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# **The Alaska Mariculture Cluster: Grant Evaluation 2023-2025**

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## Table of Contents

1. Introduction and Context	1
2. Summary of Activities, Methods, and Work to Date	4
3. Review of AMC Targets	6
4. Regional Distribution of AMC Request for Proposal (RFP) Funds	9
5. Review of Industry Challenges	11
6. Value Chain Challenges	12
7. Industry-Wide Challenges	35
8. Conclusion and Next Actions	60
Appendix A. AMC Grant Components, Subawardees, and Budgets	64
Appendix B: AMC Theory of Change	65
Appendix C. AMC Indicators and Results to Date, 2024-2025	66
Appendix D. List of Workforce Development Programs and Knowledge Exchange Activities.	70
Appendix E. Glossary of Acronyms and Key Terms	73

### 1. Introduction and Context

In December 2023, Southeast Conference (SEC) hired Ecotrust’s Measurement and Evaluation (M&E) team to provide grant evaluation services for the Alaska Mariculture Cluster (AMC), a \$49M Build Back Better Regional Challenge (BBBRC) grant, as part of its Grant Administration component.<sup>1</sup>

This document summarizes the results of the grant evaluation from the year 2023 through the end of calendar year 2025. The purpose of this evaluation is to provide a review and assessment of the work funded by the AMC over this period, while providing feedback to support any necessary adjustments in AMC’s approach during the final year of the grant. This report begins by summarizing evaluation activities to date, including methods; then provides an overview of AMC Theory of Change and Targets, and then focuses closely on the twelve Industry Challenges that the Alaska mariculture industry faces and that were identified by Ecotrust and SEC.

The Alaska Mariculture Alliance (AMA) defines mariculture as: “the production, enhancement, utilization and promotion of marine shellfish and aquatic plants cultivated in Alaska.”<sup>2</sup> AMC is attempting to form and grow a mariculture **industry cluster** in the southern coastal regions of Alaska. An industry cluster is a geographic concentration of interrelated firms, suppliers, skilled labor, and institutions, that exist in a complex dynamic of cooperation and competition. Firms that are part of industry clusters often outperform otherwise similar firms that are geographically

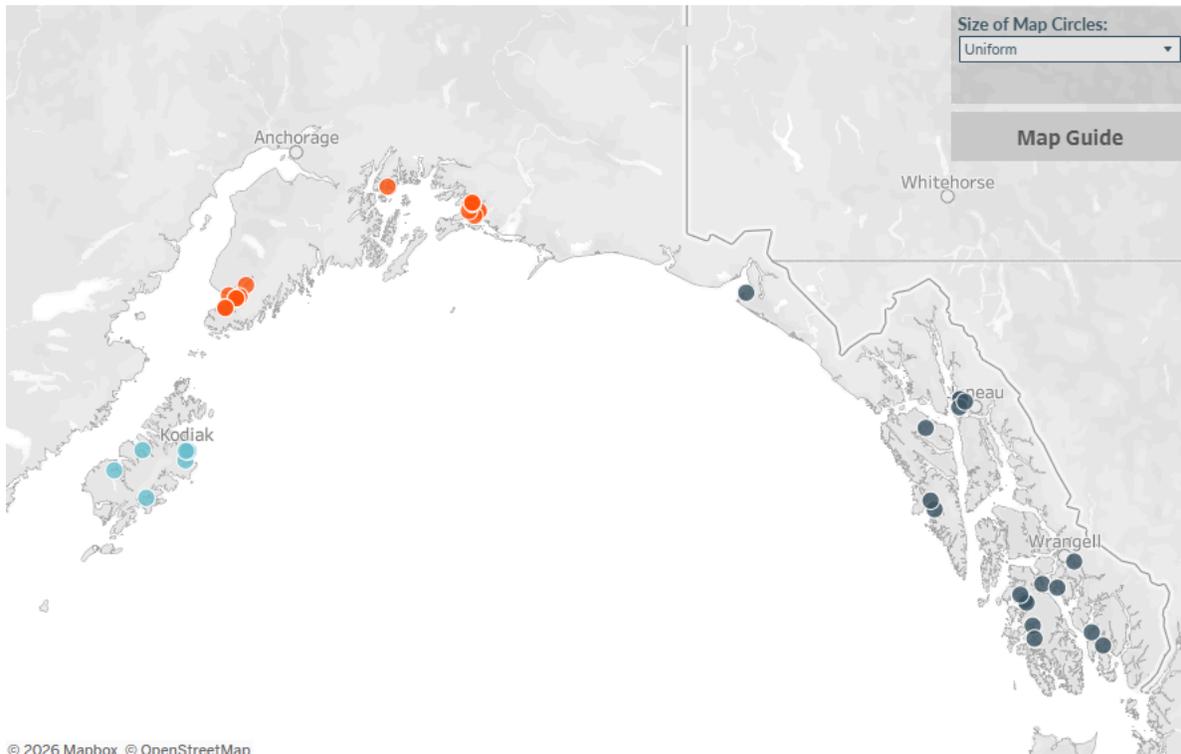
<sup>1</sup> A summary of all AMC grant components, subawardees, and budget is given in Appendix A.

<sup>2</sup> [Alaska Mariculture Alliance](#) (2026).

dispersed, due to concentration of talent and technical knowledge, and infrastructure built or adapted for the use of the industry.

Figure 1 below displays a map of active aquatic farm leases in Alaska as of the first quarter of 2025 (Jan-Mar). A total of 88 permits were authorized and 49 were pending, for a total of 137 permits. Of these, 60 were located in Southeast (dark blue), 54 in Southcentral (orange), and 23 in Kodiak and westward (light blue). Of these, 115 permits were for farms, 14 for hatcheries, and 14 for FLUPSYs. A total of 1,460 farming acres were authorized. This map demonstrates the broad geographic scope and dispersion of the regions covered by the AMC; as well, it shows geographic concentration in a few areas of coastline, including Prince of Wales Island (southern Southeast), Prince William Sound, the Kenai Peninsula, and Kodiak Island.

Figure 1. [Map of Active Aquatic Farm Leases in Alaska in 2024](#)  
(Source: Alaska Mariculture Insights)



Industry clusters may be initiated with support from public funds in the form of research and development grants and contracts, procurement contracts, loan guarantees, low-cost capital, and other forms of subsidies. For example, contracts and grants the Advanced Research Projects Agency (ARPA) at the Department of Defense were instrumental in funding the development of many of Silicon Valley’s most important innovations, including the early Internet. However, after the initial



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phase of development, successful cluster economies require leadership from outside the public sector.

The grant period for the AMC is from October 1, 2022 - September 30, 2026, with extensions for some programs and projects lasting through May 2027. By the end of the grant period, AMC's goal is to transition leadership of the Alaska mariculture industry to a range of other organizations outside the public sector, including independent businesses, financial institutions, Tribal corporations, nonprofit organizations, and universities.

AMC has brought together a broad coalition of partners that include federal, state, and local agencies; Tribal governments, Tribally led nonprofit organizations, and Tribal corporations; financial institutions, private foundations, universities, and industry associations. Prior to the BBBRC grant, many of these organizations had not worked together extensively or at all. The lead agency, Southeast Conference, issued 11 original subawards to a range of organizations:

- Alaska Mariculture Alliance (AMA)
- Alaska Fisheries Development Foundation (AFDF)
- University of Alaska Fairbanks (UAF)
- University of Alaska Southeast (UAS)
- Prince William Sound College (PWSC)
- Alaska Department of Environmental Conservation (ADEC)
- Alaska Department of Fish and Game (ADFG)
- Prince William Sound Economic Development District (PWSEDD)
- Kenai Peninsula Economic Development District (KPEDD)
- Southwest Alaska Municipal Conference (SWAMC)
- Spruce Root, a Native-led community development financial institution (CDFI)

In addition to these original subawardees, through the Mariculture Equipment Program SEC has issued subawards to nine (9) additional organizations that include Tribal agencies, Tribal corporations, State agencies, Native-led nonprofits, and other nonprofits. SEC and AMC subawardees, primarily AMA and AFDF, have contracted with an additional 46 unique organizations, who have formed partnerships with an additional 71 unique partners (individuals or organizations), to implement 112 active projects across its eight grant components. In total, 104 unique organizations are listed in the AMC Airtable Database as subawardees, contractors, and/or partners to AMC.<sup>3</sup>

The next section summarizes the activities and methods of the grant evaluation.

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<sup>3</sup> Some organizations fall into more than one category, e.g. an organization might be a subawardee, a contractor, and/or a partner. Hence the total is less than the sum of the individual categories.

## 2. Summary of Activities, Methods, and Work to Date

### 2.1. Preliminary Work: Theory of Change and Indicators

The first step in Ecotrust’s grant evaluation process was to identify a Theory of Change for the AMC. Between March and June 2024, Ecotrust, SEC, and the AMC subawardees collaboratively created a series of seven Outcome Maps to summarize the planned activities and desired outcomes of each AMC Grant Component. In December 2024, Ecotrust and SEC collaboratively synthesized these Outcome Maps into a single-page Theory of Change document, completed in February 2025 and presented as a poster at the Mariculture Conference of Alaska.<sup>4</sup> Concurrently between March and June of 2024, Ecotrust, SEC, and the subawardees developed a list of Indicators for each AMC Grant Component, which Ecotrust has used to track progress toward AMC’s goals.<sup>5</sup>

### 2.2. Document review and data analysis

To understand the progress of AMC toward its goals and outcomes, Ecotrust has reviewed the following documentation and data on AMC programs, projects, and grant components:

- Grant Component narratives and Gantt charts
- Quarterly Reports submitted by each Subawardee
- Semiannual Reports to EDA submitted by SEC
- Monthly Mariculture Liaison Reports
- Requests for Proposals (RFPs) created by SEC, AFDF, UAF, AMA, and others
- Project Overviews, Interim, and Final Reports created by RFP Awardees (Contractors)
- RFP Project Meetup Video presentations and slide decks created by Awardees
- Project data collected by SEC through the [AMC Airtable Database](#)
- Project summaries compiled by SEC through its website

### 2.3. Interviews

Ecotrust’s Measurement & Evaluation Team engaged in a series of semi-structured interviews with industry experts and community leaders to understand perceptions of AMC’s impact and identify key themes related to AMC’s achievements in addressing key industry challenges. To prepare for these interviews, between February and November 2024, Ecotrust engaged in 10 preliminary meetings with staff from SEC, the AMC subawardees, and Liaisons; and engaged in 7 additional informal conversations with regional mariculture leaders, including leaders of regional nonprofits, Tribal corporations, mariculture farmers, and AMC Governance Body members including Tribal representatives. We used these conversations to develop a thematic interview protocol. We then reached out to each AMC Liaison to support outreach to potential interviewees across the 5 regions of the AMC.

Using the protocol, between December 2024 and June 2025 we conducted semi-structured interviews with 27 people, including mariculture industry experts and community leaders across 4

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<sup>4</sup> See Appendix B for the one-page AMC Theory of Change.

<sup>5</sup> See Appendix C for a summary of all indicators and results tracked in 2024-2025.



regions of the AMC (Southeast, Prince William Sound, Kenai, and the Kodiak Archipelago)<sup>6</sup>. A large majority of the interviewees - 24 of 27 - had direct experience with an AMC grant component or AMC-funded project. Of these, 13 were RFP awardees, 5 were Governance Body members, 5 were participants in Workforce Development or Native Conservancy Immersion Training programs, and 4 were either current or former Liaisons.<sup>7</sup> Ten (10) of our interviewees were current or aspiring mariculture farmers, of which seven (7) were focused on kelp and three (3) on oysters.

Alaska Native and rural people were well represented in our interviewee sample. Fifteen (15) of our 27 interviewees worked for an Alaska Native-led organization (Tribal agency, Tribal corporation, Native-led nonprofit, and/or Native-owned small business), and 10 interviewees were Alaska Native tribal citizens. 21 interviewees lived primarily in a rural area (outside Anchorage, Juneau, Fairbanks, or Ketchikan); an additional three (3) interviewees lived in Anchorage but worked for a rural-based organization.

## 2.4. Focus Groups

Ecotrust's original scope of work for the AMC grant evaluation included focus groups as a source of qualitative data. Focus groups allow for the possibility of discussion and the inclusion of multiple perspectives, as well as sharing common experiences. Initially, our team favored semi-structured 1:1 interviews over focus groups because of their depth, as well as flexibility in scheduling. After concluding our semi-structured interviews in June 2025, we began exploring the potential for online focus groups as a more efficient, targeted means of eliciting information about AMC's impact from a wider range of key leaders and community members.

From July 2025 to February 2026, we convened four focus groups with a combined 35 participants, in Kodiak, Kenai Peninsula, Prince William Sound, and Southeast. Regional mariculture leaders in Kodiak, including Roberta Townsend Vennel of Kodiak Archipelago Leadership Institute (KALI), supported this process by advising us to convene a focus group for the Kodiak region. In July 2025, we convened a focus group of 12 regional mariculture leaders from across the Kodiak Archipelago, the majority of whom were Tribal citizens and/or worked for Tribal agencies or corporations. The success of this focus group motivated Ecotrust, the EDDs, and Liaisons to organize collaboratively the other three focus groups. Ecotrust hosted and moderated focus groups in Prince William Sound (8 participants), the Kenai Peninsula (7 participants), and Southeast (8 participants) in January and February 2026.

## 2.5. Small sample survey

In July 2024, Ecotrust designed a detailed survey, with extensive input from SEC, for Alaska mariculture affected parties to provide systematic feedback on the impacts of the AMC. Ecotrust and SEC distributed postcards with links to this survey at numerous venues, including the KALI

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<sup>6</sup> We were not able to find interviewees in Southwest Alaska (Aleutians & Pribilofs) who had sufficient experience with AMC to be interviewed productively.

<sup>7</sup> Some interviewees had more than one connection to AMC.

Rural Forum, Koniag Roundtable, and Mariculture Conference of Alaska; meetings of the Liaisons and Governance Body; as well as numerous newsletters and email blasts. The combined audience for these outlets numbered in the thousands. So far, however, we have only received 7 responses, of which only 3 respondents were directly involved in mariculture of any kind. As a result, the survey will not be a significant source of evaluation findings.

## 2.6. Site visits and conference attendance

Ecotrust staff engaged in 5 site visits and attended 4 conferences, as well as multiple Governance Body meetings, to understand the context of Alaska mariculture, listen to and interact with AMC funding recipients and subawardees, observe and participate in the governance of AMC, and recruit participants to engage in evaluation activities including surveys, interviews, and focus groups. Site visits included Alutiiq Pride Marine Institute ([APMI](#)), Southeast Alaska Tribal Ocean Research ([SEATOR](#)), [Sitka Sound Science Center](#), and two outreach and listening trips to Prince of Wales Island and Kake. Conference attendance included [Koniag Roundtable](#) (2024)<sup>8</sup>, [KALI Rural Forum](#) (2024), [Mariculture Conference of Alaska](#) (2025), and [Southeast Tribal Environmental Forum](#) (2025).

## 2.7. Summary of Methods

The above activities have resulted in Ecotrust understanding the regional economic, social, cultural, and environmental context of Alaska mariculture; observing the development of the Alaska mariculture industry and AMC's role within it; and developing relationships with industry participants, experts, and affected community members to engage in trust-based interviewing and focus group discussion. The analyses and themes identified in the remainder of this memo are the result of the groundwork described above.

## 3. Review of AMC Targets

At the outset of the grant, SEC and its partners in the AMC set targets for reaching Alaska Native and rural communities:

- Target 1: 25% of grant resources to benefit Alaska Native communities, and
- Target 2: 25% of grant resources to benefit rural communities<sup>9</sup>.

This section summarizes progress toward these targets.

SEC classified all AMC-funded projects based on whether they benefited Alaska Native populations and/or rural Alaskan communities, according to a set of criteria (described below). Projects were classified according to these criteria through analyzing project documentation, including the identity and location of lead organizations and partner organizations; the existence of collaborative agreements and letters of support from Alaska Native and rural community organizations, and project descriptions, including their intended outcomes. The classifications, along with justifications for inclusion, were compiled by SEC in its Airtable database.

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<sup>8</sup> Ecotrust's attendance at this conference was virtual.

<sup>9</sup> For the purposes of this grant evaluation, rural communities are defined as those outside Anchorage, Fairbanks, Juneau, or Ketchikan.

Criteria for inclusion for projects that benefit Alaska Native populations are as follows:

- An AK Native-led org (e.g. Tribal agency, ANC, nonprofit) is either the project lead or a major project partner;
- **or** an AK Native-led org (e.g. Tribal agency, ANC, nonprofit) has a collaborative agreement and/or Letter of Support for the project;
- **and** the final product or result of the project will provide measurable benefits to a Tribe, Alaska Native org, or Alaska Native community.

Criteria for inclusion for projects that involve and benefit rural communities are as follows:

- The project is located in a rural community;
- **or** the project has multiple locations, at least one of which is a rural community
- **and/or** the final product or result of the project will provide measurable benefits to rural communities.

Based on the above criteria, Figure 2 below identifies and displays:

- The number and proportion of AMC projects that are intended and designed to benefit Alaska Native populations, including Tribes and/or Alaska Native-led organizations;
- The number and proportion of AMC projects that involve and are designed to benefit rural communities, defined as those outside Anchorage, Juneau, Fairbanks, or Ketchikan.

The figure below counts only projects that are in progress or complete. Majorities of projects meet the criteria above for benefiting both Alaska Native populations and rural communities, as follows:

- 53% (55 out of 104 classified projects) meet the criteria above for benefiting Alaska Native populations;
- 58% (60 out of 104 classified projects) meet the criteria above for involving and benefiting rural communities.

Figure 2. Percentage and Number of AMC Funded Projects by Alaska Native Benefit and Rural Community Involvement<sup>10</sup>

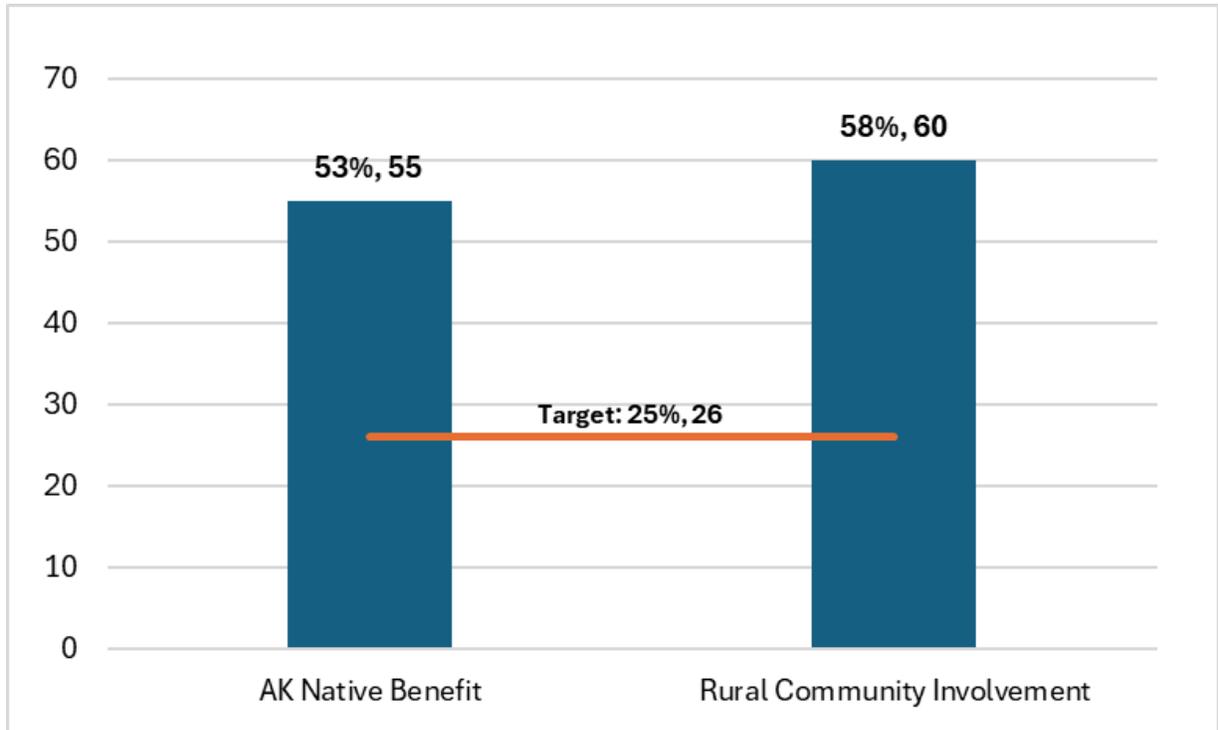
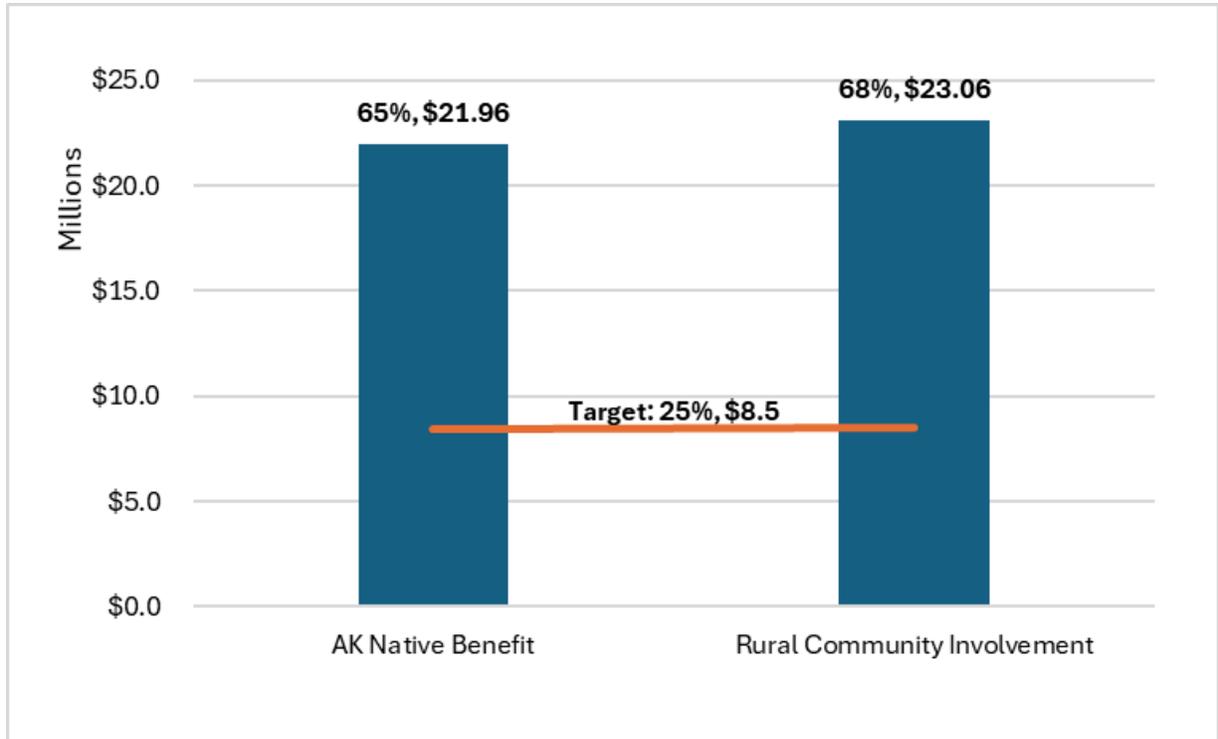


