# Science Serving the Connecticut Coast

# Connecticut Sea Grant Strategic Plan 2018-2023

photo: J. Stocker

CTSG-20-11

The Connecticut Sea Grant College Program (CTSG) is part of the National Sea Grant College Program network, established by Congress in 1966 and administered by the National Oceanic and Atmospheric Administration (NOAA), under the Department of Commerce. The National Sea Grant Office, 33 university-based state programs, the National Sea Grant Advisory Board, a National Law Center, a National Sea Grant Library, and hundreds of participating institutions comprise this national network. It is a highly leveraged federal and state partnership that harnesses the intellectual capacity of the nation's universities to solve coastal, ocean and Great Lakes problems. With its strong research capabilities, local knowledge, and on-the-ground workforce, Sea Grant offers NOAA and this country an unmatched ability to rapidly identify and capitalize on opportunities, and to generate timely practical solutions to real problems in real places. As one of Sea Grant's university programs, CTSG partners with public and private sector organizations to apply research discoveries to balance human and environmental needs, and create measurable benefits for coastal and ocean environments and communities through an integrated program of research, outreach (extension and communication) and education.

The University of Connecticut is the State's Sea Grant institution. The Connecticut program began with a marine extension program in 1974 and grew in scope to achieve full-fledged Sea Grant College status in 1988. For thirty years, CTSG has worked to foster the wise use and conservation of coastal and marine resources of the Long Island Sound (LIS) estuary, as well as work regionally, nationally and globally on issues of relevant concern. This plan recognizes the importance of coastal ecosystems and their watersheds, and explicitly acknowledges that coastal ecosystems include people. The strategy for success of any individual Sea Grant program must be consistent with the overall vision and direction of the National Sea Grant Program. It must also be tuned into the environmental, social and economic priorities and problems presented within the program's specific venue. For CTSG this includes the State of Connecticut, Long Island Sound and its watershed, extending to the Northeast Region and beyond.

This plan was developed iteratively in parallel with the new 2018-2021 National Sea Grant College Program Strategic Plan. Connecticut stakeholders and advisory bodies informed the development of the Connecticut plan by providing meaningful input and feedback that CTSG reviewed and considered during targeted staff retreats over a one-year period (see Appendix 1 for details on the process). Briefly, stakeholder engagement included several rounds of review and discussions with the Senior Advisory Board, Extension Advisory Board, discussions with colleagues, and feedback from stakeholders (83) received via an online survey broadly distributed through our listservs and those of partners to assure a broad diversity of individuals and organizations. The demographics and previous interactions of respondents with our program are documented in Appendix 1. The fact that 24% of respondents cited no previous interactions with CTSG suggests success at reaching out beyond the cadre of regular partners to identify and address local needs.

## 1. VISION

### *Thriving coastal ecosystems and communities*

This vision acknowledges the link between communities and ecosystems, and recognizes that people and their activities are an integral part of coastal ecosystems.

## 2. MISSION

### *CTSG's mission is to generate and provide science-based information and tools to help Connecticut residents and communities balance diverse coastal and marine interests and adapt to changing conditions.*

The mission recognizes Sea Grant's role as a facilitator and provider of objective information to support individuals and organizations in making informed decisions. Sea Grant supports and communicates science in a practical, actionable manner, making science real and applicable.

CTSG helps individuals and communities balance use and conservation of coastal ecosystems. Finally, CTSG's activities help build the resilience of coastal communities, coastal economies and coastal ecosystems.

## 3. CORE PURPOSE

### *We seek to passionately inspire, enable and empower people to understand and improve their world.*

The core purpose reflects what drives CTSG staff to come to work every day, why they choose to be part of the Sea Grant network. The strategic planning process renewed a sense of enthusiasm and common purpose that the team wishes to communicate.

## 4. CORE VALUES

A strong set of core values has been the foundation of Sea Grant's work from its inception. Sea Grant was founded on a belief in the critical importance of university-based, merit-reviewed research and constituent engagement. This has allowed Sea Grant to form strong partnerships with leading universities and colleges, with other NOAA programs, and with a wide range of public and private partners at the local, state, federal and international levels. This has proven to be a highly effective way to identify and solve the most relevant problems facing coastal communities. However, these partnerships require consistent adherence to these core values in order to maintain Sea Grant's reputation as a trustworthy partner.

Three key core values underpin all that CTSG does as an organization:

**1. *Integrity*** – CTSG embraces the principles of honesty, trustworthiness, respectfulness, transparency, accountability, and professionalism. CTSG believes that learning is essential to improvement, and that honesty regarding challenges and failures promotes learning and improves CTSG's capacity to effect positive change. CTSG staff are held accountable for meeting the programmatic and financial obligations of their work while addressing stakeholder needs.

**2. *Objectivity*** – CTSG serves as neutral and objective brokers of science-based information for the purpose of informing and engaging stakeholders in dialogue on coastal and marine ecosystem challenges and opportunities. CTSG does not engage in advocacy based activities.

**3. *Science driven/based*** – CTSG programs are anchored in objective, science-based information. CTSG harnesses the power of the academic community to expand the frontiers of knowledge through research and innovation, and communicates research results through its extension, communications and education programs for the benefit of society. CTSG strives to support innovative research that will lead to real life applications with associated economic and environmental benefits.

**4. *Inclusivity*** – CTSG strives to communicate and encourage participation from under-represented and under-served communities in CT in all functional areas.

