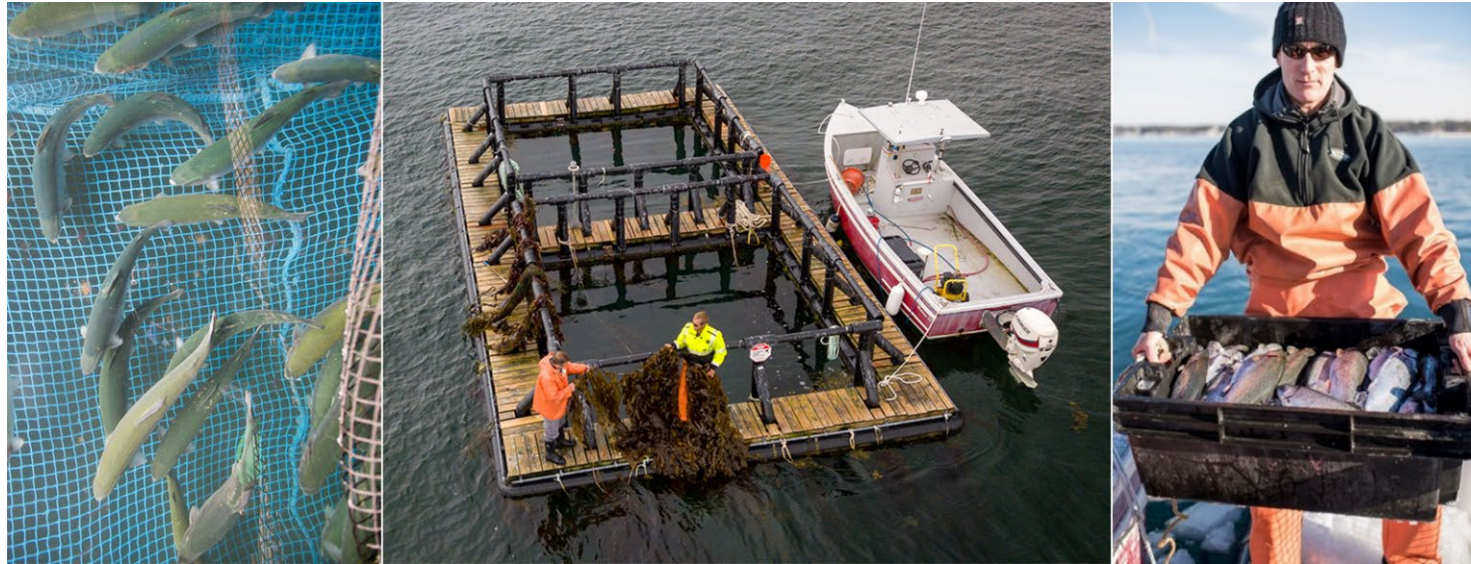
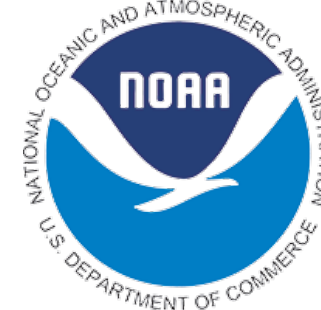


Demonstration of an Integrated MultiTrophic Aquaculture (IMTA) Project in the northern Gulf: overview and project progress



Ashley McDonald, Project Manager



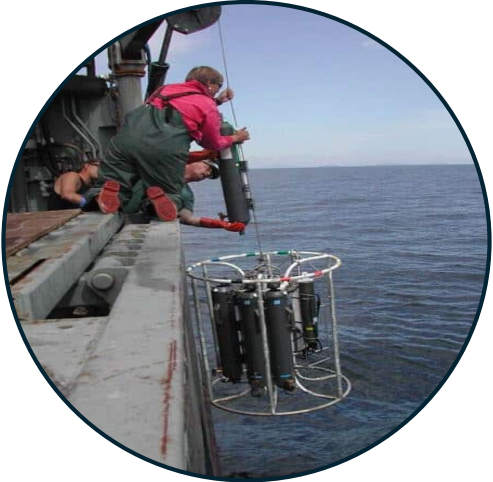
Gulf IMTA project goals



Goal 1: Demonstrate the effectiveness of sustainable and low-impact aquaculture in Alabama state waters, using indigenous species with high local market demand.



