



Years serving Alaska

Alaska Sea Grant

2019–2020 Annual Report

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Photographers. Front cover Alaska Sea Grant faculty and staff collection. P 4 Melissa Good (Unalaska). P 7 Dave Partee (Prince William Sound). P 9 courtesy of Lynsey Snovell (Petersburg). P 10 Ginny Eckert (Juneau area). P 12 Dave Partee (Utqiagvik). P 13 top Dave Partee (Utqiagvik). P 13 middle and bottom courtesy of Tom Ravens (Utqiagvik). P 14 MISR satellite, Ginny Eckert (<i>Alexandrium</i> , inset). P 16 courtesy of Valdeko Kreil (Kotzebue). P 17 Chris Sannito (Kotzebue). P 18 Dawn Montano (Juneau). P 20 Gabe Dunham (Dillingham). P 22-23 courtesy of Tobias Schwoerer (Anchorage). P 25 Deborah Mercy (Bristol Bay). P 27 Hannah Wilson (Juneau). P 28 Deborah Mercy (Prince William Sound). Back cover Alaska Sea Grant faculty and staff collection.	

2020

marks Alaska Sea Grant's 50th year. Over the last five decades, the program's research, education, and outreach activities have made positive and lasting contributions to Alaska's coastal communities, ecosystems, and economies.

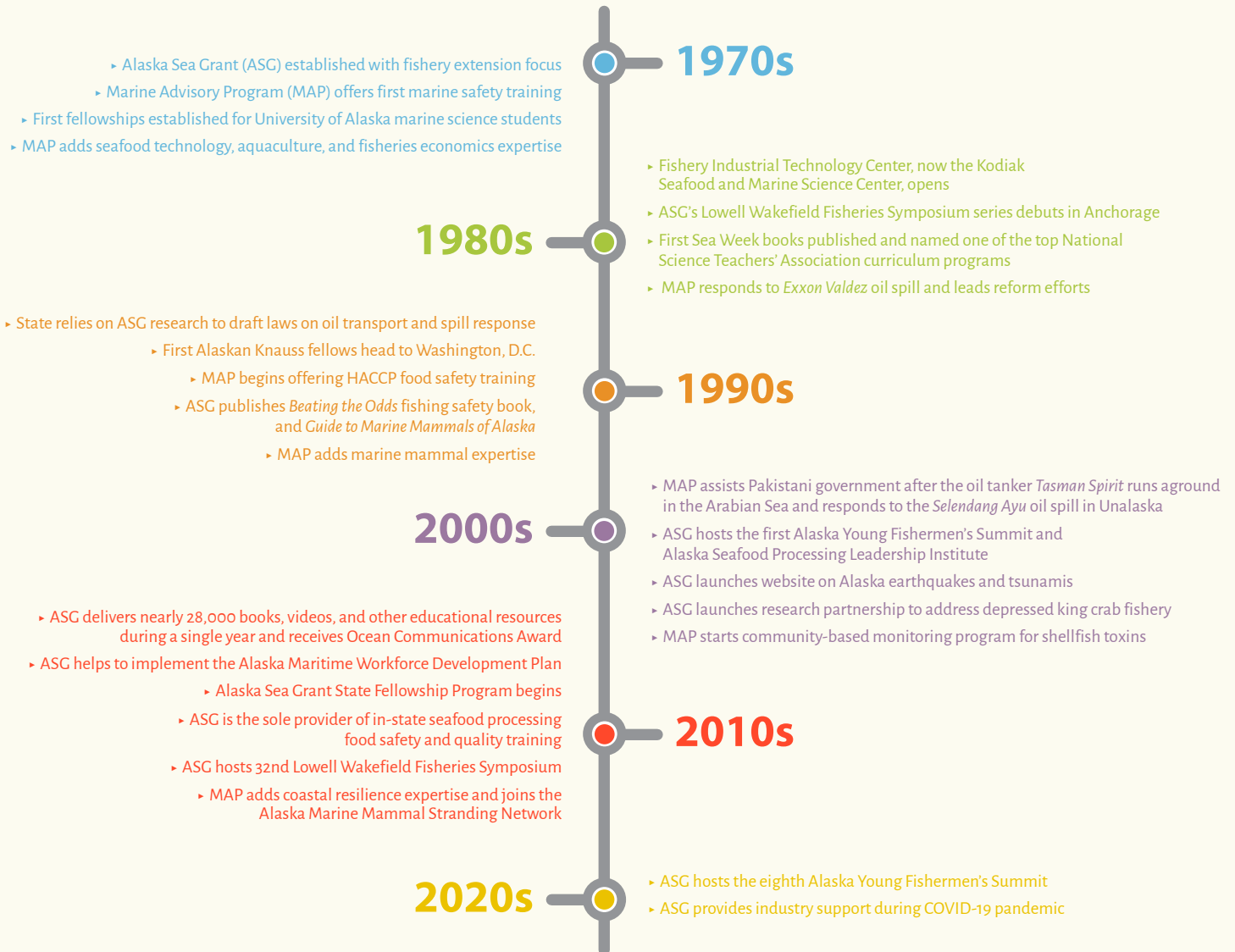
Alaska Sea Grant's first research in 1970 included studies of pinnipeds of the Bering and Chukchi Seas, and the uses of seafood waste. Since then, its activities have included hundreds of projects serving local, regional, state, and national interests. Today, Alaska Sea Grant and its Marine Advisory Program agents deliver a diverse range of training and technical assistance to Alaskans, from helping launch food-producing businesses, to planning for challenges brought by rapid changes in climate. Student fellowships and K-12 programming support a new generation of marine scientists and policy experts.