## 5. CORE STRATEGIES

Sea Grant's unique integration of research with constituent engagement is at the heart of its mission. Sea Grant ensures that science-based information is accessible to all in an unbiased manner. The diverse capabilities of Sea Grant's personnel and partners enable the organization to be creative and responsive in generating policy-relevant research and disseminating scientific and technological discoveries to a wide range of audiences.

**1. CTSG brings passion** to our work through individual and collective commitment, enthusiasm, creativity, and determination ("can do" attitude).

**2. CTSG listens and learns** to better understand stakeholder needs and inform solutions.

**3. CTSG leverages resources to generate science-based information** and develop and facilitate innovative, relevant and responsive programs and resources.

**4. CTSG shares science-based knowledge, programs, and resources** through leadership, collaboration and facilitation.

**5. CTSG as a program commits to educating itself** on issues related to diversity, equity and inclusivity to inform ourselves, our practices and our programs.

## 6. CROSS-CUTTING PRINCIPLES

In addition to its core values and core strategies, CTSG has identified three cross-cutting principles that guide its efforts in achieving its strategic goals and objectives:

**1. *Partnerships and leveraging*** – CTSG staff undertake collaborative and mutually- beneficial partnerships with local, regional, national and international organizations and institutions, in both the public and private sector, and with the end users of our outputs. CTSG staff utilize and coordinate with networks of interested individuals and organizations whenever possible. CTSG staff strengthen the

capacity of its partners to engage in research, outreach and education. CTSG seeks to leverage capacity and resources with its partners to maximize the efficiency and outcomes of its activities.

**2. *Diversity & Inclusion*** – CTSG seeks and encourages diverse perspectives and strives to develop programs and products that are representative of and accessible to the people of Connecticut. CTSG will take steps to better understand and address the diversity of our program audiences and their needs, to the extent possible while actively seeking resources and opportunities.

**3. *Leadership*** – CTSG encourages its staff members to assume leadership roles that result in new knowledge, enhanced strategic thinking, networking and sharing of information at local, state, regional, national and international levels. Assuming leadership roles strengthens our program while enhancing our skills and credibility.

**4. *Responsiveness*** – CTSG recognizes that some situations can't be predicted. The COVID 19 pandemic is an example of an unanticipated crisis that affects a broad diversity of stakeholders in a manner that continues to evolve rapidly. To the extent possible given available resources and opportunities, CTSG commits to be responsive to emerging situations and needs.

## 7. FOCUS AREAS

This strategic plan will guide the program through 2021. During this period, CTSG will focus its effort on four thematic focus areas that respond to both local and national priorities (corresponding national focus areas are shown in parentheses). CTSG recognizes that some topics (e.g. water quality, socio-economic value, changing environmental conditions) extend across multiple focus areas, and are therefore considered cross-cutting.

**1. Coastal Ecosystems and Watersheds (**Healthy Coastal Ecosystems**)**

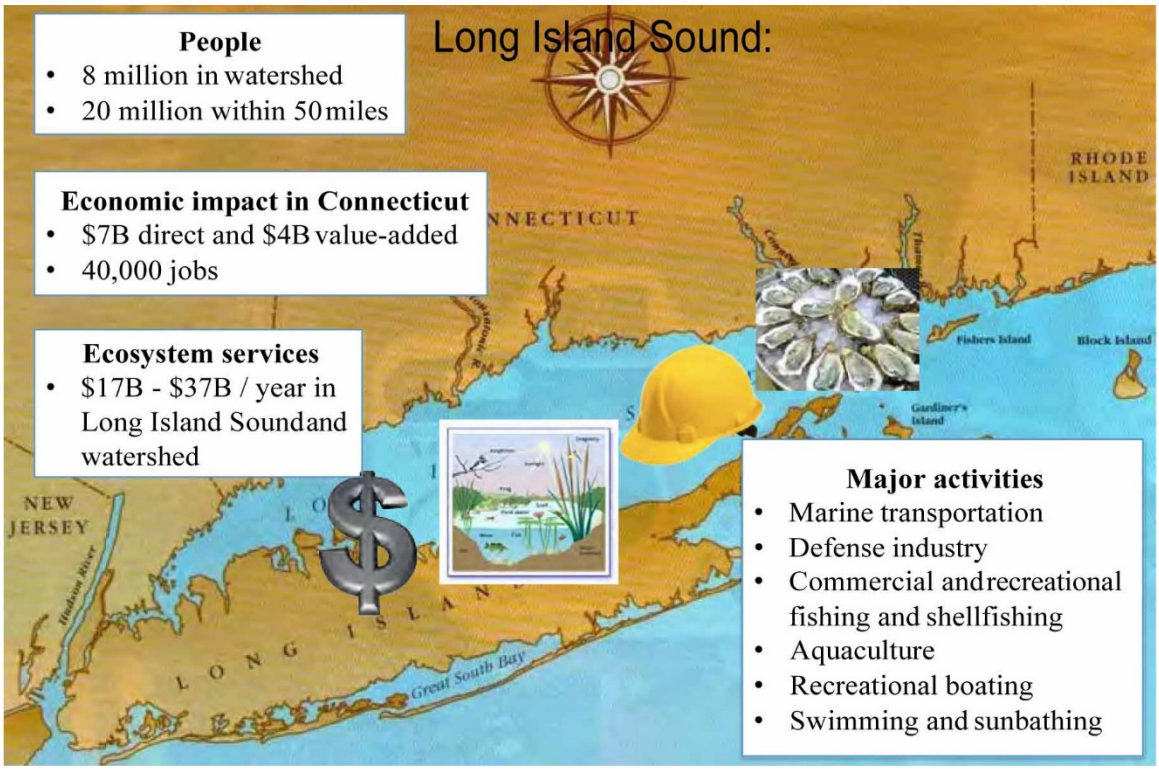
**2. Fisheries and Aquaculture** (Sustainable Fisheries and Aquaculture)

