Sustainable Career Pathways: Aquaculture
Education & Training

Massachusetts Regional Aquaculture Demonstrations Centers

- **The New England Aquarium** (NEA) is a global leader in ocean exploration and marine conservation. With more than 1.3 million visitors a year, the Aquarium is one of the premier visitor attractions in Boston and a major public education resource for the region. The New England Aquarium is a catalyst for global change through public engagement, commitment to marine animal conservation, leadership in education, innovative scientific research, and effective advocacy for vital and vibrant oceans. http://www.neaq.org/

- **The NOAA Office of Aquaculture** seeks to foster marine aquaculture through policy, science, technology transfer, outreach, and international collaboration. https://www.fisheries.noaa.gov/about/office-aquaculture

- **Salem State University's The Northeastern Massachusetts Aquaculture Center** (NEMAC) at the Cat Cove Marine: Laboratory supports aquaculture and marine biology programs. https://www.salemstate.edu/catcove

- **The University of Massachusetts Amherst's The Western Center for Sustainable Aquaculture** (WEMAC) works with freshwater aquaculture efforts.
  https://eco.umass.edu/people/faculty/danylchuk-andy-j/

- **The Southeastern Regional Planning and Economic Development District (**SRPEDD) plans for the future of southeastern Massachusetts, including the expansion of economic opportunity, the protection of natural and historic resources and the development of excellent physical and cultural amenities. They conduct research, providing technical assistance, prepare bylaws and ordinances. Two areas of focus that have implications for the future of the South Coast aquaculture industry are:
  Economic Development and Environment. http://www.srpedd.org/what-we-do
  SRPEDD works with several other institutions and partners in the South Coast region and a comprehensive list can be found here: http://www.srpedd.org/partners

- **The Southeastern Massachusetts Aquaculture Center** (SEMAC) is an agency of Barnstable County, but the Center supports aquaculture interests in all southeastern Massachusetts, including Barnstable, Bristol, Dukes, Nantucket, and Plymouth Counties. Funding is received from the Massachusetts Department of Agricultural Resources, and the budget is administered through the offices of Cape Cod Cooperative Extension. Priorities are determined by a thirteen member Board which meets twice a year. The SEMAC staff conduct research and monitoring, organize outreach and education events, administer grants, and serve as an unbiased source of information for shellfish and finfish growers in the region. http://www.capecodextension.org/marine/semac/aboutus

- **The Westport Fishermen's Association** goals are to preserve, protect and improve the water quality and marine habitat of the Westport River, marshes, tributaries and all surrounding water. http://westportriver.org/

- The **New Bedford Port Authority**, in partnership with the City of New Bedford is currently developing the regulations and processes to make it easy for commercial aquaculture to take root in the city. There are currently 8,400 acres of open water available for commercial shell-fishing within New Bedford's jurisdiction.

In 2018, they received a grant from the Atlantic States Marine Fisheries Commission to develop aquaculture off New Bedford. As a partner on this project, the Community Boating Center will be seeding oysters in Clark's Cove in early 2019 and has begun developing job training curriculum for 7th graders. They are also putting together a job training program for adults interested in learning how to grow oysters, in partnership with Seth Garfield of Cuttyhunk Shellfish Farms and Dale Leavitt, Associate Professor of Biology at Roger Williams University. https://portofnewbedford.org/aquaculture/

- **Massachusetts South Coast: A Sector Analysis**

Report prepared for the Garfield Foundation and Santander Bank and the Communities of New Bedford, Dartmouth, Fairhaven, Marion, Mattapoisett, Wareham & Westport.
https://www.ceimaine.org/wp-content/uploads/2018/04/MA-South-Coast-Aquaculture-Analysis.2018.pdf

The towns along the South Coast of Massachusetts have a history of fishing that is core to their culture, and perhaps it is no surprise the greatest port in the country, New Bedford, resides in its geographic center, and its booming commercial fisheries provide a staple to the region's economy. Equally noteworthy is the region's love of recreational shell fishing – a tradition of centuries – with literally thousands of permits issued every year throughout the towns of the South Coast. Aquaculture has been identified as the fastest-growing food sector in the world, as well as the fastest growth industry within U.S. agriculture. The East Coast shellfish industry has reportedly doubled in the past five years alone. The aquaculture of shellfish in Massachusetts – especially that of the oyster represents a viable, and growing industry that compliments that of the wild harvest fisheries. Division of Marine Fisheries (DMF) data collected from 2005 to 2014 indicate a massive 526 percent growth in aquaculture for Mass. In the mid 80's there were only about 30-40 people conducting aquaculture in Massachusetts, there are now about 360 permitted growers in the Commonwealth. There are about 1,250 acres in production and the entire farm gate value – or net value of product once it leaves the farm – was a substantial $23 million in 2016.

