



# Sea Grant

**CONNECTICUT**  
ANNUAL REPORT 2018

## LETTER FROM THE DIRECTOR

Welcome to Connecticut Sea Grant's annual report that celebrates the program's 30th anniversary year. We offer here highlights of Connecticut Sea Grant (CTSG)'s accomplishments over the 2017–18 Sea Grant fiscal year (February 2017 through January 2018). 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 train tomorrow's scientists, workforce and citizens. You can find out more via articles in our award-winning *Wrack Lines* magazine or on our website, <http://seagrant.uconn.edu>. Despite challenging economic times, 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 will “**provide science-based information to achieve healthy coastal and marine ecosystems and consequent public benefits**” 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 **\$1,220,200** in core Sea Grant funding; **\$614,655** in state match funding; **\$113,000** in other competitive Sea Grant funds (competitive fellowships and national strategic initiatives), and an additional **\$2,804,129** in leveraged funds, for a total of over **\$4.75 million**
  - ▶ The Return on Investment ratio for state matching funds is **6.7:1**
  - ▶ The Return on Investment ratio for core federal funds is **2.9:1**
- ▶ Provided technical assistance that helped lead to the creation of **8** new or expanded aquaculture businesses, **5** new shellfish regulatory positions and one new nutrient bioremediation outreach position, for a combined economic value of **\$723,320**.
- ▶ Reached **78** K-12 educators and **951** students.
- ▶ Hosted **117** public events and workshops that involved **4,170** stakeholders.
- ▶ Leveraged **3,005** hours of volunteer time towards CTSG-supported activities.
- ▶ Trained **84** processors, shellfish farmers and dealers and **10** federal and state regulators in safe seafood processing. The trainings supported **44 businesses** in eight states, supporting **\$3.2 million worth of jobs**.
- ▶ Supported **60** new and continuing undergraduate and graduate students in research, extension, workforce development and education activities.

Leveraged private funds  
\$374,880

Leveraged state funds  
\$748,192

**SOURCE  
OF CTSG  
FUNDS  
\$4,751,984**

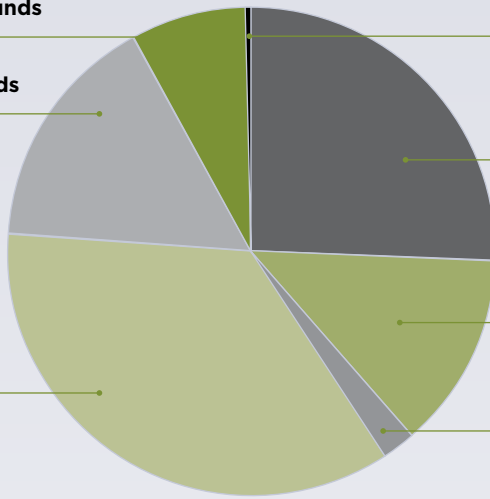
Leveraged  
federal funds  
\$1,679,857

Leveraged local funds  
\$1,200

Core federal funds  
\$1,220,200

State matched funds  
\$614,655

Other competitive  
Sea Grant funds  
\$113,000



Development  
\$17,474  
2%

Research  
480,000  
39%

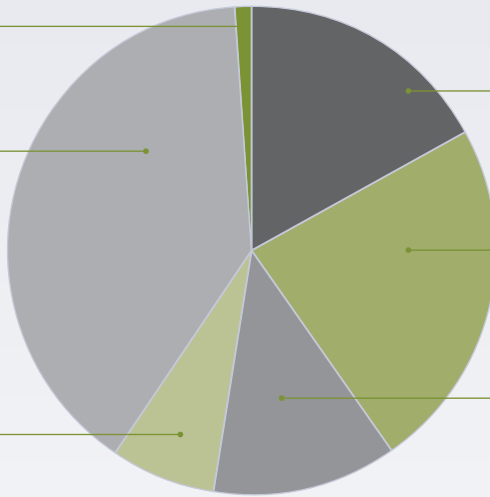
**FEDERAL  
DOLLARS  
INVESTED  
\$1,220,200**