**3. Resilient Communities** (Resilient Communities and Economies)

**4. Environmental Literacy and Workforce Development** (same as national)

Sea Grant's work is accomplished through functional areas that include research, outreach (extension and communications) and education. These functional areas are integrated across the four focus areas. Each focus area has one or more goals, measurable objectives, a series of anticipated outcomes and related performance measures and metrics. The goals describe the desired long-term direction for each focus area. The outcomes are benchmarks that CTSG will use to track its progress toward achieving each goal. Progress towards reaching outcomes will be tracked through documenting accomplishments and impacts via the annual reporting process. The performance measures (or targets) are quantitative ways of measuring outcomes. In this plan, CTSG aligns with national performance measures and developed additional state-specific measures. For each metric and performance measure, discussions were held among staff to determine targets that were ambitious but realistic, with targets often rounded up. For performance measures carrying over from past plans, targets were also assessed against past performance, in view of changing program emphasis and priorities (see Appendix 2).

## Focus Area 1: Coastal Ecosystems and Watersheds




Long Island Sound is a nationally significant estuary located in the densely populated metropolitan New York City region. The Long Island Sound estuary provides exceptional economic and ecological benefits. Pressures from the region's large population have resulted in estuarine habitat loss and degradation. In the past century, more than one-third of the Sound's tidal wetlands have been lost. Eelgrass beds that once grew throughout the Sound are in a state of decline. Today's coastal forests and coastal grasslands comprise only a fraction of their original acreage around the Sound. The rapid loss of wetlands and other important habitats has slowed due to state and federal wetland protection legislation and coastal management plans, but pollution, invasion by non-native species, and climate change continue to impact Long Island Sound habitats. Unless these trends are altered by the preservation and appropriate management of significant habitats, the restoration and enhancement of degraded habitats, and the protection of species diversity, the Long Island Sound ecosystem, even as it currently exists, will not be sustained for future generations. The ability of the Sound to support its diverse uses is dependent on the quality of its waters and the health of its living resources and habitats, as well as broad- based planning efforts that factor in social, economic and environmental considerations.

CTSG has long partnered with federal and state entities as well as NGOs to identify and prioritize issues associated with Long Island Sound ecosystems. CTSG is part of the bi-state Long Island Sound Study (LISS), which recently updated its Comprehensive Conservation and Management Plan (CCMP). CTSG will continue to coordinate and collaborate with LISS to address goals and objectives of mutual interest in the CCMP and this strategic plan, including processes and practices that affect water quality, how a changing environment affects habitats and species conservation and management, how coastal communities can become more resilient (below), and how science can best inform management. CTSG participates on the steering committee that oversees the Long Island Sound Mapping

Initiative. CTSG participates in the overall oversight for the designation of a Connecticut National Estuarine Research Reserve (NERR). CTSG engaged in the site selection process, which was recently approved by NOAA, and is now active in the development of an Environmental Impact Assessment and a Management Plan. CTSG has a strong role in the implementation of the Connecticut Blue Plan legislation that mandates the development of a marine spatial plan for Long Island Sound by 2019. A plan was completed with significant stakeholder engagement and support, and delivered to the State Legislature for approval (which was delayed by the COVID 19 pandemic). The state of Connecticut has committed to renewable energy to become a significant portion of its energy portfolio, and to be a leader in avoiding and mitigating environmental impacts of wind energy development. In so doing, CTSG director was appointed to a Commission on Environmental Standards to advise the state and engage with developers. It is expected that wind energy will continue to develop across the Northeast, and that Sea Grant may play a significant role in issues ranging from applied research to stakeholder engagement and public education. Because of its trusted role as an impartial broker of objective information, CTSG will continue to work with partners to address existing and emerging issues that contribute to improved understanding, protection, and restoration of Long Island Sound ecosystems. CTSG will accomplish this through its proven integrated research-outreach-education approach for benefits that extend to its strategic partnerships.

## Goal 1: Balanced use, conservation and management of habitats, species and ecosystems

## Objectives:

1.1.Identify, generate and communicate information about changing coastal and marine ecosystems and effects on the services they provide.

1.2.Identify, generate and communicate information on coastal and marine habitat and species conservation, management and restoration.

1.3.Identify, generate and communicate information on low impact development, storm water management and watershed management measures that minimize impact on Long Island Sound.

1.4.Identify, generate and communicate information on water quality impacts to Long Island Sound and relevant mitigation measures.

1.5.Assess needs and develop tools and trainings that can enhance decision making and policy development, in coordination with individuals, communities, managers and stewards.

## Outcomes:

1.1. Ecosystem services and their values are better understood and quantified.

1.2. Decision-making processes are improved.

1.3. Habitats and species are conserved, managed or restored.

1.4. Water quality is maintained or improved.

1.5. Storm water is managed to minimize ecosystem impacts; runoff is reduced.

1.6. Public awareness and practices are modified, contributing to a cleaner Long Island Sound, as a result of Sea Grant research, outreach and education.