Figure 3 below identifies the combined budgets of AMC projects that are intended and designed to benefit Alaska Native populations and rural Alaskan communities. As above, the figure only includes projects that are in progress or complete. The figure demonstrates that the majority of the budget resources of the AMC are in projects that meet the criteria above for benefiting both Alaska Native populations and rural communities:

- 65% of combined project budgets (\$21.96M out of \$33.95M in classified project budgets) meet the criteria above for benefiting Alaska Native populations;
- 68% of combined project budgets (\$23.06M out of \$33.95M in classified project budgets) meet the criteria above for involving and benefiting rural communities.

<sup>10</sup> Figures 1 and 2 exclude match, projects not started, cancelled projects, and RFP programs with substantial pending awards (e.g. Mariculture Equipment Round 3). Workforce Development subawards were not classified due to uncertainty about meeting the criteria.

Figure 3. Percentage and Value of AMC Funded Projects by Alaska Native Benefit and Rural Community Involvement



To summarize briefly, AMC is on track to exceed its targets of 25% of projects to benefit Alaska Native populations and 25% of projects to benefit rural Alaskan communities.

#### 4. Regional Distribution of AMC Request for Proposal (RFP) Funds

AMC has distributed a significant portion of its funding through RFPs (requests for proposals). Over the course of the grant period (ending 12/31/2025), AMC has issued 33 RFPs and issued awards with combined budgets of \$17.9M. This large number of RFPs reflects the number and complexity of the Industry Challenges that the nascent Alaska mariculture sector must overcome. The AMC has used RFPs as a vehicle for building its extensive coalition described in Section 1 above. The AMC's RFPs and awards have supported the intricate network of relationships - across and within industry sectors, nonprofits, and academia - necessary to form an industry cluster.

Figure 4 below presents the distribution of AMC funding awarded through RFPs, by target region.<sup>11</sup> The largest recipient of funds was Southwest (Kodiak & Aleutians) with \$3.8M, followed by Southeast (\$3.4M), Kenai Peninsula (\$2.7M), and Prince William Sound (\$1.6M). This distribution of funds

<sup>11</sup> RFP funded projects that target All Regions are not displayed in Figure 3. These projects include key research and data projects that cover the entire AMC area, such as De-Risking Investments. The total value of these projects is \$6.3M, which dwarfs all the region-specific projects.

suggests that Prince William Sound has been neglected; however, this region also has the smallest population of the four main AMC regions. Figure 4 demonstrates that, as of the end of calendar year 2025, the vast majority of RFP funded projects in all regions were In Progress, ranging from a low of 77% in Southeast to a high of 100% in projects covering more than one region (but not All Regions).

Figure 4. Distribution of RFP Funds by AMC Region (\$M), by Status

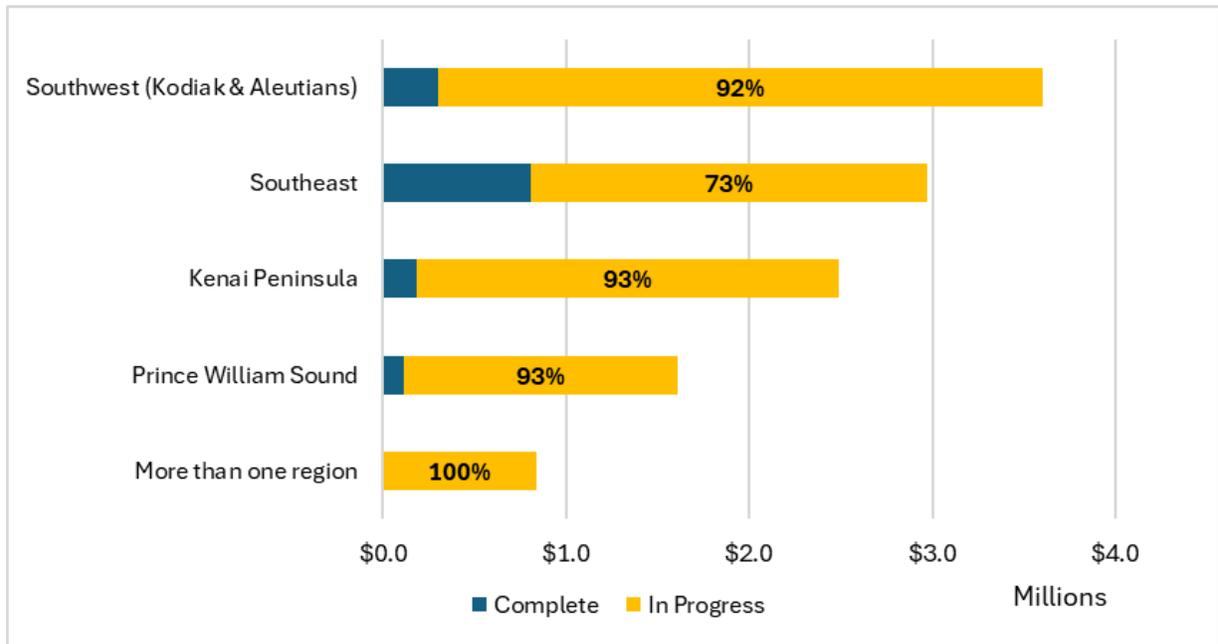


Table 1 below presents the top five communities that have been funded by RFP awards. These communities are distributed across the four principal AMC regions; the top three communities (Kodiak, Cordova, and Seward) are all considered rural.

Table 1. Top 5 Communities of RFP Awarded Projects, by Budget

Location	Region	Total Awarded Funding
Kodiak	Southwest (Kodiak & Aleutians)	\$3,301,209
Cordova	Prince William Sound	\$1,468,107
Seward	Kenai Peninsula	\$1,177,450
Juneau	Southeast	\$979,114
Ketchikan	Southeast	\$776,746

## 5. Review of Industry Challenges

In summer 2025, Ecotrust & SEC collaboratively created a list of Industry Challenges that the AMC grant is designed to address, based on the results of project document review, data analysis, and comments from interviewees. This list is given below in Tables 2 and 3, along with the number of projects addressing this challenge and their combined budgets. We group the industry challenges into two categories: those that relate specifically to the value chains for mariculture products (Table 2), and those that affect the industry as a whole (Table 3).

Table 2. List of AMC Value Chain Challenges\*

Industry Challenge	Number of Projects	Combined Projects Budget
Site Selection & Permitting	2	\$1,299,386
Hatchery & Nursery Sector	25	\$5,609,317
Cultivation	13	\$1,347,850
Food Safety	3	\$4,305,047
Stabilization, Processing, & Distribution	27	\$5,247,276
Product & Market Development	26	\$4,759,361
<b>Total</b>	<b>96</b>	<b>\$22,568,237</b>

\*Excludes Match, cancelled projects, projects not yet started, and projects uncategorized. This list is not mutually exclusive; projects that fall under more than one Industry Challenge are counted twice.

Table 3. List of AMC Industry-wide Challenges\*

Industry Challenge	Number of Projects	Combined Projects Budget
Access to Capital	5	\$9,881,532
Access to Subsistence & Food Security	8	\$872,261
Governance & Administration	12	\$4,830,790
Innovation, Technology, & Data	7	\$1,621,916
Outreach, Communication, & Knowledge Exchange	10	\$3,330,052
Workforce Development	8	\$10,722,842
<b>Totals</b>	<b>50</b>	<b>\$31,259,393</b>

*\*Excludes Match, cancelled projects, projects not yet started, and projects uncategorized. This list is not mutually exclusive; projects that fall under more than one Industry Challenge are counted twice.*

The six challenges identified in Table 2 span the mariculture (seaweed & shellfish) value chains from site selection, hatcheries, and nurseries to product development and marketing. The six challenges identified in Table 3 cut across the whole mariculture industry, including Access to Capital, Workforce Development and Innovation, Technology, and Data. The Industry Challenge of Governance & Administration speaks to the challenge of administering a large (\$49M) grant such as the AMC, in which the majority of the partner organizations had little to no previous experience managing federal grant funds.

In the following sections, we focus on each of the Industry Challenges identified above. We begin by discussing those that are specific to the value chains for seaweed and shellfish: from the initial process of farm site selection and permitting, to the production and marketing of finished products.

## 6. Value Chain Challenges

This section introduces the six Industry Challenges that comprise the value chains for mariculture products, both seaweed and shellfish. They are: Site Selection and Permitting; Hatchery and Nursery; Cultivation; Food Safety; Stabilization, Processing, and Distribution; and Product and Market Development.

Each Value Chain Challenge described below contains a description of its alignment with the AMC Theory of Change; a summary of Results to Date including at least one Indicator; a description of at least one Example Program (or Project); and one or more Successes to date and/or Challenges that remain. Some of the Challenges are followed by Responses that summarize AMC's work to date to address it.

## 6.1. Site Selection and Permitting

AMC is addressing the Industry Challenge of Site Selection and Permitting primarily through its [De-Risking Investments & Site Suitability Program](#), a targeted initiative within AMC’s [Research & Development](#) grant component (#4) focused on improving site-selection confidence for Alaska’s emerging mariculture industry. Greater confidence in mariculture site selection will reduce barriers to investment in the sector, and support mariculture farmers in choosing right-size equipment.

There is high demand for robust and scientifically validated data about the environmental characteristics and gear requirements associated with candidate mariculture farm sites across the AMC region. This need was made clear by multiple interviewees and data sources. One interviewee, who works at a nonprofit that supports mariculture farmers, noted, “It would be great if there was a way to share collected data on what makes a good farm site.” Another interviewee, who works at a Native-led nonprofit, said, “The industry is missing key questions about site selection.”

### 6.1.1. Theory of Change Alignment

The AMC Theory of Change (see Appendix 1) identifies two desired outcomes related to site selection and permitting:

- Increased private investment and startups (Intermediate Outcome)<sup>12</sup>
- Reduce cost structure for Alaska mariculture industry (Long-Term Outcome)<sup>13</sup>

### 6.1.2. Results to Date: Projects by Budget

**Indicator:** Number and value of projects: **3 projects with combined value of \$1.3M.** Table 4 below summarizes the projects and budgets devoted to Site Selection & Permitting.

Table 4. Site Selection and Permitting Projects\*

Project	Total Budget
De-Risking Investments: Ocean and Wave Simulations and Analysis	\$1,099,990
Kelp Seed Quality: Population genetics and gametophyte seed banking of Alaska kelps (KelpArk)	\$199,396
JIP 21: Sea Otter Sound Mariculture Data Initiative	\$5,396
<b>Total</b>	<b>\$1,304,782</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and projects cancelled.	

<sup>12</sup> An Intermediate Outcome is an outcome, or change in conditions, that is a building block of a longer-term outcome. The AMC intends for its Intermediate Outcomes to be initially achieved within the grant period and then continue to grow in the five years following (between 2026- 2031). See Appendix E, Glossary.

<sup>13</sup> A Long-Term Outcome is a lasting impact a program aims to achieve. The AMC intends for its Long-Term Outcomes to be achieved within 5-10 years after the grant period concludes (between 2031-2036). See Glossary.

### 6.1.3. Example Program: [De-Risking Investments in Site Suitability](#)

In July 2024, Alaska Fisheries Development Foundation (AFDF) issued the [De-Risking Investments in Aquatic Farming](#) RFP. The intent of the solicitation was to fund modeling and/or data-collection studies that support the mariculture industry in selecting appropriate sites and right-sizing equipment. The RFP led to two awards, of which the largest award (\$1.1M) was to a project led by Kelson Marine, called “De-Risking Investments: Ocean and Wave Simulations and Analysis.”<sup>14</sup>

Kelson Marine is creating new resources for the Alaskan mariculture industry’s site selection and farm design process through models of ocean currents and waves, farm site environmental characteristics (e.g. water temperatures, salinity levels, etc.), and farm-level costs of production including fixed and operating costs. These models will generate maps and datasets of environmental factors that affect mariculture; provide right-sized gear specifications for selected sites; and generate estimates of production costs based on site characteristics. The resources will cover both seaweed and shellfish mariculture, and geographically cover the entire AMC region. The data will be publicly available in reports and online maps by September 2026, providing actionable intelligence to accelerate the growth of Alaska’s mariculture industry safely. The project [Interim Report](#), which is available on the AMC website, states: “The sparse nature of actionable data in coastal Alaska is hindering quality site selection and reliable gear right-sizing, slowing the growth of safe, economically viable mariculture in the state.”<sup>15</sup>

### 6.1.4. Remaining Challenges

Interviewees raised two challenges regarding site selection and permitting: long turnaround timelines, and the potential for permitted sites to overlap and interfere with Tribal subsistence and cultural harvesting areas.<sup>16</sup>

**Challenge: Long Permitting Timelines.** Multiple interviewees spoke to the long timeline and [complex process](#) of acquiring aquatic farm permits as a bottleneck impeding mariculture industry growth. One interviewee, an oyster farmer, noted, “The state agencies are underfunded. So it’s hard to get permits because there’s not enough staff.” Another interviewee, a kelp farmer, observed: “The permitting process has improved dramatically in response to a flood of permit applications, though this is not necessarily because of the AMC’s work.”

**Challenge: Concern for Tribal Harvesting.** Tribal agency and community representatives who were interviewed voiced concerns about the risks of permitted farms interfering with cultural and subsistence harvesting areas. As one interviewee, who worked for a Tribal agency, noted: “The permitting process lacks Tribal consultation; permits tend to go to the same places that are best for

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<sup>14</sup> The other award was for an oyster seed transfer project (\$88k), which addresses the Industry Challenge of Hatchery & Nursery and is not discussed here.

<sup>15</sup> Kelson Marine, [De-Risking Investments in Aquatic Farming Interim Report](#) (2025), p. 2.

<sup>16</sup> Since AMC’s activities cannot directly affect the mariculture permitting or site selection process, these two Challenges should be understood as relevant to the context in which AMC is working, rather than an evaluation of AMC’s impact.

Tribal harvesters.” This interviewee also noted that Tribes are attempting to address this issue through the [Aquaculture Opportunity Areas](#) (AOA)<sup>17</sup> program of National Oceanic and Atmospheric Administration (NOAA).

## 6.2. Hatchery & Nursery Sector

At the beginning of the AMC grant period, hatchery and nursery capacity was identified as a significant constraint on mariculture production. The AMC project narrative identified increased production capacity and efficiency at Alaska’s existing hatcheries and nurseries as a key objective of its [Equipment and Technology](#) grant component (#7), promising to “assist existing hatcheries and nurseries with equipment modernization and associated technology innovations to reduce operating costs, increase production capacity, and improve seed quality.”<sup>18</sup>

The importance of a strong hatchery and nursery sector to Alaska’s mariculture industry cannot be overstated. As a focus group participant in Prince William Sound explained: “The hatchery is the basis of the kelp industry. If farmers don't get good seed, they're not going to be able to grow as much kelp on their farms, and that's going to reduce the amount that they can sell to the buyers and market themselves.”

### 6.2.1. Summary and Takeaways

AMC’s investments in hatcheries and nurseries have undoubtedly contributed to improvements in the sector across the AMC regions. The ongoing investments in knowledge exchange, technical assistance, and hatchery infrastructure have been critical to these recent improvements. A focus group participant said of the 2025 kelp seed output: “The quality was the best that any of us have seen yet.” AMC investments in kelp seed quality improvements, including seaweed genetic analysis and pilot testing of gametophyte culture techniques, promise to make significant progress toward informing kelp hatchery regulatory reforms to make these techniques possible at commercial scale.

### 6.2.2. Theory of Change Alignment

The AMC Theory of Change identifies five desired outcomes related to the hatchery and nursery sector:

- Adequate seed supply (Intermediate Outcome)
- Increased regulatory efficiency (Intermediate Outcome)
- Knowledge exchange (Intermediate Outcome)
- Reduce cost structure for the Alaska mariculture industry (Long-Term Outcome)
- Grow Alaska mariculture industry equitably and sustainably (Long-Term Outcome)

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<sup>17</sup> An Aquaculture Opportunity Area (AOA) is a defined geographic area of the ocean evaluated for its suitability for mariculture (here called aquaculture) by NOAA using a combination of scientific analysis and public engagement. The process of identifying AOAs is intended to maximize their compatibility with other ocean uses, while maintaining NOAA’s commitments to ocean stewardship and marine resource conservation. For a brief overview, see [NOAA Fisheries \(2024\)](#).

<sup>18</sup> Alaska Mariculture Cluster, [Equipment and Technology Component Narrative](#) (2022).

### 6.2.3. Results to Date: Projects by Species Group and Budget

**Indicator:** Number and value of relevant projects by major species group: **25 total projects, of which 12 focus on seaweed, 10 shellfish, and 3 both, with combined total budgets of \$5.6M**

In the hatchery and nursery sector, seaweed and shellfish producers have distinct needs. For seaweed producers, inconsistent quality seed, stemming from seed spool contamination, has impeded market growth. Oyster producers have a different problem: they currently rely on seed from West Coast hatcheries that are optimized for lower-latitude waters, resulting in slow growth and high juvenile mortality in Alaska’s colder conditions.

Table 5 below looks at hatchery and nursery projects by major species group of interest (seaweed, shellfish, or both). 12 of the 25 active or completed Product & Market Development projects focus on seaweed; 10 on shellfish; and 3 on both. The majority of the hatchery and nursery funding (\$3.6M out of \$5.6M, 65%) has gone to seaweed-focused projects.

Table 5. Hatchery and Nursery Sector Projects by Major Species Group\*

Species Group	Number of Projects	Total Budget
Seaweed	12	\$3,639,005
Shellfish	10	\$1,359,313
Seaweed and Shellfish	3	\$610,999
<b>Grand Total</b>	<b>25</b>	<b>\$5,609,317</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and projects cancelled.		

