

# Kodiak Seafood and Marine Science Center

## University of Alaska Fairbanks

### Alaska Sea Grant

**Annual Report**  
**FY21 (July 1, 2020 - June 30, 2021)**



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January 2022

# **Kodiak Seafood and Marine Science Center University of Alaska Fairbanks**

## **Annual Activities Report FY21 (July 1, 2020 - June 30, 2021)**

### **Executive Summary**

The Kodiak Seafood and Marine Science Center (KSMSC) is a University of Alaska Fairbanks (UAF) marine research and education center that serves as Alaska's workforce development and applied research center focused on the seafood processing and fishing industries, as designated by the Alaska State Legislature in 1983. KSMSC is a unique facility including classrooms, laboratories, a test kitchen and a pilot seafood processing plant from which UAF conducts research and provides technical assistance, workforce training and education to improve Alaska's seafood industry and food safety.

The facility is located in the island community of Kodiak, in close proximity to one of the largest and most profitable fishing ports in Alaska. KSMSC serves statewide fishery and seafood industries and benefits Kodiak Island communities. Kodiak is the third largest seafood port in the nation by volume landed and has a large resident seafood processing and fishing workforce, with plants operating 11 months a year. Kodiak Island also has a number of smaller outlying villages with strong subsistence economies based on marine resources.

Personnel working at KSMSC in FY21 consist of four Alaska Sea Grant Marine Advisory Program faculty members, a Cooperative Extension Service 4-H coordinator for Kodiak, a research associate from the College of Fisheries and Ocean Sciences (CFOS), and two staff members. Graduate students, collaborative research partners, visiting University of Alaska (UA) faculty and community groups make use of the KSMSC facility during the year.

### **KSMSC Activities in FY21**

FY21 was a busy and active year for KSMSC. KSMSC hosted classes, meetings, training, seminars or events. An increasing number of activities were hosted virtually, which allows for greater inclusivity and geographic reach.

During the fiscal year, 572 participants received workforce development training in 18 seafood processing, fishing, industry or mariculture classes offered by Alaska Sea Grant. Classes were held at KSMSC and offered to 44 Alaskan communities via online delivery. Training classes

generated over \$17,975 in fees in FY21. One UAF undergraduate Fisheries class was taught from KSMSC, serving 12 undergraduate students. 13 workshops and seminars were delivered to Kodiak and statewide audiences.

KSMSC faculty members conducted 15 research projects in the areas of seafood science, product development, fisheries, climate change, harmful algal blooms and safe subsistence harvest of shellfish. The Marine Advisory and Fisheries faculty based at KSMSC produced 18 peer reviewed publications and reports.

Technical assistance and information was provided on an ongoing basis throughout the year by all faculty members, who engaged with 35 different seafood businesses and individual food producers as well as with state and federal agencies, tribal representatives and nonprofit groups. Numerous outreach and marine education projects took place, ranging from the Kodiak Area Marine Science Symposium to K-12 marine education events. Marine Advisory faculty and 4-H staff at KSMSC engaged with over 700 local youth during the year in marine science classes, labs, personal projects, and field trips.

External funding for faculty and staff based at KSMSC came from 12 funders. Funders included Alaska Sea Grant, NOAA, Pollock Conservation Cooperative Research Center (PCCRC), UA Technical Vocational Education Program (TVEP), North Pacific Research Board (NPRB), National Sea Grant, U.S. Department of Agriculture, Kodiak Area Native Association (KANA), National 4-H Council, Denali Commission, National Science Foundation, and UAA Business Enterprise Institute (Alaska Manufacturing Extension Program).



The KSMSC pilot processing plant provides space for training, product development, food safety research, technical assistance, and other education, extension and research activities.

## **Background**

The University of Alaska Fairbanks Kodiak Seafood and Marine Science Center (KSMSC) is a 20,000-square-foot seafood processing and marine research, training and education facility. KSMSC staff and faculty work year-round to conduct applied research, provide technical assistance, and offer workforce development training and other educational opportunities to seafood workers and coastal communities locally and across Alaska.

The Kodiak Seafood and Marine Science Center's purpose is directed in AS.52.020. "The center shall create employment opportunities in the state's fishing industry and other benefits to the state by:

- (1) providing training opportunities to citizens of the state on the most efficient and appropriate technologies for the harvesting, processing, and conservation of the fishery resources of the state;
- (2) providing information and technical assistance on the adaptation of existing and new technologies to the users of the fishery resources of the state;
- (3) providing research and development activities to adapt existing technologies to enhance the economic viability of the industry;
- (4) providing research and development activities to create new technologies that will enhance the effectiveness of the industry, and provide economic benefits to state citizens; and
- (5) encouraging joint projects between industry and government in order to use industrial experience and government programs to enhance the productivity of the industry."

KSMSC is an important asset in the implementation of the Alaska Maritime Workforce Development Plan, endorsed by the Alaska State Legislature, the UA Board of Regents, the Alaska Department of Labor and Workforce Development, the Alaska Workforce Investment Board and the industry group Maritime Works. The Alaska Research Consortium (ARC), a community and industry 501(c)(3) non-profit formed in 2016 with the goal of supporting KSMSC's mission as defined in Alaska statute, worked closely with the University of Alaska Fairbanks in FY21.

## **Teaching and Training**

### **Seafood Processing, Mariculture and Fisheries Courses**

During FY21, 572 people were trained in 18 seafood processing, mariculture and fishing industry workforce development classes offered by Alaska Sea Grant Marine Advisory faculty (Table 1). Classes were held at KSMSC and shared with 44 Alaskan communities through online delivery, generating \$17,975 in program income from training fees. Classes are offered as non-credit intensives, meeting the training needs of a year-round industry. Descriptions of each class can be found: [Alaska Sea Grant Seafood Processing and Technology](#), the [Alaska Fisheries Development Foundation](#), and the [Alaska Marine Safety Education Association](#).

Table 1. FY2021 Teaching and Training Courses

<b>Course Title</b>	<b>Date(s)</b>	<b>Location</b>	<b>Course Hours</b>	<b>Participants</b>	<b>Fees</b>	<b>Instructor</b>
Introduction to Alaska Seaweed and Survey Techniques	August 5, 2020	Distance delivery	2	12	Free	Good, M.
HACCP Segment 2	October 15, 2020	Distance delivery	8	13	\$100	Sannito, C.
Smoked Seafood School	October 30, 2020	Distance delivery	7	20	\$100	Sannito, C.
Introduction to Starting and Operating a Seafood Direct Marketing Business	November 30 - December 9, 2020	Distance delivery	12.5	23	\$125	Fong, Q., Sannito, C., Dunham, G.
Smoked Seafood School	January 28-29, 2021	Distance delivery	10	29	\$100	Sannito, C.
Seaweed Farm Startup Training	February 2, 22, 24, 26, and 27, 2021	Distance delivery	18	332	Free	Good, M.
HACCP Segment 2	February 19, 2021	Distance delivery	8	20	\$100	Sannito, C.
Smoked Seafood School - ADEC private workshop	February 25, 2021	Distance delivery	10	23	\$100	Sannito, C.
AMSEA Drill Conductor Course	March 1-12, 2021	KSMSC Kodiak	18	30	Free	Matweyou, J.