Alaska Sea Grant's investments in education and outreach, and the ability to quickly transfer research to application has helped fuel important discoveries, diversify economies and build resilience in Alaska's coastal communities.

The next 50 years will bring new challenges, and Alaska Sea Grant and its Marine Advisory Program agents around the state will continue to address them with responsive, science-based action and support.



50 YEARS OF ALASKA SEA GRANT





COVID-19
SAFETY MANDATES



STAY at HOME as
much as possible

COVID-19
SAFETY MANDATES



2M
6feet

Maintain
social distancing

COVID-19
SAFETY MANDATES



REQUIRED: wear a
covering over your nose and
mouth in public

COVID-19
SAFETY MANDATES



Follow recommended
hand washing.

COVID-19 RESPONSE

Supporting Alaska-grown shellfish and seaweed

This spring, Alaska Sea Grant surveyed the state's mariculture industry to shed light on impacts from the COVID-19 pandemic. Forty-three percent of respondents reported losses of more than half of their revenue, and more than a third had laid off employees.

Pandemic-related restrictions led to closures in restaurants and tourism businesses, reducing demand for mariculture products. Farmers reported challenges due to restaurant closures, labor disruptions, and reduced opportunity for export. They shared concerns of a slow economic recovery, extended closures of restaurants, and a reduced priority on healthy, sustainable foods. Seaweed farming in Alaska is in its infancy, and those farmers are concerned whether their operations can survive in this economic climate.

In response, Alaska Sea Grant launched the Alaska Shellfish and Seaweed Growers Project to support

the industry during the pandemic and beyond, and to connect consumers with local mariculture products. Alaska Sea Grant developed an online directory of farms and retailers that sell Alaska-grown shellfish and seaweed, released the first of several planned "Meet Your Alaskan Farmer" videos, and circulated recipes to stimulate demand.

The project will continue, with plans for new videos and recipes featuring local chefs, fact sheets on shellfish and seaweeds, and food safety and handling guides for consumers and retailers.



Supporting fishing and seafood industries during COVID-19

When the COVID-19 outbreak reached Alaska this spring, Alaska Sea Grant mobilized to anticipate and respond to impacts to the seafood industry, fishing businesses, and fishing communities.

Early in the pandemic, Alaska Sea Grant's Marine Advisory Program agents with expertise in seafood and marketing organized a webinar on alternative seafood markets. Aimed at commercial fishermen at risk of losing their traditional buyers, the event covered the basics of dockside direct-to-consumer sales. Additional webinars addressed COVID-19 economic relief resources and comprehensive

courses in seafood direct marketing.

Alaska Sea Grant created a COVID-19 resources webpage to provide businesses with up-to-date information on state and federal relief programs. The information included tips for managing risk and uncertainty, and recordings of topical webinars.