## Performance measures:

**NPM1:** Number of resource managers who use ecosystem-based approaches in the management of land, water, and living resources as a result of Sea Grant activities. Target: **75**

**NPM2:** Number of acres of coastal habitat protected, enhanced or restored as a result of Sea Grant activities.

Target: **1875*** *CTSG partners with entities that have restoration as a primary focus.*

*However, CTSG neither has the authority nor does it take responsibility for leading restoration projects. CTSG will only track acres restored when it participates in a meaningful manner in restoration projects, therefore the relatively modest target.*

**NPM4:** Number of communities that adopt/implement sustainable economic and environmental development practices and policies as a result of Sea Grant activities.

Target (for Goal 1): **20*** *NPM4 applies to Goals 1 and 3. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.*

**Cross-cutting NPM9:** Number of Sea Grant tools, technologies and information services that are used by our partners/customers to improve ecosystem-based management.

Target: **28**

**CTPM1:** Number of policies/management tools that are developed/adapted/used, so that habitats and species are better managed, restored and conserved as a result of Sea Grant activities.

Target: **45**

**CTPM2:** Number of trainings/workshops/programs held for [coastal and watershed stakeholders].

Target (for Goal 1): **80*** *CTPM2 applies to Goals 1, 2, 3 and 4. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.*

**CTPM3:** Number of [coastal and watershed stakeholders] trained.

Target (for Goal 1): **3,000*** *CTPM3 applies to Goals 1, 2, 3 and 4. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.*

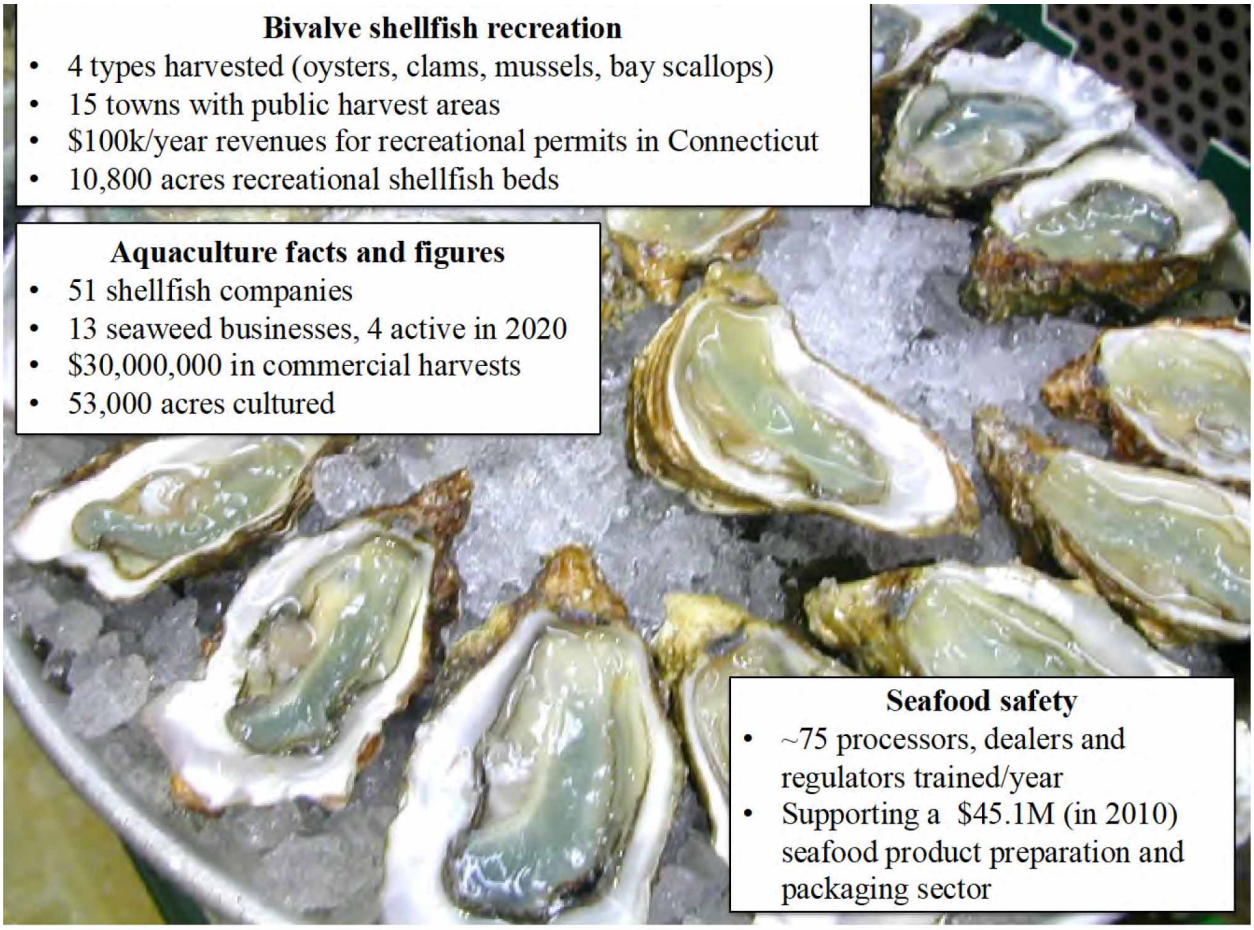
**CTPM4:** Number of cumulative gallons of stormwater diverted from direct discharge to surface waters within Connecticut or the Long Island Sound watershed as a result of CTSG and partner activities.

Target: **7,300,000**

**CTPM6:** Number of species that are managed/restored/conserved as a result of Sea Grant activities.

Target: **12**

## Focus Area 2: Fisheries and Aquaculture




The landscape of commercial fisheries and aquaculture sectors have changed dramatically over the past few years, due to a changing climate that has shifted species abundance and distribution, to gear-based aquaculture systems that have become more prevalent and visible along our coastlines, to the COVID 19 pandemic and its cascading effects on the seafood marketing and distribution system.

