What is the Sea Grant Hard Clam Selective Breeding Collaborative?

The Sea Grant Hard Clam Selective Breeding Collaborative was established under an award from the National Sea Grant Advanced Aquaculture Collaborative Programs (Hubs), to address the need to provide shellfish growers with resilient seed. This effort is developing cutting-edge genome technology to select hard clam strains (*Mercenaria mercenaria*) from existing populations that are resistant to specific environmental and biological stressors. In the first phase of the project, the research team identified strains with strong resistance to a pathogen called QPX and heat stress, which can be problematic in the Northeast and Southeast, respectively.

This research effort will address known bottlenecks within the hard clam aquaculture industry.

Credit: Joshua Reitsma

Additional information can be found at
www.hardclamhub.org
or email: hardclamhub@gmail.com

Members

Sea Grant
NOAA
Stony Brook University School of Marine and Atmospheric Sciences
MASL Marine Animal Disease Laboratory
Cornell Cooperative Extension Suffolk County
Rutgers New Jersey Agricultural Experiment Station
Rutgers The State University of New Jersey
UF IFAS University of Florida
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Molluscan Shellfish Aquaculture & Restoration Laboratory
CNRS • Sorbonne Université Station Biologique de Roscoff
Gulf Shellfish Institute Research for Sustainable Aquaculture & Healthy Ecosystems

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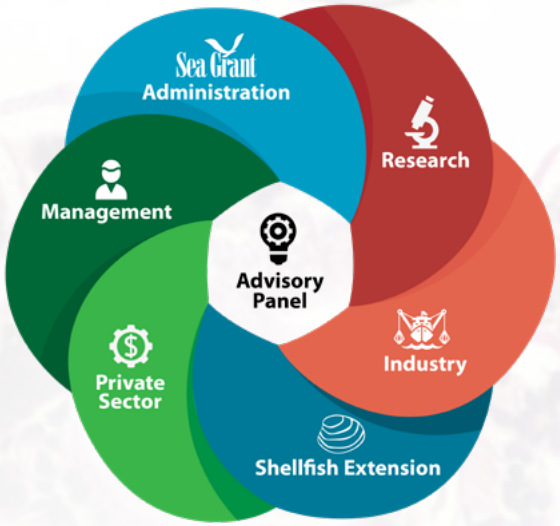
Sea Grant is a national program through NOAA with the mission to promote healthy coastal ecosystems, develop sustainable fisheries and aquaculture, provide science for decision-making, and develop formal and non-formal education training. The three main programming areas include research, extension, and education.

Sea Grant Hard Clam Selective Breeding Collaborative

A Project Using Genome Technology to Improve Production Methods in the Clam Aquaculture Industry

Credit: Chris Linder



Hub Advisory Panel Representation

Who is involved in this project?

This project involves a partnership of Sea Grant College Programs including New York, New Jersey, Woods Hole, Virginia and Florida; multiple research institutions led by Stony Brook University's Marine Animal Disease Laboratory, Cooperative Extension aquaculture professionals and a not-for-profit organization. Additionally, there is an advisory panel to ensure input from a broad group of stakeholders into this collaborative effort.

Why is this project important?

Hard clam producers in the Northeast have periodically experienced high mortality since the 1990's due to QPX, a disease that affects hard clam growth and survival (but no risk to consumers). Growers in southern regions experience high water temperatures during the summer and mortality can occur in larger clams reaching market size when low tide temperatures exceed 35°C. This project will address these two stressors (heat and QPX) that affect an economically valued and an important keystone species in the marine environment.

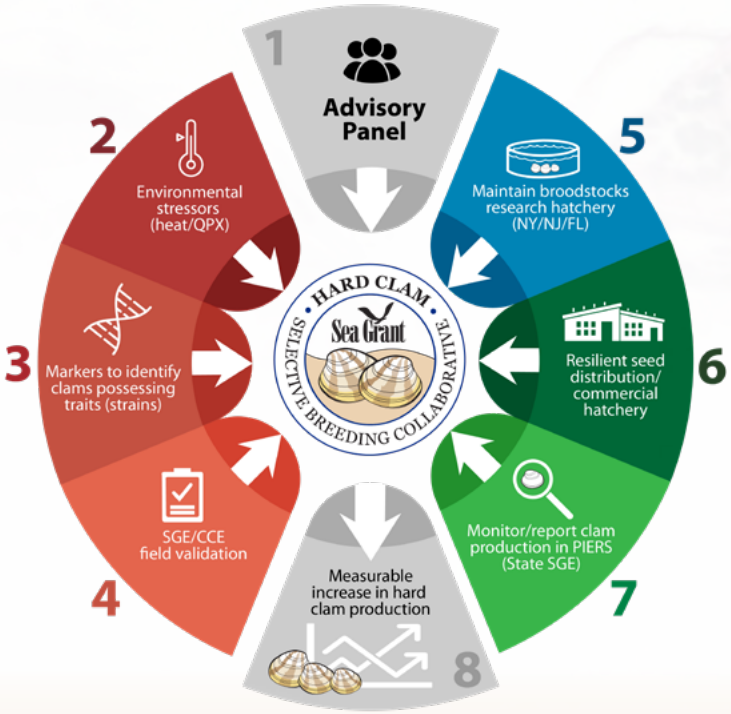
What are the goals of this project?

The research being performed will decode the hard clam genome and use this knowledge to develop special tools (SNP arrays) to identify strains that are resilient to different stressors.

A secondary goal for this project will be to establish a regional framework to continue using this genome technology to address other stressors that are problematic to growers. In the long term, this new technology will lead to higher survivorship in hard clam aquaculture operations, and private growers will be able to purchase these resilient seed from their hatcheries.

What are the outcomes of this project?

Research involved in this effort aims to improve and expand the East Coast hard clam industry. Once a resilient strain has been identified and selectively bred, Hub collaborators will develop a mechanism to transfer this seed to the industry. These actions will allow growers to improve production and conservation goals. Over time, additional research can be done to identify stocks resistant to other stressors that limit hard clam production



Selective Breeding Program Framework