AMSEA Custom Marine Safety Course	March 11, 2021	KSMSC Kodiak	8	4	Free	Matweyou, J.
HACCP Segment 2 - Pacific Seafoods	March 25, 2021	Distance delivery	8	3	\$100	Sannito, C.
Sanitation Control Procedures for Seafood Processors	April 2, 2021	Distance delivery	8	18	\$100	Sannito, C.
HACCP/GMP/Sanitation Workshop - 60 North	April 9, 2021	Distance delivery	8	9	\$100	Sannito, C.
HACCP Segment 2	April 16, 2021	Distance delivery	8	9	\$100	Sannito, C.
HACCP Segment 2	May 7, 2021	Distance delivery	8	16	\$100	Sannito, C.
AMSEA Drill Conductor Course	May 13-14, 2021	Kodiak	14	8	Free	Matweyou, J.
AMSEA Drill Conductor Course	May 26-28, 2021	Kodiak	14	7	Free	Matweyou, J.
AMSEA Drill Conductor Course	May 27-28, 2021	Kodiak	14	8	Free	Matweyou, J.

## August

- **Introduction to Alaska Seaweed and Survey Techniques.** Course location: Distance delivery. Course length: 1 day, 2 hours. Participants: 12. Audience: Prince William Sound aquatic farmers. Distance delivery training on seaweed biology, ecology, and in-field identification, along with an introduction to macroalgae survey techniques. August 5, 2020. Instructor: Good, M. Course fee: Free.

## October

- **HACCP (Hazard Analysis Critical Control Point) Segment 2.** Course location: Distance delivery. Course length: 1 day, 8 hours. Participants: 13. Certified by the Association of Food and Drug Officials (AFDO). Date: October 15, 2020. Instructor: Sannito, C. Course fee: \$100.
- **Smoked Seafood School.** Course location: Distance delivery. Course length: 1 day, 7 hours. Participants: 20. Smoking seafood practices, safety, operational issues for commercial producers. Date: October 30, 2020. Instructor: Sannito, C. Course fee: \$100.

## November

- **Introduction to Starting and Operating a Seafood Direct Marketing Business.** Course location: Distance delivery. Course length: 5 sessions, 12.5 hours. Participants: 23. For harvesters looking to sell directly into the marketplace. Date: November 30–December 9, 2020. Instructors: Fong, Q., Sannito, C. and Dunham, G. Course fee \$125.

## January

- **Smoked Seafood School.** Course location: Distance delivery. Course length: 2 days, 10 hours. Participants: 29. Smoking seafood practices, safety, operational issues for commercial producers. Date: January 28–29, 2021. Instructor: Sannito, C. Course fee: \$100.

## February

- **Smoked Seafood School-ADEC Private Workshop.** Course location: Distance delivery. Course length: 2 days, 10 hours. Participants: 23. Smoking seafood practices, safety, operational issues for commercial producers. Date: February 25, 2021. Instructor: Sannito, C. Course fee: \$100.
- **HACCP (Hazard Analysis Critical Control Point) Segment 2.** Course location: Distance delivery. Course length: 1 day, 8 hours. Participants: 20. Certified by the Association of Food and Drug Officials (AFDO). Date: February 19, 2021. Instructor: Sannito, C. Course fee: \$100.

- **Seaweed Farm Startup Training.** Course location: Distance delivery. Course length: 5 days, 18 hours. Participants: 332. Audience: Commercial fishermen, Alaska Natives, and fishing communities. Provides tools and training for Alaskans to start their own seaweed farm. Dates: February 2, 22, 24, 26, and 27, 2021. Instructor: Good, M. Course fee: Free.

### March

- **HACCP (Hazard Analysis Critical Control Point) Segment 2 - Pacific Seafoods.** Kodiak Course length: 1 day, 8 hours. Participants: 3. Certified by the Association of Food and Drug Officials (AFDO). Date: March 25, 2021. Instructor: Sannito, C. Course fee: \$100.
- **AMSEA 10-hour Drill Conductor Course (modified).** Course location: Kodiak. Course length: 18 hours. Participants: 30 Kodiak High School students. USCG-accepted curriculum, no cards issued. Dates: March 1–12, 2021. Instructor: Matweyou, J. Course fee: Free.
- **AMSEA Custom Marine Safety Course.** Course location: Kodiak, in-person and online option. Course length: 8 hours. Participants: 4. For NOAA Kodiak Fisheries Research Center. Date: March 11, 2021. Instructor: Matweyou, J. Course Fee: Free.

### April

- **HACCP (Hazard Analysis Critical Control Point) Segment 2.** Course location: Distance delivery. Course length: 1 day, 8 hours. Participants: 9. Certified by the Association of Food and Drug Officials (AFDO). Date: April 16, 2021. Instructor: Sannito, C. Course fee: \$100.
- **HACCP/GMP/Sanitation Workshop - 60 North.** Course location: Distance delivery. Course length: 2 day, 16 hours. Participants: 9. Description: HACCP certified by the Association of Drug and Food Officials. GMP/Sanitation workshop covers the eight points of sanitation and documentation requirements. Date: April 9, 2021. Instructor: Sannito, C. Course fee: \$100.
- **Sanitation Control Procedures for Seafood Processors.** Course location: Distance delivery. Course length: 1 day, 8 hours. Participants: 18. Covering eight points of sanitation and documentation requirements. Date: April 2, 2021. Instructor: Sannito, C. Course fee: \$100.

### May

- **HACCP (Hazard Analysis Critical Control Point) Segment 2.** Course location: Distance delivery. Course length: 1 day, 8 hours. Participants: 16. Certified by the Association of Food and Drug Officials (AFDO). Date: May 7, 2021. Instructor: Sannito, C. Course fee: \$100.



