



**CONNECTICUT**  
ANNUAL REPORT 2020

## LETTER FROM THE DIRECTOR

Welcome to Connecticut Sea Grant's annual report. We offer here highlights of Connecticut Sea Grant (CTSG)'s accomplishments over the 2019-20 Sea Grant fiscal year, which runs from February 2019 through January 2020, a relatively normal year which now seems distant, ending as it did just before the COVID-19 pandemic. This brief and simplified report documents our efforts at developing partnerships and leveraging resources from outside the Sea Grant core budget. It also provides a glimpse into the sources and allocation of our funds and the research efforts supported.

A few of our success stories appear as highlights summarizing selected accomplishments and impacts across our areas of investment. These range from continuing to work on developing a strong seafood sector to helping communities become more resilient to a changing climate, maintaining healthy coastal ecosystems and training tomorrow's scientists, workforce and citizens. Particularly notable this year, CTSG celebrated its 30th anniversary with "on-the-water workshops" that gave us an opportunity to host several of you on pleasant trips on vessels across different portions of Long Island Sound while sharing the work we do. Our staff also led two of the 10 (each \$1M+) successful aquaculture projects chosen through a national competition, a testament to their leadership. One is the National Seaweed Hub, the other the Regional Shellfish Hub for Southern New England. You can find out more about our program via articles in our award-winning *Wrack Lines* magazine or on our website, <https://seagrants.uconn.edu>. We are proud to continue to work with many different stakeholder groups (including industry, government, non-government and academic partners) towards achieving our mission. Simply stated, we seek to sustain and support "**thriving coastal ecosystems and communities**" by integrating research, outreach and education in partnership with stakeholders, as outlined in our Strategic Plan.

I look forward to hearing from anyone who would have feedback to offer on this report specifically, or on the program in general.

Yours,



Sylvain De Guise, Director



## SUMMARY OF CONNECTICUT SEA GRANT ACHIEVEMENTS:

- ▶ CTSG managed **\$1,225,707** in core Sea Grant funding; **\$694,151** in state match funding; **\$796,690** in other competitive Sea Grant funds (competitive grants) with **\$399,980** in associated state match, and an additional **\$1,337,685** in leveraged funds, for a total of over **\$4.45 million**.
  - ▶ The Return-on-Investment ratio for state matching funds is **3.1:1**
  - ▶ The Return-on-Investment ratio for core federal funds is **2.6:1**
- ▶ CTSG activities contributed to creating or retaining **41 jobs** and **25 businesses**, for a combined economic (market and non-market) benefit of **\$1.38 million**.
- ▶ Reached **52** K-12 educators and **1,951** students.
- ▶ Hosted **52** public events and workshops that involved **2,257** stakeholders.
- ▶ Leveraged **2,245** hours of volunteer time towards CTSG-supported activities.
- ▶ Supported **38** new and continuing undergraduate and graduate students in research, extension, workforce development and education activities.