### 6.2.4. Success: Increased Availability of Seed

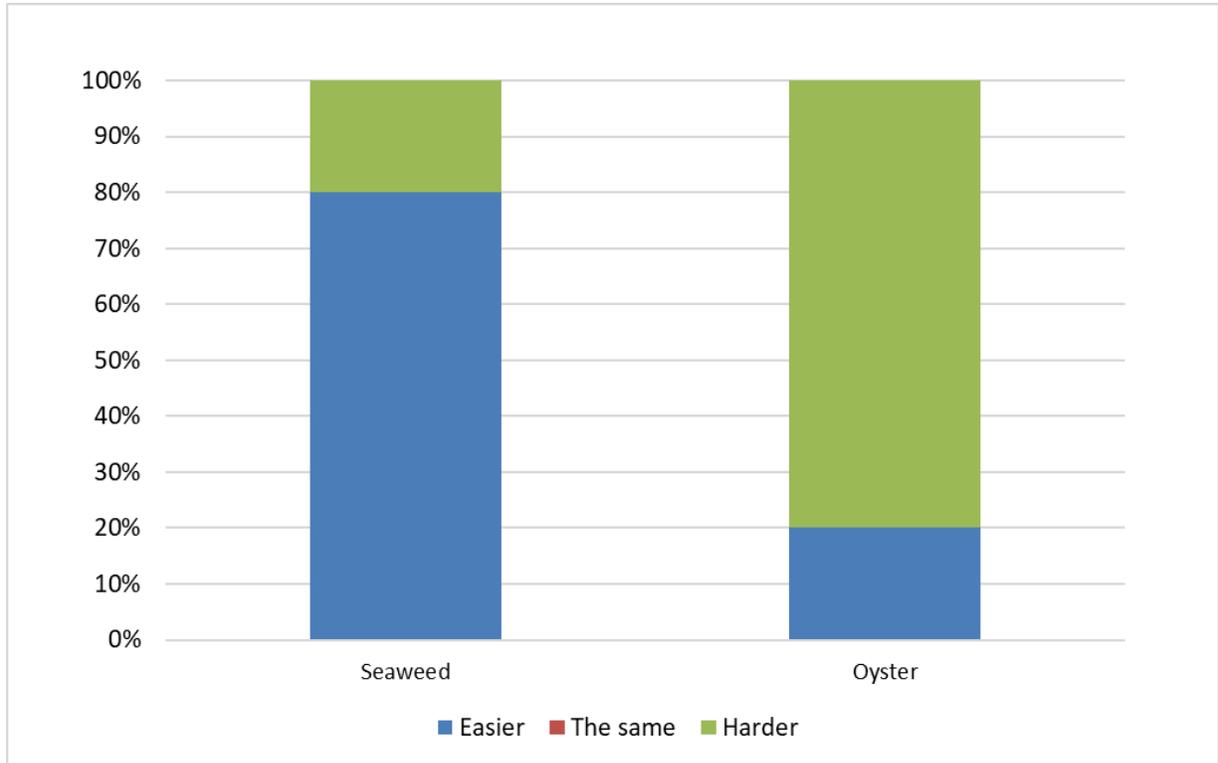
**Indicator:** Number of farmers reporting increased availability of seed: **43% for oysters, 50% for seaweed.**<sup>19</sup>

Securing a reliable supply of high quality seed is an important issue for both shellfish and seaweed farmers. As one interviewee, a kelp farmer, noted, “There have been major inconsistencies with the production of seed.” Another interviewee, a former hatchery operator, noted, “Current hatcheries’ seed spools are having issues with contamination.”

<sup>19</sup> These results came from the 2025 Aquatic Farm Survey distributed by McKinley Research. Due to the small sample size of the survey, we are reporting percentages rather than numbers.

In 2024 and 2025, McKinley Research Group<sup>20</sup>, a contractor of the AMC, distributed an Aquatic Farm Survey to understand a range of relevant issues related to seaweed and shellfish farming, including whether seed is becoming easier or difficult to source over time. Figures 5 and below summarizes the responses of oyster and seaweed farmers to that question over the years 2024 and 2025.

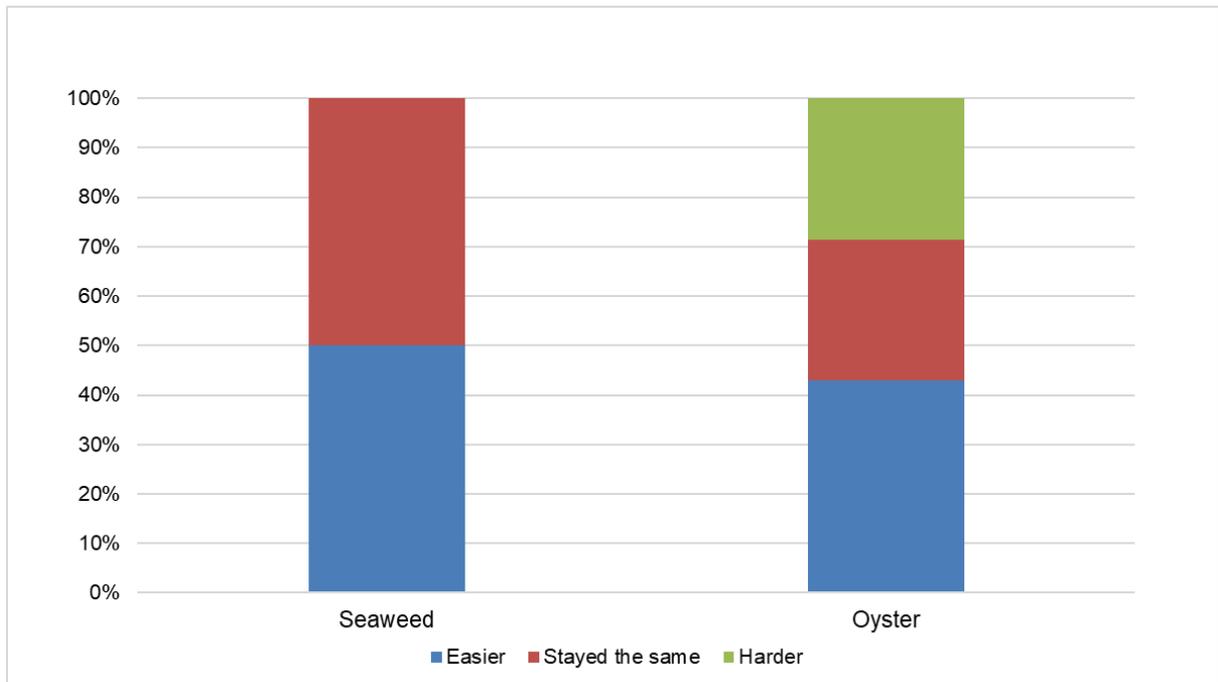
Figure 5. Change in relative difficulties in sourcing oyster and seaweed seed, 2024  
“Has it gotten harder or easier to source seaweed or oyster seed since you began farming?”<sup>21</sup>



<sup>20</sup> McKinley Research Group also publishes regular seaweed industry updates, including reports on seeded line, harvests, and new leases and permits, as a contractor to SEC providing the AMC [Economic Research Services](#).

<sup>21</sup> Data Source: McKinley Research, Alaska Aquatic Farm Questionnaire. Excludes “NA” and “Other” responses.

Figure 6. Change in relative difficulties in sourcing oyster and seaweed seed, 2025  
"In 2025 was it harder or easier to source seaweed or oyster seed than in 2024?"<sup>22</sup>



Comparing Figures 5 and 6 above shows slightly different results for seaweed and oyster farmers. For seaweed farmers, 80% of respondents in 2024 reported an easier time sourcing seed than in the past; however, only 50% of respondents said so in 2025; and the remainder reported that the difficulty of sourcing seaweed stayed the same. For oyster farmers, a larger proportion of survey respondents found it easier to source seed in 2025 compared to 2024, and a smaller proportion of respondents found it harder.

Though self-reports of easier seed sourcing cannot be directly attributed to AMC's activities, it is an indicator of overall progress in the hatchery sector of the mariculture industry, to which AMC has undoubtedly made a contribution through its work to support both shellfish and seaweed hatcheries and nurseries. The next section provides some examples of AMC's work in this area.

#### 6.2.5. Example Program: [Mariculture Equipment Program](#).

**Indicator:** Hatchery equipment provided by function and value: **41 pieces of equipment provided, with total combined value of \$5.3M.**

<sup>22</sup> Data Source: McKinley Research, Alaska Aquatic Farm Questionnaire, 2025. Excludes "NA" and "Other" responses.

The original subawards to universities and state agencies provided 15 pieces of hatchery and nursery related equipment, worth \$3.6M. Since then, the Mariculture Equipment Program issued two Equipment RFPs, rounds 1 and 2, which have focused on the hatchery/nursery sector as well as stabilization and processing. 8 of 15 equipment awards to date, worth \$2M, have gone to the hatchery and nursery sector. These awards have distributed 26 pieces of equipment worth a combined \$1.7M.

Below is a selected list of hatchery/nursery related equipment funded by both the Equipment RFP awards and the original subawards:

- Nursery expansion at Prince William Sound Science Center (PWSSC)
- Floating mariculture hatchery and lab at University Alaska Southeast (UAS)
- High performance computing cluster at Alaska Department of Fish & Game (ADFG)
- 3 FLUPSYs in Larsen Bay, Homer (Kachemak Bay), and Chenega
- Containerized kelp nursery for Native Conservancy in Metlakatla
- Seaweed and shellfish hatchery upgrades for Alutiiq Pride Marine Institute (APMI) in Seward
- Seaweed bioreactor at University of Alaska Fairbanks (UAF)

#### **6.2.6. Example Project: [Optimizing Kelp Seed Production](#)**

**Indicator:** Number of nursery operators and mariculture farmers provided with technical assistance in hatchery/nursery skills: 7

A \$215k project led by Greenwave and funded through the Kelp Seed Quality Improvement program, this project meets an identified need for training and knowledge exchange on nursery production across the Alaskan mariculture sector. The project is developing Standard Operating Procedures (SOPs) and methods to reduce contamination and increase seed quality, and assisting nursery operators in infrastructure upgrades to enhance seed quality controls. To date, the project has held a workshop in Cordova for seven (7) nurseries; offered follow-up hands-on support and TA for nursery development; built a Community of Practice around kelp nursery development; and piloted a containerized nursery at the Kodiak Marine Science Center, for which SEC provided additional funding to hire a full-time operator.

Interview results confirmed the need and importance of this intervention. In December 2024, an interviewee said, "More than anything, we're lacking a knowledge exchange and solid training on nursery production in Alaska. It's a huge bottleneck." Recognizing this need, SEC issued its [Kelp Seed Quality Improvement](#) RFP in December 2024. This RFP has awarded \$590k to date across 3 projects to address the inconsistent quality of kelp seed across Alaskan nurseries, including the one described above.

**Success: Improved Hatchery and Nursery Technology and Practices.** The AMC's work in supporting the hatchery and nursery sector has resulted in improved technology and practices across multiple regions. In Prince William Sound, the Optimizing Kelp Seed Production project (described above) and the Nursery Expansion award at Prince William Sound Science Center (PWSSC) have

complemented each other in improving the quality of hatchery and nursery technology and practices. As one focus group member in Prince William Sound explained:

The Prince William Sound Science Center was awarded funding to build out a nursery at their campus. That funding allowed them to purchase a cold room where they could better maintain water temperature; before that, there was a problem with the tanks getting too warm, and as a result, microalgae blooms were happening in the tanks, which was contaminating the seed spools and making the seed quality unacceptable to the farmers. With the Equipment award to the Science Center, they established this great nursery space. And then Greenwave came and hosted a workshop, where nursery operators from around Alaska came to see the PWSSC facility, learned best practice protocols, and then did a production run for the Cordova kelp farmers. *And the seed quality was the best that any of us have seen yet.*

Another focus group member in Prince William Sound corroborated: “The infrastructure of our hatchery is 100 times better than it was before.” The Greenwave workshop described above also benefited hatchery operators in other regions, including the Kenai Peninsula, who attended and improved their skills. A Kenai Peninsula focus group member said, “As a result of the Greenwave workshop, and the expansion of infrastructure at (our local hatchery), we’ve seen an improvement in seed quality over the last couple years. And over the medium to long run, that means a more reliable supply of commercially farmed kelp on the peninsula.”

#### **6.2.7. Example Program: [Seaweed Population Genetics Program](#)**

**Indicator:** Number of analyses on genetic diversity: whole genome sequencing on three (3) kelp species (bull, ribbon, and sugar)

The Seaweed Population Genetics program, led by the Alaska Department of Fish and Game’s (ADFG) Gene Conservation Laboratory with a budget of \$2.2M, is conducting advanced genetic research on Alaska’s main three kelp species (sugar, ribbon, and bull kelp) to inform sustainable mariculture policies, protect wild kelp populations, and support responsible industry growth. The project will provide scientific evidence to inform potential updates to Alaska’s 50-km drift zone and 50-broodstock rule (the “[50-50 rule](#)”) on a regional basis for permitting kelp farms. These updates may facilitate a wider array of hatchery and nursery propagation techniques, including gametophytes, and thus increase the growth of kelp nurseries throughout the state. The work will ensure that farmed kelp populations remain genetically diverse, which guards against inbreeding and genetic degradation. And through facilitating nursery expansion, the work will support responsible expansion of Alaska’s kelp industry.

Alaska mariculture participants recognize the need for this work. One interviewee noted in December 2024, “ADFG is not approving any innovations in kelp seeding due to genetics concerns,” which this work will address. Another interviewee noted AMC’s potential role as a driver of responsible, data-informed regulatory change: “How do we (AMC) help guide the regulations at

ADFG?” ADFG’s recent work has begun to move in the direction of supporting gametophyte culture through working with Kelp Ark, a California-based nonprofit, on its AMC-funded project “[Population genetics and gametophyte seed banking of Alaska kelps](#)”, which will develop a gametophyte bank for Alaska kelps. The project has the potential to inform Alaska’s kelp farm permitting process, and will further future scientific research related to kelp.

### 6.3. Cultivation

Developing and disseminating technology and practices for the cultivation (farming) of seaweed and shellfish is an objective woven into two grant components: [Research & Development](#) (#4) and [Equipment & Technology](#) (#7). The Research & Development component narrative includes an objective to develop applied technologies, including for seaweed farming. Consistent with that language, one of the [Joint Innovation Project](#) categories is Innovations in Seaweed Farming. The Equipment & Technology component contains an objective to “diversify cultivated species, and a commitment to develop methods for developing and farming new species, including multiple species of shellfish.”<sup>23</sup>

Investing in technology and practices for cultivation is complementary to AMC’s work in addressing the Industry Challenge of Site Selection & Permitting (see section 6.1 above). Alaska’s coastline is geographically, climatically, and hydrologically diverse. For example, while the glacial runoff into Resurrection Bay near Seward makes that area unsuitable for mariculture farming, the water near Prince of Wales Island, with no glacial runoff, is much better suited for both seaweed and shellfish cultivation. In general, the range of potential sites suitable for mariculture varies with respect to weather, ocean currents, wind patterns, and nutrient availability. As the AMC project narrative states: “The upfront costs associated with aquatic farming equipment - especially if a season of product is lost or poor due to insufficient or wrong equipment- is a significant barrier to existing and new farmers.”<sup>24</sup> Developing a range of cultivation technologies for different ocean conditions can thus increase farm operational efficiency, reduce costs, and make mariculture farming a more viable business.

#### 6.3.1. Theory of Change Alignment

The AMC Theory of Change identifies three desired outcomes related to cultivation:

- Innovative Products and Processing Techniques (Intermediate Outcome)
- Reduce cost structure of the Alaska mariculture industry (Long-Term Outcome)
- Grow Alaska mariculture industry equitably and sustainably (Long-Term Outcome)

#### 6.3.2. Results to Date: Projects by Species Group and Budget

**Indicator:** Number and Value of relevant projects, by major species group: **13 projects worth \$1.3M**, of which 8 focus on seaweed and 5 shellfish

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<sup>23</sup> Alaska Mariculture Cluster, [Equipment and Technology Component Narrative](#) (2022), p.2.

<sup>24</sup> Alaska Mariculture Cluster, [Research and Development Component Narrative](#) (2022), p.2.

Table 6 below provides a summary of the number and budget value of Cultivation focused projects by major species group. The paragraphs that follow provide examples.

Table 6. Cultivation Projects by Major Species Group

Species Group	Number of Projects	Total Budget
Seaweed	8	\$752,187
Shellfish	5	\$595,663
<b>Grand Total</b>	<b>13</b>	<b>\$1,347,850</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and projects cancelled.		

**6.3.3. Example Program: [Joint Innovation Projects - Innovations in Seaweed Farming](#)**

Innovations in Seaweed Farming is one of the six categories of Joint Innovation Projects, comprising six projects worth \$598k. Examples of this category include:

- [JIP #1: Evaluating Infrastructure and Seeding Methods for Scalable Bull Kelp Cultivation;](#)
- [JIP #2: Assessing Optimal Infrastructure and Seeding Approaches for Large-Scale Cultivation of Bull Kelp.](#)

In these two interlinked projects, SeaQuester Farms has tested new approaches, and conducted field trials, to improve and refine methods for producing food-grade, commercially viable bull kelp at their farm near Juneau, Alaska. The projects compare growth on varying types of farm arrays with different seeding strategies. The goal of these trials is to better replicate kelp’s natural growth on the seafloor, where it occurs in dispersed clusters rather than dense mats. The results, if successful, will improve yields and reduce the costs that have hindered large-scale cultivation of bull kelp. Collaborators include the Native Conservancy, Goldbelt, Spruce Root, Sustainable Southeast Partnership, Ecotrust, and CRTC, who will help share results broadly across the industry.

The two JIPs described above have made the process of farming bull kelp more tractable by providing guidance to aspiring farmers on the most productive methods and arrays to use. As an interviewee said, “The difficulty in farming bull kelp has been seen by anyone who’s farmed it.” Speaking to the results of JIPs 1-2, a Southeast focus group participant said: “The project was crucial to the development of that species (bull kelp). It was the first commercially cultivated bull kelp that met the market’s standards.”

**6.3.4. Example Program: [Other Mariculture Species.](#)**

**Indicator:** Number of new mariculture species cultivated: **12**, of which 4 seaweed and 8 shellfish species

As noted above, the original project narrative for AMC (Equipment & Technology, Component #7) identified diversification of species as an objective. The Other Mariculture Species Program has met that objective through awarding \$1.1M to 10 projects exploring the cultivation of 12 less commonly cultivated mariculture species. These species are listed in Table 7 below.

Table 7. List of New Mariculture Species (Other Species RFP)

Basket Cockle ( <i>Clinocardium nuttallii</i> )
Dragon Kelp ( <i>Eualaria fistulosa</i> )
Split Kelp ( <i>Hedophyllum nigripes</i> )
Green Sea Urchin ( <i>Strongylocentrotus droebachiensis</i> )
Pacific Dulse [Red Ribbon Seaweed] ( <i>Devaleraea mollis</i> )
Pinto Abalone ( <i>Haliotis kamtschatkana</i> )
Geoduck ( <i>Panopea generosa</i> )
Kumamoto Oysters ( <i>Magallana sikamea</i> )
Olympia Oysters ( <i>Ostrea lurida</i> )
Virginica Oysters ( <i>Crassostrea virginica</i> )
Pacific Razor Clam ( <i>Siliqua patula</i> )
Three ribbed kelp ( <i>Cymathaere triplicata</i> )

**Success: De-Risking New Mariculture Species.** While the results of 9 of the 10 Other Species trials are not yet complete as of the end of 2025, interviewees and focus group respondents have overwhelmingly provided positive feedback on the benefits of the funding opportunity, even if the trial was a failure or produced uncertain results. One Other Species recipient said in a focus group, “We’re halfway through; the funds have de-risked us by putting money toward a crop that doesn’t have a market yet.” One focus group participant in Southeast said, “I think Pinto abalone is a really exciting future product because it’s so high value, and I think it has a future value in Alaska.” Another focus group participant, working on an Other Species grant for shellfish, said: “The results aren’t good, but we have hope. I would not have attempted this project without the funding. Even having one other species would double the number of species we’re cultivating.”

#### 6.4. Food Safety

The project narrative for the AMC [Equipment & Technology](#) Component (#7) identified food safety as an important barrier to industry growth, especially with respect to the cost of testing for shellfish toxins, such as Paralytic Shellfish Toxin (PST). The AMC’s investment in improvement of toxin testing

methods promises to support the growth of the Alaska mariculture industry, with emphasis on shellfish.

#### 6.4.1. Theory of Change Alignment

The AMC Theory of Change identifies three desired outcomes related to food safety:

- Increased Regulatory Efficiency (Intermediate Outcome)
- Reduce cost structure for Alaska mariculture industry (Long-Term Outcome)
- Grow Alaska mariculture industry equitably and sustainably (Long-Term Outcome)

#### 6.4.2. Results to Date: Projects by Species Group and Budget

**Indicator:** Number and Value of Projects by Major Species Group: **3 projects with budgets \$4.3M, of which 2 focus on shellfish and 1 on seaweed**

Table 8 below presents 3 projects, of which a single food safety project, covering shellfish toxins, is the largest with a budget of \$4.1M. This project, described below in the Example, consists of the development of new methods of testing for paralytic shellfish toxin (PST), which poses a significant risk to both shellfish farmers and subsistence shellfish harvesters. The following paragraph profiles this project.