Education  
\$89,661  
7%

Administration  
\$202,074  
17%

Extension  
\$281,697  
23%

Communications  
\$149,294  
12%



**PROGRAM PRIORITIES:**

- Healthy Coastal Ecosystems and Economy
- Seafood Production and Consumption
- Hazard-Resilient Coastal Communities
- Ocean and Coastal Literacy and Workforce Development





# 2018 HIGHLIGHTS

## SEAFOOD PRODUCTION AND CONSUMPTION

### Supporting key maritime businesses:

- ▶ The Connecticut Shellfish Initiative, recipient of the 2018 Northeast Sea Grant Outstanding Outreach Achievement Group Award, led to 8 new or expanded commercial shellfish operations, 5 new shellfish regulatory positions and one new nutrient bioremediation outreach position, for a combined economic value of \$723,320. A new leasing process helps industry gain access to aquaculture areas and new research determined the economic value of recreational shellfishing is \$1.58 million per year.
- ▶ Researchers worked with state shellfish regulators to identify the environmental triggers that signal the need for shellfish growers to take steps to protect harvests from *Vibrio parahaemolyticus*, a bacteria that can cause human illness. Northeast Regional Vibrio Workshop convened shellfish growers, environmental managers and scientists to address environmental issues related to *Vibrio*.
- ▶ Survey of CT residents improved understanding of seafood and aquaculture knowledge, perceptions and preferences. Data from 1,716 diverse residents will help quantify state seafood consumption.
- ▶ Six public events promoting CT shellfish attracted 690 participants. Awareness about commercial shellfish resources also promoted through banners, posters and special issues of *Wreck Lines* magazine.
- ▶ Sugar kelp farming advanced through work with 8 current growers, prospective growers and state and federal regulators. CTSG partnered with the state Bureau of Aquaculture to draft a guide for the safe handling and processing of raw and frozen sugar kelp. Local chefs developing kelp recipes and cookbooks.



## WORKFORCE DEVELOPMENT

### Advancing valuable skills:

- ▶ Partnership of researchers, industry and shellfish regulators pioneered the application of a virus-screening technique to conclude that bacteria levels in waters near wastewater treatment plants once closed to shellfishing now meet public health standards. Results will be presented to federal and state regulators.
- ▶ Research conducted with industry to assess the viability and potential hazards of open water culture of the edible red seaweed *Gracilaria tikvahiae* included a processor job-training component.
- ▶ Eighty-four processors, shellfish farmers and dealers and 10 federal and state regulators trained in safe seafood processing. The trainings supported 44 businesses in 8 states, supporting \$3.2 million worth of jobs.
- ▶ Career development training provided for 41 new and 19 continuing undergraduate and graduate students and 64 high school students. Opportunities included local stormwater projects; a coastal town vulnerability assessment; CTSG-funded research projects; training in ornamental fish aquaculture; and 2 Knauss Marine Policy Fellowships.

“ Taking the HACCP class helped me to understand my job a lot better. A lot of the things we did already, but I didn't understand the reason. Now when I tell the workers I supervise how they have to keep the oysters and clams cool, I know why. It gave me a lot of clarity.”

— Connor Contrupe, manager/supervisor of Briarpatch Enterprises shellfish processing warehouse in Milford

## HAZARD-RESILIENT COASTAL COMMUNITIES

### Improving storm communications and guidance:

- ▶ Story map template for emergency preparedness created with emergency managers from 4 coastal towns. The story maps, posted on town websites, will identify evacuation routes, locations of medical services, shelters and respite centers and links to local weather reports. Storm preparedness guide for tourists developed for the town of Old Lyme.
- ▶ Officials from 13 coastal towns impacted by Superstorm Sandy were interviewed about the most common obstacles to planning for climate change. Responses will be used to develop products and programs to help these municipalities.
- ▶ As part of a regional NOAA partnership, CTSG co-lead an evaluation of tools that can be used to improve resilience.