Leveraged  
state funds  
\$370,238

Leveraged  
federal funds  
\$943,706

**SOURCE  
OF CTSG  
FUNDS  
\$4,454,213**

State match for  
other competitive  
Sea Grant funds  
\$399,980

Leveraged  
private funds  
\$23,741

Core federal funds  
\$1,225,707

State matching  
funds  
\$694,151

Other competitive  
Sea Grant funds  
\$796,690

**CORE FEDERAL  
DOLLARS  
INVESTED  
\$1,225,707**

Research  
34%

Education  
8%

Administration  
20%

Extension  
25%

Communications  
13%





## 2020 HIGHLIGHTS

### FISHERIES AND AQUACULTURE

#### Supporting key maritime businesses:

1. The Aquaculture Mapping Atlas was upgraded to better meet the needs of regulators, prospective applicants and municipalities for information relevant to marine aquaculture permit applications. Working in partnership with UConn CLEAR, the map's lease and gear area tool was customized to simplify the application process and better facilitate a balance between commercial harvest and resource protection.
2. CTSG joined with state and federal agencies to produce "A Guide to Marine Aquaculture Permitting in Connecticut." The 37-page handbook, available online, helps individuals navigate the regulatory process of commercial shellfish and seaweed aquaculture in Connecticut.
3. Working with a shellfish farmer and an adventure ecotour business, CTSG Extension developed and implemented kayak eco-tours of Mystic River shellfish farms to help raise awareness of local shellfish species, shellfish aquaculture and the related economic and ecosystem services provided.
4. Survey of 1,756 CT residents was conducted in cooperation with UConn Extension and UConn faculty to learn about seafood consumption, knowledge, behaviors and preferences. The data will inform public engagement programs on CT aquaculture and seafood and was summarized in a 24-page report.
5. CTSG, the state Department of Agriculture Bureau of Aquaculture, the state Department of Public Health



and the CT Agricultural Experiment Station conducted years of testing and data analysis on farmed seaweed that enabled the creation of a first-of-its-kind guide for seaweed growers. The guide, published online, covers potential food safety hazards and establishes standards for CT seaweed growers.

6. Seasonal commercial harvest activity is now allowed in 218 previously restricted acres of the Mystic River after CTSG and NH Sea Grant partnered with researchers, industry and regulators to pioneer and validate a screening technique for bacteria and viruses that can impact human health and shellfish.

**“** Sea Grant is always thinking of their stakeholders and the community at large. We can always count on them to bring to the fore discussions that are relevant for the operation of shellfish commissions or topics that affect the marine environment.”

— Wayne Church, chairman,  
Clinton Shellfish Commission

**“** Sea Grant was a key player, working in cooperation with the Connecticut Department of Agriculture/Bureau of Aquaculture, in helping members of the Noank Aquaculture Cooperative successfully reclassify the lower Mystic River to seasonally conditionally approved status for the winter months.”

— Steve Plant, owner, Connecticut Cultured Oysters

### WORKFORCE DEVELOPMENT

#### Advancing valuable skills:

1. Sixty-five people received training to apply HACCP principles to seafood processing, meeting the FDA requirement for seafood processors. The classes, provided through a partnership of CT and RI Sea Grant programs, supported 42 businesses in seven states, two regulatory agencies and \$2.1 million worth of jobs. In another HACCP program, 15 students from the Sound School and Lyman Hall High School completed the training as a school-to-career opportunity.
2. CT and DE Sea Grant programs jointly funded an undergraduate internship in green infrastructure design at the Stratford Point living shoreline site. Working with a Sacred Heart University professor, the intern learned how materials science and marine science can intersect in the design and construction of living shorelines and helped evaluate the use of biodegradable products on these projects.
3. CTSG supported workforce development in marine science for 38 undergraduate and graduate students, funding their involvement in research, development, extension and communications projects.
4. CCTSG partnered with numerous other Sea Grant programs, tribal groups and agencies from multiple states to establish the National Seaweed Hub and the Regional Shellfish Hub for Southern New England to serve as science-based, non-advocacy resources for the domestic seaweed and shellfish industries.



“The work I completed at Stratford Point was a great exercise in using critical thinking to solve environmental issues. I am thankful for the opportunity to participate in a project funded through Connecticut Sea Grant, as it allowed me to apply myself and exposed me to how innovation in materials engineering technologies can be used in the restoration of shoreline areas.”

— Samuel Koeck, University of Delaware student, summer intern at living shoreline project in Stratford, CT



REGULATORY GUIDANCE FOR THE DIRECT MARKETING OF MOLLUSCAN SHELLFISH IN CONNECTICUT

“The Sea Grant Seaweed Hub has provided a needed resource for information and collaboration regarding this developing food commodity in the United States. It provides a cross-cutting network of professionals from all areas of the seaweed supply chain including scientific and food safety expertise.”