- **AMSEA 10-hour Drill Conductor Course (modified).** Course location: Kodiak. Course length: 14 hours. Participants: 8. USCG-accepted curriculum. Date: May 13-14, 2021. Instructor: Matweyou, J. Course fee: Free.
- **AMSEA 10-hour Drill Conductor Course (modified):** Course location: Kodiak. Course length: 14 hours. Participants: 7. USCG-accepted curriculum. Dates: May 26-28, 2021. Instructor: Matweyou, J. Course fee: Free
- **AMSEA 10-hour Drill Conductor Course:** Course location: Kodiak. Course length: 14 hours. Participants: 8. USCG-accepted curriculum. Dates: May 27-28, 2021. Instructor: Matweyou, J. Course fee: Free

### **UAF Fisheries Undergraduate Credit Classes**

One class was taught by KSMSC-based UAF faculty members to students across the state. FISH 261, Introduction to Fish Utilization, is a requirement for the College of Fisheries and Ocean Sciences undergraduate Fisheries degree program.

- **FISH 261, Introduction to Fish Utilization**, 3 credits, Fall semester, 12 students, Instructor: Fong, Q. Harmful Algal Blooms, Guest Lecturer: Matweyou, J. Subsistence Foods, Guest Lecturer: Himelbloom, B.

### **UA Non-credit Instruction**

Student support and engagement with KSMSC research was provided by KSMSC-based faculty Julie Matweyou. Matweyou has been collaborating with UAA Kodiak College Professor Trussell since 2012 to bring relevant education and research on Paralytic Shellfish Poisoning to undergraduate students in Kodiak. This year, due to COVID, a UAS student reached out for field and laboratory support to complete her studies.

- Matweyou, J. 2020. Undergraduate Student Support: UAS BLaST Student Support. Provided research guidance and support to a Kodiak resident enrolled at UAS, and funded under BLaST to investigate marine microplastics in bivalves. Fall 2020.
- Matweyou, J. and Trussell, C. 2020. Kodiak College Introductory Microbiology for Health Science A240/A240L. PSP Abraxis Lecture & Lab. Toxin testing of local shellfish using the Abraxis ELISA. Fall 2020.

### **KSMSC Internship Program**

Julie Matweyou offered a graduate student internship for a Kodiak-based student conducting research as part of her Master's program at Miami University. Matweyou worked with the Alaska Sea Grant Community Engaged Internship committee to advertise and select applicants to

the new [Community Engaged Internship program](#) and hosted an undergraduate student intern from Kodiak.

- [Matweyou, J.](#) Graduate student support for Miami University of Ohio M.S. student. Co-developed and supervised a one-credit internship experience assisting with the organization and execution of the Kodiak Area Marine Science Symposium 2021 virtual event. Spring 2021.
- [Matweyou, J.](#) and [Holen, D.](#) 2021. Alaska Sea Grant Community Engaged Intern. Supervised undergraduate student for 10-week internship working with harmful algal blooms and other marine issues in the Kodiak region. May 10 – August 10, 2021.  
<https://alaskaseagrant.org/2021/07/26/kodiak-local-gets-research-experience-through-new-internship/>

## **Workshops and Seminars**

### **Outreach Presentations**

[Matweyou, J.](#) *Effectiveness of Butter Clam Cleaning Practices to Reduce PSP Risk.* Kodiak Area Marine Science Symposium (virtual). April 20, 2021.

[Matweyou, J.](#), [Dunham, G.](#), [Good, M.](#) and [Sannito, C.](#) *Supporting Alaska's Fishing and Seafood Industries: A panel discussion with Alaska Sea Grant.* Alaska ComFish 2021 virtual forum. Leadership in arranging and facilitating. March 31, 2021.

[Matweyou, J.](#) *Effectiveness of Butter Clam Cleaning Practices to Reduce PSP Risk.* ANTHC One Health Group (speed round). March 16, 2021.

[Matweyou, J.](#) *Paralytic Shellfish Toxins in Kodiak Butter Clams.* Oral presentation at the virtual KANA Marine Water Quality Workshop. February 18, 2021.

[Good, M.](#) *Identifying Research Priorities to Inform Exxon Valdez Oil Spill Trustee Fund Mariculture Proposal Development.* Alaska Shellfish Growers Association Annual Meeting. Virtual. January, 2021.

[Good, M.](#) *Alaska Sea Grant Shellfish and Seaweed Growers Project: Launching the Oyster and Seaweed Farm-to-Table Movement in Alaska.* Alaska Shellfish Growers Association Annual Meeting. Virtual. January, 2021.

[Good, M.](#) *National Seaweed Hub Update.* Alaska Shellfish Growers Association Annual Meeting. Virtual. January, 2021.

Good, M. *Building Capacity to Support Mariculture in Alaska*. Kodiak Archipelago Leadership Institute Quarterly Meeting. Virtual. November, 2020.

Good, M. *Alaska Sea Grant Shellfish and Seaweed Growers Project: Launching the Oyster and Seaweed Farm-to-Table Movement in Alaska*. Alaska Food Policy Council. Virtual. November, 2020.

Good, M. *Alaska Sea Grant Shellfish and Seaweed Growers Project: Launching the Oyster and Seaweed Farm-to-Table Movement in Alaska*. Alaska Food Policy Council. Virtual. November, 2020.

Good, M. *Alaska Sea Grant Shellfish and Seaweed Growers Project: Launching the Oyster and Seaweed Farm-to-Table Movement in Alaska*. Pacific Coast Shellfish Growers Association Annual Shellfish Conference and Tradeshow. Virtual. October, 2020.

Matweyou, J. *Addressing Paralytic Shellfish Toxins in the Kodiak Region*. Oral presentation at the virtual Kodiak Morning Rotary meeting, September 9, 2020.

Good, M. *Bering Sea and Aleutian Islands Marine Invasive Species Monitoring*. Qawalangin Tribe. Unalaska, AK. August, 2020.

## **Event Coordination**

Good, M. Steering Committee for Alaska Marine Science Symposium. Event: Alaska Marine Science Symposium. January 2021.

Good, M. Organizer and Leader. Event: Alaska Shellfish and Seaweed Festival. May 2021. <https://alaskaseagrant.org/event/alaska-shellfish-and-seaweed-festival>

Matweyou, J. Chaired the Kodiak Area Marine Science Symposium. April 19–23, 2021. <https://alaskaseagrant.org/event/kodiak-area-marine-science-symposium-2021/>

Matweyou, J. Kodiak Chamber of Commerce Fish Subcommittee Member: ComFish 2021 planning (Jan–Mar 2021). Alaska Sea Grant booth. Event: Alaska ComFish 2021 (virtual). Mar 30–31, 2021.

Matweyou, J. Kodiak Chamber of Commerce Fish Subcommittee Member: Alaska US Senate Fisheries Debate in Kodiak. Planning (Sep–Oct 2020). Event: Alaska US Senate Fisheries Debate (virtual). October 10, 2020.

Matweyou, J. Involvement as Kodiak Chamber of Commerce Fish Subcommittee: ComFish 2020 planning (Aug–Sep, 2020). Event: Alaska ComFish 2020 (virtual). September 17–18, 2020.

