work in this field?

"I have been fascinated by aquatic and marine life for as long as I can remember. Growing up in Connecticut, I spent much of my time exploring local ponds, tide pools and fishing. Fishing has been a constant in my life and as a young teen I turned that passion into a job, working on local charter fishing boats. Over the years I gained a deep understanding of the charter fishing industry and came to realize though I really enjoy doing it, it wasn't what I wanted for a long-term career. A pivotal experience that motivated me to pursue a career in marine science came while attending the Bridgeport aquaculture school. My experiences there opened my eyes to potential career paths working on the water which ultimately led me to pursue a degree in marine sciences. After graduating college, I knew I wanted to find a career that allowed me to continue working on or with the water, while also contributing to a more sustainable future for coastal industries."

Communities willing to face environmental challenges have new allies at CT Sea Grant

Story and photos by Judy Benson

On a chilly December morning as a snow squall loomed, 20 people gathered on a hillside at Hamden Town Center Park.

It was the perfect vantage point to view a small pond and surrounding vegetation with an outsized significance as an example of how one town successfully took on the challenge of resilience. In just under an acre of the park, Hamden public works crews followed nature-inspired principles to landscape the area with a pond, stone-lined channels to corral water and native plants to filter runoff and create habitat for native insects and birds. Called a rain garden, it's considered an environmentally friendly solution to flooding problems that can be scaled and adapted to a wide variety of sites.

"It was an undervalued property at the end of a stormwater outfall," said Nicole Davis, watershed projects manager for the nonprofit group Save the Sound, which worked with the town on the project.

She motioned toward the far end of the pond.

"There is the channel that the stormwater is now flowing through."

Among those learning about the pond and plantings were Sarah Schechter and Deborah Visco Abibou. They organized the field trip and complementary workshop that afternoon for local officials and volunteers who work on land use issues for towns, land trusts, watershed alliances and other groups. It was followed by three virtual workshops they organized, together with four teammates in New York, each attended by more than 100 people. The sessions featured speakers who led other types of resilience projects and shared nitty-gritty details about how much they cost and how they were funded, along with tools available to bring project ideas to fruition.

Each with the title of assistant extension educator-sustainable & resilient communities, Schechter and Abibou are part of Connecticut Sea Grant and work with four New York Sea Grant counterparts on a four-year-old bi-state initiative with the Environmental Protection Agency's Long Island Sound Study. Their collective mission is to help communities in the Sound's coastal watershed adapt to increases in flooding and storm intensity with projects that make it easier for them to build long-lasting, sustainable communities. Some of the ways they accomplish this include enhancing cooperation between regions, training and empowering local leaders, assisting with grants and other resources for community infrastructure projects and helping plan improvement projects. The team established the framework for their new positions using the results of a needs assessment to create a work plan, adjusting as they move forward.

"I've learned from our communities what needs to be done and where the support is most effective," said Abibou, who is based in North Haven and focuses on Western Connecticut. "We're still at the front end of projects, but it'll be exciting when we have projects moving to implementation. I also understand about the volume of work to be done."

Schechter focuses on Eastern Connecticut and is based at the UConn Avery Point campus in Groton. As she and Abibou began interacting with various groups, they quickly learned

Attendees at a workshop in December organized by Schechter and Abibou learn about the rain garden installed at a Hamden town park.

Nicole Davis, watershed projects manager for Save the Sound, talks about the rain garden project to the group.

Schechter joined FRESH New London volunteers at a garlic planting festival at the organization's community garden last fall.

that one of the biggest needs was funding to hire grant writers to help towns and nonprofits access larger pots of funding for projects—basically a grant to get a grant.

"We've been responding to the need for capacity to apply for grants," Schechter said. "We've also tried to provide development and planning support."

Both are early in their careers as environmental professionals. Abibou, 40, came to the position in the fall of 2021 after doing coastal restoration and resilience work in Louisiana for a few years after earning a doctorate in ecology and evolutionary biology at Tulane University. Schechter, 25, joined Connecticut Sea Grant in the spring of 2023, after earning a master's degree in environmental science and management at the University of Rhode Island while interning at Rhode Island Sea Grant.