### Better tools, planning for the future:

- ▶ Process advancing the designation of a National Estuarine Research Reserve in CT is being co-lead by CTSG. The team identified the top locations in preparation for submitting a letter to NOAA to initiate the site selection approval.
- ▶ Creation of the Blue Plan, a marine spatial plan for Long Island Sound, is co-lead by CTSG. Natural resources and human uses of the Sound were inventoried with input from experts and stakeholders and data gaps identified and addressed. The first iteration of the Resource and Use Inventory was shared publicly.
- ▶ Research on risk of wind damage to homes elevated to reduce flood hazard resulted in a more accurate modeling scheme being incorporated into housing models. Additional guidance on combined flood and wave loading comparisons for elevated and non-elevated homes is being developed.
- ▶ CTSG is co-leading an assessment of the drivers and impacts of coastal ocean acidification in the Northeast and Mid-Atlantic. Coastal industries and policymakers were identified as the key audiences for coastal acidification information; outreach products are in development.



“The value of the Story Map project is that it gives a little more recognition and identification on the local level to coastal storm preparedness. I’m looking forward to putting it on our town website and social media pages. Our experience working with the team that put this together was phenomenal, just first rate. Now we’re working with them on the Community Rating System [a FEMA program].”

— David Roberge, fire marshal and emergency management director, Old Lyme

## OCEAN AND COASTAL LITERACY

### Enhancing literacy among multiple audiences:

- ▶ CTSG’s first educational research project enrolled biology classes from 13 high schools to determine factors contributing to coastal literacy and how to improve it.
- ▶ Eighty high school students on 16 CT and RI teams competed in the 2017 Quahog Bowl; winning team participated in the National Ocean Sciences Bowl.
- ▶ Creation of a book and social media short stories telling the history of CT shellfisheries initiated. Expected publication date is 2019.
- ▶ “They Came By Water,” a sculptural installation by artists Diane Barcelo and Ashby Carlisle, helped foster appreciation for the marine environment and maritime history among diverse audiences.
- ▶ Coastal Perspectives Lecture Series drew audiences totaling 698 people, continuing growth trend of 9 to 10 percent per year.
- ▶ “Keys to the Larvae of Common Decapod Crustaceans (Lobsters, Crabs and Shrimp) in Long Island Sound,” an identification guide, produced with CTSG support. This is a valuable tool for researchers and students.
- ▶ Mentor teachers created 2 workshops assisting 16 peers to incorporate Long Island Sound content into lessons within the scope of the CT Science Frameworks and the Next Generation Science Standards.
- ▶ In partnership with NOAA’s Climate Stewards Education Project, 30 formal and informal educators participated in a 3-day workshop to learn about climate science, how to teach it and engage in resilience-related activities.



## HEALTHY COASTAL ECOSYSTEMS AND ECONOMY

### Addressing real-life problems:

- ▶ Three populations of an invasive and sometimes highly toxic species known as clinging jellyfish found in surveys of the Groton area, raising concerns about human-jellyfish interactions and the potential for severe stings. The Woods Hole Oceanographic Institute researcher worked with CTSG and local media to distribute maps and pamphlets to other researchers, bait and tackle shops, shellfish commissions, commercial shellfishermen, regulators, marinas, swimmers and boaters.
- ▶ Since 2013, 163 individuals from 54 towns have been trained in the Coastal Certificate Program, learning gardening and landscaping techniques that protect Long Island Sound water quality. The trainees met their outreach obligations by reaching more than 1,200 residents through 1,500 hours of projects, 57 public walks and talks, stewardship initiatives and distribution of informational materials.
- ▶ CT Shellfish Management Plan template created to assist municipal shellfish commissions in developing management plans. Three of 14 town commissions are currently using the template in consultation with CTSG.