## **Applied Research and Technical Assistance to Industry**

External funding for faculty and staff in FY21 based at KSMSC came from 12 funders. Funders included Alaska Sea Grant, NOAA, Pollock Conservation Cooperative Research Center (PCCRC), UA Technical Vocational Education Program (TVEP), North Pacific Research Board (NPRB), National Sea Grant, U.S. Department of Agriculture, Kodiak Area Native Association (KANA), National 4-H Council, Denali Commission, National Science Foundation, and UAA Business Enterprise Institute (Alaska Manufacturing Extension Program).

### **Harmful Algal Bloom Research**

In FY21, Julie Matweyou conducted research and monitoring to develop an understanding and forecast harmful algal blooms in the Kodiak region in order to protect human health and support subsistence shellfish harvest. A NOAA National Center for Coastal Ocean Science-funded project focused on identification and enumeration of Alexandrium cysts. She also participated in efforts to monitor Alexandrium cells through qPCR and investigations of PSP toxins in the food web. Matweyou continues to support harmful algal bloom monitoring by local tribes and KANA through collaborative planning and messaging, and laboratory support.



Significant progress was made on the NOAA funded MERHAB project focused on Alexandrium cyst identification and enumeration. The KSMSC research skiff was maintained and fitted with an electric line hauler to collect sediment grab samples. Winter 2020 field samples were collected and shared with team members at the NOAA Beaufort NC laboratory and UW-Tacoma.

KSMSC is equipped and operational for cyst enumeration through counting with an epifluorescent microscope. The Alaska Sea Grant Community Engaged (CEI) intern that Matweyou worked with in the summer of 2021 completed sediment sample processing that involved fixing, etching and staining the cysts for microscopic counts. The project team continues methods calibration and development, and preliminary cyst mapping is being developed for Chiniak Bay. Results were shared through various scientific outlets, including the 2021 Alaska Marine Science Symposium and the Kodiak Area Marine Science Symposium.

Julie Matweyou collecting sediment samples using the KSMSC research skiff. Photo courtesy Julie Matweyou.

With the help of the CEI intern, Matweyou was able to continue support of the NOAA-led HAB monitoring effort. Matweyou has been working with collaborator Steve Kibler to establish monitoring using qPCR conducted at the Beaufort Lab to enumerate cells. Seawater samples were collected twice a week from May through August. Matweyou and her intern also supported a food web study that included phytoplankton, zooplankton, invertebrate, forage fish and commercially caught fish analyzed for toxins. The project was directly linked to a current NPRB-funded study and will inform future research in the Kodiak region focused on toxins in forage fish.



Community Engaged Internship (CEI) intern Cairone Reft preparing sediment samples in a KSMSC lab (left) and assisting PIs Steve Kibler (NOAA) and Chris Guo (UAA) with the food web study. Photos courtesy of Julie Matweyou.

## **Manufacturing Extension Partnership**

The Alaska Sea Grant Marine Advisory Program continues to be a collaborator in the Hollings Manufacturing Extension Partnership (MEP), a federal grant-funded system that helps manufacturers maximize their potential and grow their businesses. In the state of Alaska, the MEP is administered by the Business Enterprise Institute at the University of Alaska Anchorage. The MEP in each state provides manufacturing companies with services and resources to enhance growth, improve productivity, reduce costs, and expand capacity. Seafood harvesting and processing are the focus of the Alaska MEP, and KSMSC faculty Quentin Fong and Chris Sannito are providing seafood processing training and technical assistance.

## **Seaweed Hub**

Two years ago, the Sea Grant network, with leadership from Alaska Sea Grant, established a National Seaweed Hub to serve as a science-based, non-advocacy resource for the domestic seaweed and seaweed aquaculture industry. This collaboration provides a framework to share

information, address challenges, identify needs, and find opportunities in the emerging industry of seaweed mariculture.

The first three goals of this project have been completed:

- establish a baseline evaluation of current needs and challenges for all seaweed stakeholders through a formal needs assessment;
- bring seaweed stakeholders from across the country together to find a path forward in addressing challenges, finding solutions to needs, and pursuing opportunities for growth (this goal was accomplished through the March 2020 Seaweed Symposium); and
- develop stakeholder-driven Virtual Work Groups comprised of a diverse group of dedicated individuals from industry, regulatory authorities, processors, culinary professionals, researchers, and others who have committed to tackling solutions to barriers to making domestic seaweed aquaculture commercially viable.

As the lead for the virtual processing working group, Alaska Sea Grant continues to organize meetings and help the group meet established objectives.

### **Farm to Table: Alaska Sea Grant Shellfish and Seaweed Growers Project**



In the spring of 2020, it was apparent that the mariculture industry was to be hit hard by the Covid-related closures occurring in the restaurant industry. As a first step to verify this assumption, KSMSC faculty conducted an impact assessment with the industry. In response to the findings, Alaska Sea Grant launched the Farm-to-Table Shellfish and Seaweed Growers Project, led by KSMSC-based Mariculture Specialist Melissa Good. That project developed and coordinated the production of four meet-the-farmer videos, four recipe cards, an oyster consumer guide, and hosted a virtual Shellfish and Seaweed Festival with more than 300 registrants and over 4,000 engagements on Facebook.

### **Mariculture Research and Training Center**

Alaska has historically not offered support for mariculture through university degrees or research. The Alaska Mariculture Development Plan prioritized the creation of a Mariculture Research and Training Center in order to address these research and training needs. In June of 2021, with the sunset of the Alaska Mariculture Task Force, Alaska Sea Grant began steps to

establish in its place the Mariculture Research and Training Center. KSMSC's Melissa Good is actively working on an implementation plan and developing materials for an outward-facing website for the new Center.

## **Business and Economic Planning for Seaweed Aquaculture Systems in the United States**

We are working on a project, Seaweed Economic Planning Business and Economic Planning, for Seaweed Aquaculture Systems in the United States. The start of this project was delayed due to COVID-19, however, we are currently under Phase 1 and working on:

- Developing a preliminary draft business planning guidebook including assessment of areas needing particular attention.
- Conducting a literature review, gathering existing industry data (including biological and technological data), and drafting the build-out of an economic/financial model.
- Identifying industry and stakeholder participants.
- Validating both economic/financial parameters related to the industry's price and cost structure and knowledge/financial literacy parameters of the industry.

