FINAL REPORT
2023/2024 Joint Innovation Project

Design and comprehensive planning of an Alaskan optimized intermodal freight container-based shellfish setting and pre-nursery seed boosting system.

Lead Entity: OceansAlaska

Category: **Boosting oyster growth at nurseries and farms**
Project Location: **Ketchikan**
Project Start Date: **August 1, 2023**
Project End Date: **June 30, 2025**

Award Amount: $89,650

Project Team & Partners: Provan Crump - Pro Aquaculture Solutions, Eric Wyatt - Blue Starr Oyster Co. have many years of experience in the design and operation of efficient and successful shellfish hatcheries worldwide and oyster nursery systems in Alaska.

PROJECT OVERVIEW

*Please provide an **updated** description of your project here using the following guidelines. We understand that projects evolve to optimize impact and that there may be changes to your original proposal.*

a. ***Problem Statement:*** Due to cold water conditions in Alaska and a limited growing season, extra-large sized oyster seed from hatcheries perform significantly better than smaller. There is a need to deliver significant quantities of locally conditioned, large sized oyster seed to instate nurseries at the optimal time, which is not being met.
b. ***Background/Context:*** Under the guidance of this project team, the development of an efficient, small scale shellfish hatchery model designed for Alaskan conditions has been underway at the OceansAlaska hatchery in Ketchikan for several years. Relevant, up-to-date and directly applicable information on the details of small shellfish hatcheries is not currently available to inform construction, economic and policy decisions. Regionally based shellfish nursery/hatchery solutions, within Alaska, verses one centralized or out-of-state hatchery may be a superior overarching strategy, but discussion on this issue remain predominantly hypothetical. Information from this project will provide real data to inform decision making.
c. ***Proposed Solution:*** This particular project takes information gleaned from up-to-date developments and fits the model shellfish hatchery in to four commercial shipping containers. This footprint and design decrease the overhead physical plant costs and dramatically increases the number of potential siting options. The project includes a detailed physical layout, with detailed equipment list and approximate costs, a biological production plan and estimated construction, equipment and operational costs. All of this information is essential to informed decision making.

*d. **Project Objectives, Tasks and Measures of Success:***

i **Objective:** Prepare Alaska optimized, implementation ready plans and procedures for container-based oyster pre-nurseries/setting facility.

1. Tasks: 1. Pro Aquaculture travel to Prince of Wales for onsite evaluation. Timeline: Sep 2024 COMPLETED
2. Development of design for a four-container shellfish setting system. Timeline: Jan 2025 COMPLETED
3. Obtain equipment sourcing quotes. Timeline: Dec 2024 COMPLETED
4. Outsource designs for CAD drawing and professional formatting: Timeline: Feb 2025 COMPLETED
5. Complete standard operating procedures. Timeline: Dec 2024 COMPLETED

ii Measure of success: Accomplishment and reporting of each task on-time.

Project engagement:

i. **Objective:** Create positive engagement with Metlakatla High School
   a. Tasks:
      i. 1. Present design and underlying system philosophy to Metlakatla High School science class and interested community members. Timeline: March 2024 COMPLETED
      ii. Conduct local evaluation of possible container-based pre-nursery system. Timeline: Sep 2024 COMPLETED
   b. Measure of success: Positive feedback from participants on sharing of information and answering questions COMPLETED

ii. **Objective:** Inform Alaska mariculture industry during the 2025 OceansAlaska/UAS Applied Fisheries Shellfish Hatchery Workshop
   a. Present design and underlying system philosophy to. Timeline: April 2025 COMPLETED
   b. Measure of success: Positive feedback from participants on sharing of information and answering questions COMPLETED

*e. **Project Outcomes:*** Share overall outcome(s) as well as brief outcome summaries relevant to project objective(s).

The containerized setting and pre-nursery system offer the ability to set up the facility in remote locations with the containers being shipped with all the equipment required to set up the facility. The cost of the containers and equipment required is as accurate as possible. The capital costs consider the set-up of the facility in the location that is chosen. The operating costs are based on experience of the needs of a facility of this size. All calculations are conservative.

