The North Carolina Shellfish Farming Academy

CARTERET
COMMUNITY COLLEGE

Sea Grant
North Carolina

Applied Sciences Division
Aquaculture Technology Credentials

1 year

- Certificate
- Online Certificate
- Diploma
- Shellfish Farming Academy Certificate

2 years

- Associates Degree
- University Transfer

North Carolina Shellfish Farming Academy

Developing a Framework for prospective shellfish grower training in North Carolina, South Carolina, and Georgia

Funding provided by:

Sea Grant Aquaculture Program 2019-NOAA-OAR-SG-2019-2005960-Enabling New Aquaculture Opportunities/Social, Behavioral, and Economic Needs in Aquaculture

Photo by Baxter Miller

NC Shellfish Farming Academy: Main component of a larger project

Need For Comprehensive Training

- Funded through National Sea Grant Aquaculture Program
- Created as a workforce development initiative
- 8 week Program, 8 evening classes and 4 field days

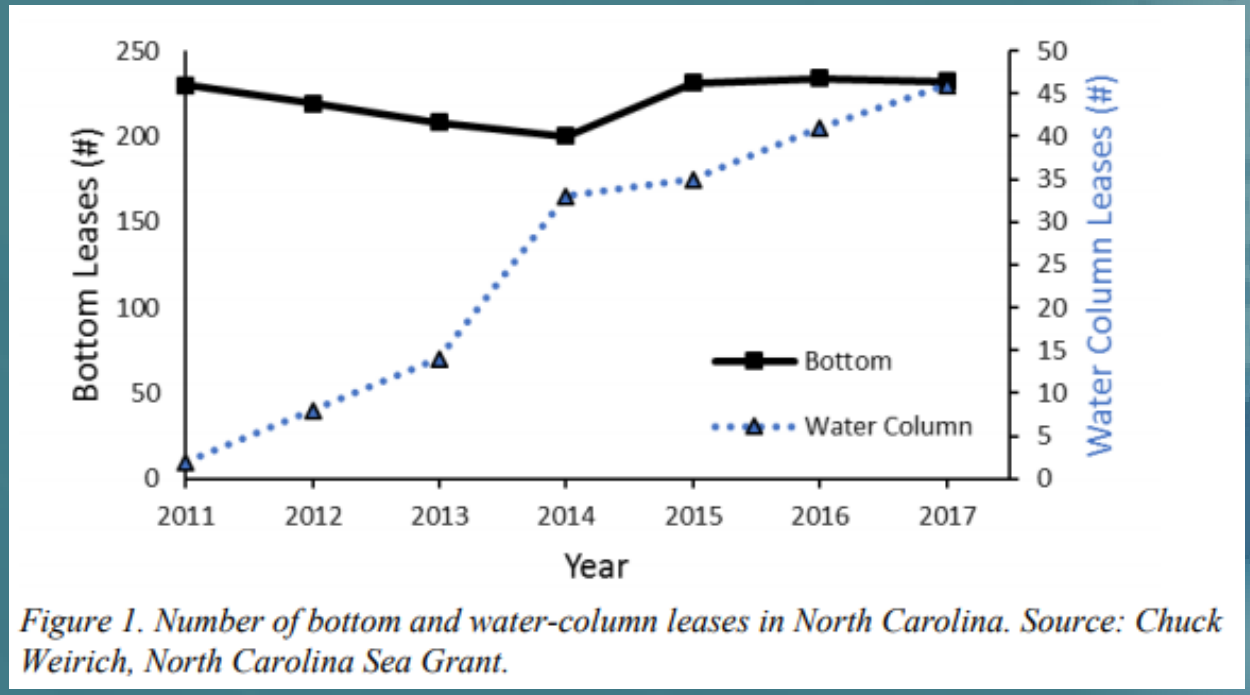
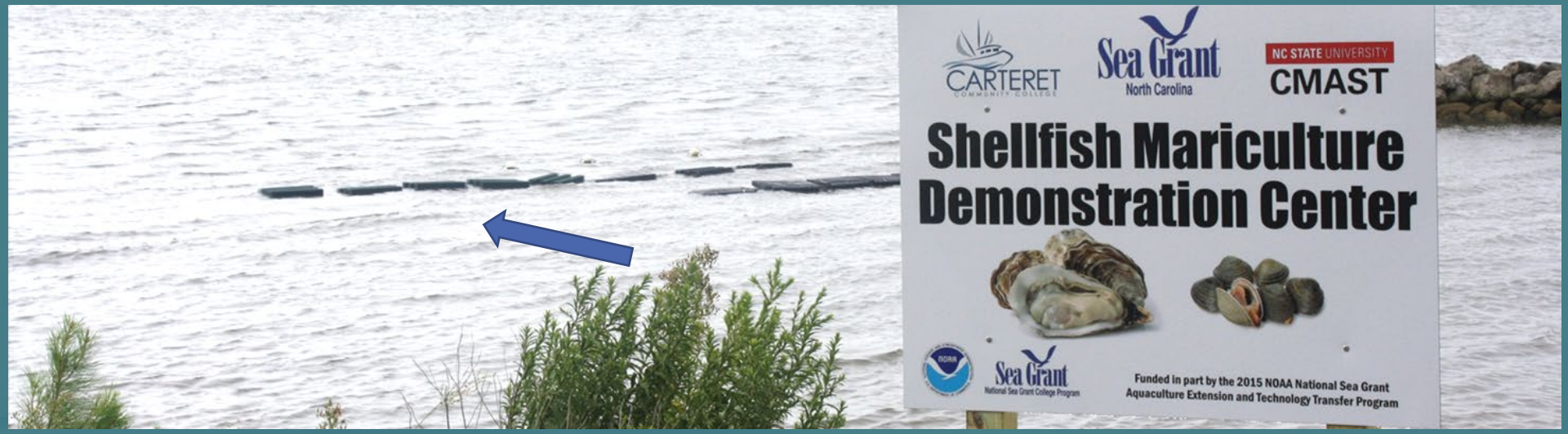
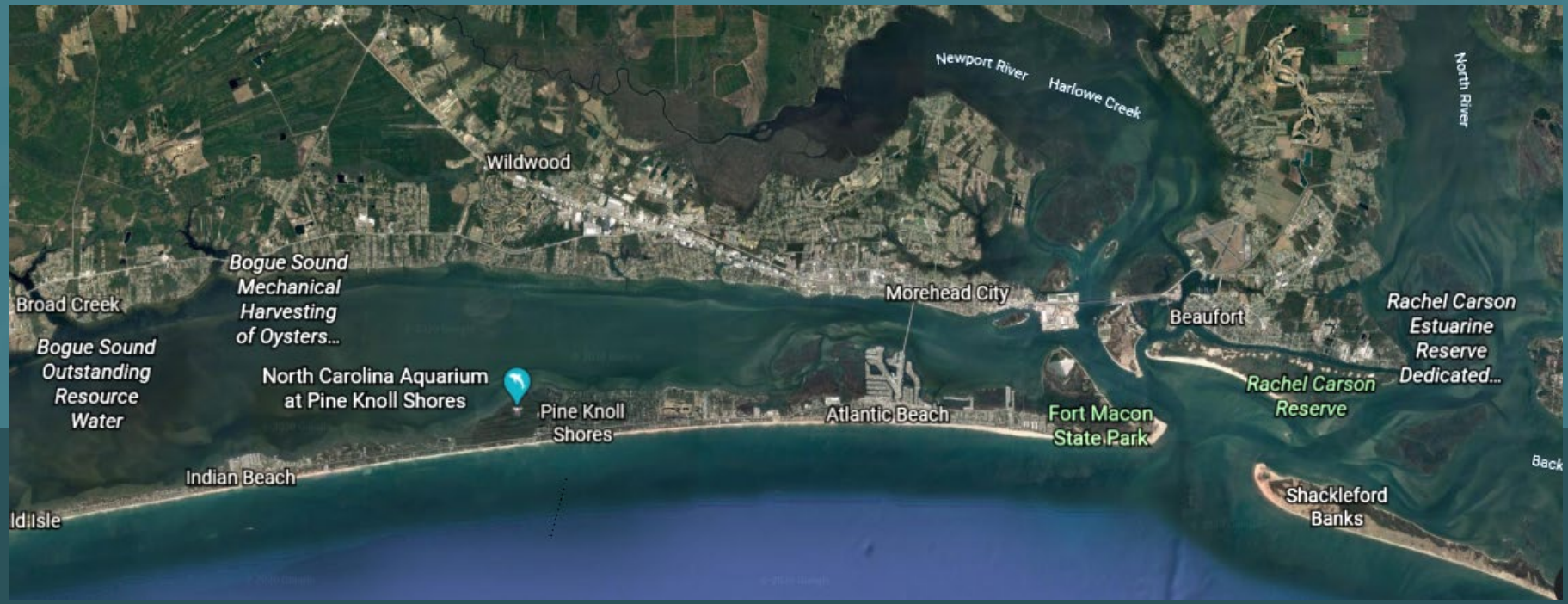