CTSG has reflected on these changes, and while we remain committed to our original objectives, we also have broadened our plan to involve greater engagement with leaders and residents of coastal communities in which fisheries and aquaculture currently exist and/or are proposed. While we recognize the value in investigating new aquaculture species and systems, we remain committed to supporting the traditional (shellfish) methods practiced and to facilitating plans to ensure the future viability of the extensive natural beds that support this sector.

Commercial fisheries, both within Long Island Sound and offshore, continue to face evolving interstate management strategies driven by new stock assessments and changing environmental conditions. In 2019, offshore fleets primarily targeted sea scallops, butterfish, silver hake, summer flounder, squid, monkfish, dogfish, skates and scup. In Long Island Sound, commercial fishermen have reinvented themselves landing smaller catches of multiple species such as black sea bass, bluefish, conch and horseshoe crab. The American lobster fishery was once a high value, high visibility endeavor in Long

Island Sound until a devastating mass mortality and population crash in the late 1990's. Failure of the stocks to recover to previous high levels has left the industry a small fraction of what it used to be. Commercial lobstermen have in large part shifted to other fisheries, transitioned to aquaculture or re-trained for other occupations altogether. CTSG developed and delivered several of these re-training programs through the Trade Adjustment Assistance for Lobsters Program. Concerns about the effects of a changing climate on the Northeast lobster resource led to the National Sea Grant American Lobster Research Initiative in 2019, along with a regionally coordinated lobster extension program. The involvement of the Northeast Sea Grant extension programs provides local contacts who bring industry and regulatory concerns to the collective effort and share research progress and results. CTSG also partners biennially with the US Coast Guard and Fishing Partnership Support Services to provide commercial fishermen with hands-on opportunities to learn or refresh safety at sea and drill conductor skills.

Recreational fishing continues to be a popular pastime in Long Island Sound. State-managed marine finfishing opportunities exist coastwide with nearly 400,000 anglers participating in this activity annually. In addition, fifteen coastal towns manage recreational shellfisheries and sell roughly 100,000 permits each year to both residents and non-residents. CTSG works with town and state government to provide information and fund research to support fisheries management decisions.

The different shellfish sectors (commercial aquaculture, recreational shellfish harvesting and habitat restoration) are facing significant challenges and opportunities, as identified through the ongoing Connecticut Shellfish Initiative. The goals of the initiative are to protect and grow (as appropriate) the state's shellfish sectors, and increase public awareness about their cultural, ecological, and economic importance. Because CTSG is science-based, and does not serve in advocacy, regulatory or enforcement roles, and with its long-term investment in meaningful extension efforts, the program has gained the respect and confidence of the different sectors, and plays a leadership role in engaging different groups in broad discussions that include controversial topics. Through an open participatory process, the initiative brought together the different sectors and facilitated conversations that coalesced into 35 recommendations, for which we are entering the implementation stage. CTSG anticipates significant impacts by continuing to focus its efforts on shellfish priorities. A recent $1.1M+ award led by CTSG to advance southern New England shellfish aquaculture through an engaged public and next generation decision support tools will represent a significant step towards implementation. Connecticut's industry is diverse and growing, but its future success lies not only with the prospective farmer and environmental managers, but in careful planning that involves coastal community leaders and residents.

A seaweed aquaculture industry is emerging with the support of CTSG innovative and entrepreneurial research and extension efforts. These efforts have led to the establishment of new businesses, a mechanism for information exchange about products and markets, including the potential for environmental benefits through bioremediation. Seaweed aquaculture is seasonal in nature; shellfish companies that are attempting to diversify products comprise a number of these seaweed companies. CTSG will continue to help facilitate the transition from research to commercial applications and encourage new crops and revenue streams for this emerging nationwide industry. A recent $1M+ award led by CTSG to create a national hub to provide science-based information and decision-making tools

for a domestic seaweed industry represents a critical step in that direction. The first national seaweed symposium (2020) kick started the effort, which included researchers, extension professional and industry members from across the country. This is a stakeholder-driven effort identifying common challenges and needs from diverse perspectives, across the country. Strategies and work plans for addressing these challenges and needs will be developed by the stakeholders with the assistance of Sea Grant Extension programs across the country.

With views informed from experience at the local to national scales, CTSG will continue to provide information, tools and assistance to contribute to the social responsibility, and economic viability and resilience of the seafood industry, and be responsive to changing needs. For example, CTSG will continue to address the needs for alternative markets and diversified sources of income. For example, CTSG promptly surveyed the aquaculture industry to document the extent of the outcome of the pandemic and rapidly responded with opportunities to maintain some cash flow to the industry during the COVID 19 pandemic, resulting in retained jobs and companies.

Demands for federally mandated seafood safety HACCP training remains high in Connecticut and southern New England. A 20-year collaboration with RI Sea Grant ensures multiple training opportunities are available each year for seafood processors, dealers and Connecticut shellfish farmers, all of whom are licensed as seafood dealers. In response to the COVID 19 pandemic, in-person trainings were modified and offered successfully using virtual platforms, enabling the Connecticut and regional seafood industry members to obtain the required training in order to remain in business or establish new businesses without delay. Working with state regulators, Connecticut also developed the first guidance for the safe handling of seaweed products for human consumption. This has in turn prompted a national conversation among state and federal regulators on formalizing safety protocols for seaweed.