## **Seaweed Processing Equipment and Guidelines**

Melissa Good and Chris Sannito researched technology and equipment used globally to conduct primary processing and manufacturing of large volumes of seaweed efficiently and in a high-quality manner. Equipment and processing procedures identified that align closely with existing seafood processing infrastructure already in Alaska were highlighted to enable rapid adoption and transition to processing seaweed. A final report and recommendations identify primary processing equipment, technology and processes, volumes of seaweed required, and potential value-added products for secondary value-added processing following primary processing. There is high demand for this information and it could help to address one of the major bottlenecks in the industry. The information will be published as a guidance document and shared in a workshop during FY22.

## **Kelp Asset Map**

A temporary employee was hired and supervised by KSMSC faculty to write a kelp asset map. The map included summary information about specific locations, volume of kelp being produced, size of kelp farms, how close those farms are to the coastline, what type of farming methods are being utilized to harvest kelp, volume of kelp, value of the kelp and kelp products, and whether or not there have been additional issues specific to various geographical locations. The final report, [Kelp Energy Products and Marine Renewable Energy for Coastal Alaska Communities](#), was published by the funder, Pacific Northwest National Laboratory, and is available online.

## Research at KSMSC FY21

- **Application of quantitative molecular methods to characterize abundance and distribution of Alexandrium cysts for NOAA's HAB Forecasting.** Matweyou (co-PI), NOAA NCCOS MERHAB, 2019–August 2022.
- **Prevalence of Paralytic Shellfish Toxins in the marine food web of southcentral and southwest Alaska.** Matweyou (unfunded collaborator), North Pacific Research Board, 2019–2021.
- **HAB monitoring with qPCR.** Matweyou (unfunded collaborator), NOAA NCCOS, 2019–ongoing (seasonal).
- **Empowering resilient fishery dependent communities and economies: seafood processing and value adding business planning outreach and education.** Fong (PI) & Sannito (co-PI), National Sea Grant, 2021–2023.
- **Business and economic planning for seaweed aquaculture systems in the United States.** Fong and Good (co-PIs), National Sea Grant, 2021–2023.
- **Economic status and contributions of U.S. Aquaculture: Analyzing viability, economic impact, and management measures for future success.** Fong (co-PI), National Sea Grant, 2021 –2023.
- **Characterization of aquaculture in the western U.S.** Fong (co-PI), USDA Western Regional Aquaculture Center, 2020–2022.
- **Development of value-added market opportunities for Pollock co-products: Screening of Pollock roe and milt for bioactive peptides that have an anti-inflammatory effect to improve human health.** Fong (PI), Pollock Conservation Cooperative Research Center, 2019–2022.
- **Indigenizing salmon science and management.** Ringer. (co-PIs: C. Carothers, J. Black and R. Donkersloot), National Science Foundation, 2021-2023.
- **Tamamta (All of Us): Transforming western and Indigenous fisheries sciences together.** Ringer (Co-PIs: C. Carothers, J. Black, C. Stern, and P. Westley), National Science Foundation: NSF Research Traineeship, 2020-2024.
- **Resource access, well-being, and small-scale fishing livelihoods in Alaska's rural and Indigenous communities.** Ringer. (PI: R. Donkersloot), North Pacific Research Board, 2020-2024.



- **Farm to Table: Alaska Sea Grant Shellfish and Seaweed Growers Project. Launching the oyster and seaweed Farm-to-Table movement in Alaska.** G. Eckert, Co-PI M. Good, NOAA National Sea Grant, 2020-2023.
- **Market assessment for manufacturing and sales of Alaska seaweed.** PI M. Good, Subaward from Denali Commission, 2020-2021.
- **Nurturing the successful growth and maturation of a domestic seaweed aquaculture industry: Identifying and removing barriers and promoting opportunities.** Co-PI M. Good, NOAA Sea Grant Advanced Aquaculture Collaborative Programs, 2019-2022.
- **The perfect storm: Establishing a pilot seaweed farm in the Alaska peninsula.** PI M. Good, NOAA Sea Grant Exploring New Aquaculture Opportunities, 2019–2021.

## **Seafood & Mariculture Business Assistance**

Technical assistance was provided in areas listed below:

- Water activity measurement of food products
- Dried seaweed product development assistance
- pH testing of new food products
- Seafood contamination analysis
- Heat distribution studies for cookers
- Refine HACCP and SSOP plans
- Develop safe process for juice production
- Provide process authority letters
- Equipment selection for new processing enterprise
- Seafood processing facility planning and development
- Seafood product texture and appearance improvement
- Business plan development
- Marketing opportunities
- Pickling process evaluation
- Food product development protocol
- Provide Process Authority letters for food manufacturers
- Starting a seaweed farm
- Starting an oysters farm
- Aquatic farm permitting and licenses
- Mapping for aquatic farm sites
- Shellfish farm
- Marketing of mariculture products
- Shellfish and seaweed seed sources
- Seaweed organic certifications

- Seaweed processing
- Oyster packing house requirements
- Seaweed hatchery operations
- Mobile seaweed hatchery units
- Seaweed and shellfish farming resources
- Aquatic farm site selection

Sample of individuals, companies, agencies and groups seeking assistance from KSMSC:

- Seabear Smokehouse
- TJ's Land Clearing
- Homer Brewing Company
- Cool Cache Farms
- Foraged and Found Edibles
- Bearcats Fishhouse
- Coal Point Seafoods
- Bristol Bay Economic Development Corporation
- Alaska Department of Environmental Conservation
- Pacific Seafoods
- Sea Venture Seafoods
- Barnacle Foods
- Two Guys and a Boat
- Blue Evolution
- Hot Shot Sisters
- Trident Seafoods
- FOSS North America
- Tommy G's Meat and Sausage
- Orca Cannery
- Luke Owens
- Glacier Valley Ferments
- Steam Dot
- Alaska Department of Fish and Game
- NOAA Fisheries Alaska Region
- Blue Evolution
- SeaAlaska
- Southeast Conference
- Lake and Peninsula Borough
- Annette Island School District
- Canoe Lagoon
- Alaska Sea Greens
- Noble Ocean Farms
- Blue Wave Futures
- Saltwater Inc.

## **Public Service and Marine Education**

### **Kodiak Area Marine Science Symposium**

After postponing the 2020 Kodiak Area Marine Science Symposium (KAMSS) due to COVID-19, we were happy to host KAMSS 2021 virtually April 19–23, 2021. The symposium featured 27 oral presentations that were delivered live over Zoom, eight poster presentations and four local community events including a Kodiak 4-H marine debris art activity that attracted close to 100 Kodiak youth.

Overall, the event was a big success with about 200 attendees. Details of the event, including the abstract book and Program agenda, can be found on the [Kodiak Area Marine Science Symposium event web page](#). We give a big thank you to our Kodiak steering committee, our session chairs, the presenters and the attendees who helped make this event a success.



