

Sea Grant

CONNECTICUT
ANNUAL REPORT 2023

LETTER FROM THE DIRECTOR

Welcome to another issue of Connecticut Sea Grant's annual report. We offer highlights of Connecticut Sea Grant (CTSG's) accomplishments over the 2022-23 Sea Grant fiscal year, which includes February 2022 through January 2023. This brief and simplified report documents our efforts at developing partnerships and leveraging resources from within and outside the Sea Grant core budget. It provides a glimpse into the sources and allocation of our funds, and the research, extension and education efforts supported.

Some 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. But something special just happened. A commercial fisherman who had just taken the safety at sea and first aid training we co-sponsored rescued a man from his overturned skiff in the 55' waters of Long Island Sound and saved his life! While this technically did not happen in this reporting year, it is worth mentioning that our trainings are relevant and have life-saving value!

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.

Best,



SUMMARY OF CONNECTICUT SEA GRANT ACHIEVEMENTS:

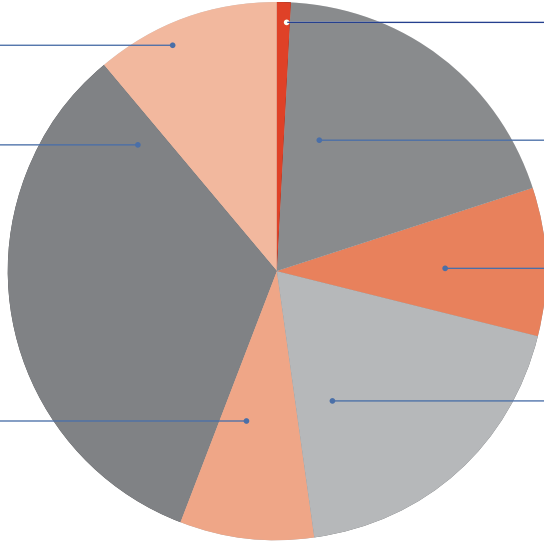
- ▶ CTSG managed **\$1,481,220** in core Sea Grant funding; **\$719,784** in state core match funding; \$1,430,993 in other competitive Sea Grant competitive funds with **\$657,152** in associated competitive funds match, and an additional **\$3,396,438** in leveraged funds from federal, state and private sources, for a total of nearly **\$7.7** million.
 - ▶ The Return-on-Investment ratio for state matching funds is **4.6:1**
 - ▶ The Return-on-Investment ratio for core federal funds is **4.2:1**
- ▶ CTSG activities contributed to creating or retaining **48** jobs and **41** businesses, for combined documented economic (market and non-market) benefits of at least **\$2,296,326**.
- ▶ Reached **211** K-12 educators through professional development, which benefited their students
- ▶ Leveraged **1,518** hours of volunteer time towards CTSG-supported activities
- ▶ Supported **27** new and continuing undergraduate and graduate students in research, extension, workforce development and education activities.

