Equipment and Technology Subaward Semi-Annual Report

Organization:	Prince William Sound Science and Technology Institute, 700 New England Cannery Rd, Cordova, AK 99574
Project Title:	Equipment Reporting; Project #7 Equipment & Technology – Environmental Chamber (Kelp Hatchery).
Project Number:	07-79-07904
Reporting year:	2026, final report
Report Prepared by:	Dr. Tiffany Stephens, Research Scientist at Prince William Sound Science Center (PWSSC)

Narrative:

During this reporting period (ending September 30, 2026), the environmental chamber was used primarily to cultivate commercial kelp seed string using spore-based seeding protocols. Commercial seed production typically runs from August through November. However, the 2025 effort continued into 2026 for a second run and details for both the 2025-2026 and 2026-2027 seasons are included here for clarity.

The majority of the seed produced during the 2025-2026 hatchery effort was out planted on farms in early October 2025, with the exception of 10,000 feet of sugar kelp that was out planted in early January 2026. The total commercial seed cultivated in the funded environmental chamber was 44,400 ft of sugar kelp (*Saccharina latissima*), 2,000 ft of bull kelp (*Nereocystis luetkeana),* 2,400 ft of ribbon kelp (*Alaria marginata*), and 2,000 ft of giant kelp (*Macrocystis tenuifolia*) for that commercial season. All of it was provided to three kelp farms in Prince William Sound: Noble Ocean Farms, Royal Ocean Kelp Company, and Wild Blue Mariculture.

After the latest out planting in January 2026, the hatchery was cleaned and shut down until June 2026, when preparations for the 2026-2027 season began. Seed cultivation resumed in August 2026 and has continued past the end of this grant and reporting period, with all seed expected to be ready for out planting by October 15, 2026, weather pending. Production from this effort (August-October 2026) is expected to total 53,800 ft of sugar kelp, 600 ft of bull kelp, and 4,400 ft of ribbon kelp – all seed is being supplied to five Prince William Sound kelp farms for the 2026-2027 season: Noble Ocean Farms, Royal Ocean Kelp Company, Wild Blue Mariculture, Two Moon Kelp, and the Native Village of Eyak.

Hatchery operations were led by postdoctoral researcher Dr. Angela Korabik – who managed the hatchery space and cultivation – with support from Technician Dakota Bell, who was hired to assist with seed cultivation from August to November 2026.

Generally, the environmental chamber purchased under this grant was extremely effective at keeping temperatures cool and consistent throughout the hatchery season. During the hatchery season, we generally kept the chamber temperature between 10-12 °C, but during later experiments, the cooler was successful at keeping temperatures as low as 5 °C on a consistent basis. Once installed, the temperature is easy to control and change as needed, with the caveat that we do need to crawl onto the top of the environmental chamber to do so, thus introducing ladder and height-based hazards. During the first year of operation, there were some issues with the cooling fans dripping excessive condensation into the inside of the hatchery, but this issue was mitigated with the installation of drainage hoses that now channel excess condensation outside of the hatchery. During the second year, we did notice that one side of the hatchery seemed to be consistently 1 °C warmer than the other side, albeit while still maintaining a consistent temperature

from day to day. Ultimately this spatial difference in temperature was minimal and didn't have a significant effect on hatchery operations, but we are looking into potential causes for this discrepancy.

In addition to commercial production, the environmental chamber was used to grow experimental kelp seed using gametophytes, rather than spores, as the inoculant. This research was supported by a grant awarded to Dr. Korabik by the Alaska Mariculture Cluster's Seed Quality Improvement RFP. Her research ran alongside commercial seed cultivation without affecting commercial seed quality or schedule. Research spools included approximately 800 ft of bull kelp and 800 ft of three-rib kelp (*Cymathere triplicata*). All research-related expenses were covered by independent research grants.

Equipment status and use:

Equipment name, description	Status	Notes on Use, Metrics, Functionality
Environmental chamber with kelp hatchery	Operational	Can grow approx. 75,000 ft of seed line; 1-2 batches are achievable per typical cultivation window (Aug-Dec) for a maximum of 150,000 ft per year.

Third-Party / Commercial Use:

Equipment used	Commercial entity name & type	Dates / duration of arrangement	Fee charged ($)
None			

Impact on operations:

Before this award, PWSSC had no temperature-controlled space for cultivating kelp seed. The environmental chamber gave us that capacity. The chamber's main advantage is reliability: it holds more stable temperatures than the in-line water chillers used at other hatcheries, providing consistent, controlled conditions for seed development. As a result, we can now produce high-quality kelp seed and supply it to local farmers, which directly supports the growth of the mariculture industry in the Prince William Sound region.

Industry and regional benefit:

The environmental chamber has made PWSSC a reliable seed producer in Prince William Sound. Before this award, Cordova farmers depended on producers outside the region, whose seed quality was inconsistent and who did not necessarily prioritize Prince William Sound farms. In one instance, Cordova farmers had reserved seed from an outside provider, only to be told late in the cultivation cycle that farms closer to that provider would be served first. That left them at risk of losing a growing season. Local production now gives Prince William Sound mariculture stakeholders a reliable, nearby seed source and greater seed security, while also greatly reducing the amount of

time kelp needs to be held outside the water during transport between hatchery to farm. The seed produced in the chamber has also been of high enough quality that local farmers have chosen to stop buying seed from outside providers altogether. By removing a key supply bottleneck and reducing reliance on outside sources, the equipment is directly supporting the stability and growth of the region's mariculture industry.