Education and Training: Massachusetts

- **Massachusetts Maritime Academy** offers a Shellfish Constable Training Program at the Maritime Academy campus. This is an 80-hour training program (over a two-week period) that includes the basics of shellfish biology, environmental parameters and shellfish management as well as various topics in law enforcement, CPR training and will include an exam and certificate of completion for successful enrollees. The fee for the course is $495.00 per person. https://www.maritime.edu/maritime-training-courses

- **The East Coast Shellfish Growers Association** (ECSGA) represents over 1,000 shellfish farmers along the eastern seaboard from Maine to Florida. The ECSGA maintains a website and list serve with valuable information for growers and others in the industry. https://ecsga.org/

- **The University of Massachusetts Dartmouth's School for Marine Science and Technology** (SMAST) conducts world class education, research and policy development related to fisheries, coastal preservation, ocean modeling, underwater robotics, climate change and related fields. SMAST offers Ph.D. and Master's programs in marine science. SMAST is the lead campus for the UMass Intercampus Marine Science graduate program. In late 2017, UMass Dartmouth officially opened a new $55 million, 64,000 square foot marine science facility known as the School for Marine Science & Technology East (SMAST East). This new facility located on Clark's Cove has tripled the University's marine science presence in New Bedford. https://www.umassd.edu/smast/

- **Quincy College's Aquaculture Certificate Program** consisting of 22 semester hours of introductory courses in shellfish aquaculture and business management. Classes include a combination of hands-on practical experience, applied science and business courses. Students learn hands-on skills throughout the aquaculture practicum series such as water quality testing, system construction and maintenance, treatment, feeding, and breeding technology. The focus of the program is on salt-water shellfish species. Graduates of the certificate program may find employment on private farms, commercial hatcheries or begin their own aquaculture production. https://quincycollege.edu/program/aquaculture/

- **University of Massachusetts, Boston** offers an online aquaculture course, "Introduction to Sustainable Marine Aquaculture". The course is open to anyone with a high school diploma interested in a career in the aquaculture industry. UMass Boston students can take the course for credit; for people outside UMass Boston there are for-credit and non-credit options. Two other online aquaculture courses, "Aquaculture Production" and "The Business of Marine Aquaculture", will be offered at a later date. https://www.umb.edu/academics/environment/professional_development/aquaculture

- **Salem State University** offers an undergraduate BS degree program with an Aquaculture Concentration option. The aquaculture concentration focuses on the controlled cultivation and harvest of aquatic plants and animals. Students will gain practical skills in the husbandry of aquatic organisms through applying knowledge gained from courses in biology, chemistry, business, and other disciplines. Skills learned will provide graduates a hands-on appreciation of the aquatic environment and aquaculture systems. Graduates will have the skills needed to set-up and operate their own facility, to work at a private or public hatchery and to pursue employment in a parallel field such as resource management, fisheries biology, marine, or environmental science. https://www.salemstate.edu/academics/colleges-and-schools/college-arts-and-sciences/biology

- **The Community Boating Center, Inc. in New Bedford** is in the initial stages of planning an effort with the Greater New Bedford Workforce Investment board to target youth that are out of school with apprentice opportunities for boatbuilding, offshore wind, marine trade and aquaculture. Curriculum will be developed with existing growers to create opportunities primarily for people who live and work in the New Bedford area. The Center is also working with the New Bedford Port Authority to help develop a workforce training component for the New Bedford Aquaculture Initiative. www.communityboating.org

- **Woods Hole Sea Grant** and the **Cape Cod Cooperative Extension Marine Program** offer a course titled "The Fundamentals of Shellfish Farming". The course is taught by Marine Program staff and guest speakers who make their living growing shellfish. The fee for the 8-week course is $150.00. The Extension often posts other Aquaculture Workshops, Technical Advice and Outreach. https://www.capecodextension.org/