Table 8. Food Safety Projects by Major Species Group

Name	Species Group	Total Budget
Paralytic Shellfish Poisoning (PSP) Testing Method Development	Shellfish	\$4,105,545
JIP 22: PlanktoScope Trials for HAB and Biofouling Detection	Shellfish	\$99,972
JIP 16: Reducing Impact of Iodine & Heavy Metals in Seaweed	Seaweed	\$99,530
<b>Total</b>		<b>\$4,305,047</b>
<i>* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and projects cancelled.</i>		

#### 6.4.3. Example Project: Paralytic Shellfish Poisoning (PSP) Testing Method Development

**Indicator:** Existence and availability of an improved PSP testing method: **Method exists and is soon to be made available**

Paralytic shellfish poisoning (PSP), caused by paralytic shellfish toxin (PST), poses a significant risk to shellfish consumers and therefore farmers. AMC set aside \$4.1M across the grant period to improve PST testing methods at the Alaska Department of Environmental Conservation (ADEC)'s Environmental Health Laboratory (EHL), so that the issues and costs related to this food safety risk would not be a barrier to industry growth. Before the grant was issued, PSP testing limitations at

the State of Alaska, and limited processing capacity, were identified as a significant obstacle to the Alaska mariculture industry's current size and growth potential. The funding for the project included the purchase of expensive laboratory equipment for PST testing that had not been previously available in Alaska.

The original project for ADEC EHL was to validate alternative testing methods for PSP/PST, including purchase and use of a range of equipment for the purpose. However, in 2025 a plankton that contains Diarrhetic Shellfish Toxin (DST) was discovered in the vicinity of Southcentral Alaska. DST is not currently a problem in Alaska, but is at risk for becoming one. EHL is now pivoting its focus from PST to DST testing method validation, and will return to PSP testing method validations subsequently. This pivot was approved and supported by SEC by providing direct support for commercial shellfish and future aquaculture activities. To date, ADEC EHL has purchased and installed new testing equipment using the method of liquid chromatography-tandem mass spectrometry or LC/MS/MS; hired two new staff; and validated testing methods.

In 2025, the PSP testing project also faced several significant obstacles, including the cancellation of the Interstate Shellfish Sanitation Conference (ISSC), which delayed the completion of the project. The project has also experienced staffing challenges, including turnover and the need to recruit and hire personnel with specialized training.

Mariculture industry participants have shown an awareness and understanding of the importance of this project. An interviewee, a Governance Body member who was aware of this project, said, "The new machine for paralytic shellfish toxin testing has reduced our dependence on lab mice." A focus group member, who is an oyster farmer, said: "The lab equipment at EHL has been a major benefit to the oyster industry."

## **6.5. Stabilization, Processing, and Distribution**

Stabilization, primary processing, and distribution are important and interlinked industry challenges for both seaweed and shellfish farmers. In the case of kelp, the product has a short shelf life between the time it leaves the water and when it must be processed before it begins to degrade. Oysters, once harvested, require efficient cleaning, sorting, and toxin testing before they are sent on to final consumers. Efficient stabilization and processing lines are thus critical for robust mariculture value chains, whether the final products are to be sold locally, or shipped long distances. In the case of kelp, stabilization can extend the shelf life from hours to months, depending on the method of processing. The AMC supported stabilization, processing, and distribution of kelp and shellfish through 26 projects that include Joint Innovation Projects (JIPs), Equipment awards, and Feasibility Studies.

### **6.5.1. Summary and Takeaways**

The vigorous funding of pilot-scale innovation projects, forward-looking feasibility studies, and high-value equipment for Stabilization, Processing, & Distribution responds to a keenly felt need in the Alaska mariculture industry. AMC has awarded funding to build critical processing capacity in

seaweed and shellfish growing communities; invested in pilot scale testing in a variety of stabilization methods to meet a wide range of markets; and supported feasibility studies to upgrade core infrastructure for processing, storage, and distribution of seaweed and shellfish products.

Developing right-sized stabilization and processing equipment and infrastructure is critical for the current and future success of Alaskan kelp industry, especially given high costs of energy and transport. One interviewee, based at a nonprofit, noted in particular that “The Chugach region (Southcentral Alaska) will need good kelp drying and stabilization infrastructure to be competitive.” The investments in both mobile and stationary stabilization and processing equipment across the AMC regions are steps toward meeting these needs.

### 6.5.2. Theory of Change Alignment

The AMC Theory of Change identifies three desired outcomes related to stabilization, processing, and distribution:

- Innovative Products and Processing Techniques (Intermediate Outcome)
- Increased Processing Capacity (Intermediate Outcome)
- Reduce cost structure for the Alaska mariculture industry (Long-Term Outcome)

### 6.5.3. Results to Date: Projects by Species Group and Budget

**Indicator:** Number of relevant projects by major species group: **26 projects with combined budget of \$5.2M**, of which 19 focus on seaweed, 4 on shellfish, and 3 on both

Table 9 below provides a summary of Stabilization, Processing, & Distribution projects by major species group. In terms of major species group of interest (Seaweed and/or Shellfish), a large majority of the projects related to Stabilization, Processing, & Distribution addressed Seaweed alone (19 out of 26, \$4.4M out of \$5.3M total budget), with an additional 3 projects (\$394k) addressing both Seaweed and Shellfish. This focus reflects the nascent stage of the kelp market, and the importance of kelp stabilization in multiple forms for access to multiple markets.

Table 9. Stabilization, Processing, and Distribution Projects by Major Species Group\*

Species Group	Number of Projects	Total Budget
Seaweed	19	\$4,324,499
Shellfish	4	\$478,984
Seaweed and Shellfish	3	\$443,793
<b>Grand Total</b>	<b>26</b>	<b>\$5,247,276</b>
*Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and cancelled projects.		

#### 6.5.4. Example Program: Mariculture Equipment Program

**Indicator:** Processing equipment by type and value awarded: **48 separate pieces of processing equipment**, with total value of \$3.45M

As one interviewee pointed out in December 2024, “There are not enough stabilizing equipment or facilities in Alaska.” Through the Mariculture Equipment Program RFPs, rounds 1 and 2, as well as original subawards made at the beginning of the grant period, AMC has funded a wide range of processing equipment for multiple types of seaweed and shellfish processing. Currently, 7 out of 15 Equipment awards to date, worth \$3.4M out of \$5.3M in total award budgets, focus on Stabilization, Processing, & Distribution. For example:

- **Mariculture Equipment 2: Kelp Primary Processing Platform (KP3).** The Sun’aq Tribe received a \$2.3M award in the [second round](#) of Equipment funding to launch the KP<sup>3</sup> (Kelp Primary Processing Platform), a modular system capable of producing stabilized kelp products for agriculture, food, and beauty markets. The facility will include five processing lines to produce dried kelp, frozen kelp, kelp extracts, kelp pulp, and biostimulants. Led by the Sun’Aq Tribe, the project is a partnership between 14 organizations: five Alaska Native organizations, six industry partners, the Kodiak Economic Development Corporation, and two regional kelp farming organizations.<sup>25</sup> The processing lines will be housed at the Tribe’s Wildsource facility and serve as a shared regional asset to advance economic opportunity, sustainability, and equity in Kodiak’s mariculture industry.

Below is a selected list of processing equipment funded through the Mariculture Equipment Program:

- Seaweed dryers: Belt and rotary drum
- Seaweed shredders
- Seaweed blanchers
- At-sea floating processor
- Screw press for seaweed dewatering
- Dried seaweed milling system
- Oyster weight grader
- Oyster tumbler
- Complementary equipment for pumping, cleaning, heating, cooling, insulating, freezing, washing, electrical, transport, and storage for both seaweed and shellfish

**Success: Building Regional Processing Capacity.** The processing equipment awards have opened up market opportunities for whole regions of the AMC, including Prince William Sound. One focus group member said:

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<sup>25</sup> [KP3 Overview Presentation, July 2025.](#)

The drying equipment and the At-Sea Floating Processor (both Round 1 awards) allowed us to develop a new market relationship that's allowing them to expand in the 2026 season. It's creating more opportunity for the farmers, for local businesses, and setting the stage for more participation from new industry members as well. It's exciting that there's now a large market opportunity for the farmers to work with. Previously, there was no processing equipment and no markets, so it's a big win for anybody growing seaweed in the region.

**Challenge: Difficult Reimbursement Process.** Multiple focus group members have spoken of the difficulties involved in acquiring and being reimbursed for the equipment. One Southeast focus group member, who works for a small business that partners with nonprofits, said: “The whole process of getting funding, getting the equipment, installation, and the approvals, is incredibly onerous, and makes it challenging to get it in place quickly enough to be able to demonstrate the benefit.” A focus group participant in Prince William Sound observed that the long wait times for approval of equipment funding can make the recipient miss an entire harvest season for kelp processing: “It takes time to submit documentation to the EDA to have clearance to purchase equipment, and so there's some equipment that we're not going to have in place for this processing season that I initially hoped we would have.”

#### **6.5.5. Example Program: Joint Innovation Projects**

**Indicator:** Number of Stabilization and Processing Methods Pilot Tested: 15

The challenges of stabilization and processing require solutions that are tailored to region and community. The Joint Innovation Projects have been an effective funding source for pilot-scale, community-oriented stabilization and processing solutions. 11 out of 29 Joint Innovation Projects funded to date, worth \$1M out of \$2.6M in total award budget to date, focus on Stabilization, Processing, and Distribution. These projects are heavily concentrated in rural areas and involve Alaska Native-led organizations. 9 out of 11 projects, worth \$820k in total budget, are in rural areas; 9 out of 11 projects, worth \$793k in total budget, are either led by or have a major partnership with an AK Native organization.

- **JIP 7: Approaches to Small-Scale Kelp Stabilization & Markets.** Led by Saltwater Inc. and Regeneration North in partnership with Chugach Regional Resources Commission (CRRC), this \$99k project addressed the challenge of primary processing at the community hub and/or small farm collective scale (10-30 acres) and looks to match processing methods to the local context and suitability for end products and markets. This JIP conducts primary processing trials using five methods: solar high tunnel dryer, infrared dryer, belt dryer (Beltomatic), fermentation, and salting. Its kelp stabilization activities are directed toward markets in three product categories: food products, plant biostimulants, and bath products.

There are multiple methods of stabilizing and processing kelp, with different cost structures and energy requirements. The optimal method of kelp stabilization depends on both the region and its local cost structure (e.g. energy and transport costs), and the final destination market for the kelp to

be processed. For instance, whereas some buyers and final producers require kelp to be delivered in stabilized wet form, others require dried kelp.

**Success: Pilot Testing Stabilization and Processing Equipment.** Table 10 below identifies all the named processing equipment and methods tested from all available reports related to just two RFPs issued through the AMC: the Joint Innovation Projects Rounds 1 and 2. This list is best understood as a work in progress. These projects account for only 11 of the 26 total AMC funded-projects related to Stabilization, Processing, & Distribution. Given the early stage of development of the majority of these projects, the final list of processing equipment and methods tested, explored, and adopted through AMC-funded projects is almost certain to be larger than the one below. As one focus group participant noted, “Different methods work for different communities and different scales.”

Table 10. *Kelp Stabilization and Processing Equipment and Methods Tested (Joint Innovation Projects Only)*

<b>Pre-Stabilization</b>
Mechanical Dewatering (e.g. Vincent CP-4 Screw Press)
Shredding (e.g. Vincent VS-8 Shredder)
<b>Drying</b>
Solar Tower
Solar High Tunnel
Infrared
Belt Drying (e.g. Beltomatic)
Forced-air (e.g. Airflow 156)
Cabinet tray
Heat pump / waste heat
<b>Wet Processing Methods</b>
Fermentation
Acids/Chemical Reagents
Salting
Distilling
Freezing
<b>Milling/Grinding</b>
Hammermill (e.g. Schute MiniMill)

#### 6.5.6. Example Program: Feasibility Studies.

Multiple interviewees cited infrastructure limitations as a key impediment to the growth of mariculture. The AMC does not directly fund infrastructure development, such as the building and renovation of processing facilities, warehouses, distribution centers, energy sources, or retail locations. However, the AMC does fund feasibility studies which can assess the potential for successful infrastructure development. To date, AMC has funded 9 feasibility studies worth \$1.1M in total budget. Nearly all Feasibility Studies (8 out of 9, worth \$1M out of \$1.1M), focus on building facilities for Stabilization, Processing, & Distribution, including kelp processing and distribution and sales of both kelp and shellfish. Of these 8 projects, 6 projects worth \$0.7M, are in rural areas; all these projects are led by and/or include a major project partner that is Alaska Native-led, and are intended to benefit Alaska Native communities. An example:

- **Feasibility Study 4: Mobile Seaweed Processing and Dehydration** is a \$116k project led by The Native Conservancy, based in Eyak/Cordova, to explore the economic and engineering feasibility of a floating, mobile seaweed processing facility. The project will build a database of current commercially-available seaweed processing equipment; recommend a specific design for a mobile and modular seaweed processing solution; and deliver CAD architectural layout drawings and a plan for installation and operation. It will also identify potential complementary uses of the processing facility during the 'off season', build a database of dehydrated seaweed product specifications, and assess demand (quantity and value) for mobile seaweed processing in Alaska.

#### 6.5.7. Stabilization, Processing, & Distribution: Remaining Challenges

Two key challenges remain in Stabilization, Processing, and Distribution: building and retrofitting infrastructure, and mobilizing and distributing technical expertise for rural Alaskan communities.

**Challenge: Building and Retrofitting Infrastructure.** Interviewees repeatedly pointed out the limitations of existing infrastructure (buildings, energy, etc.) for this key link in the mariculture value chain. Earlier in the development of mariculture, many industry players believed that the existing fish processing infrastructure could be adapted for mariculture; however, close examination of that infrastructure revealed that most of it was unsuitable. As one interviewee, a small business person, succinctly stated: "The existing fish processing infrastructure is too large-scale for the mariculture industry." The Feasibility studies are one important step toward identifying the appropriate infrastructure for mariculture; building and/or retrofitting that infrastructure is a remaining challenge.

**Challenge: Mobilizing Technical Expertise.** Another critical component of a successful mariculture value chain is a wide distribution of technical expertise in the deployment of stabilization and processing equipment. Interviewees repeatedly highlighted the need for knowledge transfer, sharing, and technical assistance on these topics. One interviewee, based at a nonprofit, said, "The AMC should identify experts to share knowledge of equipment with aspiring processors and

farmers". Another interviewee, based at a Tribe, recommended, "AMC should put more resources into technical assistance for equipment."

## 6.6. Product and Market Development

Developing a diverse array of mariculture products with robust market demand is a critical component of the success of the Alaska mariculture industry. As one interviewee said in December 2024, "We need product development, marketing, and market development for kelp." Strong product and market development is also critical for a successful transition away from the AMC grant and toward a mariculture industry in which market demand is the primary source of revenue. This section summarizes AMC's work to date on product and market development.

Product diversification is critically important for the future of the kelp industry in particular. The recent (2026) publication by Greenwave, [State of the Kelp Industry](#), noted in its Executive Summary:

As of 2025, three market segments account for a growing share of contracted volume: agriculture, biomaterials, and functional ingredients for food and personal care. This demand is driven by real problems faced by real industries: detoxifying ingredients in food and cosmetics, helping land-based farmers adapt to extreme weather and rising fertilizer prices, and reshoring supply chains with domestically produced raw materials.<sup>26</sup>

The product and market development activities undertaken by AMC's programs have increasingly addressed at least two of these three market segments: agriculture and functional ingredients. AMC's investments in these growing markets promises to drive increased demand for Alaskan kelp into the future.

### 6.6.1. Theory of Change Alignment

The AMC Theory of Change identifies three desired outcomes related to product and market development:

- Innovative Products and Processing Techniques (Intermediate Outcome)
- Increased sales of existing products (Intermediate Outcome)
- Create new markets and expand demand for AK Mariculture products (Long-Term Outcome)

### 6.6.2. Results to Date: Projects by Species Group and Budget

**Indicator:** Number of relevant projects, by major species group: **27 projects, with combined value of \$4.8M**, of which 19 focus on seaweed, 4 shellfish, and 4 both.

Table 11 below reports the number of Product & Market Development projects by major species group of interest (seaweed/kelp, shellfish, or both). To date, 19 of the 27 active or completed Product & Market Development projects focus on seaweed/kelp; 4 on shellfish; and 4 on both. The emerging

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<sup>26</sup> Greenwave (2025), [State of the Kelp Industry](#), Executive Summary, p. 2.

nature of the Alaskan kelp industry, and the importance of multiple markets to ensure the growth of that industry, explains the focus on kelp.

Table 11. Product and Market Development Projects by Major Species Group

Species Group	Number of Projects	Total Budget
Seaweed	19	\$3,090,172
Shellfish	4	\$344,673
Seaweed and Shellfish	4	\$1,324,516
<b>Grand Total</b>	<b>26</b>	<b>\$4,759,361</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and cancelled projects.		

### 6.6.3. New Mariculture Product Categories

**Indicator:** Number of product categories being explored and/or developed: **5 broad product categories**, of which 4 are focused on kelp

Currently, AMC-funded projects are testing/exploring 5 broad product categories, of which four are specifically focused on kelp. The wide range of potential products that can be made with kelp, combined with the currently thin markets for kelp, can help to explain the reasons for the focus on kelp product testing. Relevant projects include 6 JIPs exploring a variety of kelp-based product lines; 3 Kelp Agricultural Product Development projects which all explore kelp-based biostimulant production; and 3 Other Species projects exploring both kelp- and shellfish-related products. These products are listed in Table 12 below; examples of the relevant projects are summarized in the sections that follow.

Table 12. List of Mariculture Product Categories Tested/Explored

Agricultural products
Carbon Credits
Fresh and packaged food products and ingredients
Health and beauty products
Wine and spirits

### 6.6.4. Example Program: [Marketing Program](#)

**Indicator:** A marketing plan that addresses barriers, gaps, and opportunities exists and is being implemented: **Plan exists and is being implemented**

The AMC Marketing program is the centerpiece of the [Market Development](#) grant component (Component #5), with a budget of \$634k. Beginning in July 2025, contractors Tastemaker Communications and Rising Tide Communications, are creating a unified brand identity for Alaska mariculture, developing a media library, and designing digital tools to help farmers and processors tell their stories. They are bringing Alaska mariculture to national trade shows and culinary festivals, and hosting inbound media tours and chef familiarization trips to Alaska’s coastal farms.

**Success: Consumer-Facing Marketing Materials.** Focus group participants have noticed this work since it began and applauded it, highlighting the need for consumer-facing marketing materials to raise the visibility of Alaska mariculture. One focus group participant in Prince William Sound said, “Tastemakers and Rising Tide just hit the ground running with chef and media tours, trade shows, point-of-sale materials, and branding including logos.”

#### **6.6.5. Example Program: [Joint Innovation Projects.](#)**

Currently, 6 active or completed Joint Innovation Projects have explored 5 separate product categories involving kelp (see Table 12 above). An example:

- **JIP 6: Novel Compound Discovery in Alaskan Kelp.** This project focuses on unlocking the industrial potential of Alaska’s kelp resources by extracting high-value bioactive compounds from three commonly cultivated kelp species in Kodiak (dragon kelp, split kelp, and bull kelp). These bioactive compounds (including fucoidan, laminarin, fucoxanthin, and polyphenols) are in wide industrial use in the production of dietary supplements, pharmaceuticals, and cosmetics. The initiative thus aims to demonstrate the feasibility of compound extraction as a pathway to scaling Alaska’s mariculture industry. Our interviews revealed significant interest in the results of this study; as one interviewee noted, “Studies to understand the biochemical makeup of the seaweed are critical for value chain development.”

#### **6.6.6. Example Program: [Kelp Agricultural Product Development and Testing.](#)**

This program was developed by SEC in response to the identified potential of kelp-based plant biostimulants to play a key role in bringing the Alaska mariculture industry to scale. The program made awards to 3 projects, totaling \$1.2M. An example:

- **Pacific Kelp Company: Transforming Alaskan Kelp into High-Value Agricultural Inputs.**<sup>27</sup> This project is testing the efficacy of Pacific Kelp Company’s nutrient-dense liquid kelp extract product for turfgrass and vineyard markets specifically, as these two crop systems have great potential to benefit from a liquid kelp extract and high potential for commercialization as high value specialty crops. Collaborating with Cornell University and Washington State University, PKC is analyzing the impact of these extracts on soil health, crop resilience, and yield enhancement. By proving the efficacy of kelp-based biofertilizers

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<sup>27</sup> This project is also called Kelp Ag Product R&D: Diverse Agricultural Solutions Utilizing Alaskan Kelp.

and biostimulants, this project will open new commercial pathways for Alaska’s mariculture industry, offering farmers an environmentally sustainable alternative to traditional fertilizers.