"We saw an opportunity to address Long Island Sound Study goals for resilience of communities and ecosystems through Sea Grant extension and outreach methods," said Sylvain De Guise, director of Connecticut Sea Grant. "While pooling resources, capacity and expertise of the team with members in Connecticut and New York, we envisioned a place-based approach where extension professionals like Deb and Sarah are embedded in the communities they serve. We meet people where they are to better understand their needs and help address them. Deb and Sarah have a great combination of technical expertise and people skills to fulfill that role."

Hearing from some of the community partners Abibou and Schechter have been working with is probably the best way to understand how they've been trying to make the abstract idea of "sustainable and resilient communities" into a reality.

Take Vanessa Liles, director of PT Partners public housing task force in Bridgeport, and leader of other initiatives in the state's most populous city that is also one of its poorest. The housing complex her group represents, home to about 31,500 people, is located near the city's sewage treatment plant. The plant is under legal order to expand and upgrade so its discharge doesn't pollute Long Island Sound. Residents wanted to have a say in the project.

"This is an industrial zone, but the people who live here shouldn't be unfairly targeted," Liles said. "Deb started coming to our monthly meetings and has been great at adding expertise on these issues, telling us what questions to ask, and explaining aspects about the chemicals and types of equipment used in the treatment tanks. They wanted to tear down a greenway of trees between the plant and the current facility, but we're fighting now to get the trees put back in."

Abibou's participation, Liles said, has helped empower her group by sharing her technical knowledge, participating in a listening session with residents and helping secure funds for a grant writer, the first step toward addressing a longstanding need to tackle persistent flooding problems in the neighborhood.

"She understands that relationship building is really key to being effective," Liles said. "This is exactly what a grass-roots organization needs."

Chris Sullivan heads an organization that serves a large region, Fairfield and New Haven counties, plus the town of Southington. Through Abibou, he learned about funding available for resilience projects, and had just such a project in mind.

"We've been trying to get funding to update our Norwalk River watershed plan, but we hadn't been successful," said Sullivan, the executive director of the Southwest Conservation District for the past five years. "The plan we had was outdated and needed to be revised and enhanced."

With the updated version of the plan, now in early stages, the district hopes to be able to begin addressing the water quality, erosion, flooding and nutrient problems plaguing the Norwalk River and its watershed. Sullivan also attended a workshop organized by Abibou and Schechter that introduced him to a host of grant programs, along with giving him an opportunity to network with colleagues from other organizations.

Abibou participated in a meeting of the Six Lakes Park Coalition in July 2024 to gather public input on plans for a future state park in the Six Lakes area of Hamden.

"There are all sorts of projects we can do, but having help finding the best potential funders is really helpful," Sullivan said.

The district also worked with Abibou on a water science education event last fall focusing on the Mill River in New Haven, Sullivan said. About 50 adults and youth attended, many affiliated with the New Haven-based organization CPEN (Community Placemaking Engagement Network). It was the first time the district had worked with CPEN, but he expects it won't be the last.

"We've been trying to do more in underserved communities, so this is a great connection," Sullivan said. "It's been really helpful to have Deb interact with and connect different parties."

In Eastern Connecticut, Schechter has also made an impact, despite being on the job for less than two years. Megan Granato, sustainability and resilience manager for the Town of Groton, was also new to her job when Schechter started, but the two quickly connected.

"She helped provide funding for incentives to engage the public in our tree survey and has participated in our community resilience meeting with stakeholders," Granato said. "I really appreciate Sarah as another sounding board for resilience planning. I'm really thankful for my relationship with Sarah."

Granato also took advantage of a field trip planned by Schechter and Abibou to see a series of bio-retention projects installed by the City of New Haven that help address that city's flooding problems.

Maggie Favretti, founding director of the Alliance for the Mystic River Watershed, recalled that Schecter participated in the early stages of the two-year-old organization as it was honing its mission.

"She helped us define what we meant by community resilience, and with what we can do regionally," Favretti said. "She also made it possible for us to access funding for a community learning and gathering event, making it possible for it to be free."