Challenges and Mitigation:

No significant challenges. As mentioned in the narrative, there was minor, unwanted condensation inside the environmental chamber in Year One but that was mitigated by installing drainage hosing.

Photos and documentation:

Please see the images and captions on the following pages.

Other:

PWSSC appreciates Southeast Conference's support through this award. One challenge we want to highlight is the cost of seed production. The price farmers can currently pay for kelp seed does not cover the cost of running a seed operation, especially at the small scale needed to serve Prince William Sound. Based on our experience, we expect that continuing to operate at this scale will not be economically self-sustaining if the monetary returns from seed sales are to 100% cover the hatchery manager (and possible technician). Keeping the environmental chamber and hatchery running will likely require pairing seed production with complementary research funding, or support from state programs or third-party organizations such as GreenWave. We recognize this is not SEC's responsibility alone. However, we would welcome SEC's support, as a regional and industry organization, in advocating to the State Legislature and other funders for dedicated support for mariculture seed operations, which are foundational to industry growth in Alaska.



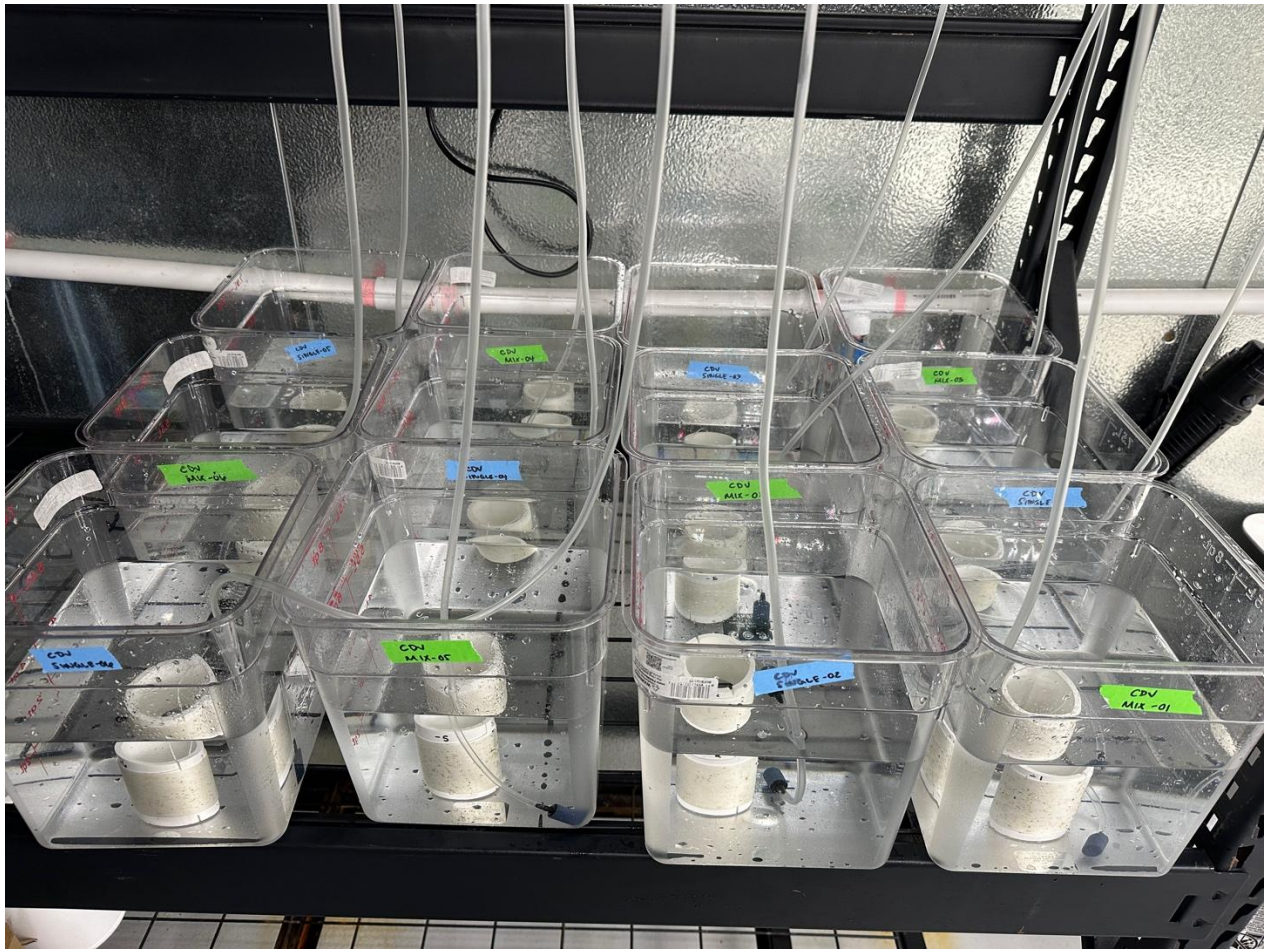
Spools produced in 2025 (*left*) and 20206 (*right*).



Interior Hatchery set up in 2025 (*left*) and 2026 (*right*).



Outside view of the hatchery with the water filtration system (two large seawater storage tanks with water treatment in between).



Hatchery was used for experimental as well as commercial production of kelp.