Leveraged state
\$819,920

Leveraged federal
\$2,533,908

SOURCES OF CTSG FUNDS

Competitive match
\$657,152



Leveraged private
\$42,610

Sea Grant core
\$1,481,220

State match on core funds
\$719,784

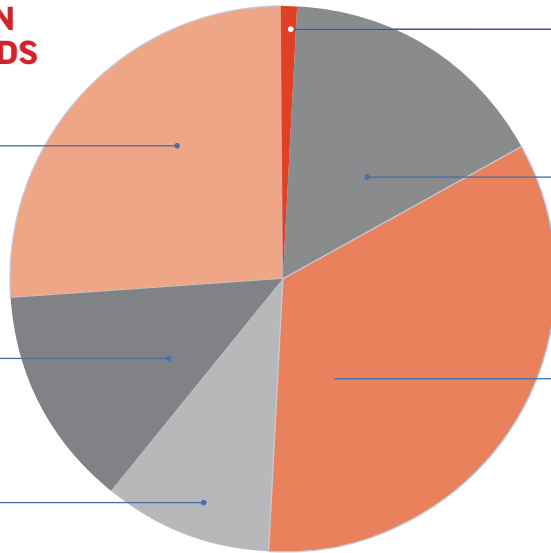
Sea Grant competitive
\$1,430,993

DISTRIBUTION OF CORE FUNDS

Research
26%

Communications
13%

Education
10%



Program development
1%

Management
16%

Extension
34%





2023 HIGHLIGHTS



FISHERIES AND AQUACULTURE

1. To support and expand sustainable aquaculture, the Southern New England Sea Grant shellfish hub addresses public perception and permitting and policy objectives with trainings, outreach, and public trust fact sheets for CT, MA and RI aquaculture law review and community engagement workshops in CT.
2. CTSG extension educator and National Seaweed Hub leader was contributing expert to 2022 FAO-WHO report on food safety for seaweed. The report references CTSG's 2020 document, *Seaweed Production and Processing in Connecticut: A Guide to Understanding and Controlling Potential Food Safety Hazards*, and a related CTSG communications article.
3. A shellfish extension educator, hired by CTSG and based at the NOAA Fisheries Milford Lab, is serving as a regional liaison between the lab and the 10 Sea Grant programs from Maine to Virginia, fostering research partnerships to address industry concerns including poor hard clam growth in NJ and hatchery crashes in the Northeast.
4. CTSG secured funding for a part-time shell recycling coordinator to begin working with relevant state

agencies, restaurants and other interested parties to develop the guidance for shell recycling programs to enhance oyster reefs and encourage larval oyster settling.

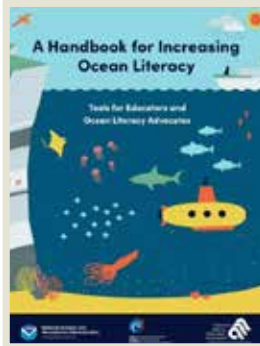
5. CTSG staff and partners developed a business planning and management tool to support seaweed aquaculture industry. It was demonstrated to the interested farmers at the Second National Seaweed Symposium.
6. CTSG partnered with the Coast Guard and Fishing Partnership Support Services to offer three safety and survival training opportunities for commercial fishermen and state maritime personnel. The program enabled 49 participants to practice safety skills, 14 to become certified drill conductors and 10 to receive vessel stability training.
7. CTSG facilitated shellfish industry economic resilience from the devastating effects of the pandemic by purchasing portable refrigerated storage units to enable eight companies to adapt their business plans to include direct marketing of clams, oysters and kelp to consumers.





ENVIRONMENTAL LITERACY

1. CTSG reaches specific audiences to enhance knowledge, appreciation and stewardship of the Long Island Sound watershed, as well as people's relationship to the environment. This was achieved through two magazine issues, 30 news stories, numerous social media posts, an annual report and engagement in the overall program.



2. CTSG is represented by its education coordinator on the Intergovernmental Oceanographic Commission Group of Experts on Ocean Literacy of the UN Educational, Scientific and Cultural Organization, and on the steering committee for the UN Ocean Decade program, Ocean Literacy with All. She co-leads the Ocean Literacy Research working group for the Global Ocean Literacy Research community and chairs the National Marine Educators Association Ocean Decade working group and Ocean Literacy committee.
3. Two mentor teacher workshops were attended by 49 educators. From 2002 to 2022, CTSG'S peer-to-peer teaching model has engaged 34 K-12 mentor teachers to share with 554 formal and informal K-12 educator peers how to incorporate relevant Long Island Sound science into curricula linked to the Next Generation Science Standards through hands-on learning.
4. CTSG partnered with a New Haven organization to increase DEI strategies for training community leaders and participation in climate actions. Dr. Camille



Gaynus, a postdoctoral fellow studying coral reefs and a member of Black in Marine Science, spoke to 160 students and 52 educators to encourage involvement in environmental issues, actions and careers.

5. A multimedia artist, children's book writer and illustrator and a fiber artist supported by CTSG created works relevant to the coastal environment that reached non-traditional audiences.
6. CTSG collaborated through its research coordinator on the development of Connecticut's Blue Heritage Trail, resulting in the installation of eight informational signs at points of interest in the Thames River watershed to be used with a series of walking, driving and boating tours (found on the IZI travel app).