**Success: Early-Stage Agricultural Product Development.** The Kelp Agricultural Product Development and Testing Program is an example of AMC leadership creating a new, unanticipated program to meet an identified industry challenge. Six evaluation interviewees specifically identified the potential for biostimulants and other nonfood market outlets to play an important role in industry scaling. An interviewee, who works for a small business, said, “Food markets will not be enough to absorb all the seaweed being produced.” Another interviewee, with a background in kelp research, noted, “Biostimulants are a good entry level market opportunity. A farmer could sell to them while focusing on improving the crop to sell to higher value markets eventually.” A focus group participant, a kelp farmer with extensive experience in product development, summed up the issue as follows: “The intent with these analyses is to find some new large-scale markets, high volume and low margin, that will pay for processing infrastructure. *We need the foundational volume markets to develop the infrastructure so that we can actualize the smaller volume, higher margin product markets.*”

#### 6.6.7. Example Program: [Other Mariculture Species.](#)

The Other Mariculture Species Program aims to expand the range of kelp and shellfish species cultivated as part of Alaska mariculture. To date, the program has made 10 awards worth \$1.2M, which have explored 12 mariculture species beyond those most commonly cultivated (Pacific oysters, bull kelp, sugar kelp, or ribbon kelp).<sup>28</sup> For example:

- **Other Species 1: Cockle Clams.** This \$118k project, led by Chugach Regional Resources Commission in partnership with the Kachemak Shellfish Mariculture Association (KSMA), is advancing the cultivation of basket cockles using suspended culture systems originally developed for oysters. Hatchery-produced juvenile cockles will be grown in KSMA’s FLUPSY and subsequently in lantern nets and metal trays across up to four farms in Kachemak Bay. If successful, the project could introduce a high-value shellfish species to Alaska’s mariculture portfolio, as well as enhance subsistence resources. A focus group member on the Kenai Peninsula described cockle clams as “a native commercial species that can be product ready before oysters, to diversify the market and add something that might be able to grow a little bit faster.”

#### 6.6.8. Example Program: [Seaweed Tissue Analysis](#)

**Indicator:** Number of seaweed tissue analyses: **17 species<sup>29</sup> of wild and farmed seaweed** analyzed; over 4000 separate analyses conducted (100 samples x 40 analyses/sample)

<sup>28</sup> A complete list of these species is given in Table 7, Section 6.3.4 above.

<sup>29</sup> The common names of the species analyzed are: Sieve Kelp, Ribbon Kelp, Turkish Towel, Dead Man's Fingers, Five-Ribbed Kelp, Three-Ribbed Kelp, Stringy Acid Kelp, Dulse/Red Ribbon, Dragon Kelp, Rockweed, Red Ogo, Split Kelp, Giant Kelp, Bull Kelp, Prickly Pear, Sugar Kelp, and Sea Lettuce.

Over 2024-2025, the Seaweed Tissue Analysis program, administered by Alaska Fisheries Development Foundation (AFDF), has collected and analyzed over 100 samples across 17 species of wild and farmed seaweed, with 40 analyses conducted per sample, to identify nutritional content, valuable bioactive compounds, processing potential, and quality assurance. Analyses included component nutrients, carbohydrates, bioactives, vitamins, and trace elements. The results are now publicly available through an interactive [Seaweed Tissue Analysis Dashboard](#).

**Success: Increased Understanding of Seaweed Tissue Composition.** Interviewees and focus group participants were strongly supportive of the seaweed tissue analysis, and understood it to be part of a broader effort to find nonfood markets for kelp. One interviewee, who works for a statewide nonprofit, said, “The seaweed tissue analysis is increasing knowledge that can help build markets. The studies to understand biochemical makeup of the seaweed have been critical for value chain development.” A third interviewee, who works for a Native-led nonprofit, said “Alaskan kelp may be ready for bulk bioextraction, such as alginates, if we knew what we wanted to extract, and were able to optimize for that compound.” A fourth interviewee, who works for a Tribal corporation, said, “The only way to get high value kelp out of Alaska is by exporting refined products.” In sum, Alaska mariculture industry participants know and understand the importance of identifying biochemical compounds in seaweed for the purpose of identifying new product and market opportunities. A focus group participant, a kelp farmer, spoke to the importance of the seaweed tissue analysis: “If an industry person wants to get to a new market, they’ll have a derivative analysis to take into the market, and assist in creating labels for a product.”

## 7. Industry-Wide Challenges

This section introduces six industry-wide challenges that must be overcome for the value chains discussed in the previous section to function, as well as for the industry as a whole to operate equitably and sustainably. They are: Access to Capital; Access to Subsistence and Food Security; Governance and Administration; Innovation, Technology, and Data; Outreach, Communication, and Knowledge Exchange; and Workforce Development.

As in the above section on Value Chain Challenges, each Industry-Wide Challenge described below contains a description of its alignment with the AMC Theory of Change; a summary of Results to Date including at least one Indicator; a description of at least one Example Program (or Project); and one or more Successes to date and/or Challenges that remain. Some of the Challenges are followed by Responses that summarize AMC’s work to date to address it.

### 7.1. Access to Capital <sup>30</sup>

Access to capital is one of the critical industry challenges facing current and aspiring mariculture farmers. Before the AMC was initiated, the Mariculture Incentive Grant Program (MIGP), funded by

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<sup>30</sup> In this section, we are defining “Capital” specifically to refer to financing options and financial instruments, such as loans. A more complete definition of capital could also include infrastructure, equipment, and intellectual property. We also set aside broader definitions of capital such as knowledge and skills (human capital), networks (social capital), or environmental assets (natural capital).

the State of Alaska and administered through the Alaska Mariculture Alliance (AMA), provided matching funds for expanding or starting mariculture operations including kelp, shellfish, hatcheries, and processors. At least one interviewee has spoken highly of the MIGP, calling it “very helpful”. However, as one interviewee, a kelp farmer, noted, “Alaskans don’t have a lot of capital sitting around that they can use for match”. A clear need for affordable financing for mariculture startups remains. The AMC’s Revolving Loan Fund (see below) is intended to meet that need.

### 7.1.1. Theory of Change Alignment

The AMC Theory of Change identifies 3 desired outcomes related to Access to Capital:

- Increased Private investment and Startups (Intermediate Outcome)
- Reduce cost structure for the Alaska mariculture industry (Long-Term Outcome)
- Grow the Alaska mariculture industry equitably and sustainably (Long-Term Outcome)

### 7.1.2. Example Program: [Revolving Loan Fund](#).

The AMC’s Revolving Loan Fund (RLF), which is one of the eight Grant Components (Component #1), is the centerpiece of the AMC’s work to overcome the Industry Challenge of Access to Capital. The RLF aims to expand the participation of financial institutions in the mariculture space, and in turn enhance mariculture businesses’ access to capital. Without a vehicle to support lending, the financial sector will be reluctant to invest in an early-stage industry such as mariculture. Without a track record against which to assess the risk of a mariculture business, and in the presence of the Industry Challenges identified in this evaluation, financial institutions may perceive mariculture businesses as too risky to be creditworthy, constraining startups’ access to capital. The RLF aims to change that calculus by providing protection against the risk of default in the form of collateral support (see below).

The RLF’s goal is to increase access to capital, create quality jobs, and grow the Alaska mariculture industry while protecting Alaska’s environment, indispensable cultural resources, and economic future. The RLF is a **collateralization** support program, which works by providing or enhancing collateral to help mariculture-related startup businesses qualify for loans. The AMC RLF offers collateralization opportunities, maximizes borrowing amounts, and complements existing funding programs, such as the above-mentioned Mariculture Incentive Grant Program (MIGP).

The RLF received EDA approval to begin lending in July 2025.<sup>31</sup> Administered by SEC, the RLF has two financial partners: Northrim Bank and Spruce Root. Spruce Root has a complementary subaward that provides technical assistance and business planning support as well as lending. The interest rates are set by each lending partner based on current market conditions and overall credit quality and risk factors. Eligible businesses include for-profits, start-up businesses, Alaska Native-owned start-ups and businesses, and cooperatives. Loans may be intended for production and processing of mariculture products, business expansion, business retention, farms and producers, retail, commercial, service, industrial, and manufacturer operations in relation to the Alaska mariculture

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<sup>31</sup> The approval process for the RLF was lengthy due to EDA’s lack of familiarity with collateralization loan programs.

industry. The RLF has set targets of 50% of funds directed toward Alaska Native and/or distressed rural communities. Where possible, RLF funds will be utilized in conjunction with other public or private monies.

### 7.1.3. RLF Results to Date (2025)

Table 13 below provides a breakdown of the projects and budgets related to the Revolving Loan Fund. The Fund has an \$8M corpus, with about \$1.7M set aside for a combination of technical assistance, staffing support, and additional funds to be lent out as part of the corpus. An additional \$124k is set aside for consulting on fund administration.

Table 13. Access to Capital Projects

Project Name	Total Budget
Revolving Loan Fund Corpus (Principal)	\$8,052,265
Technical Assistance and Corpus Support (TBD)	\$1,705,267
Loan Fund Consulting & Plan Development	\$124,000
<b>Grand Total</b>	<b>\$9,881,532</b>

At the end of calendar year 2025, the RLF had achieved the following outcomes:

**Indicator:** Number of financial partnerships established with other lending institutions:

- **Two financial partners**, Spruce Root and Northrim Bank, with one more partner in process

**Indicator:** Number and dollar value of loans enhanced / directly provided by lending partners;

- **One loan deployed to one mariculture farm, worth \$50,000**
- **Two additional loans to two mariculture farms conditionally approved, worth \$525,000**

**Indicator:** Number of mariculture businesses financed by direct or enhanced loans

- **Three mariculture businesses financed (including conditionally approved loans)**

**Indicator:** Number of mariculture entrepreneurs receiving technical assistance by RLF partners:

- **25 entrepreneurs** receiving technical assistance under RLF

**Indicator:** Number of mariculture business plans supported by RLF partners

- **10 business plans** supported by financial partners

Mariculture farmers and businesses have anxiously awaited the deployment of the RLF lending corpus in 2024-2025. One interviewee, a kelp farmer, said in December 2024: “The Equipment and RLF are the projects with the greatest potential impact; and they're the ones that have been hardest

to get off the ground. If the RLF were up and running, it would be supporting all the other component projects.”

## 7.2. Access to Subsistence & Food Security

The enhancement of marine habitats for the purpose of expanding wild shellfish and seaweed populations is a part of the AMA’s definition of mariculture (see Introduction). Since time immemorial, Alaska Native peoples and Tribes have engaged in deliberate enhancement of shellfish and aquatic plant habitats for subsistence, culture, and community food security purposes. Clam gardens are a prominent example of habitat enhancement for subsistence access that date back thousands of years. AMC recognizes that these activities qualify as mariculture, and has funded a range of projects that can support access to subsistence in the service of community food security.

### 7.2.1. Theory of Change Alignment

The AMC Theory of Change identifies two desired outcomes related to Access to Subsistence and Food Security:

- Sufficient and appropriate mariculture investments in AK Native and rural communities (Intermediate Outcome)
- Grow Alaska mariculture industry equitably and sustainably (Long-Term Outcome)

### 7.2.2. Results to Date: Projects by Budget

**Indicator:** Number and value of projects by major species group: **8 projects, with combined budgets of \$872k, of which 7 focus on shellfish**

Table 14 below presents the number of projects addressing Access to Subsistence & Food Security by major species group and budget. Statements of support for the use of AMC funds to address this challenge by interviewees follow.

Table 14. Subsistence/Food Security Projects

Project Title	Species Group	Total Budget
Other Species 1: Cockle Clams	Shellfish	\$117,612
Other Species 5: Pinto Abalone	Shellfish	\$149,982
Other Species 6: Geoducks	Shellfish	\$98,640
Other Species 8: Pacific Dulse	Seaweed	\$150,000
Other Species 9: Pacific Razor Clams	Shellfish	\$129,980
JIP 22: PlanktoScope Trials for HAB and Biofouling Detection	Shellfish	\$99,972
JIP 28: Evaluating subsistence shellfish beaches for future enhancement projects	Shellfish	\$28,350

JIP 29: Developing increased survival techniques for shellfish enhancement through implementing predator protection	Shellfish	\$97,725
<b>Total</b>		<b>\$872,261</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and cancelled projects.		

Tribal agencies and Native-led nonprofits have noted, affirmed, and supported AMC’s decision to fund projects related to this Industry Challenge. One interviewee, who works for a Native-led nonprofit, said: “AMC has encouraged subsistence enhancement for local and Native populations. That’s a good thing.” From the perspective of another interviewee, who works at a Tribal agency, this support has been insufficient: “There’s some support in AMC for traditional harvesters, but it’s an afterthought”. A third interviewee, also housed at an AK Native-led nonprofit, noted that access to subsistence resources is, in many cases, a higher priority for Alaska Native communities than industrial development: “On our side, sometimes we’re looking for accessibility rather than, say, trying to start a kelp farm. It’s more about access to the resource.” A fourth interviewee, who also works for a Tribal agency, stresses the importance of subsistence harvesting for Alaska Native diet and well-being: “Relearning our diet and medicines (through harvesting) is healing us from the inside out.”

The most prominent examples of AMC-funded projects addressing this Industry Challenge have been led or co-led by Alutiiq Pride Marine Institute (APMI), a Tribally led marine research facility based in Seward, on the Kenai Peninsula. APMI is a subsidiary of Chugach Regional Resources Commission (CRRC), a Tribally led resource management nonprofit that serves the Chugach region of Southcentral Alaska and is a partner to the AMC. Subsistence resource enhancement is at the core of APMI’s work, with a focus on the populations of a range of shellfish species including butter clams, littleneck clams, cockles, abalone, scallops, sea cucumbers, geoducks, and bidarki (an edible sea snail). APMI also functions as a commercial oyster and kelp hatchery. Through CRRC, APMI has received two AMC grants, and partnered on a third, to enhance access to subsistence and food security for Tribes.

**7.2.3. Example Program: Joint Innovation Projects - Shellfish Enhancement.**

Shellfish Enhancement is one of the six project categories listed under the Joint Innovation Projects (JIPs) administered by AFDF as part of the Research and Development component (#4). Enhancement of shellfish habitat promises to benefit Alaska Native communities who harvest these resources for food security and sovereignty, as well as potentially benefiting commercial mariculture farmers. For example:

- **JIP 27: Hatchery cultivation of the Pacific razor clam.** Led by CRRC and located at APMI in Seward, this project identified best practices to raise juvenile razor clams for the purpose of restocking beaches for restoration or subsistence harvest. The project focused on

broodstock conditioning, larval rearing at commercial densities, and nursery grow-out procedures that could eventually support both restoration of wild populations and commercial farming. Broodstock collections in Lower Cook Inlet yielded two successful spawning events, producing an estimated 400,000 juveniles averaging 1.2 mm from 105 clams collected. The project aims to generate repeatable protocols and establish Alaska's first consistent source of razor clam seed. If successful, this effort could provide new opportunities for shellfish farmers and support ecological restoration where razor clam populations have collapsed.

- **JIP 28: Evaluating subsistence shellfish beaches for future enhancement projects.** APMI partnered with Pacific Shellfish Institute and received \$28,350, to update their survey techniques to assess subsistence shellfish beaches in the Chugach region. This project allowed APMI to re-survey beaches that had been previously surveyed in the early 2000s with funding from the Exxon Valdez Oil Spill settlement. They worked with PSI to modernize their survey techniques, including the use of drones to collect imaging, and handheld GPS to map population densities, ages, and size classes. This information will help APMI, in collaboration with ADFG, understand the feasibility of outplanting to enhance the shellfish population on the beaches of interest.

### 7.3. Governance & Administration

Governing and administering a grant of the size, scale, and complexity of the AMC is an Industry Challenge in itself. With a total budget of \$49M, covering an area spanning five regions of Alaska, and aiming to build entire supply chains for both seaweed and shellfish, the AMC requires effective governance that spans the diverse regions and populations of southern coastal Alaska. At the outset of the grant, most of the partner organizations, including SEC, had little to no experience managing federal grant funds. SEC and all the AMC subawardees, contractors, and RFP award recipients have had to build capacity to manage these funds. While the learning curve has been steep, building this administrative capacity has been a benefit of the AMC.

Southeast Conference (SEC) is the lead agency for the AMC, and administers the grant as a whole.<sup>32</sup> SEC co-manages the Governance Body & Outreach grant component (#2) along with the Alaska Mariculture Alliance and three other Economic Development Districts (EDDs) of the AMC regions: Prince William Sound (PWSEDD), Kenai Peninsula (KPEDD), and Southwest Alaska Municipal Conference (SWAMC). Alaska Fisheries Development Foundation (AFDF), a subawardee, manages the R&D and Green Energy grant components.

#### 7.3.1. Theory of Change Alignment

The AMC Theory of Change identifies two desired outcomes related to Governance & Administration:

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<sup>32</sup> For a more complete description of the AMC partnership, please see the Introduction.

- Sufficient and appropriate mariculture investments in AK Native and rural communities (Intermediate)
- Grow AK mariculture industry equitably and sustainably (Long-Term)

### 7.3.2. Results to Date: Projects by Budget

**Indicator:** Number of relevant projects and budgets: **13 projects, with combined budgets of \$4.8M**

Table 15 below provides a summary of the projects devoted to the Industry Challenge of Governance & Administration.

Table 15. Governance & Administration Projects by Implementing Agency or Contractor

Project / Item	Implementing Agencies or Contractors	Budget
SEC Grant Administration (Component #8) Management	SEC	\$2,222,250
AFDF Research and Development (Component #4) Program Management	AFDF	\$933,687
Mariculture Equipment Program Management	SEC	\$578,123
AMA Program Management	AMA	\$496,076
SEC Governance, Coordination, and Outreach (Component #2) Program Management	SEC	\$246,007
SEC Research & Development (Component #4) Program Management	SEC	\$140,000
Green Energy (Component #6) Management	AFDF	\$78,913
R&D Consulting Services	Jordan Hawskwell, Contractor	\$65,000
Grant Management Consulting Services	Juliana Leggitt, Contractor	\$30,000
Alaska Fellows Program	SEC	\$25,000
Mariculture Equipment Program Legal Consulting	Markos Scheer	\$10,000
Misc. Expenses inc. Program Support	SEC	\$7,484
<b>Total</b>		<b>\$4,833,290</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and cancelled projects.		

### 7.3.3. Results to Date: Perceptions of Governance

**Indicator:** Self-reports of positive governance outcomes from Governance Body members, Tribal representatives, Liaisons, and other AMC constituencies:

- **152 total comments on governance from 22 interviews<sup>33</sup>, of which:**
- **30 (20%) were classified as praise, 46 (30%) were classified as criticism, and 76 (50%) were neutral** including questions, observations, and recommendations
- Comments became more positive and less critical over time (December 2024 - May 2025)

Interviewees expressed a range of views of the governance of the AMC, around a series of themes explored in this section. Interviews conducted early in the sample tended to be more critical of the AMC governance than those conducted later in the sample: of the first 11 interviewees who commented on governance, six (6, 55%) provided more criticism than praise, while three (3, 27%) provided more praise than criticism. Of the second 11 interviewees to comment, an equal proportion of interviewees offered more praise (5, 45%) as those that offered more criticism (5, 45%). The following paragraphs summarize 2 successes and 3 challenge areas highlighted by interviewees and focus group participants. AMC is actively responding to one of these challenge areas; its work in this area is summarized by the Response paragraph below.

**Success: Increased Transparency and Adaptive Governance.** A recurring theme in interviews was the difficulty of keeping track of the diverse and complex projects and programs comprising the AMC. In this light, interviewees acknowledged SEC's increased efforts in transparency of finances and governance over the 2024-2025 period, including the development of the AMC Airtable database and increasingly candid budget discussions at the Governance Body meetings. One interviewee, who works for a statewide mariculture organization, praised AMC's adaptive ability: "The AMC has responded to feedback on its missteps; it's corrected its own mistakes". Another interviewee, who works for a Tribally led nonprofit, noted "AMC's funding streams have been reliable in a world where funding has become more unstable."

**Success and Challenge: Progress on Equity and Remaining Questions.** Overall, respondents expressed a range of views about how equitable the AMC has been toward Alaska Native and remote rural populations. Before the release of the Airtable database, interviewees found equity in the AMC difficult to assess, magnified by a lack of publicly available evaluation reporting. One interviewee, who works for a Tribally led nonprofit, noted, "I only know about the work in Alaska Native communities that's being led by organizations that I partner with." Another interviewee, who works for a regional Tribal agency, expressed concern that "AMC resources aren't making it to Southeast tribes at a broader scale." Interviewees expressed optimism about AMC's progress on equity over the 2024-2025 period. One interviewee, who works for a small business that partners with Tribally led organizations to hire interns, said, "I think opportunities for Alaska Native people in AMC will grow."

**Challenge: Hands-On Industry Experience Perceived as Undervalued.** Some interviewees perceived AMC's governance to lack sufficient input from industry participants with hands-on expertise. One interviewee, a small business person, expressed the view that "not much of the money is going to the business of working on the water." Another interviewee, also a small business owner, corroborated: "Most of the people making decisions about the AMC are salaried, working in

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<sup>33</sup> 5 out of the 27 interviewees did not make comments on the AMC's governance.

offices, and have nothing directly to do with the industry.” A third interviewee, also a small business owner, said in March 2024: “There should be more farmers - people with boots on the ground - involved in governance.”