— Steven W. Bloodgood, acting director, Division of Seafood Safety, Center for Food Safety & Applied Nutrition, U.S. Food and Drug Administration



## RESILIENT COMMUNITIES

### Better tools, planning for the future:

1. A new storm briefing template developed for the National Weather Service Eastern Region Weather Forecasting Offices incorporates recommendations from a Sea Grant Coastal Storm Awareness social science research project focused on improving the clarity and messaging of storm briefing materials. It was used during the 2019 hurricane season and adopted nationwide as the template for all tropical storm-related briefings.
2. CTSG and UConn Extension supported an undergraduate summer intern to create a video explaining coastal and inland flooding and climate change impacts as an educational and planning tool for municipal officials and commission members. The video, “Rising Waters: Planning for Flooding in Connecticut,” is posted online and was played for Gov. Ned Lamont.
3. CTSG, CLEAR and the Rockfall Foundation sponsored a Climate Adaptation Academy workshop for 35 land use professionals titled, “Site Development and Green Infrastructure for Changing Weather Patterns.”



# ENVIRONMENTAL LITERACY

## Enhancing literacy among multiple audiences:

1. CTSG continued its co-sponsorship of the Coastal Perspectives Lecture Series, engaging 461 community residents, faculty and students in topics relevant to Long Island Sound, the ocean and maritime history.
2. The 22nd annual Quahog Bowl brought together 80 students on 16 teams from high schools in CT and RI, involving 20 teachers and 70 trained volunteers. The winning team, from the Science and Technology Magnet High School of Southeastern Connecticut, earned 8th place in the National Ocean Sciences Bowl competition.
3. Artist Elizabeth Ellenwood received a CTSG arts support award to present her “Among the Tides” exhibit of ghostly, granular images of beach trash using various photographic methods at the Alexey von Schlippe Gallery. Ellenwood joined Marine Sciences Professor Evan Ward in a transdisciplinary panel about marine debris from artistic and scientific perspectives.
4. CTSG hosted three “on-the-water” workshops as part of its 30th anniversary celebration, leading tours of the Thimble Islands, Norwalk and Groton-Stonington harbors as researchers and Sea Grant staff shared their work on projects including coastal resilience, commercial shellfishing, biogeochemistry and legal implications of climate change.
5. CTSG supported a staff member’s five-month research leave to develop, teach and evaluate marine science coursework and a community outreach project focused on water quality at the Mariposa DR Foundation Center for Girls in the Dominican Republic. Forty-five girls ages 10 to 14 were taught four marine science and four field classes in Spanish. The course was designed to advance the school’s mission of ending generational poverty through education and empowerment, and will continue to be taught at Mariposa.
6. With physical signage and available virtually on a website and the IZI travel app, the Blue Heritage Trail offers an environmental quest for the UConn Avery Point campus and a boating trail for Poquottannuck Cove.



*Hosting Tessa Getchis as a volunteer to lead our River Keepers program proved to be an amazing privilege. Her expertise allowed our students to explore the Yásica River estuary with a new lens. Tessa engaged the students in questions about island ecology and environmentalism, how human behavior impacts coastal communities, and integrated all that with how sustainability is the world’s most pressing social justice issue, especially for girls.”*

— Amanda Bucci, program coordinator and director of art & culture, Mariposa DR Foundation



## COASTAL ECOSYSTEMS AND WATERSHED

### Addressing real-life problems:

1. The third year of the “Don’t Trash Long Island Sound” campaign was launched with six weeks of social media posts, giveaways of colorful “Protect Our Wildlife” educational stickers, beach cleanups and the publication of op-ed articles in Connecticut



- newspapers. Four new partners joined in the campaign with CTSG, the Long Island Sound Study and Mystic Aquarium.
- The 2019 Rapid Assessment Survey of 10 marinas in southern New England and New York identified and documented non-native species, their distribution and spread. Twenty marine invaders and 17 cryptogenic species were found. Nine partner organizations conducted the assessment.
  - CTSG leads the Coastal Certificate Program, in which master gardeners and other gardening enthusiasts learn about environmental issues relevant to Long Island Sound and how changes in landscaping practices can help improve water quality. The trainees serve as ambassadors for alternative gardening practices through outreach talks, displays and installations.
  - Through a joint effort of CTSG, CT DEEP and UConn Marine Sciences, a hybrid site was chosen for a National Estuarine Research Reserve (NERR) in Connecticut and sent to the NOAA administrator for the designation process.
  - The final version of the first marine spatial plan for Long Island Sound has been completed. The Long Island Sound Blue Plan was signed by the DEEP commissioner; final approval by the state Legislature was deferred due to COVID-19.