Alaska Sea Grant focused efforts in the Bristol Bay region, which hosts as many as 13,000 workers from outside Alaska, who participate in a \$1.5 billion wild salmon fishery. Partnering with the Bristol Bay Economic Development Corporation, the Bristol Bay Native Association and the local

radio station KDLG, Marine Advisory Program agent Gabe Dunham answered questions on-air about mandates and local ordinances. The Marine Advisory Program administered a survey, funded by the National Science Foundation, to gather information on rates of infection and mortality in Bristol Bay throughout the summer and into the fall.

The COVID-19 response effort will continue. Survey findings will help the Bristol Bay region manage future risks, and an upcoming direct marketing course will help fishing businesses be more resilient during this challenging time.



Creative approaches to education during a pandemic

The 2020 pandemic is impacting not only the country's economy and healthcare industry, but also children's social and educational opportunities. Recognizing this, Alaska Sea Grant adapted several of its formal and informal educational programs.

Alaska Sea Grant's work involves identifying and addressing local needs and priorities. That's exactly what Sunny Rice, Sea Grant's Marine Advisory Program agent in Petersburg, did in helping to develop the first Petersburg Summer Science Camp three years ago. This year she adapted the camp to be active and engaging and online.

Camp kids met with local scientists by videoconference each morning to discuss the day's science and data-collection techniques. Then they were off—working in pairs for safety—to determine biodiversity in intertidal zones, observe marine mammals in the local harbor, or analyze water quality in a muskeg. Science kits with materials they needed for these activities were provided by the local library. At the end of the day, they met again by videoconference to share their activities.

Meanwhile in Unalaska, the annual Dockside Discovery field trip for elementary school students was adapted by Sea Grant's Melissa Good. Local

students were encouraged by their teachers—two of whom were trained SCUBA divers bringing up marine life from the depths of the harbor—to watch through Facebook Live or on the local TV station, and to ask questions online to be answered in real time by the adults on the dock. The online event reached over 7,000 people from around the country, according to KUCB, the local public radio and TV station.

“We look forward to implementing some of these new tools and technologies post-pandemic to increase marine literacy in Alaska and expand our reach beyond Alaska,” explained Alaska Sea Grant director Ginny Eckert.



Seafood safety course goes online

In May, Alaska Sea Grant conducted its first fully-online Seafood HACCP class, a national program to ensure seafood in stores and restaurants is safe. HACCP certification is required for all processors in Alaska.

Due to the COVID-19 pandemic, in-person classes had to be cancelled. Alaska Sea Grant was granted temporary permission to hold these essential classes online.

Processors from across Alaska have taken advantage of Alaska Sea Grant's online offerings. "The Zoom platform worked well and allowed for group exercises to be conducted just as an in-person class" said instructor Chris Sannito, Alaska Sea Grant's seafood technology specialist. A second online class was offered in October, with more planned for early 2021.



OUR CHANGING ENVIRONMENT

Understanding salmon streams in a changing climate

Alaska is observing dramatic shifts in temperature and precipitation, and how these changes will affect salmon is a big concern. Salmon are the most valuable of Alaska's commercial fish, netting fishermen \$744 million annually. Decreasing salmon runs would affect Alaska's ecosystems—and the economy.

Scientists are particularly concerned about changes in streamflow. As one researcher explained, “streamflow is the master variable that controls everything in a river's ecosystem, from the icefields to the ocean.” Without this understanding, the future of the ecosystem's inhabitants are difficult to predict.

To address this knowledge gap, Alaska Sea Grant-funded researchers created a streamflow classification tool to help integrate observations at different watersheds, to create a more complete

ecosystem picture and predict climate change impacts.

They also created tools to better understand the effects of climate change on salmon and other freshwater-dependent fish. These included a salmon lifecycle model to help understand how salmon might be affected by changes such as an increase in water temperature.

While Alaskan salmon face adaptation challenges as watersheds change, the results of this research give resource managers actionable insight into the future of this economically and culturally important species.



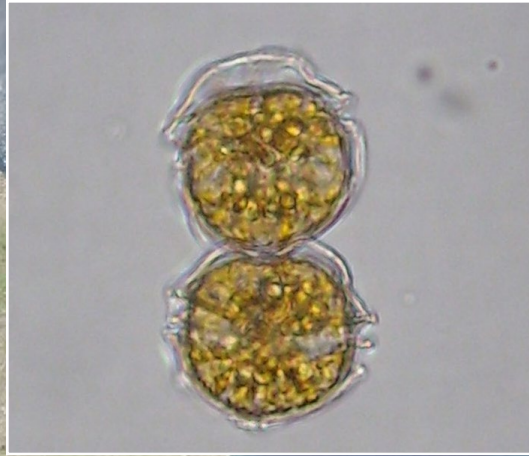
Building tools for community resilience in a warming Arctic

Years of record low sea ice have left Arctic coastal communities more exposed to flooding and erosion caused by storms. Utqiagvik, on Alaska's northern coast, experienced an estimated \$10 million in damage from a single storm in 2017.