**Challenge: Barriers to Entry.** Some interviewees and focus group participants expressed concern that the current AMC is not sufficiently inclusive of new entrants to mariculture and favors people who are already involved in, and connected to, the industry. As one interviewee, who worked for a regional nonprofit, said, “Most of the AMC funding is going to people who have already been doing mariculture.” A focus group participant, who works for a Tribal agency, said: “I don't know if we're helping the actual startup of folks coming into Mariculture. For folks that are already established, it's helped them quite a bit. If you're not established, I don't think you're getting anything out of it.”

**Response: Building a New Industry.** The AMC has had to balance the multiple needs of catalyzing an industry in its earliest stages, where risk of entry remains high. As a result, the organizations best positioned to receive AMC funding are those with relevant experience in mariculture, including permit holders for farms and hatcheries. The workforce development courses offered by the universities and the Native Conservancy, as well as the technical assistance and business planning support offered by Spruce Root, are both areas where new entrants to mariculture are welcome. The de-risking of the industry provided by multiple AMC projects is setting the stage for new entrants to mariculture to start businesses with a more robust basis of information about site selection, equipment, production costs and requirements, and markets.

#### 7.3.4. Results to Date: Perceptions of Administration

**Indicator:** Self-reports of positive experiences with grant administration or processes from Governance Body members, Tribal representatives, Liaisons, and other AMC constituencies:

- **155 total comments on grant administration from 19 interviewees, of which 66 (43%) were classified as praise, 66 (43%) were classified as criticism, and 23 (15%) were neutral** including questions, observations, and recommendations
- Comments became more positive and less critical over time

Interviewees and focus group participants identified 3 successes and 5 challenge areas in the administration of the AMC grant, as summarized below. AMC is actively responding to 4 of these challenge areas, as indicated below in the Response paragraphs. Interviews conducted early in the sample tended to be more critical of the AMC governance than those conducted later in the sample: of the first 10 interviewees who commented on governance, six (6, 60%) provided more criticism than praise, while three (3, 30%) provided more praise than criticism. Of the second 9 interviewees to comment, only two (2, 22%) provided more criticism, and six (6, 67%) provided more praise.

#### **Success: Appropriate and Aligned Opportunities.**

The majority of interviewees expressed that the RFP opportunities offered by AMC are appropriate to the needs of multiple mariculture affected parties. In particular, interviewees praised the Joint Innovation Projects (JIPs). One interviewee, who works for a small business that processes kelp, said,



"The JIP opportunity has been an opportunity to expand on what we're doing." Another interviewee, who works for a Native-led nonprofit, said, "The AMC grant has allowed us to build additional capacity as well as reach our objectives." A third interviewee, also working at a Native-led nonprofit, said, "We've enjoyed the ability to collaborate with different organizations through the AMC projects."

### **Success: Flexible Administration and Funding**

Interviewees and focus group participants praised SEC's flexibility in responding to awardees' concerns. One focus group participant, who had received an equipment award, said: "We started out with one vendor, but we lost trust in them and switched to another. The price went up, and the quality (of equipment and service) was much better. SEC was more than happy to hear our concerns and allocate more funds in our direction so that our project was successful."

### **Success and Challenge: Accessibility of Application Process.**

The majority of interviewees felt positively about the administration of RFP awards: clear, simple, accessible, and straightforward billing and reimbursement processes. Some felt it was slow and cumbersome, but not when compared to other federal funding opportunities. One interviewee, who works for a small business, said: "I think they made the application requirements simple and easy to understand, compared with other grants." Most respondents praised the flexibility and responsiveness of the awarding organizations, while noting that at times, staff turnover made that responsiveness inconsistent (see above). However, several interviewees from remote rural and Alaska Native communities noted that Tribal agencies often required more time to respond to the RFP opportunities than the timeline provided. One interviewee, who works for an Alaska Native-led nonprofit, said, "Tribes work on a longer approval timeline than the private or nonprofit sectors; therefore they need longer RFP timelines. And some tribes don't have enough bandwidth to apply."

**Response: Ongoing Process Improvements.** SEC and AFDF have listened closely to applicants' feedback, including those from Alaska Native and rural communities, about the accessibility of the application process, and worked to lengthen application timelines whenever possible. For example, in the Mariculture Equipment Program, the application window for the Round 1 RFP was 49 days, which many considered too short. As a result, the window for Round 2 was 104 days, and for Round 3 it was 127 days. Regarding the Other Species Program: the application window for Round 1 was 77 days and for Round 2 was 99 days. For the Joint Innovation Projects, the Round 1 window was 41 days, and the Round 2 window was 92 days. AFDF and SEC made a last minute decision to open a Round 3, which necessitated a shortened application window of 57 days. SEC and AFDF have had to balance the needs of applicants with the requirements of awarding a large amount of funding to a complex set of organizations within the AMC grant's four-year timeline.

**Challenge: Staff Capacity and Turnover.** Interviewees and focus group participants identified staff capacity at AMC's lead agency and subawardees as a concern, including staff turnover. One interviewee, who works for a statewide nonprofit, said, "SEC has struggled with personnel turnover, which has created some problems with continuity." Another interviewee, who works for a small

business that had received several AMC awards, said in February 2024: “The AMC needs more assistants, more people to be the intermediary or contact person. They should hire more interns and increase their staff budget by 10-15%.”

**Response: Increased Team Capacity.** SEC has been aware of the need for increased team capacity and has responded over the course of the grant period. At the outset of the grant, SEC’s AMC team consisted of four full-time staff members, and as of the end of calendar year 2025 it is up to six full-time staff members.

**Challenge: Clarity of Funding Guidelines.** Several interviewees expressed concerns about lack of clarity, particularly around eligibility requirements and budget categories. For instance, regarding budget categories, several interviewees remarked that they had been confused around the distinction between Supplies and Equipment. Another interviewee expressed difficulty in understanding the distinction between Installation (of equipment) and Construction. A third interviewee, a small business person, said in December 2024, “Because of the lack of clarity around funding restrictions, we had to rewrite our entire (JIP) proposal. We were lucky that we had nonprofit partners who could purchase the equipment that we were ineligible for, and that we needed in order to be successful.”

**Response: Learning Curve and Capacity Building.** AMC staff understand that EDA’s eligibility requirements and funding restrictions pose difficulties for some organizations. AMC staff, including those at SEC and AFDF, have worked to make these requirements as transparent as possible, including stating them clearly on RFPs. For example, the JIP RFP states:

Funding is not eligible to be used for infrastructure, including real property or improvements to real property. Funding cannot be used by a for-profit enterprise to purchase equipment. “Equipment” means purchases of single units with a total purchase price, delivered, in excess of \$5,000.00. Only EDA-eligible entities (non-profits, tribes, Alaska Native Corporations, Universities, or communities) are eligible to use funds to purchase equipment and retain ownership of the equipment. If a private company proposes to purchase equipment as a part of a project, it may be possible for AFDF, or another EDA-eligible entity, to purchase and retain ownership of the equipment for future lease and use by the public. This will be decided on a case-by-case basis.

For the finer points of distinction, such as between equipment and supplies, budget modifications, and other process points, all AMC participants, including SEC and AFDF, have been on a learning curve. As part of the Mariculture Equipment Program, AMC has provided subawardees with onboarding materials and onboarding meetings to provide clarity around these questions. As the AMC lead organization, SEC has been in constant communication with EDA to resolve difficulties and advocate on behalf of awardees. AMC staff understands that any delays in reimbursement may pose challenges to organizations on tight budgets, and encourages awardees to reach out to grant administrators for any needed clarifications.

**Challenge: EDA Grant Restrictions.**<sup>34</sup> A wide range of interviewees and focus group participants expressed frustration with the EDA’s restrictions on the use of AMC funds. Small businesses expressed frustration that, as for-profits, they were barred from applying for equipment funding. One interviewee, a small business owner, said: “If for-profit companies, who know how to use the equipment, could apply for it, that would be way easier.” Some Alaska Native community members expressed frustration that AMC funding could not be used for infrastructure, which is a critical need in Alaska Native communities. One interviewee, who works for a Tribal agency, said: “The funding restrictions work against Tribes. Tribes are seeking funding for mariculture infrastructure, and the EDA funds are not for that purpose.” An interviewee, who works for a nonprofit and provides technical assistance to aspiring Alaska Native mariculture farmers, said, “The EDA funding restrictions make it very hard for aspiring small-scale, rural, Alaska Native farmers to get started.”

**Challenge: Small Award Sizes.** Some respondents believe that the award sizes are too small to be meaningful. One interviewee, who works for a small business, said: “we couldn't have done our project (JIP) if we hadn't already had another grant.” Another interviewee, who works for an Alaska Native-led nonprofit, said, “The award sizes are too small to tackle big questions.” A third interviewee, who works for an Alaska Native Corporation (ANC), said, “To be successful investing in a Tribe, you’d need to invest a lot more than a couple hundred thousand dollars. So you’d need to work with fewer tribes.”

**Response: Variable Award Sizes.** The AMC Airtable Database tracks awards by RFP. Table 16 below presents the average award size by RFP, for the ten (10) RFPs with the most awarded projects. Award size ranges from a low of \$86k for JIPs to a high of \$493k for the second round of Mariculture Equipment Program awards.

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<sup>34</sup> NOTE: This paragraph should be considered as part of the overall context rather than a statement of evaluation of the grant performance itself, since it relates to an aspect of the grant that neither SEC nor its subawardees can influence.

Table 16. Award Sizes by RFP (10 RFPs with most awarded projects)

<b>RFP</b>	<b>Average Award Size</b>
Mariculture Equipment (Round 2)	\$493,186
Kelp Ag Product R&D	\$414,270
Mariculture Equipment (Round 1)	\$235,333
Seaweed Tissue Analysis	\$202,500
Kelp Seed Quality Improvement	\$197,513
Carbon Sequestration	\$125,811
Feasibility Study	\$120,401
Other Species	\$111,907
JIP (All Rounds)	\$86,095

## 7.4. Innovation, Technology, & Data

Providing adequate data for mariculture farmers, value chain participants, investors, public agencies, nonprofits, foundations, and other supporters to make decisions, innovate new products and practices, and understand their impacts, is an important Industry Challenge. Developing new technology that lowers the cost of production, such as more energy efficient vessels, can make mariculture production less costly and more profitable. Providing accurate market information about the prices of mariculture products, and the cost of inputs, is critical for aspiring producers to decide whether, when, and in what mariculture species to invest. Understanding the environmental impact of mariculture, including its potential for carbon sequestration, can help mariculture farmers access carbon markets as well as provide philanthropists, public agencies, and impact investors with information to make granting and investment decisions.

### 7.4.1. Theory of Change Alignment

The AMC Theory of Change identifies five desired outcomes related to Innovation, Technology, and Data:

- Low Carbon Industry (Intermediate Outcome)
- Innovative Products and Processing Techniques (Intermediate Outcome)
- Knowledge exchange (Intermediate Outcome)
- Reduce cost structure of Alaska mariculture industry (Long-Term Outcome)
- Grow AK mariculture industry equitably and sustainably (Long-Term Outcome)

#### 7.4.2. Results to Date: Projects by Species Group and Budget

**Indicator:** Number and value of projects by major species group: **7 projects with combined value of \$1.6M, of which 3 focus on seaweed and 4 focus on both seaweed and shellfish**

Table 17 below presents the number of projects addressing Innovation, Technology, and Data by major category or RFP, major species group, and budget. (This evaluation report and its related work are included in this table under “Grant Evaluation Services”).

Table 17. Innovation, Technology, and Data Projects by Major Species Group

Program / Project	Major Species Group	Number of Projects	Budget
Green Energy in Mariculture	Seaweed and Shellfish	1	\$600,000
Alaska Mariculture Insights, Consulting, & Analysis	Seaweed and Shellfish	1	\$454,429
Grant Evaluation Services	Seaweed and Shellfish	1	\$255,000
Carbon Sequestration	Seaweed	2	\$214,302
Economic Research: Tracking Alaska Mariculture Industry Growth	Seaweed and Shellfish	1	\$60,000
Joint Innovation Project #20: Helical Anchor Performance Analysis	Seaweed	1	\$38,185
<b>Grand Total</b>		<b>7</b>	<b>\$1,621,916</b>

*\* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and cancelled projects.*

#### 7.4.3. Example Project: [Alaska Mariculture Insights](#).

Alaska Mariculture Insights is a website that presents data, information, and storytelling about mariculture, including market insights broken down into the different supply chain stages for seaweed and oysters. The website is focused on collaboration and information sharing across the industry including private and public sectors. It hosts the economic research memos published by McKinley Research Group, which include data on harvest by major species group, seed imports and sales, and permit applications. The site also includes guidance for every link of the seaweed and oyster value chains, from permitting and site selection to cultivation/grow-out, processing, and sales. It also includes sections on the Future Outlook for each major species group, based on interview data collected from farmers.

Aspiring mariculture participants including hatchery operators, farmers, processors, and product developers require accurate and timely market information in order to make informed decisions. Alaska Native-led organizations, including Tribal agencies, Tribally led nonprofits, Alaska Native Corporations, and entrepreneurs who are Tribal citizens, are among those seeking this information; as one interviewee, who works for a Tribal agency, said: “Tribal communities are looking for more data to support decision making around mariculture, especially: market feasibility, operating costs,

and infrastructure.” The Alaska Mariculture Insights platform is an online resource for these collected and published data.

#### 7.4.4. Example Program: [Green Energy in Mariculture \(GEM\)](#)

**Indicator:** Baseline data measurements of energy use in mariculture: **data exists and has been analyzed and reported for 22 businesses across four AMC regions**

The Green Energy in Mariculture (GEM) project, which comprises one of the eight AMC Grant Components by itself (Component #6), is designed to ensure that the industry develops sustainably and minimizes fossil fuel combustion by improving energy efficiency and using renewable energy when feasible. With a budget of \$599,916, the three main deliverables of the Green Energy project include:

- Baseline data measurements of energy use in mariculture
- A long-term renewable energy plan
- An energy “best practices guide” that includes analysis of renewable energy alternatives, energy audit procedures, and standards for the Alaska mariculture industry.

Led by Dr. Chandler Kemp from the University of Alaska Fairbanks, the GEM team includes researchers from UAA, UAS, and Alaska-based firms Rain Coast Data and Pacific Alternatives. Together, they worked with farmers, processors, and Tribal partners across Alaska to understand how energy is currently used at mariculture sites and how efficiency and renewable power can strengthen Alaska’s economy.

In November 2025, this project produced a [Green Energy in Mariculture Survey Report](#) that shared findings from a mariculture business energy survey by Raincoast Data, with 22 observations spanning four AMC regions: Southeast, Prince William Sound, Kenai Peninsula, and Southwest.<sup>35</sup> The survey included 36 questions which collected information on the businesses’ operations, equipment, and annual energy use in the form of gallons of fuel and kWh of electricity. Vessel operations and kelp stabilization were the two major business functions that accounted for the majority of energy use. 20 out of 24 survey respondents (83%) were located in a rural area. An interviewee, who contributed to the green energy survey, noted that “nobody else is gathering these data”.

The benefits of the Green Energy research are yet to come. A green energy plan and best practices guide are in process, and on track to be written by the end of June 2026, and shared before the end of the grant period. The abovementioned interviewee said, “We are developing a more unified understanding of energy issues in mariculture.” By the end of 2026, this understanding will be shared with the public.

**Challenge: Energy Costs.** Finding ways to reduce the cost of energy is a primary concern of many remote rural and Alaska Native communities. This concern extends across the supply chain. As one focus group participant from a remote rural Alaska Native community said: “There’s a big concern

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<sup>35</sup> [Green Energy in Mariculture Project Update](#)

about the cost of electricity in kelp processing.” An interviewee, also from a remote Alaska Native community, corroborated: “The electricity rate around here by itself is pretty outrageous. It’s cost prohibitive until our community uses a certain amount, but we’re nowhere near that amount.”

#### **7.4.5. Example Program: [Carbon Sequestration](#).**

In October 2025, SEC released a Carbon Sequestration RFP and has since made 4 awards worth \$500k, of which two of them are focused on data collection. The goals of AMC’s Carbon Sequestration work are to support new economic opportunities and increase Alaska’s competitive advantage in the marine carbon dioxide removal (mCDR) market. These projects will provide critical information about Alaska’s potential competitive advantages in the mCDR market and offer insight into how the mariculture industry can be a leader in that market. The Carbon Sequestration Program also supports applied research that explores how Alaska’s ecosystems can contribute to global carbon reduction efforts while improving marketability of Alaska’s mariculture products and strengthening the state’s mariculture industry.

In 2020, the carbon sequestration potential of kelp was touted as a potentially transformative solution to climate change in the pages of TIME Magazine.<sup>36</sup> Since that article was published, subsequent scientific research has revealed high levels of uncertainty around kelp’s long-term carbon sequestration and storage potential. Nevertheless, the potential for both environmental and economic benefit provide justification for investing in carbon sequestration research and development. One interviewee advocated for this work in December 2024 by saying, “The AMC should put some resources toward researching carbon sequestration in kelp, even if the results are negative or inconclusive.”

### **7.5. Outreach, Communication, & Knowledge Exchange**

One of the primary economic explanations for why industries tend to cluster together is the phenomenon of “knowledge spillovers”. In a well-functioning industry cluster, knowledge of the technologies, methods, and disciplines underlying the industry is widespread. Industry conferences, academic departments, training programs, consultants with high levels of expertise supporting multiple firms, and employees changing firms all contribute to the diffusion of knowledge across firms within an industry, supporting industry growth.<sup>37</sup>

Alaska’s long coastline and dispersed populations, communities, and ecological conditions pose a challenge for developing an industry cluster with robust knowledge spillovers. Intentional and well-resourced outreach, communication, and knowledge exchange programs can help to overcome the hurdles posed by geography and distance.

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<sup>36</sup> [The Ocean Farmers Trying to Save the World With Seaweed](#)

<sup>37</sup> For an overview of this topic, see Rosenthal and Strange (2004), [Evidence on the nature and sources of agglomeration economies](#).

### 7.5.1. Theory of Change Alignment

The AMC Theory of Change identifies three desired outcomes related to Outreach, Communication, & Knowledge Exchange:

- Knowledge exchange (Intermediate Outcome)
- Broadly distributed skills, ownership, and participation (Intermediate Outcome)
- Sufficient and appropriate investments in Alaska Native and rural communities (Intermediate Outcome)
- Grow AK mariculture industry equitably and sustainably (Long-Term Outcome)

### 7.5.2. Results to Date: Projects by Budget

**Indicator:** Number of relevant projects by value: **10 projects with combined budget of \$3.3M**

Table 18 below provides a summary of the main Outreach, Communication, & Knowledge Exchange projects by budget. This table does not include the substantial number of Workforce Development activities that include knowledge exchange; those activities are summarized in the Workforce Development section below.

Table 18. Outreach, Communication, and Knowledge Exchange Projects by Budget

Project Name	Budget
Regional EDD Outreach (KPEDD, SWAMC, and PWSEDD)	\$1,285,048
Mariculture Liaisons Program	\$1,011,078
AMA Program Management	\$496,076
Public Relations & Outreach Plan and Implementation	\$262,500
Mariculture Conference of Alaska (2023-2025)	\$245,400
Conferences (Seagriculture, Alaska Symphony of Seafood)	\$19,950
Crisis Communications Plan	\$10,000
<b>Grand Total</b>	<b>\$3,330,052</b>
* Includes projects that also addressed other industry challenges. Excludes Match, projects not started, and cancelled projects.	