**Kodiak Area Marine Science Symposium**



Online | Kodiak, Alaska | April 19–23, 2021  
Sponsored by Alaska Sea Grant at the University of Alaska Fairbanks

View schedule and register at  
[alaskaseagrant.org/event/kodiak-area-marine-science-symposium-2021/](https://alaskaseagrant.org/event/kodiak-area-marine-science-symposium-2021/)

KAMSS event flier. Courtesy Julie Matweyou.

## **Comfish Alaska**

Alaska Sea Grant continues to support ComFish, Alaska’s annual fishery industry trade show. KSMSC faculty Julie Matweyou has served on the Kodiak Chamber of Commerce ComFish planning committee since 2014 and is directly involved in the selection and development of the Forums and Events. The 2020 ComFish event was postponed from Spring 2020 and held virtually from September 17–18, 2020. ComFish Alaska was back on track with the spring 2021 event held virtually March 30-31, 2021.

Matweyou organized and moderated a [presentation focused on workforce development](#) featuring Alaska Sea Grant Marine Advisory Program agents Chris Sannito, Gabe Dunham and Melissa Good. Matweyou also organized Alaska Sea Grant as a virtual vendor on the online platform where faculty and staff were able to interact and share Sea Grant’s work with a statewide audience.

## **Environmental Stewardship**

Julie Matweyou supported environmental stewardship through monitoring for invasive marine tunicates on settling plates in St. Paul Harbor in June 2021. This is an ongoing project in partnership with the [Smithsonian Environmental Research Center](#). KSMSC provided a meeting space (in-person and virtual) for K.E.L.P., which is a monthly forum led by KANA where local residents can discuss current issues.



Alaska Sea Grant CEI intern (center) works with local Kodiak Area Native Association and Kodiak Soil and Water Conservation District staff to monitor for invasive tunicates in St. Paul Harbor. Photo courtesy of Julie Matweyou.

## **Cooperative Extension Service: Kodiak 4-H Youth Development Program**

Alaska 4-H is one of many programs in the Cooperative Extension Service and serves as the state's premier youth development program, using research-based information and strategies. 4-H is open to all youth from kindergarten through high school.

In FY21, Kodiak 4-H operated with one paid staff member (housed at KSMSC), 30 trained volunteer leaders, and over 25 resource leaders (members of the community who provided resources in terms of supplies and local knowledge). Programming by staff and leaders included topics like Archery, Rifle, Pistol, Horse and Dog projects, Small Animals, Gardening, Bread Making, Photography, Quilting, and Fiber Arts. Additionally, the 4-H Kodiak program has a Therapeutic Riding program that operates in partnership with Providence Kodiak Island Medical Center to benefit youth with disabilities and special needs.

Kodiak 4-H had 132 enrolled youth members during the 2021 fiscal year and reached an additional estimated 500 local youth with community events. With funding from the the Alaska Community Foundation, National 4-H Council, and USDA, Kodiak 4-H was able to extend to a statewide and national reach as well.

## **Tamamta (All of Us): Transforming Western and Indigenous Fisheries Sciences Together Graduate Program**

In 2020, a UAF graduate program began called Tamamta. Tamamta means “all of us” in the traditional Sugpiaq and Yup'ik languages of Alaska's southcentral coast. Danielle Ringer, a UAF graduate and CFOS research associate based out of KSMSC, is the program coordinator who helped Tamamta faculty launch the first year of the five-year program. The National Science Foundation is providing \$3 million in funding through its National Research Trainee (NRT) Program, which is designed to encourage innovation in STEM graduate education training. Funding is also being provided by the National Science Foundation's Navigating the New Arctic initiative.

The Tamamta program centers on bridging Indigenous and Western sciences to transform graduate education and research in fisheries and marine sciences. An interdisciplinary team of UAF faculty members and other partners guide the students as they use a co-production of knowledge approach to explore key questions in fisheries and marine research, education, and management. The first cohort of nine students are all Indigenous and a majority of the new Tamamta fellows grew up in rural communities, such as Kodiak, Saint Paul Island, Bethel, Kwethluk, Utqiagvik and Metlakatla. The Tamamta program is a joint program of UAF's College of Fisheries and Ocean Sciences and the College of Rural and Community Development. A second cohort of graduate students is being recruited for 2022 Tamamta fellowships.

## **Boards and Councils served by faculty at KSMSC**

- ADEC Alaska Food Safety Advisory Committee
- ASMI Seafood Technical Committee
- Association of Latin Women in Alaska
- Alaska Marine Safety Education Association
- OceansAlaska Board of Directors
- Western Regional Aquaculture Consortium Extension Technical Committee Chair
- National Seafood HACCP Alliance Advisory Committee
- Kodiak 4-H Leadership Council
- Alaska Volunteer Leaders Organization

## **KSMSC in the News**

- [Kodiak serves up local science at a fast clip](#). Alaska Fish Radio. April 12, 2021.
- [Fine art fish](#). Kodiak Daily Mirror. April 21, 2021.
- [Alaska's secret Cold War seafood export: shellfish toxin for the CIA](#). KMXT 100.1 FM Kodiak. April 22, 2021.
- [The heat wave that crashed cod](#). Alaska Fisheries Report. KMXT 100.1 FM Kodiak. April 22, 2021.
- [Talk of the Rock: The return of KAMSS](#). KMXT 100.1 FM Kodiak. April 26, 2021.
- [Farm Fresh](#). Kodiak Daily Mirror. August 31, 2020.
- [Kodiak woman inducted into 4-H Hall of Fame](#). KMXT 100.1 FM Kodiak. October 14, 2020.
- [Marie Rice inducted into the 4-H Hall of Fame](#). Kodiak Daily Mirror. October 30, 2020.
- [KANA ramps up shellfish testing](#). Kodiak Daily Mirror. November 30, 2020.

## **Publications and Reports**

Eighteen publications, reports or outreach materials were produced by UAF KSMSC-based faculty and staff.

Donkersloot, R., J. C. Black, C. Carothers, **D. Ringer**, W. Justin, P. M. Clay, M. R. Poe, E. R. Gavenus, W. Voinot-Baron, C. Stevens, M. Williams, J. Raymond-Yakoubian, F. Christiansen, S. J. Breslow, S. J. Langdon, J. M. Coleman, and S. J. Clark. 2020. Assessing the sustainability and equity of Alaska salmon fisheries through a well-being framework. *Ecology and Society* 25(2):18.

Donkersloot, R., J. Coleman, C. Carothers, **D. Ringer**, P. Cullenberg. 2020. Kin, community and diverse rural economies: Rethinking resource governance for Alaska rural fisheries. *Marine Policy*, 117, 103966. **Fong, Q. S.W.**, J. Kwon, C. Dewitt. 2021. Development of value-added

market opportunities for pollock co-products: Screening of pollock roe and milt for bioactive peptides that have an anti-inflammatory effect to improve human health. Project Report submitted to PCCRC.