- **Tabor Academy Oyster Farm. Tabor Academy, Marion MA** has started a program for students called "Oyster Farm". This is a collaborative project with the Town of Marion which started in 2013. Students support the existing shellfish propagation program in Marion by raising oysters to seed shellfish beds and oysters' natural ability to clean the water. https://www.taboracademy.org/page/school-by-the-sea/oyster-farm

Education and Training: Rhode Island

- **Roger Williams University's Center for Economic and Environmental Development** offers a 14-week non-credit course during the winter/spring semester titled "Applied Shellfish Farming" It's intended to teach both aspiring shellfish farmers and aquaculture professionals how to commercially grow oysters, quahogs, scallops and mussels. The course is led by Dale Leavitt, Aquaculture Extension Specialist and Professor of Marine Biology at Roger Williams University. The fee for the course is $75 per student. Since 2017, this course has been offered in an on-line webinar type broadcast and is now offering training to national and international attendees. https://www.rwu.edu/news/news-archive/roger-williams-university-course-will-equip-shellfishfarmers

Roger Williams University offers a major and a minor in Aquaculture and Aquarium Science which is offered in partnership with the New England Aquarium in Boston.
https://www.rwu.edu/undergraduate/academics/programs/aquaculture-and-aquarium-science

Roger Williams University offers Rhode Island coastal homeowners a Dockside Aquaculture Program in an effort to allow local residents with the knowledge, tools and official license to safely farm oysters on their waterfront property for the personal consumption of the license holder. The $1,500 fee for the course includes registration, guidance through the application process, submission of the application, gear required to grow the oysters, and 2,000 seed oysters. Although this course is no 44 longer being offered (due to time constraints for the managers of the course), this is an interesting model worth considering, although not allowed in Massachusetts.
https://www.rwu.edu/academics/schools-and-colleges/fssns/ceed/dockside-aquaculture

- **University of Rhode Island**

  Aquaculture and Fisheries Science B.S.

  The Aquaculture and Fisheries Science program at URI is one of the oldest aquaculture programs in the northeastern United States. The program is designed to prepare you for academic, professional, or technical careers focused on the use and conservation of aquatic animals by humans.
  https://www.uri.edu/programs/program/aquaculture-and-fisheries-science-b-s/

  Graduate Certificate in Aquaculture and Fisheries

  The URI Graduate Certificate in Aquaculture and Fisheries provides students with degrees in biological or environmental fields focused advanced training needed to find professional employment in the areas of Aquaculture and Fisheries. The program also allows students to complete the requirements of the American Fisheries Society (AFS) Professional Certification Program at the Associate Fisheries Professional (AFP) level. On completion of the Aquaculture and Fisheries graduate certificate, students will have the knowledge and skills to: (1) apply knowledge in a variety of disciplines and practical skills to address real-world problems in food security, as it relates to seafood; and (2) find employment in agencies and businesses involved in research, scholarly, and problem-solving endeavors in the field of Aquaculture and Fisheries.
  Students completing the Aquaculture and Fisheries Graduate Certificate program will practice advanced skills in class projects and specialty courses that take advantage of resources in marine sciences at the University of Rhode Island, including the Fisheries Center, freshwater aquaculture facilities, the Commercial Fisheries Center (a partnership with non-profit commercial fisheries associations), the Blount Aquaculture Research Laboratory, the Tuna Aquaculture Research Facility, and several research and teaching vessels. A broad set of existing class options can accommodate students from programs within or beyond the University of Rhode Island pursuing to complement their major in marine or aquatic sciences, environmental sciences, or marine affairs, with additional targeted skills and knowledge in aquaculture and fisheries.
  https://web.uri.edu/favs/academics/graduate-certificate-in-aquaculture-and-fisheries/

  Sustainable Seafood Production / Aquaculture Extension

  Providing the most current science-based information in sustainable and profitable aquacultural crop production practices to growers through site visits, periodic publications, workshops and more.
  https://web.uri.edu/coopext/programs/food-systems/aquaculture/

Stone Soup Leadership Institute

www.stonesoupleadership.org