“We are working to find a sustainability sweet spot, where the expertise of those entrusted with managing marine resources is informed by the values of those who enjoy those resources.”

—Eric Schultz, UConn professor, Department of Ecology and Evolutionary Biology

## OMNIBUS FUNDING-SUPPORTED RESEARCH

- Based on angler surveys about preferences and likely behavior changes, researchers created an economic model to predict the impact of various regulatory approaches to reducing the harvest of tautog in Long Island Sound. The model will be used to inform management and stock recovery projections. **Pengfei Liu, Eric Schultz, UConn.**
- Research documents how conventional tide gates dramatically alter flow regimes in tidal estuaries, and how discharge measurements at a single tide gate and the radioactive isotope <sup>7</sup>beryllium can reliably be used to evaluate how contaminated sediments are transported. **Gaboury Benoit, Yale University.**
- Sources of dissolved inorganic nitrogen including that from two sewage treatment plants are quantified, and the sources of nitrogen contributing to the growth of the invasive macroalgae *Cladophora* in Little Narragansett Bay are assessed. **Julie Granger, UConn.**
- Effects of projected climate change on blooms of neurotoxic dinoflagellate species *Alexandrium catenella* are assessed. Blooms of this species have caused shellfish bed closures in New England. **Hans Dam, UConn.**

- Investigation of methylmercury concentrations in seawater and zooplankton display large temporal and spatial variability between shallow and offshore sampling stations, a key to understanding the mobility of this neurotoxin from lower to higher trophic levels. **Zofia Baumann, UConn.**

“As a result of the CTSG funding, we determined that there is an important seasonality to the nitrogen sources and to the amount of nitrogen that discharges into Little Narragansett Bay from the Pawcatuck River. This finding is important to consider by managers in estimating targets for mitigation of nitrogen pollution from the watershed.”

—Julie Granger, UConn associate professor, Department of Marine Sciences



## OTHER RESEARCH PROJECTS ADMINISTERED BY CTSG:

- Social science research documented the long-term effects of the 1999 Long Island Sound lobster resource disaster, investigating both the impacts of the fishery collapse on individuals and communities and the factors that affected people's ability to adapt and recover. **Tarsila Seara, University of New Haven.**
- Researchers and seaweed farmers partnered to develop a novel system using underwater GoPro cameras to monitor how finfish are using multitrophic aquaculture systems for oysters and kelp as shelter. **Dave Hudson, Maritime Aquarium at Norwalk.**
- Four research projects focused on water quality, ecological issues and human behaviors within Long Island Sound and its watershed received \$1.5 million through the Long Island Sound Study research program managed by CT and NY Sea Grant programs. The research focuses on natural and social science questions that can inform management actions. **UConn, Clark University, FL Atlantic U., CUNY, Queens College, Columbia University.**
- Researcher identified significant differences in the PCB concentrations in gray seal pups from two distinct rookeries using dried blood spot cards. The technique has been validated to accurately measure and quantify blood PCBs. **Milton Levin, UConn, Tufts University.**

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**Wrack Lines**, won the Grand Award for Publication Excellence in the 2020 national APEX competition, highlighting a year of accomplishments for our biannual magazine. The fall-winter issue, with the theme of "Rethinking Relationships with the Places We Love," explored the Hudson River National Estuarine Research Reserve to show the possibilities for what a CT NERR could become. It gave a platform for the many voices that helped create the Long Island Sound Blue Plan, examined marsh migration research, and offered fresh perspectives on gardening that benefits birds, bees and other pollinators and wildlife. The spring-summer issue tackled the world's big challenges—plastic pollution, systemic poverty and climate change among them. Under the theme of, "Too Big? Too Late? Acting Locally to Take on the World's Major Challenges," it told the unique stories of people finding a way to make a difference through art, education, research and solar-powered boat building. Subscriptions for the print and electronic versions have grown to reach more than 3,200 households, schools, colleges, libraries, businesses, tourist and nature centers, hospitals and other outlets, and a new "Talk to Us" feature is generating reader feedback.

## SENIOR ADVISORY BOARD

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