**“** *I sold my lawn care business in 2011; prior to 2010 we were using synthetic fertilizer and a five, sometimes six-step application schedule on lawns. But I knew how to apply it. It was the Master Gardener and Coastal Certificate Program that started to change the way we looked at managing our farm*  
— Tom Kalal, owner with his wife Nancy of Cranberry Meadow Farm in East Lyme



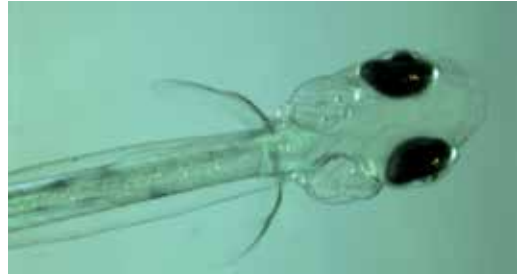
## CURRENT RESEARCH

### Core and Northeast Sea Grant Consortium research projects:

- ▶ Experiment shows the survival of copepods, the most abundant organism in the oceans, will likely be reduced by ocean warming and acidification. This will in turn affect fish population dynamics. A larger experiment is ongoing. **Hans Dam**, *University of Connecticut*
- ▶ Important carbon, nitrogen and phosphorous balances and exports developed for Long Island Sound, informing adaptation strategies for wet and dry years. Calculations developed through the project are transferrable to estuaries globally. **Penny Vlahos and Michael Whitney**, *University of Connecticut*
- ▶ Changes in methylmercury concentrations in Atlantic silversides and Northern quahogs from shallow embayments were quantified over the lifespan of these key foods for larger fish. Recreational and subsistence fishermen can be exposed to methylmercury via consumption. **Zofia Baumann**, *University of Connecticut*
- ▶ Researcher surveyed residents of 24 coastal towns to determine willingness to support ecologically friendly approaches to sea level rise and storm surge adaptation, versus conventional adaptation methods. **Stephen Swallow**, *University of Connecticut*
- ▶ With Mystic Aquarium and other partners, researchers are assessing the practicality of raising coral reef fish popular with hobbyists through aquaculture. Preliminary guidance on how to raise royal gramma, a popular aquarium fish, developed. **Paul Anderson**, *Mystic Aquarium*
- ▶ Preliminary results of research on northern sand lance, a key forage species, suggests it may be one of the most sensitive species to rising levels of CO<sub>2</sub>. Dramatic reductions seen in survival rates with increased CO<sub>2</sub> levels which were amplified in combination with rising temperatures. **Hannes Baumann**, *University of Connecticut*

“It’s pretty cool to say that as a young researcher, I’m doing something that’s never been done on a coastal estuary. It’s certainly important for Long Island Sound. We have such a large impact on our coastal ecosystems and they are very important to our economy and health. This work has set me up to stay working on coastal ecosystems when I graduate. I didn’t have those skills before, because my background was in pure chemistry. I want to have a job doing environmental chemistry work. That’s why I came to graduate school.”

— **Allison Byrd**, marine sciences graduate student, about her work-study experience on Sea Grant-funded research quantifying the carbon, nitrogen and phosphorous balances and exports for Long Island Sound that will inform adaptation strategies for wet and dry years



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*Wrack Lines* expanded its reach both in print and online, now with more than 1,000 institutions, organizations, businesses and households across the state signed up for its electronic and print editions. A focus group was convened that made several recommendations that have been implemented. Among these are the creation of a new list serve, the addition of supplemental online articles and content and photos that better define our name and mission to readers. "From Sea to Table," the theme of the Spring–Summer 2018 issue, highlighted well-known and lesser-known local seafood, from clams and oysters to black sea bass and scup. Eight CT chefs contributed recipes. New writers and photographers are featured in this and upcoming issues. In addition to *Wrack Lines*, the CTSG website, Facebook and Twitter pages are frequently updated with articles and photos about our activities.



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