WORKFORCE DEVELOPMENT

1. CTSG partners on HACCP-based seafood training courses with UMaine and RI, NY and FL Sea-Grant programs; 54 individuals trained, yielding economic impact exceeding \$1.26 million.



2. CTSG addresses public concerns about aquaculture operations through its Aquaculture 101 program. A 12-week course for new and prospective shellfish farmers, *Foundations of Shellfish Farming*, began in person in January 2023.
3. CTSG support enabled a UConn doctoral candidate to collect unprecedented data on bromophenols and build on a single bromoanisoles study in the Arctic marginal ice zone. The results are potentially transformative as little is known about these halogenated natural products.
4. CTSG teaches Climate Corps, one of three UConn Environment Corps courses that combine classroom instruction, service learning and Extension outreach. A five-year follow-up survey showed many students have begun graduate programs in environmental fields, gone into environmental careers and are becoming environmentally active citizens.
5. CTSG supported two undergraduate summer research fellows to encourage more underrepresented and underserved students to pursue marine and coastal-related professions through early career experience, training and mentorship opportunities. One student researched the relationships among saltmarsh plants and their insect and insectivorous bird communities in the saltmarsh ecosystems, while the other explored decadal changes in copepod body size in Long Island Sound.

RESILIENT COMMUNITIES



1. Five new CT and NY extension professionals conducted an informal needs assessment of coastal Long Island Sound communities in 2022, identifying top environmental threats, challenges and barriers to implementation of sustainability and resilience initiatives.

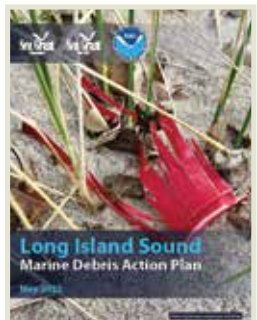
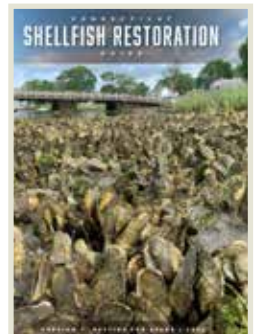
2. CTSG, Avalonia Land Trust and UConn Extension foresters implemented a multi-faceted approach to increase the resilience of the Hoffman Evergreen Preserve coastal forest in Stonington to a warming climate; it is now included on the Northern Institute of Applied Climate Science website as a demonstration project.
3. CTSG was a partner in a project to install a living shoreline at the mouth of the Connecticut River in the Borough of Fenwick. The living shoreline is composed of nine rock sills located below low tide, 0.4 acres of restored marsh, 500 feet of restored cobble beach and reconstructed dune, a relocated tidal creek and a new culvert.
5. Seven Sea Grant programs committed to working locally and regionally to provide coordinated expertise to offshore energy stakeholders in the Northeast. CTSG is working with three fishing/aquaculture industry members serving as program advisors. Two magazine articles were published and staff are participating in the regional community of practice on offshore wind.
6. CTSG, with support from the NOAA North Atlantic Regional Team, initiated the Connecticut Community Participation & Risk Communication Pilot to support relationship building with community organizations and leaders that are trusted among underserved communities. Resilience extension professionals are providing resources to vulnerable communities.



COASTAL ECOSYSTEMS AND WATERSHED

1. CTSG partnered with the UConn Center for Land Use Education and Research (CLEAR) to initiate a new extension program to assist municipalities interested in establishing Stormwater Authorities as a means for generating funds to support stormwater management.
2. Supported by the EPA and administered by CT and NY Sea Grant, the Long Island Sound Study Research Grant Program awarded \$4.2 million to 19 institutions and organizations to address priority questions to inform management actions in the Long Island Sound watershed over a two-year period.