## Goal 2: Fisheries, aquaculture, and marine resources provide food and jobs, and sustain economic, ecological and cultural values.

### Objectives:

2.1.Identify, generate and communicate information on management and changing environmental conditions related to fisheries, marine aquaculture or marine resources.
2.2.Identify, generate and communicate information on public health and socio- economics related to fisheries, marine aquaculture or marine resources.

2.3.Coordinate with individuals and communities to assess needs and support the development and application of tools, products, trainings and policies that will be used in support of fisheries, aquaculture or marine resources.

2.4.Identify, generate and communicate information on the historical and cultural importance of fisheries, aquaculture or marine resources.

### Outcomes:

2.1.Better understanding of economic, historical and cultural value/impacts of fisheries, aquaculture and marine resources.

2.2. Increased public engagement and awareness of these maritime sectors.

2.3. Enhanced opportunities for recreational fisheries (particularly shellfish).

2.4. Enhanced opportunities for commercial fisheries and aquaculture enterprises.

2.5. Preserved and increased access to the shoreline and infrastructure.

2.6. Protection and responsible growth of fisheries, aquaculture, and marine resources.

2.7. Safe seafood supply and associated public health benefits.

## Performance measures:

**NPM3:** Number of fishermen, seafood processing and aquaculture personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities.

Target: **215**

**NPM10:** Economic and societal impacts derived from Sea Grant activities (market and non-market; jobs and businesses created or sustained)

**Number of businesses created**

Target: **0*** *CTSG will assist in the creation of businesses, and record and report relevant data, however it does not have control over whether a business is created or not; therefore the plan includes a goal of 0.*

**Number of businesses sustained**

Target: **120**

**Number of jobs created**

Target: **0*** *CTSG will assist in the creation of jobs, and record and report relevant data, however it does not have control over whether a job is created or not; therefore the plan includes a goal of 0.*

**Number of jobs sustained**

Target: **200**

**Cross-cutting NPM12:** Number of individuals certified or recertified in Hazard Analysis Critical Control Point (HACCP) as a result of Sea Grant activities.

Target: **275**

**CTPM2:** Number of trainings/workshops/programs held for [seafood industry members, regulators, and members of the public].

Target (for Goal 2): **50*** *CTPM2 applies to Goals 1, 2, 3 and 4. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.*

**CTPM3:** Number of [fisheries and aquaculture industry members and regulators] trained.

Target (for Goal 2): **750*** *CTPM3 applies to Goals 1, 2, 3 and 4. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.*

**CTPM7:** Number of new or upgraded shellfish acreage (compared to 2017 baseline). Target: **23,120**

**Note:** Number of acres of protected, enhanced or restored natural shellfish beds (compared to 2020 baseline) will be captured under NPM2.

**CTPM8:** Number of new commercial leases, applications and permits as a result of CTSG and partner activities (compared to 2017 baseline).

Target: **41**

**CTPM9:** Number of new tools, technologies or approaches developed to enable fishing and aquaculture industries to supply safe and sustainable seafood as a result of CTSG and partner activities.

Target: **21**

**CTPM10:** Number of new tools, technologies, approaches or programming developed to inform audiences about Connecticut fisheries, aquaculture, marine resources and maritime heritage as a result of CTSG and partner activities.

Target: **60**

## Focus Area 3: Resilient Communities


The resilience of Connecticut's coastal communities and maritime economies may be impacted by climate change, severe weather events, and other hazards. Hurricanes, nor'easters, high tide events, and heavy precipitation can adversely affect Connecticut's coastal and inland communities. With a coastal geology ranging from sands to metamorphic rock, the shoreline is in a constant state of flux due to erosion and accretion. Climate change adds another dimension to existing coastal hazards with predictions of more intense coastal storms and precipitation events, as well as rising sea levels.

Climate change is causing: increased storm intensity, sea level rise, increases in coastal flooding due to storm surge, and increased coastal erosion. Increased flooding not only causes property damage, but also blocks low-lying roads, underpasses and evacuation routes. An increase in extreme precipitation events within the Long Island Sound watershed is already occurring and has caused more frequent local and regional flooding. Connecticut's communities are partnering with local, state and federal agencies, academic institutions, and other entities to identify and implement measures that will foster their resilience to coastal hazards and climate change impacts.

CTSG has a long history of meaningful and responsive relationships with communities through its extension staff. While numerous entities and programs focus on community resilience, CTSG will continue to work directly with communities on the coast and in the Long Island Sound watershed to assess their needs, enhance their awareness and preparedness. This includes activities such as the ongoing Climate Adaptation Academy, a forum for exchange of information between researchers, outreach professionals and practitioners on topics relevant to climate resiliency strategies, and Climate Corps, a new undergraduate classroom and service learning opportunity to assist Connecticut communities in adapting to climate change. CTSG will also continue to implement the results of the recent social science research initiative on risk communication and decision making.

## Goal 3: Coastal and watershed communities are more resilient to a changing climate and environment.

### Objectives:

3.1.Identify, generate and communicate information on resilience in the face of changing climate, environmental and/or socio-economic conditions.

3.2.Support the development of information, tools and trainings that address the needs of communities/stakeholders for use in adapting to changing climatic, environmental and/or socio-economic conditions.

### Outcomes:

3.1.Communities are aware of changing climatic, environmental and/or socio- economic conditions and their implications.

3.2.Communities have the knowledge and tools to prepare for and adapt to changing climatic, environmental and socio-economic conditions.