In response, Alaska Sea Grant-funded researchers organized community monitoring of shoreline in Utqiagvik, and used those data to develop a coastal change model. The model predicts nearshore water levels, wave height, and shoreline erosion, helping community leaders understand levels of risk and anticipate the likelihood of storm damage in specific areas. The town used the model to strategically place sand berms and take other mitigation actions where they're needed most.

By involving members of the community as volunteer coastal monitors, the project also increased awareness and involvement in storm mitigation planning and climate change issues. While the severity of storm events is likely to increase as the Arctic warms, the community of Utqiagvik is now better prepared for the future.





FOOD SAFETY IN TRADITIONAL FOODS

Bering strait, image taken by MISR satellite. <http://www-misr.jpl.nasa.gov>

Helping communities manage risk to food from harmful algal blooms

Many Alaskans, including those living in remote Arctic coastal communities, rely on subsistence harvests of marine wildlife for nutritional, cultural, and economic benefit. However, warming ocean temperatures have increased the frequency of harmful algal blooms (HABs), which produce dangerous toxins that concentrate in animal tissues and threaten the safety of traditional subsistence foods.

Alaska Sea Grant's Gay Sheffield addressed this challenge by working with the Alaska Harmful Algal Bloom Network and local partners to facilitate a two-day HAB workshop in Nome. This workshop focused on the concerns of community members and educating local healthcare providers on the symptoms of HAB poisoning and effective treatments.

The workshop included information on identification of algal species, monitoring techniques, impacts to the ecosystem, and the latest research and monitoring results.

Workshop participants, including tribal government officials, regional healthcare workers, oceanographers, and marine wildlife and HAB researchers, published a New York Times op-ed to increase national awareness of the impact of climate change on the people of the Bering Strait region. Alaska Sea Grant also produced and distributed two bulletins about recent HAB events in the region, helping area residents make informed, safe decisions about wild food harvest.



Expanding traditional food choices for elders

Eldercare facilities serving Native residents have been looking for ways to incorporate more traditional foods. Seal oil has long been a part of the Alaska Native diet. However, traditional room-temperature processing of seal oil can result in potentially fatal botulism. In 2016, Alaska Sea Grant began an effort, working with an eldercare facility in Kotzebue, to adapt traditional processing methods to ensure the food is safe and meets State of Alaska requirements.

Alaska Sea Grant's Chris Sannito and Brian Himelbloom (retired), in collaboration with the University of Wisconsin Madison, tried a few different food safety approaches. Pasteurization equipment adapted from the dairy industry was found to be effective with seal oil and is now being used in this process. A final plan for safe seal oil rendering has been completed and was approved by the Alaska Department of Environmental Conservation. This traditional food is now safely being served to elders in Kotzebue, and the process is authorized for use by eldercare facilities throughout the state that wish to provide traditional foods to their residents.





**SUPPORTING A DIVERSIFIED
AND GROWING ECONOMY**

Young fishermen learn the business and management of commercial fishing

With support from over a dozen Alaska businesses and organizations, Alaska Sea Grant hosted the eighth Alaska Young Fishermen's Summit (AYFS) in January 2020. Fifty early-career fishermen from Atka, the Pribilof Islands, Bristol Bay, Prince William Sound, Kodiak, King Cove, Homer, Sitka, Petersburg, Juneau, Anchorage, Girdwood, Fairbanks and Ester participated in the three-day summit.

AYFS addresses the challenges facing new entrants into Alaska's commercial fishing fleet by providing training on the land-based aspects of running a sustainable commercial fishing operation, including financial management, seafood markets, the science and management of commercial fisheries, the

commercial fisheries regulatory process, and vessel safety.