### 7.5.3. Example Program: [Liaisons Program](#).

**Indicator:** Number of community entities engaged with on mariculture topics: **117 community entities contacted**, out of a total list of 161 relevant entities (73%)

Managed by the Alaska Mariculture Alliance (AMA), the Mariculture Liaisons are tasked with providing communication, connection, and coordination services to rural and Alaska Native communities. Each of the five AMC regions has one Liaison, who is housed at an Alaska Native-led

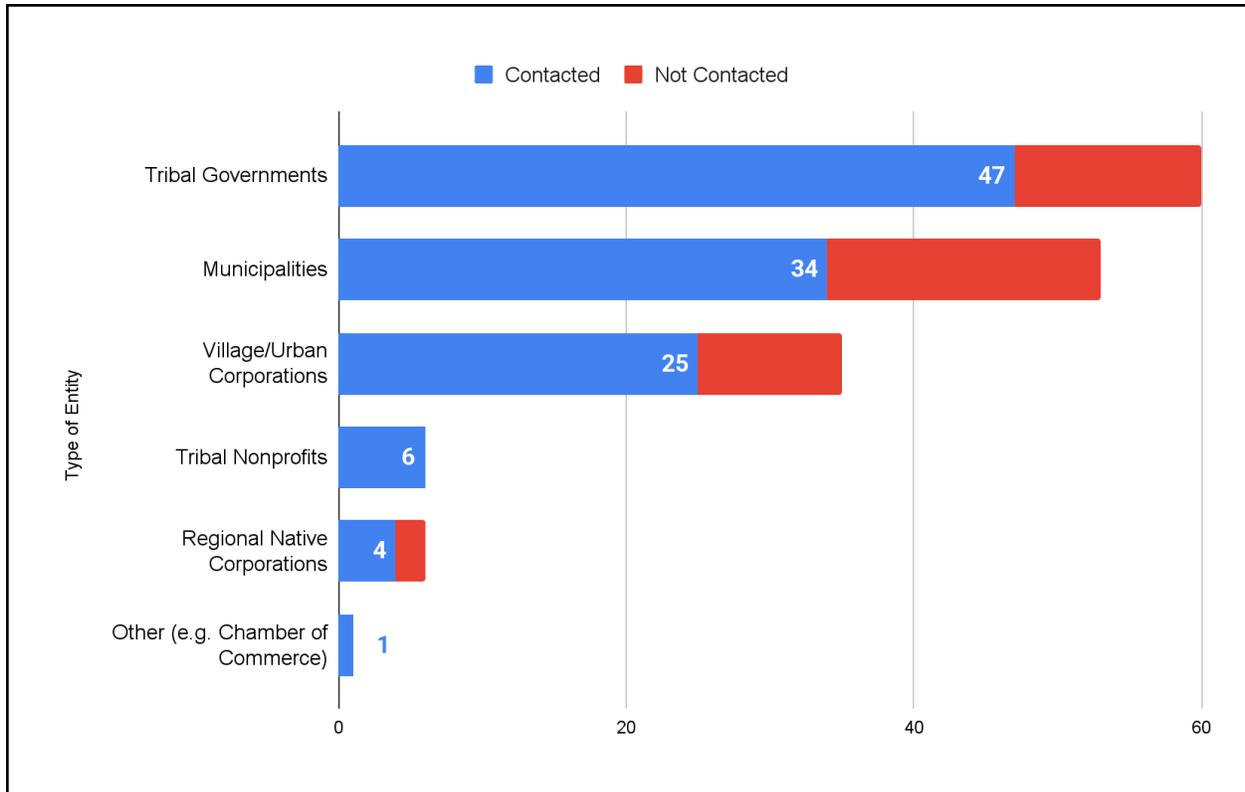


organization. The Liaisons facilitate access to resources within the AMC grant and generally support mariculture development efforts that meet local and Tribal priorities.

Feedback on the Liaison program has been overwhelmingly positive. Interviewees and focus group participants have praised Liaisons for supporting a very diverse range of functions, including supporting farmers in permitting and business formation; grant proposal writing including accessing RFPs and defining project scopes; outreach to Alaska Native communities, agencies, and nonprofits; connecting farmers with one another; and supporting education and training. One interviewee, who works in a leadership position at a Native-led nonprofit, said: “The reporting about Liaison activities doesn't do justice to the Liaisons' contributions.” Another, who works for an EDD, said: “A lot of effort and support is going to the Liaison program to make these resources as available as possible, to the Native communities as well as everyone else.” A focus group participant, who works for a Tribal Corporation, said: “Our Liaison has been invaluable in assisting us with our permitting process. It was a complicated process, and (they) were just amazing. We're very grateful to (them).”

AMC Liaisons were provided with lists of Tribal Governments, Municipalities, Village/Urban Corporations, Regional Native Corporations, and other relevant entities to contact regarding mariculture opportunities through the AMC. Through the end of 2025, Liaisons had contacted 117 out of 161 relevant entities (73%). Figure 7 below summarizes the number of community entities contacted by entity type (Tribal Government, Municipality, etc.) All entities contacted represented Alaska Native populations and/or remote rural communities.

Figure 7. Number of Community Entities Contacted by Liaisons, by Type



**Challenge: Inconsistent Support Across Regions.** Interviewees pointed out a major challenge faced by the Liaison program: two of the five regions - Southeast and Southwest/Aleutians - have had inconsistent Liaison support due to staff turnover, as well as high levels of geographic dispersion of communities within the region, making travel throughout the region costly and time-consuming. As one interviewee, based in Sitka, noted: “Ketchikan seems a world away from us.” A Southeast focus group participant said, “Part of the challenge is that Southeast is so diverse, and the distances are so great, that traveling between places is challenging even on a good day in many remote communities. It’s a daunting task.” A Southeast interviewee based in a rural community said: “Having one Liaison for the whole of Southeast is difficult.” Multiple focus group participants in Southeast, which included kelp and oyster farmers, processors, and Tribal agency staff, admitted having rarely, if ever, spoken to their Liaison over the grant period.

Interviewees and focus group participants from both Southeast and the Aleutians identified scarcity of outreach overall, including Liaison support, as a significant constraint on their ability to access AMC resources. One interviewee, who works for a statewide nonprofit, noted, “It has been difficult to find a Liaison for all the regions: Southwest as well as Southeast.” A third interviewee, a small



business person in a remote rural community, recommended, “AMC should employ more consultants who can do outreach to rural communities, including Tribes.”

**Response: Ongoing Outreach Efforts.** AMA understands the difficulties that Southeast and Southwest Alaska have experienced in receiving consistent Liaison support, and has responded actively. In Southeast, Ecotrust hired a new Liaison in May 2025, who has reached out to the majority of Alaska Native and rural organizations in the region. In response to feedback, AMA’s 2025 contract with Ecotrust for Southeast Liaison coverage includes a more substantial budget for travel and personnel time to help make up the gap in coverage. In Southwest, Qawalangin Tribe of Unalaska (QTU) hired a new Liaison in September 2025. The Southwest Liaison has collaborated with AMA, SEC, and SWAMC to develop a nuanced outreach approach for 2026 that will bring Aleutian community members to Kodiak for an multi-day immersive mariculture experience.

#### 7.5.4. Example Project: [Mariculture Conference of Alaska](#).<sup>38</sup>

Produced by Alaska SeaGrant and the Alaska Mariculture Research & Training Center (AMRTC), the sister organization of AMA, the Mariculture Conference of Alaska is an annual industry conference, accompanied by a trade show and industry association meetings, whose goal is to support the continued development of mariculture in Alaska by reviewing accomplishments, addressing challenges, and exploring opportunities in research, innovation, education, and industry growth. It has emerged as the single most important in-state, statewide forum for knowledge exchange and networking for the Alaska mariculture industry.

Interviewees spoke highly of the Mariculture Conference as a forum to bring together industry participants. One interviewee, who works for a statewide nonprofit, said: “AMC’s support of the Mariculture Conference of Alaska has facilitated farmer to farmer connections.” Another, who works for a university, said: “Having the Mariculture Conference has been helpful to keep up with what everybody else is doing.” However, interviewees’ responses show that a single annual event cannot reach every mariculture industry participant. An interviewee, a mariculture farmer who works for a Tribal agency, said: “The Mariculture Conference of Alaska doesn’t work with the majority of our Tribe’s timelines.”

### 7.6. Workforce Development

Workforce Development (Grant Component #3) comprises one of the Grant Components of the AMC. With a budget of \$10.5M, it is the second-largest of the seven Grant Components by budget.<sup>39</sup> The grant narrative states that “the objective of the Alaska Mariculture Cluster workforce development component is to support the growing mariculture industry in Alaska through education, learning, and skills development that are aligned with industry needs, broadly accessible,

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<sup>38</sup> The Mariculture Conference of Alaska is also considered to address the Industry Challenge of Workforce Development; see section 17 below.

<sup>39</sup> The largest Grant Component by value is Equipment and Technology, at \$15.2M, not including the Non-Federal Matching share.

and culturally responsive.”<sup>40</sup> Three subawardees have received funds as part of this component: University of Alaska Fairbanks (UAF), University of Alaska Southeast (UAS), and Prince William Sound College (PWSC). One additional program, the Immersion Training Program created by Native Conservancy (NC), was not originally part of the Workforce Development component but is considered part of this Industry Challenge.

### 7.6.1. Theory of Change Alignment

The AMC Theory of Change identifies three desired outcomes related to Workforce Development:

- Broadly Distributed Skills, Ownership, and Participation (Intermediate Outcome)
- Knowledge exchange (Intermediate Outcome)
- Grow AK mariculture industry equitably and sustainably (Long-Term Outcome)

### 7.6.2. Results to Date: Programs by Budget

Table 19 below presents the workforce development programs by budget. University of Alaska Fairbanks Subaward is the largest line item with a budget of nearly \$6M. Each program represents a large number of activities. A list of these activities for each of the three university programs is given in Appendix D at the end of this document.

Table 19. Workforce Development Programs by Budget

Subaward/Program Name	Budget
University of Alaska Fairbanks Subaward (UAF)	\$5,981,977
University of Alaska Southeast Subaward (UAS)	\$2,358,078
Prince William Sound College Subaward (PWSC)	\$1,607,089
Immersion Training Program (NC)	\$450,000
Hands On Farm Training <sup>41</sup>	\$322,340
Barge Marine Survey	\$3,360
<b>Totals</b>	<b>\$10,722,842</b>

### 7.6.3. Results to Date: Program Participants

#### Indicators:

- Total number of people trained across university programs + Immersion Training: **906**
- Total number of people participating in knowledge exchange & technology transfer sessions: **867**

<sup>40</sup> Alaska Mariculture Cluster, [Workforce Development Narrative](#) (2022), p.1.

<sup>41</sup> As of 12/31/2025, an RFP for this line item had been issued, but funds not yet awarded.

- Number of technology transfer, knowledge exchange, outreach, and related media activities: **16** distinct activities, of which some are recurring<sup>42</sup>

Table 20 below presents the total number of people reached across the three college/university programs (UAF, UAS, and PWSC), across three major types of Workforce Development activity: Education & Training, Technology Transfer & Knowledge Exchange, and Outreach & Media. These activity types are aggregated as follows:

- **Education & Training** includes all in-person workshops, short courses (including Native Conservancy’s Immersion Training Program), online workshops/webinars, college courses, semester programs, certificate programs, degree programs, and internship programs.
- **Technology Transfer & Knowledge Exchange** includes all activities defined by subawardees as such, plus the Mariculture Conference of Alaska, which we consider a Knowledge Exchange event.
- **Outreach & Media** includes an estimate of people reached at outreach events including festivals and fairs; as well as people reached via newsletters and social media including Instagram, Youtube, and podcasts.

Table 20. Number of people trained/reached by activity type, University of Alaska + NC Immersion Training, 2024-2025\*

Activity Type (General)	Total Participants	AK Native	Rural
<b>Education &amp; Training</b>	906	95	262
<b>Technology Transfer &amp; Knowledge Exchange</b>	867	85	173
<b>Outreach &amp; Media</b>	4060	200	540

*\*Data collection on Alaska Native and Rural participation is incomplete; not all programs collected data on participants by whether they were Alaska Native or lived in a rural location.*

These numbers show underrepresentation of Alaska Native people relative to the AMC target of 25%, in Education and Training (95 out of 906, or 10.4%) as well as Technology Transfer & Knowledge Exchange (85 out of 867, or 9.8%). Rural residents are well represented in Education & Training (262 out of 906, or 28.9%) and slightly underrepresented in Technology Transfer & Knowledge Exchange (173 out of 867, or 20%).

#### 7.6.4. Example Program: Native Conservancy Immersion Training.

In 2024-2025, the Native Conservancy held immersion training in Kake and Metlakatla, two rural Alaska Native communities in Southeast Alaska. As an example of the impact of this work, the Kake training was conducted in partnership with Spruce Root and Organized Village of Kake (OVK). The training brought together tribal leaders, existing and emerging kelp farmers, and workforce trainees, and other local people who sat in where possible. The four-day training offered a unique

<sup>42</sup> See Tables C2 and C3 in Appendix C.



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opportunity for Kake community members to share knowledge, acquire skills, and work towards a future of Indigenous-led mariculture, acknowledging the importance of continuing the community's "customary traditional use" of seaweed for subsistence and ceremony. The training featured an opening dinner with locally sourced foods. Throughout the training, participants engaged in an open discussion about aspirations, concerns, challenges, connections to culture, and ways of working. Topics included sourcing wild bull kelp sorus tissue and spore release, processing kelp seeds for nursery growth, monitoring wild kelp beds, kelp farming/cultivation, kelp processing including recipes for cooking/fermenting, traditional and modern uses for kelp, and business planning. Total attendance was 8 full-time attendees and 6 local people who visited or attended part of the trainings. All participants were Alaska Native and remote rural residents.

An interviewee from Kake provided a glowing review of this opportunity: "The Native Conservancy immersion training was a valuable opportunity to learn about the industry in every aspect: business planning, farming, nursery, processing, harvesting, array building, and outplanting. They were able to tell us about the growth cycle, the business side of things, and the whole permitting process."

#### **7.6.5. Example Program: Alaska Aquaculture Semester**

**Indicator:** Percentage of trainees who self-reported that trainings were effective (4 or 5 on a scale of 1 to 5), by program: **90-100%** (see Figures 6 and 7 below)

Alaska Aquaculture Semester (AAS) is a semesterlong program at University of Alaska Southeast (UAS), offered one semester per year, that provides students with essential occupational training to enter and succeed in the aquaculture workforce. Shellfish and seaweed mariculture play a central role, as well as salmon enhancement (e.g. hatcheries). The program also teaches maritime skills, including outboard maintenance and small vessel operation, with no prior experience assumed. The program includes a 100-hour internship requirement that provides students with direct experience working in relevant fields. The program benefits from a teaching kelp farm at nearby Sitka Sound Science Center; and a partner commercial kelp farm several miles to the north.

Students' response to AAS in its two years of operation to date have been overwhelmingly positive, as shown in Figures 8 and 9 below. These data have been corroborated by the results of interviews. One interviewee, a Workforce Development instructor, said, "70% of my students answered that they would want to work in mariculture." This interviewee also said, "The opportunities we've been able to provide, the experiences, learnings, and partnerships are going to continue beyond the life of this grant." Another interviewee, who had received an Occupational Endorsement Certificate (OEC) through one of the UA programs, called it "formative - probably the most amazing thing I've done in my life."

Figure 8. “How well prepared do you feel entering the workforce with your learned skills and knowledge base?” (1=least, 5=most)

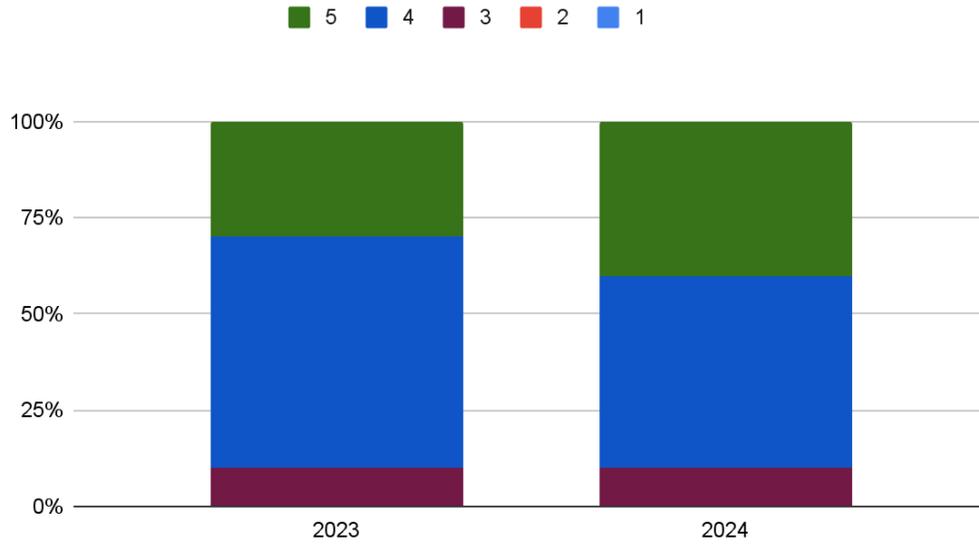
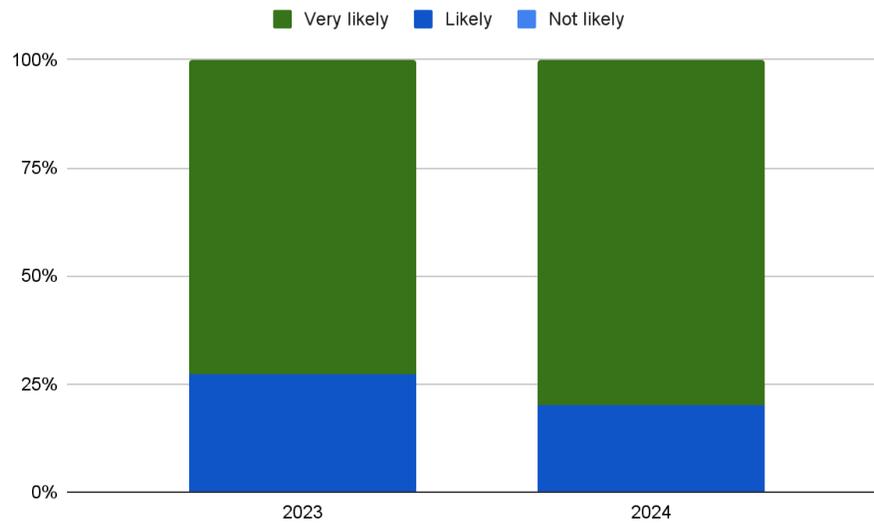


Figure 9. “After this semester, how likely are you to enter an aquaculture/mariculture field?”



**Challenge: Location of In-Person Training.** With the multiple successes in addressing the Industry Challenge of Workforce Development, interviewees and focus group participants also mentioned a key challenge: a mismatch between the location of many of the in-person trainings hosted by the universities and SeaGrant, and the location of many current and aspiring seaweed and shellfish farmers and processors, including Alaska Native and rural communities. One focus group participant, based in a remote rural community, said in January 2026, said:

It would have been great if the workforce development budget had funded more opportunities based on local communities. It's a challenge for people to leave their home for a while, and set aside all their other responsibilities to go attend these trainings. It would have been better to see more of that funding spent locally, and have Sea Grant employees traveling to our communities. It would have created more engagement and opportunity for people to participate.

Many farmers in remote rural communities have taken on training employees themselves. One focus group participant, a kelp farmer based in a remote rural community, said in January 2026: "When it comes for us to hire people for our kelp farm, they're completely untrained. We train them. So far, whatever's happening hasn't really trickled down to our region." An interviewee on the Kenai Peninsula said in December 2024, "I still can't find trained people on short notice."

The challenge works in the other direction as well: farms in less remote areas also experience location mismatch when seeking to offer training and internship opportunities to Alaska Native people and remote rural residents. As one kelp farmer said: "We developed a farmer training targeted to Alaska Native people. But one thing that's been difficult is that we often will get inquiries that are not local. Getting a remote applicant also requires us to have funding to bring them to where the farm is, and have enough work for them in the time they're here. Since we're often working with weather windows, that's been a great challenge and maybe a barrier."

**Response: Rural and Virtual Opportunities.** Sea Grant, UAS, UAF, and PWSC understand the challenges posed by high geographic dispersion of mariculture across the southern coast of Alaska. While it is not possible for workforce development activities to occur in every community, it's important to note the level of geographic diversity that the workforce development providers have achieved. Table 21 below provides data on the number of workforce development events, and total participants, occurring in rural areas across the AMC regions. These include training, education, outreach, knowledge exchange, and technology transfer. While the majority of such activities have taken place in a few rural locations, such as Sitka and Kodiak, there have also been significant numbers of online, virtual, or hybrid events (13 events with 339 participants), including multiple trainings and knowledge exchanges. There has also been some dispersion of training events across rural locations including Cordova, Valdez, and a range of locations on Prince of Wales Island. Finally, AMC has provided travel assistance for many of its trainings.

Table 21. Number of Workforce Development Events and Participants in Rural Areas, 2023-2025

Location	Number of Events	Number of Participants
Sitka	15	632
Kodiak	6	355
Online, Virtual, or Hybrid	13	339
Haines	1	200
Cordova	3	58
Valdez	4	52
Valdez, Seward	2	15
McGrath	1	12
Craig	1	10
Homer	1	10
Larsen Bay	2	8
Klawock	1	7
Naukati Bay	1	6
Eyak, Valdez	1	3
Homer, Prince of Wales	1	3
Prince of Wales, Kodiak	1	2

**Success: In-Person Training Workshops.** Interviewees and focus group participants praised the training workshops provided by Greenwave, which have traveled to a wider range of communities than the university programs. One interviewee said in January 2025: “It seems like Greenwave has done more workforce development than the Workforce Development component.” A focus group participant said in January 2026: “Most of the training that my partner and I have received have come through Greenwave workshops, which have been pretty darn fantastic.”

Similarly, interviewees in remote rural communities praised the Native Conservancy immersion trainings for coming to their community and delivering trainings in person, rather than requiring aspiring trainees to travel. The consensus among interviewees and focus group participants is that in-person, locally provided trainings are preferred, especially in remote rural communities.