Goal 2: Train local commercial fishers and farmers in offshore IMTA aquaculture techniques, permitting requirements, and reduction of aquaculture impact on local ecosystems.



Goal 3: Conduct adequate monitoring of the system to determine environmental influence.



Goal 4: Complete two growout seasons with harvest, beginning in fall 2025.

State of AL IMTA system overview

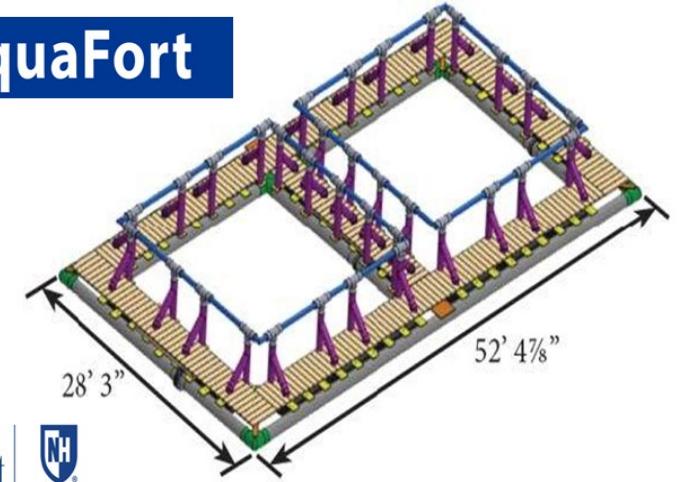
Based on UNH and NH Sea Grant AquaFort original design

Manufactured by Innovasea

Main distinctions- Native Gulf species and copper alloy mesh will be added to fish pens (predator deterrent)



AquaFort



Sea Grant
New Hampshire

NH
Extension



Eastern
Oyster



Red
Drum



Graceful
Red Weed

IMTA operations

Growout (November to June)

Harvest (June)



Thad Cochran Marine Aquaculture Center

Finfish- Red Drum (*Sciaenops ocellatus*)

Native

Grows optimally in coastal AL waters

High demand in local markets

Primarily grown for stock enhancement (currently)

Broodstock collected from local Mobile Bay area

Received: 11 February 2022 | Revised: 7 May 2022 | Accepted: 12 August 2022

DOI: 10.1111/jwas.12921

APPLIED RESEARCH

Journal of the
World Aquaculture Society

WILEY

WILEY

Characterization of supply of marine finfish species with potential for commercial growth in the United States

Carole R. Engle¹ | Jonathan van Senten² | Michael H. Schwarz²

IMTA operations

Growout (November to June)

Harvest (June)



Thad Cochran Marine Aquaculture Center

Bivalve- Eastern Oyster (*Crassostrea virginica*)

Native

Grows optimally in coastal AL waters

High demand in seafood markets

Only current aquaculture species in state waters

Est. 100,000 triploid spat produced for stocking

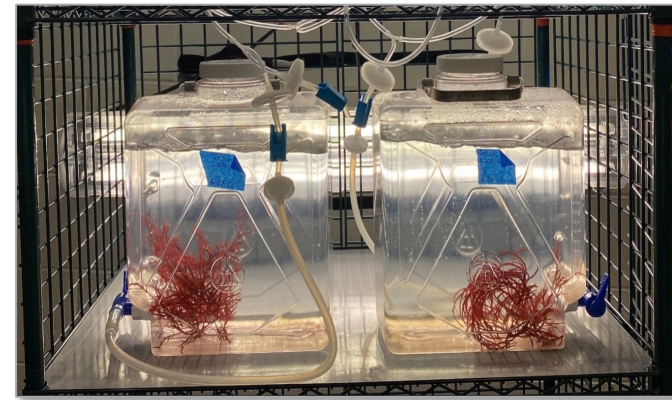
Not for consumption



IMTA operations

Growout (November to June)

Harvest (June)



Thad Cochran Marine Aquaculture Center

Macroalga- Graceful Red Weed (*Gracilaria* sp.)

Native

Grows optimally in coastal AL waters

Unknown local market value

Primarily grown in China for aquaculture feed and agar

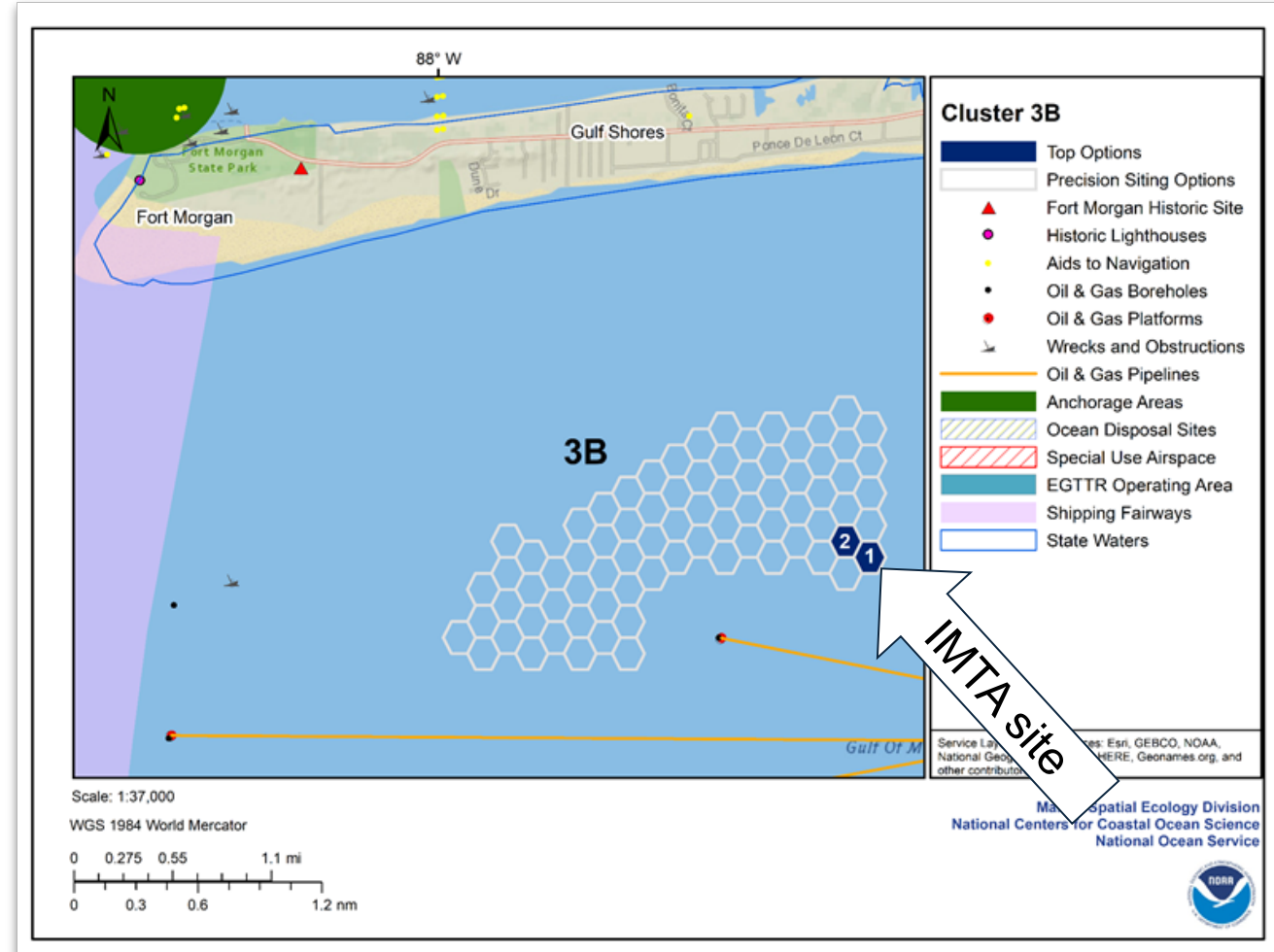
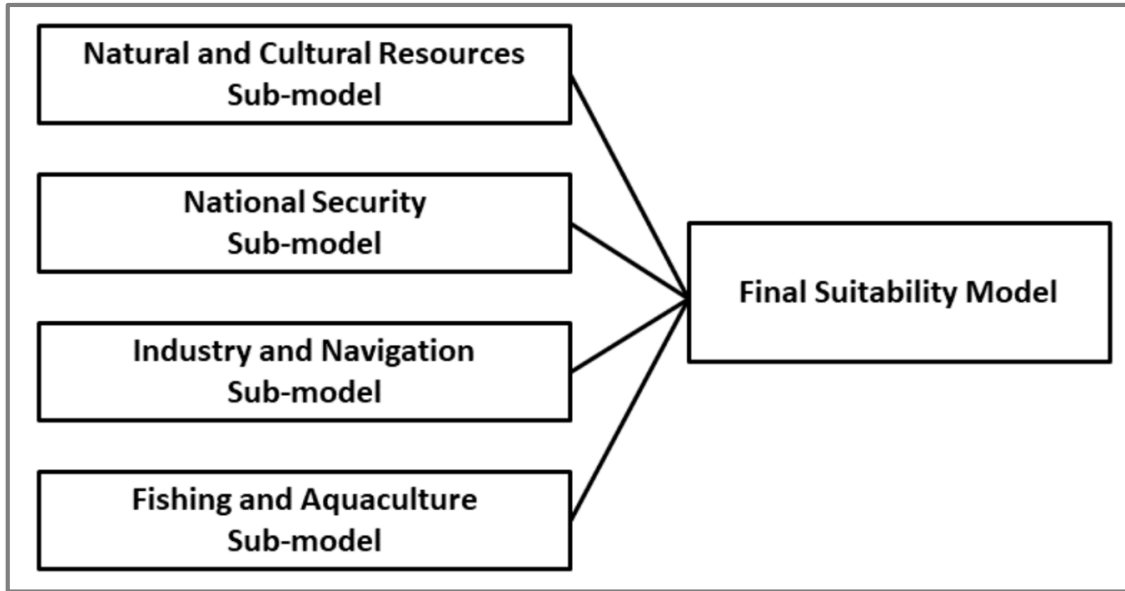
Est. 2.4kg produced for stocking

No current plans for product



AquaFort mooring location

NOAA NCCOS siting analysis decision



AquaFort mooring location

Site overview



Location: 3.1 km S off of Fort Morgan Beach, 8.5 km SE of Mobile Bay inlet

Closest port: approx. 13 km SE from Dauphin Island, AL,

Depth: 35 - 39 ft (10.7-11.8 m) within state waters

Seawater temperature: 59 - 88° F (15-31°C)

Current velocity: 0.04 - 0.92 m/s

Max farm footprint (including anchorage): 1.36 hectares (3.4 acres)

Maximum annual production: ~30,000 lbs in 4-6 months growout

- We will start with 4,000 Redfish with intent to harvest at 2 lbs

Project milestones

- Pre-app presentation virtual meeting (May 2024)
 - Agencies that attended-
 - ✓ • ADCNR- AL Dept of Conservation and Natural Resources
 - ✓ • ADEM- AL Dept of Environmental Management
 - ✓ • ADPH- AL Dept. of Public Health
 - ✓ • DoD
 - ✓ • NOAA NMFS and NOAA NOS
 - ✓ • BOEM
 - ✓ • EPA
 - ✓ • USFWS
 - ✓ • Army Corps
 - ✓ • Coast Guard

Project milestones

- Permit applications required and approved:

- ✓ ADEM- Water Quality Certification and Alabama Coastal Consistency Concurrence (separate approvals)
- ✓ ADCNR State Lands Division- Research Activity Permit
- ✓ ADPH- Shellfish Aquaculture Permit
- ✓ DoD- Activity agreement in Navy area statement
- ✓ NOAA Protected Resources- monitoring and reporting
- ✓ USFWS- Agreement to maintain bird-safe practices
- ✓ Army Corps- Activity Permit
- ✓ Coast Guard- PATON and Local Notice to Mariners

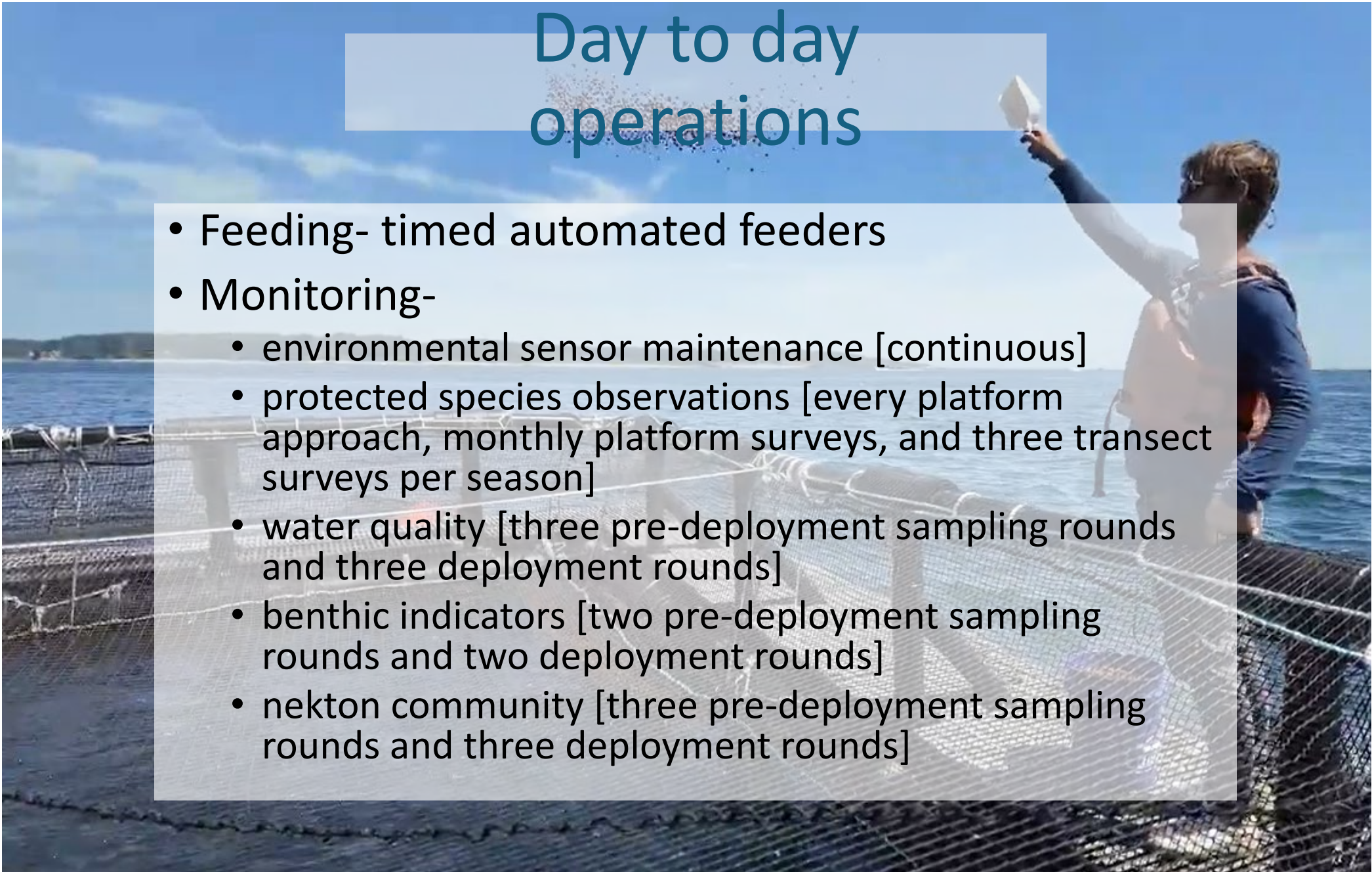
The background image shows a boat, possibly a research vessel, on a body of water. Several people are visible on the deck. The boat has an American flag flying from its mast. The scene is set during sunset or sunrise, with the sun low on the horizon, creating a warm glow. The water is calm, and the sky is a mix of orange and blue. A semi-transparent white box with blue text is overlaid on the top part of the image.

Project timeline (Year 1)

- Ongoing and planned assembly and deployment activities :
 - AquaFort assembly began this week
 - Expect to deploy the platform in mid-November
 - Red Drum will be stocked two weeks after the platform is deployed (following sea trial period)
 - Oysters and macroalgae will be added to Seapa baskets and hung from platform
 - Products will be harvested in mid to late June
 - AquaFort will be towed back inland at end of season

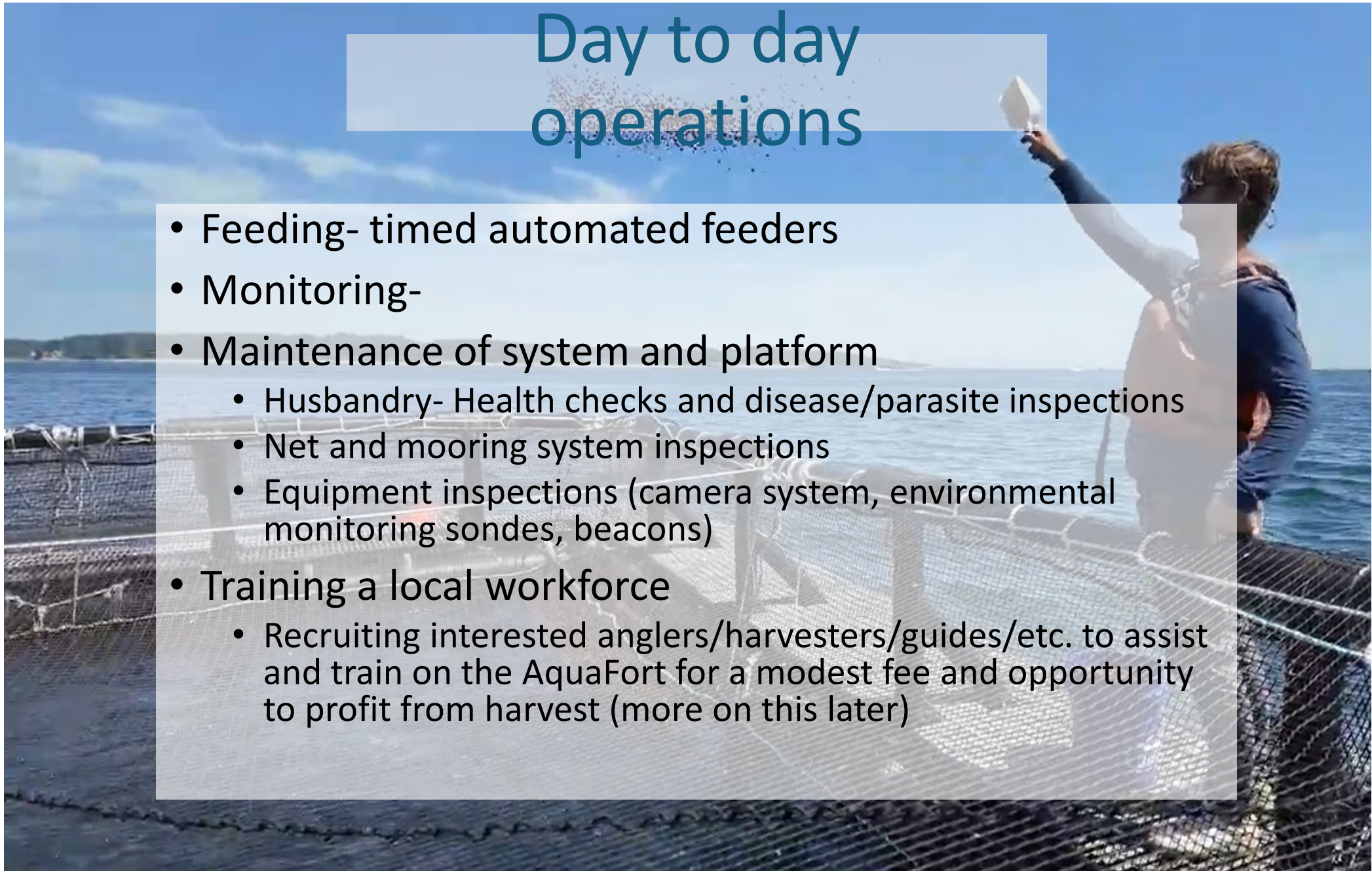
Day to day operations

- Feeding- timed automated feeders
- Monitoring-
 - environmental sensor maintenance [continuous]
 - protected species observations [every platform approach, monthly platform surveys, and three transect surveys per season]
 - water quality [three pre-deployment sampling rounds and three deployment rounds]
 - benthic indicators [two pre-deployment sampling rounds and two deployment rounds]
 - nekton community [three pre-deployment sampling rounds and three deployment rounds]



Day to day operations

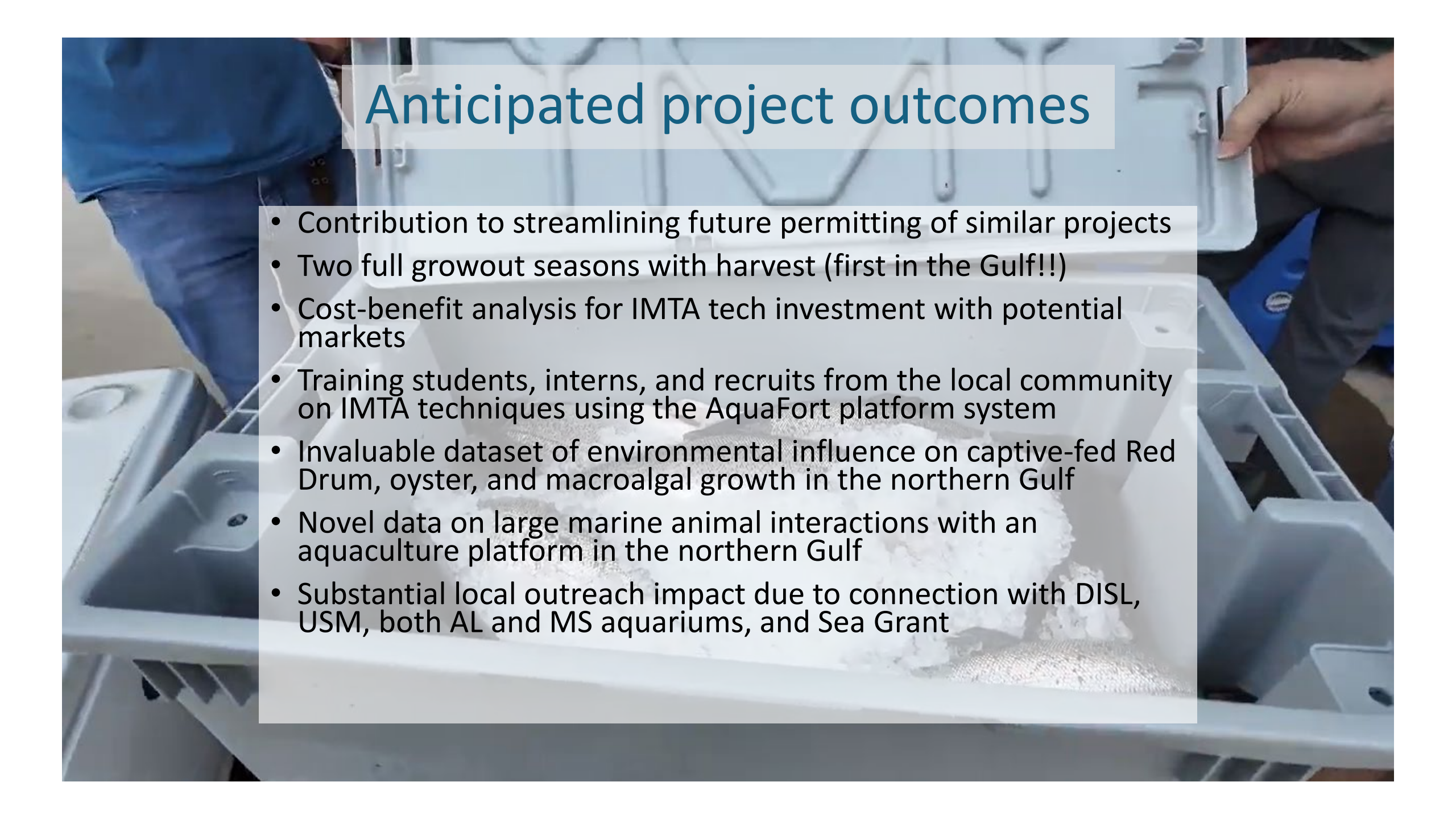
- Feeding- timed automated feeders
- Monitoring-
- Maintenance of system and platform
 - Husbandry- Health checks and disease/parasite inspections
 - Net and mooring system inspections
 - Equipment inspections (camera system, environmental monitoring sondes, beacons)
- Training a local workforce
 - Recruiting interested anglers/harvesters/guides/etc. to assist and train on the AquaFort for a modest fee and opportunity to profit from harvest (more on this later)





Day to day operations

- Feeding- timed automated feeders
- Monitoring-
- Maintenance of system and platform
- Training a local workforce
- Outreach and education
 - Live streaming from the platform, twin IMTA displays at the Alabama and Mississippi Aquariums, educational tours to the platform to demonstrate the IMTA farming process
- Harvest
 - Only Red Drum go to market, still need to find processor/buyer
 - Oysters and macroalgae donated for research and restoration purposes



Anticipated project outcomes

- Contribution to streamlining future permitting of similar projects
- Two full growout seasons with harvest (first in the Gulf!!)
- Cost-benefit analysis for IMTA tech investment with potential markets
- Training students, interns, and recruits from the local community on IMTA techniques using the AquaFort platform system
- Invaluable dataset of environmental influence on captive-fed Red Drum, oyster, and macroalgal growth in the northern Gulf
- Novel data on large marine animal interactions with an aquaculture platform in the northern Gulf
- Substantial local outreach impact due to connection with DISL, USM, both AL and MS aquariums, and Sea Grant

Happening right now!





Happening right now!