Figure 1. Number of bottom and water-column leases in North Carolina. Source: Chuck Weirich, North Carolina Sea Grant.

Class Offered Through Carteret Community College

- Offered through the Corporate and Community Education department at Carteret Community College
- Hybrid Classroom Sessions on Tuesday evenings
- Hands-on field days every other Saturday
- 48 contact hours
- Meant to accommodate people already working in other fields


CARTERET
COMMUNITY COLLEGE
Sea Grant
North Carolina
NC STATE UNIVERSITY
CMAST
Shellfish Mariculture
Demonstration Center
Sea Grant
National Sea Grant College Program
Funded in part by the 2015 NOAA National Sea Grant
Aquaculture Extension and Technology Transfer Program


Newport River
Harlowe Creek
North River
Wildwood
Bogue Sound
Mechanical
Harvesting
of Oysters...
Broad Creek
Bogue Sound
Outstanding
Resource
Water
North Carolina Aquarium
at Pine Knoll Shores
Pine Knoll
Shores
Morehead City
Beaufort
Rachel Carson
Estuarine
Reserve
Dedicated...
Rachel Carson
Reserve
Atlantic Beach
Fort Macon
State Park
Indian Beach
Idlisle
Shackleford
Banks

Permitting

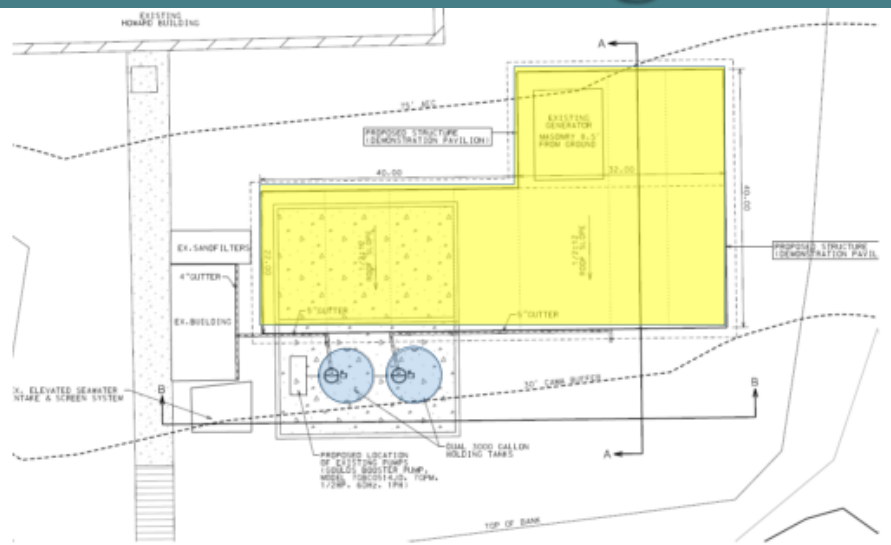


Figure 14b: Inset of 14a Location of Demonstration Pavilion (Yellow) and rainwater storage tanks (blue) that will be used for stormwater management


CMAST
CCC
Aquaculture
Facility
pavilion
Legend
Bottom culture (predator netting)
Floating/suspended gear main line
Screw anchor or PVC pipe
Bottom Cage
Rack and Bag
Floating Upweller
Dock and Gangway
Submerged Aquatic Vegetation Area
Designated walkway

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Curriculum Development

Discussions with:

- Current shellfish growers
- NC Division of Marine Fisheries personnel
- Carteret Community College
- Similar programs in other states

Meant to guide the curriculum and take advantage of work done by existing programs

Listen to stakeholder needs; Review and adapt work done by others to build curriculum

Goals of the NC Shellfish Farming Academy

Expose students to the many different facets of running a shellfish aquaculture operation

Build foundational knowledge that can be used in farm work and decision making

Increase the likelihood of success for new growers

Workforce Development: Main goal

Topics Divided into Ten Modules

- Each module has a presentation
- Relevant Handouts used as course material
  - SRAC
  - NRAC
  - Sea Grant Publications
  - Culture manuals
  - ECSGA materials
- Quizzes given as review and for students who watched recorded lessons

Classroom Topics

- Intro to Shellfish Aquaculture in NC
- Biology of Bivalves
- Hatchery and Nursery Techniques
- Grow-out Methods
- Risk to Shellfish Crops
- Lease Site Selection
- Best Management Practices
- The Leasing Process
- Shellfish Sanitation
- Business Planning and Marketing

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Module 6: Oyster Grow-out

Aim:

Introduce course participants to the many varieties of gear and strategies to grow oysters and the basic production cycle used to that end. Included in this will also be rigging and anchoring gear, choosing the best gear for their site, and when to tell that gear, lines, and anchors need replaced.

Objective:

By the end of this module, participants should be able to make an informed decision on what gear types will be most applicable to certain sites and methods of farming. They should also have a full understanding of how to select and install anchors, lines, and other infrastructure to use their gear with.

Topics to be covered:

- **Needed components for growing oysters**
  - **Location**
  - **Gear**
  - **Equipment**
- **Culture zones**
- **Site considerations on gear**
- **Extensive culture**
  - **Cultch planting**
  - **Spat-on-shell**
- **Intensive culture**
  - **On-bottom**
    - **Trays, bags**
  - **Off-bottom**
    - **Cages, trays**

Activity:

Have course participants shuck oysters and clams and use the "anatomy" hand-out to identify internal organs.

Participants should be able to readily identify:

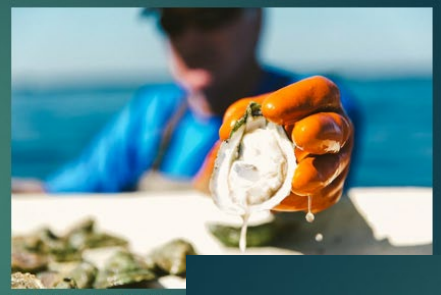
- Gills – oyster and clam
- Labial palps – oysters and clams
- Stomach – oysters and clams
- Gonads – oysters and clams
- Abductor muscle – oysters and clams
- In-current and ex-current siphons – clams only
- Foot – Clams only

Benchmark Questions:

- Why is it important to understand the biology of the animals you intend to grow?
    - The biological traits of the species you are planning to grow will affect decisions regarding:
        - Lease siting
        - Gear choice
        - Production cycle in general
- Which biological aspects are important in planning your farm operations?
    - Feeding methods, shell growth, Life style, waste removal, feeding methods

