

University of Alaska Fairbanks  
**College of Fisheries and  
Ocean Sciences**

**Annual Report**  
**2019**



COLLEGE OF FISHERIES  
AND OCEAN SCIENCES

University of Alaska Fairbanks



## Message from the Dean

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With this annual report, it is an honor to bring to your attention that the College of Fisheries and Ocean Sciences (CFOS) is on the move with ambitious—and realized—goals as it strives to address the most pressing aquatic ecosystem challenges facing Alaska, the nation and the world.

Our college has a well-earned reputation for excellence in fisheries, marine biology and oceanography research and education programs. Among the highlights of this past year, we hired new tenure-track faculty: Gwenn Hennon, Will Burt and Seth Danielson in the department of oceanography and Curry Cunningham in the department of fisheries. We created a new Alaska Blue Economy Center and strengthened our extensive major facilities by commissioning a new coastal research vessel, *Nanuq*. We managed to increase enrollment in our undergraduate program for a fourth consecutive year, and we welcomed many new graduate students. And, we continued our long-standing tradition of strong public engagement and outreach with Alaska's coastal communities, subsistence hunting organizations, and key partners.

CFOS is also a remarkably resilient organization. In that regard, and in light of the unprecedented turmoil resulting from Alaska's budget challenges, I would be remiss not to highlight our outstanding staff—the boots on the ground who ensure the college operates efficiently and effectively. We owe a debt of gratitude to these unsung heroes.

With new faculty hires and resources, dedicated staff, broad stakeholder support and more than 900 alumni, our students, staff, researchers and faculty are working to advance the mission of CFOS as a world-class organization engaged in research, education and public service programs that extend across Alaska and beyond.

As we usher in our fourth year as a college, I welcome and encourage you to learn more about the important and fascinating work being conducted by our talented faculty, staff, and students.

*S. Bradley Moran, Dean  
College of Fisheries and Ocean Sciences*

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▼ *Nanuq on her shake-down research cruise in Prince William Sound. Photo by Seth Danielson.*





# Academics

▲ Madison Kosma prepares a drone to collect humpback whale feeding footage in Sitka. Photo by JR Ancheta.

CFOS is widely recognized for its high-quality undergraduate and graduate academic programs focused on aquatic ecosystems. This past year was highlighted by a number of new CFOS degree programs and student achievements.

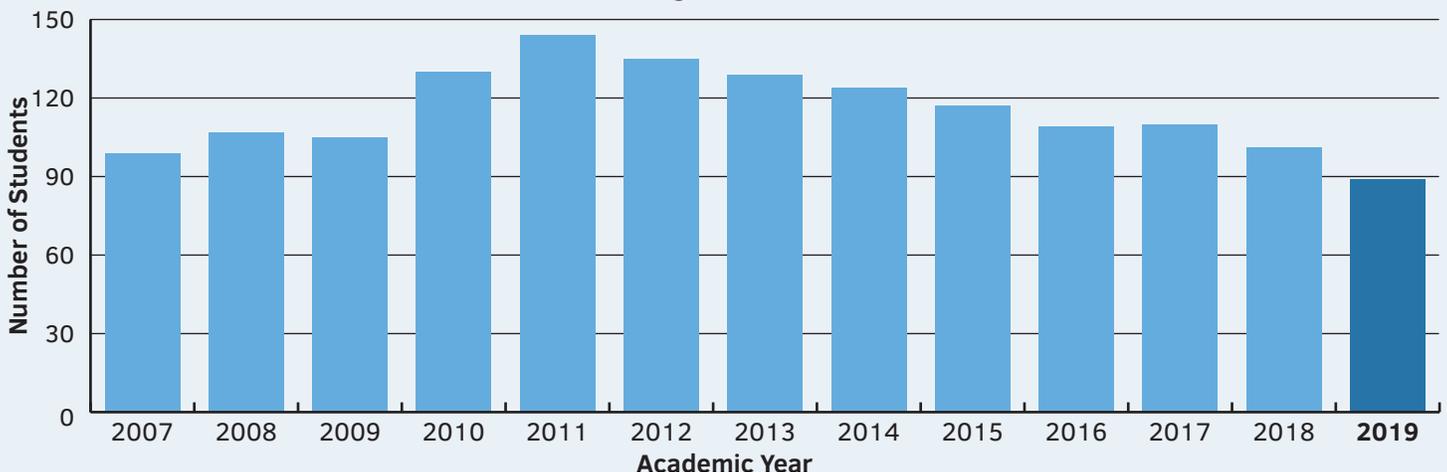
For example, we successfully launched the new Blue MBA degree, which combines the online Master of Business Administration offered by the School of Management with CFOS courses in Fisheries, Marine Biology or Oceanography. CFOS faculty are actively developing web-based courses that will allow students to participate in this graduate program through an entirely asynchronous format. Our faculty are also working to make the Master of Marine Studies (MMS) curriculum available on the web. By offering these degree programs online, the Blue MBA and MMS

will position CFOS at the forefront of Professional Science Master's degree programs focused on aquatic ecosystems and the Blue Economy.