3.3.Communities are able to consider tradeoffs among ecosystem services, land use change, and measures to increase resilience to a changing climate, environmental and/or socio-economic conditions.

3.4.Communities have the knowledge and tools to prepare for and adapt to the effects of changing water quality and quantity.

## Performance measures: (see below after Goal 4 – covers both goals)

## *Goal 4: Coastal and watershed communities are prepared for and respond to hazards.*

### Objectives:

4.1.Identify, generate and communicate information on, and whenever possible respond to coastal and watershed hazards of natural or human origin.

4.2.Support the development of tools and trainings addressing the needs and resilience of communities as they prepare for and respond to coastal hazards.

### Outcomes:

4.1. Stakeholders are aware of and understand hazards and their implications.

4.2.Communities have the knowledge and tools to prepare for, mitigate and manage the consequences of hazards.

### Performance measures:

**NPM4:** Number of communities that adopt/implement sustainable economic and environmental development practices and policies as a result of Sea Grant activities.

Target (for Goal 3): **4*** *NPM4 applies to Goals 1 and 3. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.* (Goal 3)

**NPM5:** Number of communities that adopt/implement hazard resiliency practices to prepare for and respond to minimize coastal hazardous events as a result of Sea Grant activities.

Target: **18** (Goal 4)

**CTPM2:** Number of trainings/workshops/programs held for [communities].

Target (for Goals 3 and 4): **42*** *CTPM2 applies to Goals 1, 2, 3 and 4. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.* (Goals 3&4)

**CTPM3:** Number of [coastal and watershed stakeholders] trained [to enhance their resilience to hazards/climate change, in order to prepare for, respond to, and if possible, minimize impacts of hazardous coastal events as a result of CTSG and partner activities].

Target (for Goals 3 and 4): **1750*** *CTPM3 applies to Goals 1, 2, 3 and 4. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.* (Goals 3&4)

**CTPM11:** Number of communities trained. Target: **225** (Goals 3&4)

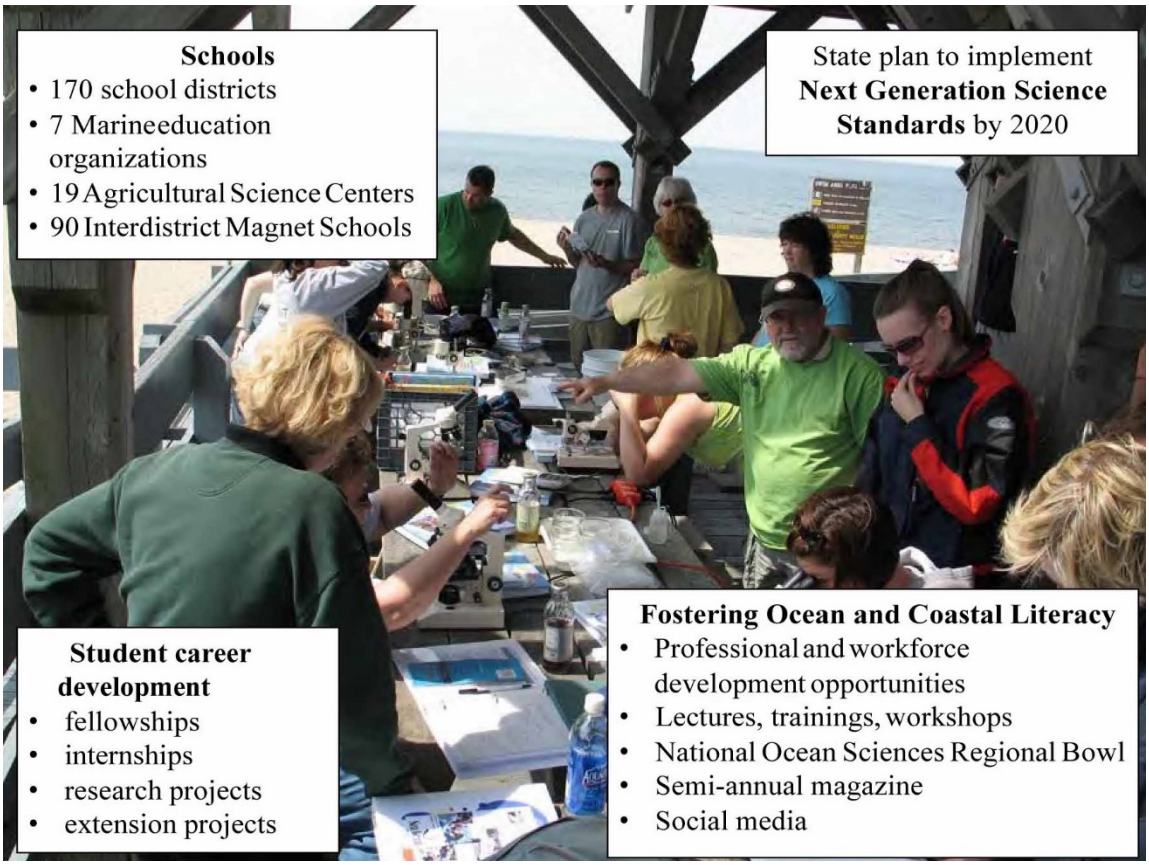
**CTPM12:** Number of people who access resources and/or use the tools enhance their resilience to hazards/climate change, in order to prepare for, respond to, and if possible, minimize impacts of hazardous coastal events as a result of CTSG and partner activities.