**Fong, Q. S.W.,** C. Dewitt and M. Kohan. 2021. Development of value-added market opportunities for pollock co-products. Final Project Report submitted to PCCRC.

**Good, M.** 2020. Kelp Seasoning. Recipe Card. Alaska Sea Grant.  
<https://alaskaseagrant.org/our-work/aquaculture/>. December 2020.

**Good, M.** 2020. Meet the Farmer video: Salty Lady Seafoods Meta Mesdag. Alaska Sea Grant.  
<https://alaskaseagrant.org/our-work/aquaculture/>. October 2020.

**Good, M.** 2020. [Seeking input on Aquaculture Opportunity Area designations](#). Alaska Sea Grant. December 2020.

**Good, M.** 2020. Bull Kelp Salsa. Recipe Card. Alaska Sea Grant.  
<https://alaskaseagrant.org/our-work/aquaculture/>. October 2020.

**Good, M.** 2020. Oyster Rockefeller. Recipe Card. Alaska Sea Grant.  
<https://alaskaseagrant.org/our-work/aquaculture/>. October 2020.

**Good, M.** 2020. [Alaska Sea Grant debuts farm-to-table mariculture directory for Alaska](#). July 28, 2020.

Greengrove, C., Masura, J., **Matweyou, J.** and Kibler, S. 2020. MERHAB19: Application of quantitative molecular methods to characterize abundance and distribution of Alexandrium Cysts for NOAA's HAB Forecasting Annual Progress Report Year 1. September 2020.

Greengrove, C., Masura, J., **Matweyou, J.** and Kibler, S. 2021. MERHAB19: Application of quantitative molecular methods to characterize abundance and distribution of Alexandrium Cysts for NOAA's HAB Forecasting. Annual Progress Report Year 2. June 2021.

Kibler, S. R., R. Wayne Litaker, R.W., **Matweyou, J. A.,** Hardison, D, R., Wright, B. A., Tester, P. A. 2021. Paralytic Shellfish Poisoning toxins in butter clams (*Saxidomus gigantea*) from the Kodiak Archipelago, Alaska. Submitted: Harmful Algae. July 2021.

**Matweyou, J.,** Kibler, S., Hart, C., Masura, J. and Greengrove, C. 2021. Application of quantitative molecular methods to characterize abundance and distribution of Alexandrium Cysts for NOAA's HAB Forecasting – Year 1 Update. Poster. Resubmitted for the Kodiak Area Marine Science Symposium, April 19–23, 2021.

**Matweyou, J. A.**, Litaker, W. R., Kibler, S. R., Wright, B. A., Hardison, D. R. and Tester, P. A. 2021. Community-based PSP testing for shellfish - Kodiak Region Summary. Poster. Kodiak Area Marine Science Symposium, April 19–23, 2021.

**Matweyou, J. A.**, Kibler, S., Hart, C., Masura, J. and Greengrove, C. 2021. Application of quantitative molecular methods to characterize abundance and distribution of Alexandrium Cysts for NOAA's HAB Forecasting – Year 1 update. Poster. Alaska Marine Science Symposium. January 26–28, 2021.

**Matweyou, J. A.**, Litaker, W. R., Kibler, S. R., Wright, B. A., Hardison, D. R. and Tester, P. A. 2021. Community-based PSP testing for shellfish - Kodiak region summary. Poster. June 2020. Alaska Marine Science Symposium, Jan 26–28, 2021.

Tester, P., **Matweyou, J.**, Himelbloom, B., Wright, B., Kibler, S., Litaker, W. 2020. Saxitoxin and the Cold War. Ph. Hess [Ed]. 2020. Harmful Algae 2018 - From Ecosystems to Socioecosystems. Proceedings of the 18th International Conference on Harmful Algae. Nantes, International Society for the Study of Harmful Algae. 214 pages. ISBN: 978-87-990827-7-3.

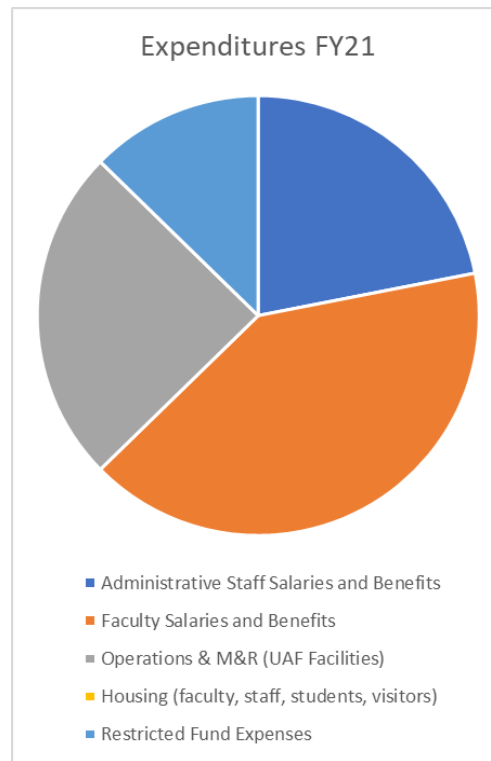
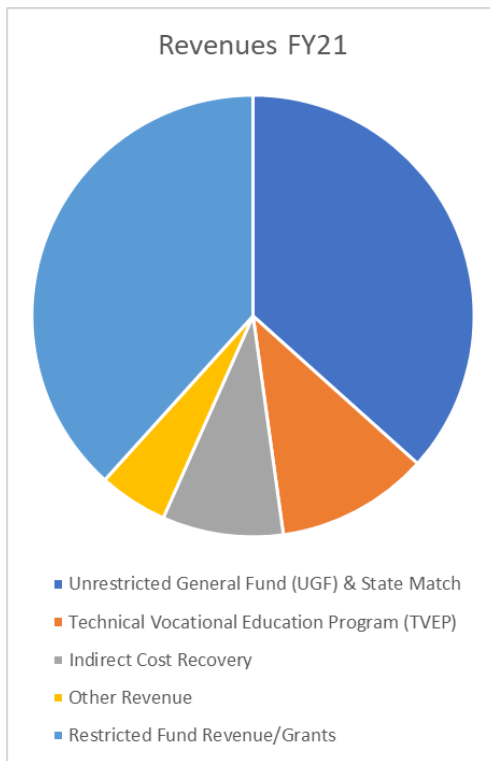
Westley, P. A.H., J. C. Black, C. Carothers, and **D. Ringer**. 2021. State of Alaska's salmon and people: introduction to a special feature. Ecology and Society 26(4):33.