Experts in finance, insurance, and seafood provided the fishermen in 2020 with up-to-date information needed to run a successful commercial fishing business. Senators Lisa Murkowski and Dan Sullivan provided video welcome addresses, and longliner Jim Hubbard provided the keynote address.

AYFS is a model for fishermen training programs around the country and is the basis of the Young Fishermen's Development Act that is under consideration in Congress. For more information on the Alaska Young Fishermen's Summit, visit <https://alaskaseagrant.org/ayfs>.



Training aspiring fishing crew in Western Alaska

Alaska's fishing industry is attracting fewer young workers, and there are few resources to help aspiring crew members succeed. Alaska fishing captains traditionally hire new crew with little experience, having them learn on the job. This comes at a cost: inexperienced and untrained crew results in more accidents and decreased production. For the new crew member, the lack of fishing skills comes with challenges to personal safety, a steep learning curve, and half-share pay. Alaska Sea Grant is addressing this challenge with a "crew class" training program to arm newcomers with needed information and skills, thereby increasing productivity and safety.



The class was developed in Dillingham by Gabe Dunham and a team of local commercial fishing captains. Since the pilot class in 2018, Dunham has worked with partners at the Bristol Bay Native Association to train over 100 prospective crew from many Western Alaska communities, with plans to expand to other regions.

"Reaction has been positive from our fishing industry," said Dunham. "We have local fishing captains giving their time to help teach the workshops, which is important because they know the particulars of fishing in our region."



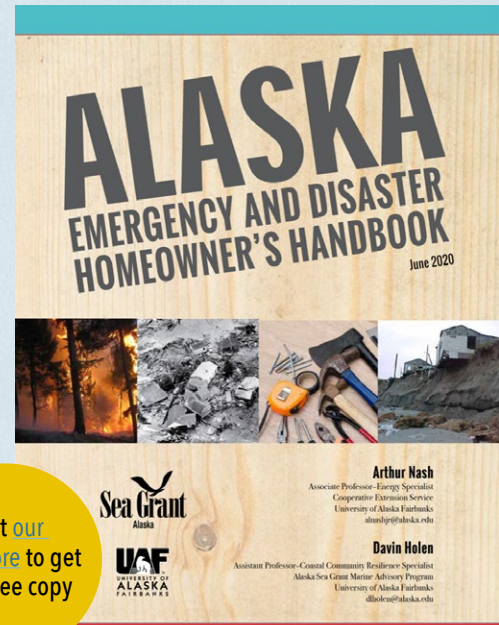
Helping Alaska homeowners prepare for emergencies

Alaska Sea Grant is distributing a new guide to help Alaska homeowners prepare for and recover from natural disasters and extreme weather conditions. The *Alaska Emergency and Disaster Homeowner's Handbook* provides specific steps for dealing with heavy rains, high winds, freezing temperatures, earthquakes, tsunamis, wildfires, volcanic eruptions, erosion, and flooding from storm surges.

Davin Holen, Alaska Sea Grant's coastal community resilience specialist, partnered with UAF's Cooperative Extensions Service to create the guide, inspired by a similar book from Hawai'i Sea Grant.

Some of the Alaska-specific challenges addressed in the guide are transportation and supply chain issues, and a need for self-sufficiency given the geographic remoteness and limited emergency services of many small communities.

“We wanted this guidebook to be useful to all homeowners, including in rural Alaska,” said Holen. “It’s focused on simple ways they can fix their homes’ foundations to mitigate effects of thawing permafrost, clearing the area around the house to limit fire danger, or fastening a roof to withstand high winds. We also looked at preparedness, in case you have to leave your home, and what to expect when you return.”



Visit our
bookstore to get
your free copy



Helping the aviation industry manage the threat of invasive species

In 2015, *Elodea* was discovered in Anchorage at the world's busiest floatplane base, Lake Hood. This submersed freshwater plant is an invasive species in Alaska lakes and a hazard to floatplanes. Floatplanes are widely used for summer travel in Alaska, and can spread the invasive plant to lakes throughout the state. In order to anticipate potential future *Elodea* hotspots, Alaska Sea Grant-funded researchers and collaborators surveyed pilots to identify how it may spread.

Researchers also collected data to capture the economic harm to the industry if *Elodea* continues to spread. Pilots reported concerns taking off or landing at shallow-water destinations if *Elodea* might be present. Half indicated that they would avoid regularly-trafficked destinations if dense aquatic vegetation were present.