NC Shellfish Farming Academy

https://pelicanseafoodcompany.com/products/clams



Shucked raw oyster by Paul Manley

Everything you
about starting
North Carolina

Hatchery Techniques

Bryan Snyder

Bryan Snyder

Shellfish Nursery

DESIGN AND STRATEGIES

Bryan Snyder

Bryan Snyder

Sea Grant
North Carolina

Business Planning

- Partnership with the Small Business Center at Carteret Community College
- Different business instructors for each offering so far
- Hoping to build some more uniformity and add shellfish specific instruction to this section in future offerings

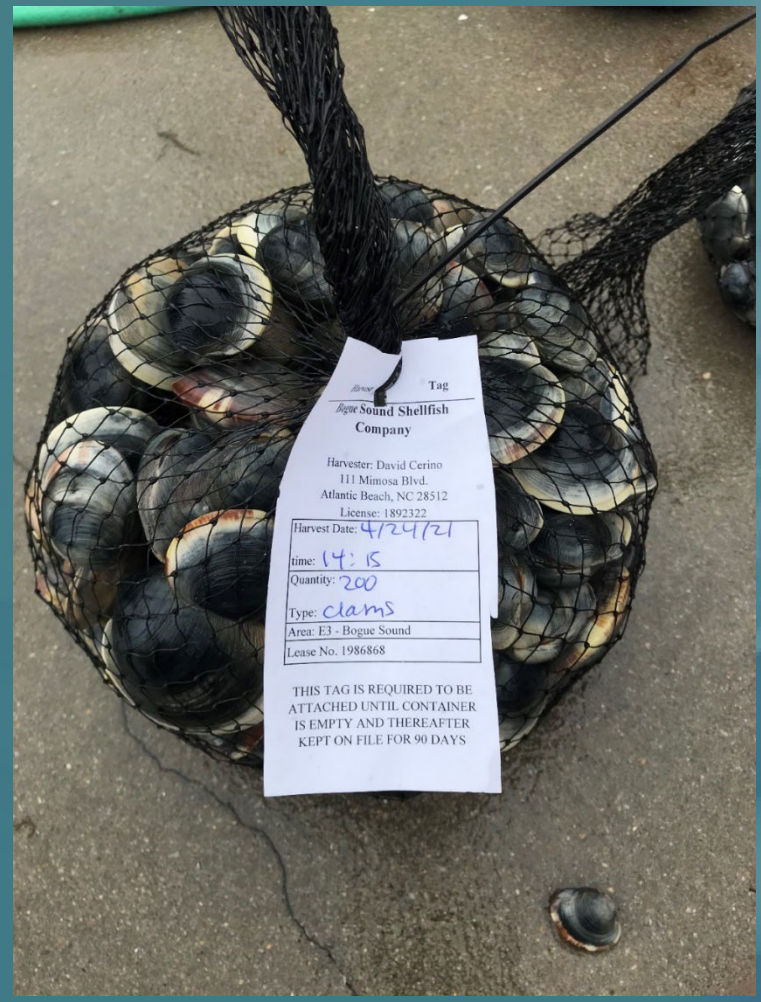
Hands-On Field Days

- Every other Saturday for 8 weeks
- 6-hour days for a total of 24 hours
- Designed to give students hands on experience
- Work from seed to harvest

Perfect technique for ensuring a planting density of 50 clams / ft^2


CMAST
NC STATE UNIVERSITY
The Center for Marine Sciences and Technology


adidas
Science
Life



Bagging and Tagging / Labeling Clams


MARICULTURE SUPPLY CO
DOWN EAST
est.
2017

Broodstock Conditioning System

MORRIS FAMILY SHELLFISH FARMS

WELCOME TO MORRIS FAMILY SHELLFISH FARMS
SEA LEVEL NC

Metrics of Success

- 9 class offerings since June 2020
- 10th offering scheduled for March 2024
- 85 Graduates of 106 enrolled students, 80% Graduation rate
- 32 Students entering the industry, 30%

Many Thanks To:

Jacob Boyd

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Shannon Jenkins

Shawn Nelson

Chuck Weirich

Dave Cerino

Frank López

Eric Herbst

Questions? Email Bryan Snyder: Snyderb@Carteret.edu