The Alliance also received a grant writing support grant with Sarah's help. The grant writer the Alliance hired then successfully applied for a larger grant to create a community-led plan for the watershed.

"As a start-up organization," Favretti said, "I don't know what we would have done without Sarah."

In addition to the grants and local partnership work, Abibou, Schechter and the rest of the resilience team worked together to create a web-based resilience tool library available to anyone with Internet access. Called the Long Island Sound Resilience Resource Hub (https://www.lisresilience.org/), it is a collection of curated information about environmental problems, possible solutions, and examples of how to implement and sustain projects that Favretti and many others working on resilience are finding invaluable.

Now, as the pair work on designing a new funding workshop that responds to the changing grant landscape, they are drawing on the motivations that first drew them to resilience work to stay focused and committed.

"I developed a passion for coastal issues in Connecticut as an undergraduate at UConn," Schechter said. "Not everyone has the same opportunity to access the coast, but there are ways to make it easier. It's really interesting to learn why these places are important to people and help make sure that they can continue to be connected to the coast. That's what keeps me going."

Abibou said she was drawn into resilience work out of a desire to make an impact on conservation solutions in the human sphere, a departure from her academic career in the more esoteric world of wildlife research.

"I had a growing appreciation of community and place," she said. "And I came to appreciate that communities need to be the ones making the decisions about the places they live. Their support is really vital to getting projects initiated but also to making them last. It's really satisfying to be responsive in working with communities to make a difference."

Deborah Abibou (left) can be reached at:
deb.abibou@uconn.edu

Sarah Schechter (right) can be reached at:
sarah.schechter@uconn.edu

Deborah Visco Abibou, left, and Sarah Schechter.

What's in our names?

What are wrack lines? The word wrack is a term for various kinds of seaweed, and wrack lines are the collections of organic matter (sea grass, shells, feathers, seaweed and other debris) that are deposited on shore by high tides. More generally, wrack lines are where the sea meets the land.

With our magazine *Wrack Lines*, we tell stories about the intersection of the land, sea and Connecticut Sea Grant. So what is Connecticut Sea Grant? One of 34 Sea Grant programs across the country, it helps residents make the most of our coastal resources and inland waterways. It addresses the challenges that come with living by the water or within the Long Island Sound watershed, in a state with 332 miles of shoreline and three major tidal rivers.

This NOAA-state partnership based at UConn's Avery Point campus works with aquaculture farmers, fishermen and seafood purveyors to help their businesses prosper. It funds research essential to understanding and managing our changing coastal and inland environments. It provides communities and local leaders with the information they need to make better land and shoreline decisions that result in more resilient communities and healthier watersheds. It educates students as well as teachers and adults of all ages about the marine environment.

Connected to experts and residents who live, work and recreate in the Sound and its watershed, it brings varied interests together around a common purpose of working for mutually beneficial solutions to problems. Small in staff but big in impact, Connecticut Sea Grant is like a pilot boat that navigates the way for large vessels toward safe harbors. Since 1988, Connecticut Sea Grant has supported "Science Serving the Connecticut Coast."

A blade of kelp lies in the wrack line along a beach at the UConn Avery Point campus. Photo: Judy Benson

HELP US HOST AN EVENT FOR THE 40TH ANNIVERSARY CELEBRATION OF THE LONG ISLAND SOUND STUDY!

This August marks the 40th Anniversary of the Long Island Sound Study. If you are interested in joining in on the celebrations, please contact Lillit Genovesi and Maggie Cozens to learn more. Stickers, activities, and other items will be available for participating partners.

Contact:

Lillit Genovesi, New York Sea Grant
Long Island Sound Study Outreach Coordinator –
New York City and Westchester County
Email: Lillit.Genovesi@Cornell.edu
Maggie Cozens, Connecticut Sea Grant
Long Island Sound Study Outreach Coordinator – Connecticut
Email: Margaret.cozens@uconn.edu

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Researchers lower a Nisken bottle into the waters of Mumford Cove in Groton at dawn as part of a CT Sea Grant-funded research project. Photo: Judy Benson

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