This research provides information for policymakers and aviation operators about the importance of managing aquatic invasives in order to maintain the economic viability of floatplane travel. The survey also increased awareness of *Elodea* among floatplane pilots, informing them of the hidden cost of invasive species transmission and steps pilots can take to minimize spread.



Alaska Sea Grant benefits Alaska's economy

Alaska Sea Grant produced over \$8.5 million in economic benefit last year (February 2019–January 2020), determined using a framework established by National Sea Grant. The benefits resulted from work in marine safety training, seafood safety classes, seafood technology programs, professional consultations, and other activities.

Alaska Sea Grant helps workers and businesses by providing services such as specialized training and certification. For example, the Better Process Control School provides FDA-recognized certification in thermal processing and acidified food.

Economic benefit also comes from providing essential workforce assistance and training in coastal communities. For example, Alaska Sea Grant helped conduct safety training required by the US Coast Guard for commercial fishermen operating more than three miles from shore.

Alaska Sea Grant helps businesses and constituents through consulting and laboratory services. Our seafood marketing and technology experts provide a range of consulting services to commercial seafood harvesting and processing businesses, helping with business plans, researching processing

equipment, and helping them meet regulatory requirements.

Alaska Sea Grant also supports communities in ways that are hard to quantify. For example, Alaska Sea Grant supports safe and sustainable subsistence harvesting, a practice deeply rooted in Alaska Native cultures, promotes marine science literacy to both children and adults through publications and events, and provides marine and seafood safety training and information around the state.



Alaska Sea Grant State Fellowship Program

Class of 2019



Katlyn Haven
National Park Service



Madison Kosma
*NOAA Fisheries Alaska Region,
Protected Resources Division*



Meredith Pochardt
*NOAA Fisheries Alaska Region,
Habitat Conservation Division*



Alicia Schuler
*NOAA Fisheries Alaska Region,
Protected Resources Division*

Class of 2020



JoMarie Alba
*NOAA Alaska Fisheries
Science Center*



Nichole LaRoche
National Park Service



Angela Moran
*North Pacific Fishery
Management Council*



Hannah Wilson
Alaska Sea Grant

Knauss Marine Policy Fellowship



Ann-Christine Zinkann
Executive Fellow, 2020

*International Ocean Liaison,
NOAA Ocean Observing
and Monitoring Division*



Alaska Sea Grant research trainees

Reyce Bogardus PhD geoscience
Increasing the Capacity of Alaskan Coastal Communities to Adapt and Respond to Storm-Driven Coastal Hazards

Kristopher Carroll MS interdisciplinary geospatial data science
Climate-Driven Arctic Coastline Modeling: Improving Erosion Forecasts for Communities

Jesse Coleman PhD fisheries (graduated)
Graying of the Fleet in Alaska's Fisheries: Defining the Problem and Assessing Alternatives

James Curry MS marine biology
Geographic Variation of Nearshore Carbonate Chemistry in the Gulf of Alaska

Douglas Duncan MS fisheries (graduated)
Navigating the Predator Gauntlet: Impacts of Nearshore Marine Fishes on Hatchery and Wild Juvenile Salmon in Southeast Alaska

Kristopher Ford MS civil engineering
Arctic Risk Management Network: Linking Regional Practitioners and Researchers to Improve Mitigation Through Participatory Action Research by Community Monitors about Erosion, Surges, and Nearshore Sea Ice Loss as Mutual Priorities

Jesse Gordon MS fisheries
Integrating Local Ecological Knowledge and Survey Data to Improve Assessment and Management of Rockfishes in Alaska

(cont.)

Alaska Sea Grant research trainees (cont.)

Sonia Ibarra PhD fisheries
*Sustainability of Coastal Communities and Sea Otters:
Harvest and Future Management of Sea Otters*

Jillian Jablonski MS interdisciplinary
*Incorporating Environmental Change in Planning for
Healthy Coastal Ecosystems and Economies*

Erika King MS fisheries
*Reassessing Hatchery Mating Policy in Alaska:
is Non-selective Mating Unnatural?*

Jamie Musbach MS fisheries
*Metabolic and Growth Physiology of Early Life History
Stages of the Northern Spot Shrimp, *Pandalus platyceros**

Drew Porter MS marine biology
*Copper Toxicity to Bristol Bay Sockeye Salmon Larvae
under Field-Relevant Water Quality Conditions*