Possible production costs of $190,000 with a resulting potential revenue of $67,500 (or even double that of $150,000) show that operation of the facility (or any similar facility in Alaska) is not a highly profitable business. Shellfish hatcheries and nurseries are essential to the production of oysters, but operate on thin to negative margins.

Data collected, tables, pictures, and further descriptions will be shared below.

Please see complete report for tables, pictures and descriptions

f. ***Successes, Challenges, Lessons learned:*** Although the basic model of a single container demonstration system was presented to the Metlakatla High School and other potential parties, there was not much interest in pursuing such an operation. As the model of a production facility unfolded and interest coming forth for information to inform Sea Grant's Shellfish Hatchery Economic Analysis, the decision to pursue only one model of a four-container facility was made. Information from this report can be used to plan smaller sized operations. The majority of the equipment and future operational costs center around the pumping, filtering and heating of seawater. Scenarios that optimize these aspects would seem the wisest to pursue.

g. ***Continuation + Dissemination of Results:*** These results will be disseminated through the Alaska Mariculture Cluster and through Oceans Alaska's partner originations UAS Applied Fisheries program and Alaska Sea Grant. As mentioned above, these results will be considered in Sea Grant's Shellfish Hatchery Economic Analysis, which is currently underway.

DATA & PROJECT OUTCOMES

Please tables, projections and conclusions in the full report.

ADDITIONAL INFORMATION

- **Project Timeline:**

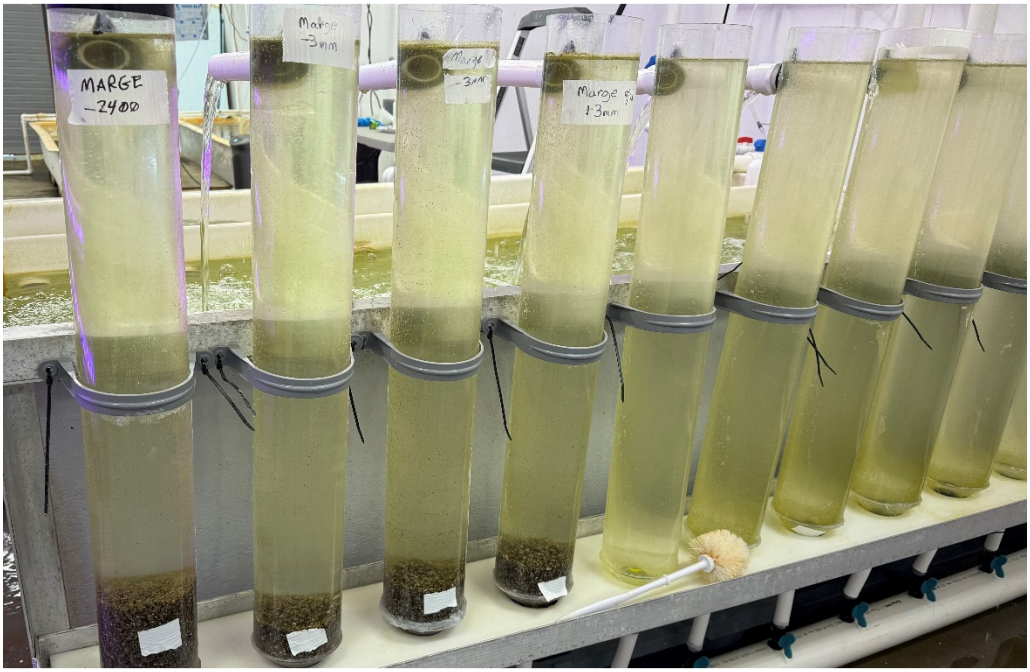
  The project has been completed within the amended timeframe.

BUDGET

- **Final budget**

  The project has been completed under budget with final numbers to follow separately.

PHOTOS



SNAPSHOT SUMMARY SLIDESHOW

See accompanying slideshow