3. CTSG, the CT Department of Agriculture and partners produced a shellfish restoration guide with background material on the state's oyster populations; policy, management, research and outreach recommendations to facilitate restoration planning; a guide to siting shellfish restoration projects; a roadmap to the permitting process; and best management practices. This tool is the second developed under a shellfish restoration strategic plan.



4. As part of a shellfish habitat restoration strategic plan, CTSG partnered with state agencies to map intertidal and sub-tidal oyster habitat to classify historical reefs as non-reefs, low-density reefs or high-density reefs. These classifications will enable state agencies to prioritize areas for restoration efforts.

5. CT and NY Sea Grant, with support from the NOAA Marine Debris Program, led the effort by 45 partner groups to complete the 2022-2027 Long Island Sound Marine Debris Action Plan. It identifies actions to address single-use plastic and other consumer debris, microplastics and microfibers, and abandoned and lost fishing/aquaculture gear in the Long Island Sound region.

CTSG-SUPPORTED RESEARCH

1. CTSG is leading a partnership on behalf of the Sea Grant network to understand the national landscape on Contaminants of Emerging Concern and identify Sea Grant's role. Resulting from the development of a national framework and research competition, four projects are funded examining the effects of per- and poly-fluorinated substances (PFAS) and CECs across watersheds with socioeconomic disadvantaged urban communities. **Celia Chen**, *Dartmouth College*; **Christopher Perkins**, *University of Connecticut*; **David Taylor**, *Roger Williams University*; **Kang Xia**, *Virginia Tech*.
2. Age and growth estimates for 800 black sea bass are improving understanding of local and broader regional implications of increasing abundance of this species in Long Island Sound. Analyses of trawl survey and historical time-series data provide key information. The presence of black sea bass and other meso-predators in historical time-series and from trawl surveys in the Sound are analyzed. **Hannes Baumann**, *University of Connecticut*.
3. Adaptation response of the copepod *Acartia tonsa* to simultaneous ocean warming and acidification is assessed over 65 generations, with results showing diminished population resilience. **Hans Dam**, *University of Connecticut*.
4. Granite gravel seeded with kelp propagules, known as "green gravel," is tested as a means of restoring Long Island Sound's kelp forests, which host biodiverse communities and provide essential ecosystem services. **Sean Grace**, *Southern Connecticut State University*.



5. Based on an analysis of survey data, a model for measuring the construct of ocean identity is created, and a toolkit for organizations to use for engagement, outreach and education around ocean issues is developed. **Miriah Russo Kelly**, *Southern Connecticut State University*.
6. To advance equitable flooding solutions across Long Island Sound, research is conducted using socio-economic models, demographic data and historical records from the National Flood Insurance Program (NFIP) to characterize the attitudes and behaviors relevant to a community's flood risk mitigation strategy and determine barriers to NFIP participation. **James Knighton**, *University of Connecticut*.
7. Phytoplankton and edible shellfish are analyzed to determine levels of bioaccumulation of per- and polyfluoroalkyl substances (PFAS), and advance understanding of the movement of these contaminants through Long Island Sound food webs. **Christopher Perkins**, *University of Connecticut*.



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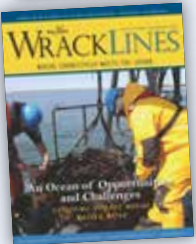
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Wrack Lines, our semi-annual magazine, was recognized with an Award of Excellence in the 2023 APEX/Communications Concepts Awards for Publication Excellence. The Fall-Winter 2022-2023 issue explored the theme of, "Looking Ahead: people and projects shaping the future," featuring a cover story about offshore wind development impacting Connecticut, the first in a series. The Spring-Summer 2023 issue offered part two of the offshore wind series, this one looking at the perspectives of commercial fishermen on the turbine farms arising in ocean waters of the North Atlantic. The issue's theme was, "An Ocean of Opportunities and Challenges: exploring diverse marine career paths." *Wrack Lines* reaches a growing cross-section of the Connecticut population through its print and electronic editions, distributed to libraries, high schools, colleges, nature centers, businesses and dozens of other venues statewide. Find current and past issues here: <https://seagrant.uconn.edu/publications/wrack-lines/>

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