Wendel Raymond PhD fisheries (graduated)
*Sustainability of Coastal Communities and Sea Otters:
Harvest and Future Management of Sea Otters*

Ann Thomson Raymond MS fisheries (graduated)
Applied Research for a New Seaweed Aquaculture Industry in Alaska

Chris Sergeant PhD fisheries
*Assessing the Resilience of Southeast Alaskan Salmon
to a Shifting Freshwater Environment*

Wesley Strasburger PhD fisheries
*Environmental Covariates of Young of the Year Sablefish
Growth and Recruitment in the Gulf of Alaska*

Brian Ulaski PhD marine biology
The Importance of Seaweed Wrack as Habitat and Resource



ADVISORY COMMITTEE

Chair: **Lea Klingert**, President, Commercial Fishing and Agriculture Bank

Assistant Chair: **Jeff Kauffman**, Vice President, Central Bering Sea Fishermen's Association

Barb Amarok, Director, University of Alaska Fairbanks Northwest Campus

James Balsiger, Alaska Regional Administrator, NOAA National Marine Fisheries Service

Kaja Brix, Arctic Program Director, NOAA Fisheries Alaska Region (Alternate for James Balsiger)

Michael Brubaker, Director for Community Environment and Health, Alaska Native Tribal Health Consortium

Diana Evans, Deputy Director, North Pacific Fishery Management Council

Nicole Kimball, Vice President, Pacific Seafood Processors Association

Michael Kohan, Seafood Technical Program Director, Alaska Seafood Marketing Institute

Scott Lindsey, Acting Regional Director, NOAA National Weather Service

Molly McCammon, Executive Director, Alaska Ocean Observing System

Vera Metcalf, Director, Eskimo Walrus Commission at Kawerak, Inc.

Hazel Nelson, Board of Directors, Bristol Bay Native Corporation

Kris Norosz, Petersburg

Dave Reggiani, Aquaculture Expert, Prince William Sound Aquaculture Corporation

Ralph Samuels, Vice President of Government and Community Relations, Princess Cruises/Holland America

Milan Shipka, Acting Director, Agriculture, Natural Resources and Extension, UAF

Chris Siddon, Marine Fisheries Scientist, Alaska Department of Fish and Game

Greg Siekaniec, Regional Director for Alaska, US Fish and Wildlife Service

Dee Williams, Deputy Regional Director, US Geological Survey

ALASKA SEA GRANT BY THE NUMBERS



1,622
K-12 students educated
in marine science

197
K-12 educators trained



208
Businesses
sustained or created



190
Fishermen/
processors trained



77
Jobs sustained or created

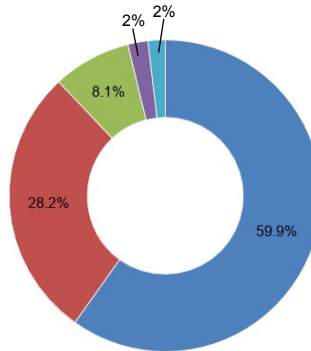


14
Graduate students
worked on Alaska Sea
Grant-funded research



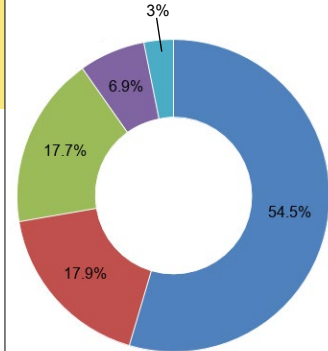
6,787
Publications distributed

Operating Revenue



- ASG core funds (federal and match)
- University of Alaska funds
- Grants
- Program income
- Donations (cash and in-kind)

Expenditures



- Outreach, education and communications
- Research and student fellowships
- State and Knauss fellowships
- Program development
- Program management

Operating Revenue, Year 4 Omnibus

ASG core funds (federal and match)	\$2,804,053
University of Alaska funds	\$1,320,464
Grants	\$377,527
Program income	\$99,686
Donations (cash and in-kind)	\$82,568

Expenditures

Outreach, education & communications	\$2,558,825
Research and student fellowships	\$837,757
Program management	\$830,153
State and Knauss fellowships	\$322,954
Program development	\$141,664

ALASKA SEA GRANT FACULTY AND STAFF