**Success: Increased Interest in Mariculture Farming.** As shown in Figures 6-7 above, students’ levels of self-reported preparation and interest in entering the mariculture field is high. One focus group participant has perceived a shift in that interest from employment to entrepreneurship: “When we



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first started taking interns, most people wanted jobs at farms. This year, I'm seeing students that want their own farm. That's exciting for us, because it means the expansion of the industry and people we can continue to work with."

## 8. Conclusion and Next Actions

Through the calendar year 2025, AMC made measurable progress toward overcoming all 12 of the Industry Challenges mentioned above. Each Industry Challenge mentioned above includes at least one Success or Example project that illustrates this progress. Yet the bulk of AMC's work is still in progress, and many challenges remain to be overcome in order to unlock the potential of the industry.

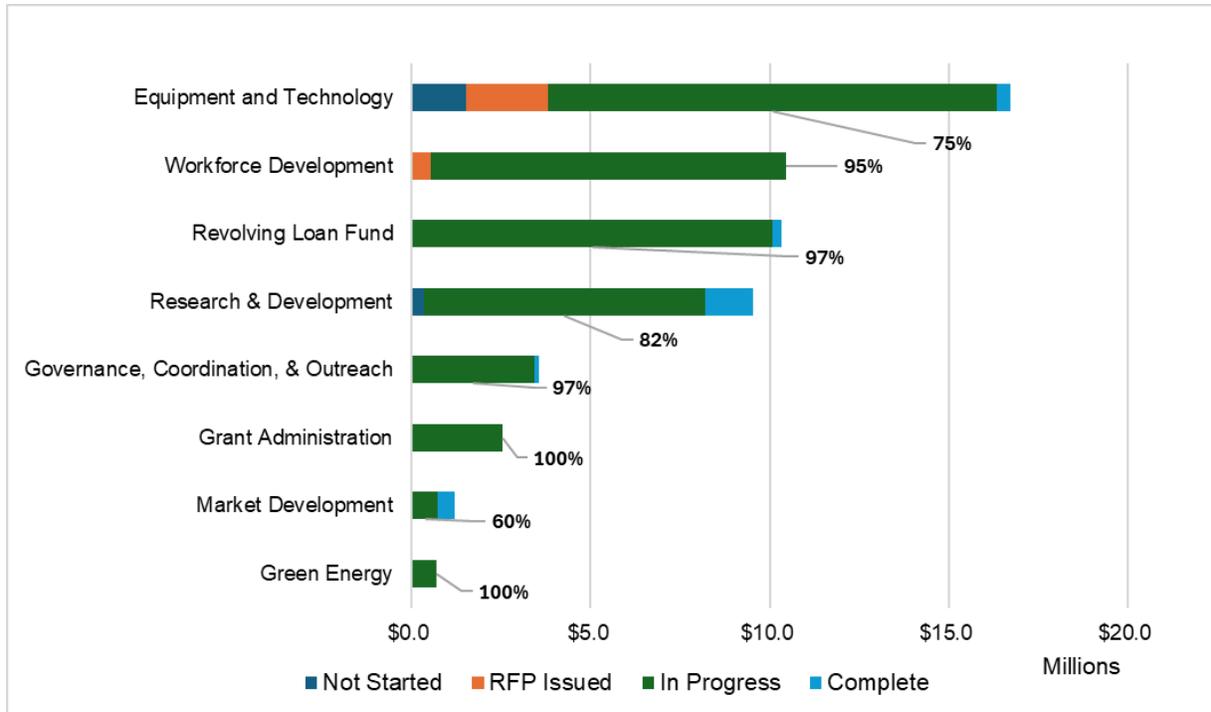
### 8.1. Works In Progress

The vast majority of the AMC's work is in progress. Figure 10 below provides summaries of the total budget value of AMC funded projects by Grant Component based on project status, excluding Match. The green bars indicate projects whose status is In Progress. As the figure makes clear, the majority of the AMC funding is in projects whose status is In Progress.<sup>43</sup>

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<sup>43</sup> Some of the projects classified as In Progress are large line items whose work may be well over half complete as of the end of 2025. Hence this graph does not provide information to make distinctions between projects that are recently started, and projects whose work is almost complete; both would be classified as In Progress.

Figure 10. AMC Funding Status, by Grant Component



The next two paragraphs highlight two examples of the major AMC components whose work is in progress: the Equipment awards and the R&D data collection on kelp genetics and farm site suitability. Once completed, these two components promise to unlock mariculture industry growth by overcoming three key Value Chain challenges: Site Selection and Permitting; Hatchery and Nursery; and Stabilization, Processing, & Distribution.

**8.1.1. Example: Mariculture Equipment Program**

The projects awarded through the Mariculture Equipment Program are some of the most potentially impactful, and most valuable, AMC-funded projects. Through end of calendar year 2025, only 2% of Equipment awards and related projects (by value) are complete; 75% are In Progress, and the remainder (23%) have not been initiated. Equipment awardees and SEC have had to overcome numerous hurdles to ensure acquisition of the best equipment, including navigating difficult funding restrictions and accessing technical expertise. Much of this equipment is being shipped from overseas, including through the Panama Canal; tariffs and other economic uncertainties are affecting the prices of the equipment.

**8.1.2. Example: R&D Data Collection.**

The two largest funded Research and Development (Component #4) initiatives, the Seaweed Population Genetics Program and the De-Risking Investments and Site Suitability Program, are both

In Progress. These two initiatives promise to overcome significant hurdles and increase the potential for growth of mariculture farming. The Seaweed Population Genetics Program aims to make hatchery regulations more flexible and geographically tailored; the De-Risking Investments analysis will provide farmers with accurate information about ocean conditions and startup costs, reducing the uncertainty of investments.

## **8.2. Transition to Private Sector Leadership.**

Whether they are initiated through public or private funding, cluster economies must ultimately rely on private sector investments to be successful. AMC funding has set the table for successful private sector investment in mariculture via key investments in a large number of areas including pilot-scale product testing, applied research for product development (e.g. seaweed tissue analysis), production at scale to meet demand, site de-risking, toxin testing, genetic analysis for regulatory enhancement, workforce training, strategic investments in hatchery/nursery and processing equipment, cultivation of new species, efforts to lower energy costs and increase renewables, and loan enhancement through collateral support. What remains is for private mariculture firms to supply seaweed and shellfish products; private buyers of seaweed and shellfish to purchase them in response to consumer demand; and banks and private investors to invest where it is needed to achieve scale necessary to reduce industry costs.

Promising signs of private sector involvement include: the recent bulk purchase of kelp from farmers across three regions (Prince William Sound, Kodiak, and Prince of Wales Island) by a large-scale Canadian buyer based in British Columbia; the promising results from the seaweed tissue analysis, revealing a large range of marketable compounds; and the promise shown by a range of new product trials.

## **8.3. Appreciation and Optimism**

As of the end of 2025, Alaska mariculture industry participants have expressed enthusiastic appreciation for AMC's contribution and are cautiously optimistic about the future of Alaska mariculture. A focus group member who is a kelp farmer said, "The existence of AMC and BBB funding was a significant factor in getting investment for our region's enterprises, because it demonstrated de-risking. I think we'll look back and say that this AMC project has significantly changed the trajectory of mariculture in Alaska - in a positive direction." Another focus group member, a kelp processor, said, "It's too early to call it a massive success, but I think we'd be on a different trajectory if it had not occurred. I think we've learned a lot through this process, and are starting to figure out what will move the needle further." A third focus group member, a hatchery operator, said: "It's been incredible, the amount of leaps and bounds people have been able to take through new species and new technologies. I don't know where or how fast the industry would have grown without it. It's been kind of light speed. It's been a fantastic resource for the industry."

## **8.4 High Uncertainty**

High uncertainty remains regarding the pace and direction of growth. New entrants, including Tribal entities, are still seeking more reliable market information. A focus group participant from a Tribal



agency in Southeast noted, “We’re still at a point where we need more information: market costs, what markets are available, and an overall marketing aspect for rural communities, including offsets, for what our Tribe is talking about.” A focus group participant from a nonprofit on the Kenai Peninsula said about the kelp market specifically, “I think it’s too up in the air to figure out what a couple years from now is going to look like.”

To sum up briefly: existing data, documentation, and collected data and testimony from interviewees and focus groups point toward an overall positive impact of the AMC on the Alaskan mariculture industry. AMC investments have supported industry de-risking and overcoming the Industry Challenges summarized in this evaluation; and the outlook for the industry is promising. Yet, industry challenges remain, and the projected impacts of increased production are still yet to come. As a focus group participant from Kenai Peninsula said: “Right now, it’s hard to measure toward the target of building a \$100M industry within 20 years. A lot of the measurable impacts are in things like research and awareness, and those things are harder to quantify.”

Interviewees and focus group participants identified the grant timeline as a constraint: despite the apparently long timeline, in agricultural terms the grant period covers only four harvest seasons. As one focus group participant put it, “When you only get one chance a year to pull kelp out of the water, four years is not a very long time.”

#### **8.4. Next Actions**

Upon completion of all grant components, Ecotrust M&E will engage in one more round of data collection, and subsequently draft and publish a Final Evaluation Report for the AMC for all grant activities through the end of the grant period. The official end of the grant period is September 2026; some projects have been granted no-cost extensions through May 2027.



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## Appendix A. AMC Grant Components, Subawardees, and Budgets

Grant Component	Subawardees	Component Budget
#1 Revolving Loan Fund	Spruce Root	\$10,331,532
#2 Governance, Coordination, Outreach	Alaska Mariculture Alliance, Kenai Peninsula Economic Development District, Prince William Sound Economic Development District, Southwest Alaska Municipal Conference	\$3,552,709
#3 Workforce Development	Prince William Sound College, University of Alaska Fairbanks, University of Alaska Southeast	\$10,467,144
#4 Research & Development	Alaska Department of Fish and Game, Alaska Fisheries Development Foundation	\$9,421,572
#5 Market Development	Alaska Fisheries Development Foundation	\$1,207,500
#6 Green Energy	Alaska Fisheries Development Foundation	\$681,329
#7 Equipment & Technology	Alaska Department of Environmental Conservation, Central Council Tlingit & Haida Indian Tribes of Alaska, Chenega Regional Development Group, Chugach Regional Resources Commission, Kachemak Shellfish Mariculture Association, Kenai Peninsula Economic Development District, Larsen Bay Tribe, Native Conservancy, OceansAlaska, Prince William Sound Economic Development District, Prince William Sound Science Center, Sun'Aq Tribe of Kodiak	\$12,488,561
<b>Total</b>		<b>\$48,150,347</b>

## Appendix B: AMC Theory of Change



### TARGETS

- 25% of Cluster resources to AK Native populations
- 25% of Cluster resources to underserved communities

### ECONOMIC GOALS

- Grow a \$100 million industry in ten years and a \$325 million industry in 20 years
- 550 jobs in 10 years and 1,800 jobs in 20 years

### KEY ASSUMPTIONS

- Public investments to de-risk the mariculture sector will catalyze sufficient private investment to spur industry growth
- Alaska is positioned to be a global leader in mariculture due to its ample coastline, existing seafood infrastructure, and workforce
- Simultaneous investments and innovations throughout the value chain will overcome chicken-and-egg barriers
- The AMC coalition can contribute to a new approach to equitable economic development
- Mariculture business and job creation can be aligned with the lifeways of Alaska Native and rural residents in coastal Alaska



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## Appendix C. AMC Indicators and Results to Date, 2024-2025

Industry Challenge	Indicator	Result to Date
Site Selection and Permitting	Number and value of projects	3 projects with combined value of \$1.3M
Hatchery/Nursery	Number and value of relevant projects by major species group	25 total projects, of which 12 focus on seaweed, 10 shellfish, and 3 both, with combined total budgets of \$5.6M
Hatchery/Nursery	Number of farmers reporting increased availability of seed between 2024-2025	43% of oyster farmers, 50% of seaweed farmers
Hatchery/Nursery	Hatchery equipment provided by function and value	41 pieces of equipment provided, with a total combined value of \$5.3M.
Hatchery/Nursery	Number of hatchery/nursery operators and mariculture farmers provided with technical assistance in hatchery/nursery skills	7 hatchery/nursery operators supported
Hatchery/Nursery	Number of analyses on genetic diversity	Whole genome sequencing on 3 kelp species (bull, ribbon, and sugar)
Cultivation	Number and Value of relevant projects, by major species group	13 projects worth \$1.3M, of which 8 focus on seaweed and 5 shellfish
Cultivation	Number of new mariculture species cultivated	11, of which 3 seaweed and 8 shellfish species
Food Safety	Number and Value of Projects by Major Species Group	3 projects with budgets \$4.3M, of which 2 focus on shellfish and 1 on seaweed
Food Safety	Existence and availability of an improved PSP testing method	Method exists and is soon to be made available

Stabilization, Processing, Distribution	Number of relevant projects by major species group	26 projects with combined budget of \$5.2M, of which 19 focus on seaweed, 4 on shellfish, and 3 on both
Stabilization, Processing, Distribution	Number of Stabilization and Processing Methods Pilot Tested	15 methods of stabilization and processing tested
Stabilization, Processing, Distribution	Processing equipment by type and value awarded	48 separate pieces of processing equipment awarded, with total value of \$3.45M
Product & Market Development	Number of relevant projects, by major species group	27 projects, with combined value of \$4.8M, of which 19 focus on seaweed, 4 shellfish, and 4 both.
Product & Market Development	Number of product categories being explored and/or developed	10 product categories explored, of which 9 are focused on kelp
Product & Market Development	Number of seaweed tissue analyses	17 species analyzed, over 4000 separate analyses conducted
Product & Market Development	Market research report completed and disseminated	Report completed and disseminated
Product & Market Development	Marketing plan that addresses barriers, gaps, opportunities specific to community, population	Plan has been developed and is being implemented
Access to Capital	Number of financial partnerships established with other lending institutions	Two financial partners, Spruce Root and Northrim Bank, with one more partner in process
Access to Capital	Number and dollar value of loans enhanced / directly provided by lending partners	One loan deployed to one mariculture farm, worth \$50,000; with two more loan applications in development
Access to Capital	Number of mariculture businesses financed by direct or enhanced loans	One mariculture business financed
Access to Capital	Number of mariculture businesses receiving technical assistance by RLF partners:	25 total businesses receiving technical assistance under RLF,

Access to Capital	Number of mariculture business plans supported by RLF partners	10 business plans supported by financial partners
Access to Subsistence and Food Security	Number and value of projects by major species group	8 projects, with combined budgets of \$872k, of which 7 focus on shellfish
Governance and Administration	Number of relevant projects and budgets	13 projects, with combined budgets of \$4.8M
Governance and Administration	Self-reports of positive governance outcomes from Governance Body members, Tribal representatives, Liaisons, and other AMC constituencies	152 total comments on governance from 22 interviews, of which 30 (20%) were classified as praise, 46 (30%) were classified as criticism, and 76 (50%) were neutral including questions, observations, and recommendations
Governance and Administration	Self-reports of positive experiences with grant administration or processes from Governance Body members, Tribal representatives, Liaisons, and other AMC constituencies	155 total comments on grant administration from 19 interviewees, of which 66 (43%) were classified as praise, 66 (43%) were classified as criticism, and 23 (15%) were neutral including questions, observations, and recommendations
Innovation, Technology, Data	Number and value of projects by major species group	7 projects with combined value of \$1.6M, of which 3 focus on seaweed and 4 focus on both seaweed and shellfish
Innovation, Technology, Data	Baseline data measurements of energy use in mariculture	A report exists with data collected and analyzed for 22 businesses across four AMC regions
Outreach, Communication, Knowledge Exchange	Number of relevant projects by value	10 projects with combined budget of \$3.3M
Outreach, Communication, Knowledge Exchange	Number of community entities engaged with on mariculture topics	117 community entities contacted (73% of total poll)



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Workforce Development	Total number of people trained	906 people trained
Workforce Development	Total number of people participating in knowledge exchange & technology transfer sessions	867 people participating in knowledge exchanges
Workforce Development	Number of technology transfer, knowledge exchange, outreach, and related media activities	16 distinct technology transfer, knowledge exchange, outreach, and related media activities
Workforce Development	Percentage of trainees who self-reported that trainings were effective (4 or 5 on Likert), by program	90-100% of trainees report that the trainings were effective

## Appendix D. List of Workforce Development Programs and Knowledge Exchange Activities.

**Table C1. UAF Education & Training Activities**

Alaska Mariculture Incentive Grant Program Webinar
Beginning Farmer Business Planning, Marketing, and Processing
Better Process Control School
Bull Kelp Workshop
Business Planning for Kelp Farms
Exploring Ocean Farmer Co-ops Roundtable
Forklift Training for Mariculture Operators
HACCP
Harmful Algal Bloom Training for Shellfish Farmers
Introductory Seaweed Cultivation and Processing Workshop
Kelp Business Planning & Marketing Workshop
Kelp Farm Operations: Training of the Trainers
Kelp Nursery Workshop
Kelp Processing Training
Larsen Bay FLUPSY Training
Mariculture Internships
Oyster Farm Operations Workshop
Oyster Hatchery Train-the-Trainer
Pinto Abalone Training
Sanitation Control Procedures for Seafood Processors
Seaweed Dryer Workshop
Seaweed Drying Forum
Seaweed Harvest & Market Development workshop
Seaweed Processing Demonstration
Seaweed Stabilization Workshop
Shellfish / Oyster Hatchery/Nursery Workshops
Vibrio Webinar

<b>Table C2. UAF Outreach &amp; Media Activities</b>
Mariculture Conference of Alaska
Kodiak Kelp Festival
Mariculture Photography Contest and Gallery
Alaska Seaweed and Shellfish Festival
Ketchikan Street Fair Mariculture Corner
Southeast Alaska State Fair
AMRTC Salty Interview Sessions Social Media Series
Juneau Maritime Festival Mariculture Booth
Know Your Alaskan Farmer Youtube Video series
Newsletter subscribers
Instagram followers

<b>Table C3. UAF Technology Transfer &amp; Knowledge Exchange Activities</b>
Scottish Seaweed Industry Knowledge Exchange & Webinar
Oyster Industry Knowledge Exchange Webinar
Alaska Seaweed Genetics Workshop Information Exchange
WA-AK Knowledge Exchange
Farmer Knowledge Exchange Grant Program

<b>Table C4. UAS Education &amp; Training Activities</b>
Alaska Aquaculture Lab (3 day intensive)
Alaska Aquaculture Semester, UAS
Associate's Degree in Applied Fisheries Science
Business and Marketing in Aquaculture Course
Introduction to Alaska Mariculture



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<b>Table C5. PWSC Education &amp; Training Activities</b>
Mariculture Internship Program
Marine Natural Resources Technician OEC
Teachers Marine Ecology Professional Development Courses, UAA
Traveling Maritime Tech Courses (Small Engine Repair, Train the Trainer)



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## Appendix E. Glossary of Acronyms and Key Terms

### Acronyms:

AAS: Alaska Aquaculture Semester  
AFDF: Alaska Fisheries Development Foundation  
AMA: Alaska Mariculture Alliance  
AMC: Alaska Mariculture Cluster  
APMI: Aluutiq Pride Marine Institute  
BBRC: Build Back Better Regional Challenge  
CRRC: Chugach Regional Resources Commission  
DSP: Diarrhetic Shellfish Poisoning  
DST: Diarrhetic Shellfish Toxin  
EDD: Economic Development District  
FLUPSY: Floating Upweller System  
HAB: Harmful Algal Bloom  
HACCP: Hazard Analysis and Critical Control Points  
JIP: Joint Innovation Project  
KALI: Kodiak Archipelago Leadership Institute  
KPEDD: Kenai Peninsula Economic Development District  
M&E: Measurement and Evaluation  
MIGP: Mariculture Incentive Grant Program  
OEC: Occupational Endorsement Certificate  
PSP: Paralytic Shellfish Poisoning  
PST: Paralytic Shellfish Toxin  
PWSC: Prince William Sound College  
PWSEDD: Prince William Sound Economic Development District  
PWSSC: Prince William Sound Science Center  
RFP: Request for Proposals  
RLF: Revolving Loan Fund  
SEC: Southeast Conference  
SOP: Standard Operating Procedure  
SWAMC: Southwest Alaska Municipal Conference  
UAA: University of Alaska Anchorage  
UAF: University of Alaska Fairbanks  
UAS: University of Alaska Southeast



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**Key Terms:**

- Indicator: A specific, observable, and measurable marker used to track progress, performance, or change toward achieving a program's goals and objectives; a piece of evidence of success.
- Industry Cluster: A group of firms in related industries that are closely linked by common product markets, labor pools, similar technologies, supplier chains, and/or other economic ties.
- Intermediate Outcome: An outcome, or change in conditions, that is a building block of a longer-term outcome.
- Long-Term Outcome: A lasting change that a program aims to achieve over time.
- Mariculture: the production, enhancement, utilization and promotion of marine shellfish and aquatic plants.
- Outcome: A desired change in the world that a program or project seeks to make.