Another program that came online this past year is the Bachelor of Science in Fisheries and Ocean Sciences degree with a Fisheries Science concentration, offered jointly by CFOS and the University of Alaska Southeast (UAS) School of Arts and Sciences. This collaborative program allows Juneau-based UAS students to earn a Bachelor of Science degree in Fisheries Science. The new program already has a number of students enrolled, and interest is growing.

Nearly 20 students completed undergraduate internships this year. Students worked on a variety of fisheries and ocean sciences research projects

## Graduate Student Enrollment by Year



in collaboration with a number of state agencies and organizations, including Alaska Department of Fish and Game, Metlakatla Indian Community Department of Fish and Wildlife, Bureau of Indian Affairs, Alaska SeaLife Center, Sitka Tribe, Tanana Chiefs Conference, SeaAlaska and the Northern and Southern Southeast Regional Aquaculture Associations.

Several of our undergraduate students were successful in garnering recognition and research awards this past year. Alyx Hoover, Tibor Dorsaz and Jonathan Napier received Undergraduate Research and Scholarly Activity (URSA) project awards, and Alyx Hoover and Jonathan Napier received URSA travel awards to present their research at national scientific meetings. Alyx Hoover was also selected to represent Alaska in presenting her research at the Council on Undergraduate Research in Washington, DC. Brian Zhang and Tibor Dorsaz were beneficiaries of URSA mentor support as part of the EPSCoR Coastal Margins project, and Kelsie Maslen received a Dean’s Choice Award for her poster on capelin trophic dynamics.

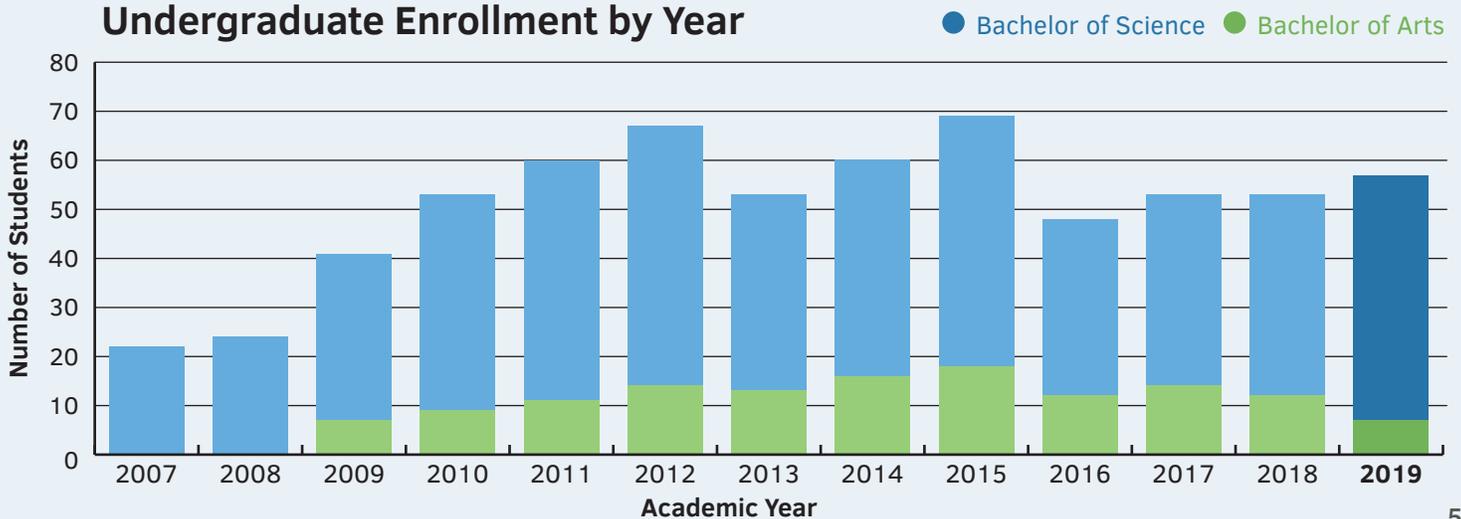
CFOS graduate students were also recognized with research awards. Amy Kirkham received a 2019 John A. Knauss Marine Policy Fellowship and is working for US Senator Lisa Murkowski. Recipients of the Northern Gulf of Alaska Applied Research Award included Brian Ulaski, Cheryl Barnes and Julia McMahon. And, Jesse Gordon, Brian Ulaski, Ashley Rossin, Ann Thompson, Marta Ree and Jamie Musbach were awarded Sea Grant Graduate Student Fellowships. Zane Chapman and Chris Guo received Coastal Marine Institute student awards. Fellowship support from the Rasmuson Fisheries Research Center was awarded to Kelly Cates, Jeanette Gann,



▲ Heidi Mendoza-Islas holds an *Aequorea* sp. jelly sampled during a Northern Gulf of Alaska Long-term Ecological Research (NGA LTER) cruise on Sikuliaq. Photo by Loren Schaible.

Katja Berghaus, Cheryl Barnes, Julia McMahon and Kirsten Ressel. Finally, Kirsten Ressel received an URSA award to mentor undergraduate students Cameron O’Neill and Kelsie Maslen. Congratulations to all CFOS students for another productive year!

### Undergraduate Enrollment by Year





# Research

▲ *Eric Klein, LeeAnn Munk and Jordan Jencks collect watershed samples in Kachemak Bay as part of the Fire and Ice EPSCoR project. