

Development of a mobile kelp processor and harvesting platform to provide on-water support for Alaska's commercial kelp farmers

Lead Entity: Mothers of Millions

Category: Kelp cultivation

Project Location: Seward, AK

Project Start Date: September 2024

Expected End Date: September 2025

Award Amount: \$100,000

Project Team & Partners: Mothers of Millions, Native Conservancy

Project Overview

Problem Statement:

- Commercial kelp farmers in Southcentral Alaska face significant logistical and economic barriers in harvesting, stabilizing, and transporting large volumes of kelp from remote aquatic farms to population centers. These barriers increase costs, reduce quality, and limit participation in Alaska's emerging kelp mariculture industry—especially for small and medium-sized operations in remote, coastal communities.

Background/Context:

- Mothers of Millions LLC (MOM) is a woman-owned and operated small business established to fill key gaps in Alaska's seaweed value chain by developing mobile processing solutions that meet farmers where they are. Most coastal Alaskan communities lack access to nearby processors, forcing farmers to shoulder costly logistics and stabilization efforts on their own.
- MOM's approach supports both economic and environmental sustainability by bringing processing to the farm site, reducing transportation burdens, and connecting farmers to viable markets. This project was funded to develop and demonstrate a mobile kelp processor and harvesting platform that can stabilize kelp on the water, improve product quality, and support market expansion for Alaska-grown kelp.

Proposed Solution:

- MOM proposed to design and deploy a mobile, organic-certified seaweed harvester and processor that:
 - Meets farmers at their farm sites to process and stabilize kelp immediately after harvest.
 - Reduces spoilage and transportation costs by processing on-water.
 - Provides a direct market channel by purchasing kelp from participating farms.
 - Works toward organic certification for both farmers and processor.
 - Tests and refines processing and stabilization methods aligned with commercial end uses.

Project Objectives, Tasks and Measures of Success:

- **Objectives:**
 - Develop and operate a mobile seaweed processor that can support commercial kelp farmers during the 2024–2025 harvest.

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- Pilot organic certification of kelp farms and processor.
 - Evaluate and document the economic feasibility of mobile processing.
 - Strengthen buyer relationships for sustained kelp purchasing beyond the Build Back Better grant period.

Tasks Completed:

- Harvesting, processing, and stabilization of commercial kelp from farms across Prince William Sound.
- Expansion of purchasing area to include an additional farm in Southeast Alaska.
- Coordination with Oregon Tilth to initiate and complete organic certification for all participating farms and MOM's processing operations.
- Development of a stabilization solution and method suitable for the agricultural market.
- Collection of cost and pricing data to inform feasibility assessment.

Measures of Success:

- Mobile processor successfully deployed and operated during Spring 2025 harvest.
- All farmers completed certification paperwork and received or are pending organic certification.
- Stabilized product accepted by a large-scale agricultural buyer.
- Processing efficiency improved, with reduced spoilage and faster turnaround.
- Preliminary cost-benefit data demonstrating financial viability for mobile processing model.

Project Outcomes:

DATA & PROJECT OUTCOMES

- **Regions Served:** Prince William Sound and Southeast Alaska
- **Farms Supported:** 4 farms total (3 in Prince William Sound; 1 in Southeast Alaska)
- **Total Biomass Processed:** ~11,000 kg wet weight kelp
- **Organic Certification:** All participating entities completed Oregon Tilth certification process (certificates issued fall 2025)
- **Market Outcomes:**
 - Developed a new agricultural market channel for stabilized kelp.
 - Strengthened buyer relationships for future product demand.
 - Supported continued farmer participation by providing direct processing and purchase agreements.

Overall Outcomes:

MOM completed harvesting, processing, and stabilization of commercial kelp in Prince William Sound and expanded operations to Southeast Alaska. The mobile processing platform demonstrated that on-water stabilization is both logistically feasible and economically advantageous for farmers operating in remote regions.

Outcome Summaries by Objective:

- **Mobile Processing Implementation:** Successfully stabilized over 11,000 kg of kelp, improving processing efficiency by an estimated 40% compared to baseline operations.
- **Organic Certification:** MOM and all participating farmers achieved certification through Oregon Tilth, positioning Alaska producers to enter premium organic markets.
- **Market Development:** MOM pivoted from freezing-based stabilization to a solution-based process to meet agricultural market demand and built a relationship with a large-scale regional buyer, as requested by participating farmers.
- **Economic Feasibility:**
 - Purchase price paid to farmers: **\$1.00 per wet pound**
 - Processing and stabilization costs: **\$0.25 per wet pound**

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- Shipping and freight costs: **\$0.50 per pound**
 - Average stabilized product value: **\$1.75 per pound (wet-weight equivalent), delivered south of the 46th parallel.**

These figures indicate that the mobile model can yield positive margins when scaled and provide more equitable pricing for farmers when using a mobile processor. Additionally, these numbers indicate costs incurred for small-scale processing, but prices for processing and freighting harvested kelp product would be more favorable at larger scales.

Successes, Challenges, Lessons learned:

Successes:

- Expanded operations across multiple regions of Alaska.
- Achieved organic certification for both processor and farms.
- Strengthened farmer–buyer relationships and market confidence.
- Validated the technical feasibility of on-water stabilization.
- Gathered valuable cost and production data to guide future scaling.

Challenges:

- Morphological differences in kelp across farms required frequent operational adjustments during harvest.
- Shifting market conditions necessitated a pivot away from frozen kelp toward stabilized product formats.
- Accurate harvest forecasts and weather constraints increased logistical complexity.

Lessons Learned:

- Flexibility in processing method and buyer engagement is critical to industry growth.
- Farmer collaboration is key to successful certification and harvest coordination.
- Early engagement with buyers during planning phases helps align product specifications with market demand.
- Mobile processing dramatically increases harvest efficiency and quality retention, but future designs should continue to optimize deck space and throughput.

Continuation + Dissemination of Results: MOM hopes to continue expanding mobile processing support to additional regions, with targeted deployment to the Kenai Peninsula and Southeast Alaska for the Spring 2026 harvest.

The project team submitted an abstract to present findings on organic certification challenges and successes, in collaboration with Oregon Tilth, at Alaska’s fourth annual mariculture conference.

The results of this project underscore the economic potential of mobile processing for scaling Alaska’s kelp industry, supporting new farmers, and building long-term relationships with end buyers.

ECONOMIC FEASIBILITY AND MARKET DATA

As part of the project’s final reporting, Mothers of Millions (MOM) compiled approximate cost and pricing data to assess the economic feasibility of the mobile kelp processing model following the completion of Build Back Better funding.

- **Farmer Purchase Price:** Farmer purchase price depends on quality and quantity of harvest per farmsite.
- **Processing and Stabilization Costs:** Costs to harvest-assist, process, stabilize, and transport to the road system or to an end user south of the 46th parallel would be feasible at \$.35 per wet pound for a minimum of 100,000 pounds of wet kelp. After this harvest season, integrating the processing and transportation was deemed the most cost-effective approach.

- **Market Shift and Buyer Development:**
 - MOM’s decision to transition from frozen product trials to solution-based stabilization directly aligned with market signals in the agricultural sector.
 - Working with a large-scale regional buyer allowed MOM and participating farmers to explore a long-term purchasing relationship that could establish stable pricing and purchasing agreements beyond the grant period.
 - This approach, requested by participating farmers, is expected to provide a more durable economic pathway for continued kelp farming in Southcentral and Southeast Alaska.

These findings demonstrate the promise of the mobile processing model in achieving economic viability while directly supporting farmer participation and reducing barriers to market access.

Additional comments:

The project demonstrated the critical role mobile processing can play in scaling Alaska’s mariculture sector and supporting rural economic growth. The collaboration between MOM, Oregon Tilth, and participating farmers provides a replicable pathway for organic seaweed certification, supporting the long-term sustainability and market readiness of Alaska’s kelp industry.

BUDGET

Category	Budgeted	Expended	Notes
Equipment & Vessel Modifications, Labor (Harvesting, Processing, Coordination)	\$57,000	\$62,899	Retrofitting and upgrades for mobile processor, crew labor and coordination during Spring 2025 harvest
Organic Certification & Compliance	\$22,000	\$13,039	Administrative costs, assistance with certification paperwork, farm inspection fees
Materials & Supplies	\$21,000	\$24,062	Purchasing of organic kelp from farmers
Total	\$150,000	\$100,000	100% of awarded funds expended

PHOTOS









SNAPSHOT SUMMARY SLIDESHOW

Slideshow attached.