Target: **700**

**CTPM13:** Number of people (including graduate and undergraduate students, interns, fellows and volunteers) who participate in career specific activities targeted to develop new or enhanced career relevant skills [related to resilience] as a result of CTSG and partner activities.

Target (for Goals 3 and 4): **95*** *CTPM13 applies to Goals 1, 2, 3, 4 and 6. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.* (Goals 3&4)

## Focus Area 4: Environmental Literacy and Workforce Development




The education of future environmental professionals and leaders is critical to the responsible use and management of our nation's ocean and coastal resources. Science and engineering majors, future marine scientists and education professionals need opportunities to learn science in real world settings and apply their skills at work under the mentorship of practicing scientists.

Existing environmental and maritime-related professionals need opportunities to master new skills or meet changing requirements to stay competitive in an ever-evolving workplace.

Producing and sustaining an environmentally and scientifically literate society as well as a group of technical, policy and managerial professionals, and a network of active volunteers to serve on boards and commissions, is essential. Further, an environmentally and scientifically literate society can help provide a stream of interested citizen scientists.

Successful and comprehensive environmental literacy and workforce development programs must address issues relevant to an array of constituents, while ensuring linkages to the Ocean Literacy Campaign, a grassroots, consensus-driven effort to identify what every person should know about ocean science.

CTSG has been recognized for its leadership in environmental literacy at the local to international scale, while remaining relevant to local and regional workforce development needs. While other entities

contribute to environmental and ocean literacy by attracting audiences to their sites (aquariums, marine education non-profits) or delivering classroom programs, CTSG will continue to partner with educators, formal and informal educational organizations and institutions of higher education to develop and share resources, approaches and opportunities. Education activities and workforce development efforts are not limited to "Environmental Literacy and Workforce Development", but rather are interwoven into all the focus areas to be as innovative and responsive as possible in view of needs and opportunities. It remains important for CTSG to be flexible and adaptive in not only the content of its programs, but also the delivery. For example, the COVID 19 pandemic has severely restricted in-person gatherings, and forced a sudden shift to different modes of delivery of information.

## Goal 5: An environmentally literate public that values and respects the coastal environment and maritime heritage.

### Objectives:

5.1.Identify, generate and communicate information on historical, current and emerging coastal topics and issues.

5.2.Create opportunities and/or share information about coastal heritage, educational and stewardship activities.

5.3.Facilitate relevant Science, Technology, Engineering, Arts and Mathematics (STEAM) educational opportunities.

5.4.Develop and enhance the teaching and learning of ocean and coastal science content through educational research, assessment and evaluation strategies.

### Outcomes:

5.1. People are aware of, contribute to and use Sea Grant activities and products.

5.2. People learn through formal and informal science and environmental education opportunities.

5.3. Educators and scientists apply tools and techniques to enhance their ability to teach about Long Island Sound, ocean and coastal science.

5.4. People are motivated to undertake stewardship activities.

### Performance measures:

**NPM6:** Number of Sea Grant products that are used to advance environmental literacy and workforce development.

Target: **45**

**NPM7:** Number of people engaged in Sea Grant-supported informal education programs.

Target: **13,000**

**Cross-cutting NPM13:** Number of peer-reviewed publications produced by Sea Grant.

Target: **25**

**Cross-cutting NPM16:** Number of postsecondary students financially-supported by Sea Grant in higher education programs (undergraduate, graduate).

Target: **100**

19

**Cross-cutting NPM17:** Number of postsecondary degrees financially-supported by Sea Grant in higher education programs (undergraduate, graduate).

Target: **23**

**Cross-cutting NPM18.** Number of P-12 students reached through Sea Grant-trained educators or directly through Sea Grant education programs.

Target: **12,500**

**Cross-cutting NPM19:** Number of P-12 educators who participated in Sea Grant education programs.

Target: **350**

**Cross-cutting NPM20:** Number of volunteer hours. Target: **8,000**

**Cross-cutting NPM21:** Number of Sea Grant sponsored/organized events. Target: **300**

**Cross-cutting NMP22:** Number of attendees at Sea-Grant sponsored/organized events.

Target: **14,000**

**Cross-cutting NPM23:** Number of public or professional presentations. Target: **600**

**Cross-cutting NPM24:** Number of attendees at public or professional presentations. Target: **19,000**

**CTPM14:** Number of people that undertake stewardship activities as a result of CTSG and partner activities.

Target: **500**

**CTPM15:** Number of scientists who share their research with non-peer audiences as a result of CTSG and partner activities and resources.

Target: **55**

## Goal 6: A skilled and knowledgeable marine and maritime workforce.

## Objectives:

6.1.Support undergraduate and graduate student career development through research, education and outreach projects, fellowships and internships.

6.2. Share career and other professional opportunities through a variety of means.

6.3. Provide and facilitate skill building and training opportunities.

6.4. Serve as mentors.

## Outcomes:

6.1.A diverse workforce seeks marine, maritime, environmental and related career opportunities.

6.2.The current and future needs of marine, maritime, environmental and related occupations are met by a workforce with relevant education, training, and acquired skills.

## Performance measures:

**NPM8:** Number of Sea Grant-supported graduates who become employed in a job related to their degree within two years of graduation.

Target: **24**

**CTPM13:** Number of people (including graduate and undergraduate students, interns, fellows and volunteers) who participate in career specific activities targeted to develop new or enhanced skills as a result of CTSG and partner activities.

Target: **210*** *CTPM13 applies to Goals 1, 2, 3, 4 and 6. Targets have been set separately, but the total numbers will be reported as the sum for all these goals.*