# KSMSC Fiscal Operations

<u>Revenues</u>	FY17	FY18	FY19	FY20	FY21
Unrestricted General Fund (UGF) & State Match	\$689,886	\$950,406	\$923,400	\$728,301	\$395,910
Technical Vocational Education Program (TVEP)	\$41,800	\$81,500	\$37,700	\$85,888	\$120,602
Indirect Cost Recovery	\$47,129	\$42,333	\$68,486	\$76,128	\$95,636
Other Revenue	\$ -	\$4,518	\$9,908	\$35,921	\$54,403
Restricted Fund Revenue/Grants	\$234,990	\$308,741	\$634,670	\$499,718	\$413,853
<b>Total Revenue</b>	<b>\$1,013,805</b>	<b>\$1,387,498</b>	<b>\$1,674,164</b>	<b>\$1,425,957</b>	<b>\$1,080,404</b>

<u>Expenses</u>	FY17	FY18	FY19	FY20	FY21
Administrative Staff Salaries and Benefits	\$74,880	\$176,035	\$207,188	\$330,664	\$260,448
Faculty Salaries and Benefits	\$401,169	\$441,027	\$470,403	\$507,028	\$484,546
Operations & M&R (UAF Facilities)	\$302,682	\$311,254	\$311,903	\$344,851	\$293,117
Housing (faculty, staff, students, visitors)	\$ -	\$ -	\$50,000	\$36,563	\$ -
Restricted Fund Expenses	\$234,990	\$449,398	\$634,669	\$145,424	\$150,584
<b>Total Expenses</b>	<b>\$1,013,721</b>	<b>\$1,377,714</b>	<b>\$1,674,163</b>	<b>\$1,364,530</b>	<b>\$1,188,695</b>



<u>Dept</u>	<u>Grant #</u>	<u>Grant Title; Agency</u>
ASG	G06591	Marine Advisory Program Development; UA Foundation
ASG	G09111	Citizen Science Excursions; UA Foundation
ASG	G11088	BBC Title III F 2017-2021; US Dept of Education
ASG	G11377	Value-added Market Opportunities; UA Foundation
ASG	G11936	Alaska Sea Grant Omnibus 2018-2022; NOAA
ASG	G12201	Center ICE; Office of Naval Research
ASG	G12662	Pollock Roe to Improve Human Health; UA Foundation
ASG	G12795	NIST/MEP; NIST/MEP
ASG	G12871	Co-op Monitor Harmful Algal Blooms; Kodiak Area Native Corp
ASG	G12930	New Aquaculture Opportunities 2019; NOAA
ASG	G12936	Mammal Stranding R&R Western AK; NOAA
ASG	G13021	SG Seaweed Collaborative; University of Connecticut
ASG	G13073	HAB Forecasting Alexandrium Cysts; University of Washington
4-H	G13254	FY20 Alaska Smith-Lever 3 b/c; USDA
CFOS	G13302	NSF-CRCD/CFOS: Indigenous Salmon; NSF
ASG	G13312	AFDF Kelp Product Development; AFDF
ASG	G13592	Marine Mammal Stranding Response an; NOAA
CFOS	G13683	NRT: NNA: Tamamta (All of Us); NSF
ASG	G13709	Kelp Asset Mapping; US Dept of Education
ASG	G13763	Market Assessment for Manufacturing; AFDF
CFOS	G13906	AK Rural and Indigenous Comm's; North Pacific Research Board
4-H	G13941	FY21 Alaska Smith-Lever 3 b/c; USDA
ASG	103010	Seafood Processing Leadership; TVEP
ASG	103010	Seafood Safety Lab Equipment; TVEP

## **Administration**

- Ginny Eckert, Director, Alaska Sea Grant
- Quentin Fong, Seafood Marketing Specialist, Professor, KSMSC coordinator, Alaska Sea Grant Marine Advisory Program and the College of Fisheries and Ocean Sciences

## **UAF Faculty Based at KSMSC**

- Quentin Fong, Seafood Marketing Specialist, Professor, KSMSC coordinator, Alaska Sea Grant Marine Advisory Program and the College of Fisheries and Ocean Sciences
- Julie Matweyou, Marine Advisory Program Agent, Associate Professor, Alaska Sea Grant Marine Advisory Program
- Chris Sannito, Seafood Processing Specialist, Research Assistant Professor, Alaska Sea Grant Marine Advisory Program
- Melissa Good, Mariculture Specialist, Research Associate Professor, Alaska Sea Grant Marine Advisory Program

## **Staff**

- Laurinda (Kay) Bodi, KSMSC Facilities Manager, Facilities Services/Alaska Sea Grant
- Kate Schaberg, 4-H Program Coordinator, Cooperative Extension Service
- Danielle Ringer, Research Associate, College of Fisheries and Ocean Sciences
- Lexa Meyer, Seafood Processing Workforce Development Coordinator, Alaska Sea Grant

## **Alaska Research Consortium**

The Alaska Research Consortium (ARC), is a community/industry organization formed in 2016 when continued operation of the Kodiak Seafood and Marine Science Center was in jeopardy. ARC advocates for sustainable fisheries, marine resources, and the blue economy to support coastal communities into the next generation. ARC focuses on workforce and technology development, training, and research that sustains and increases the value of Alaska's marine resources.

One key objective of ARC is to “support programs and sustainability of the Kodiak Seafood and Marine Science Center by acting as a liaison between the University of Alaska, the seafood industry and Alaska’s resource-dependent communities.”

In Fiscal Year 2021, actions by ARC related to KSMSC included:

- ARC completed a project entitled “Alaska’s Seafood Future” which created an Action Agenda to develop a Seafood Workforce Training Program, engage youth in seafood processing careers and re-establish seafood applied research in Alaska. The Action Agenda is guiding the development of key funding requests based at KSMSC related to leadership training, ammonia refrigeration operations and other seafood workforce training.
- ARC’s board met via Zoom with new UA Interim President Pitney, UA Associate VP Cothren, UAF Provost Prakash, and UAF Vice Chancellor for Administration Queen to discuss the importance of KSMSC to the seafood industry and the economic gain from the seafood industry to Alaska.
- ARC board representatives met with a UAF leadership team that traveled to Kodiak including UAF Provost, Alaska Sea Grant director, UAF Vice Chancellor for Administration and UAF Vice Chancellor for Research, most of whom had never been to KSMSC before.
- ARC staff worked with Alaska Sea Grant to develop two TVEP proposals in support of seafood workforce training and leadership development (funded) and ammonia refrigeration training (not funded).
- ARC submitted a request to Senator Murkowski’s office for directed funding for an ammonia refrigeration training program. To date, this funding is in the Senate budget working its way through the FY22 budget process.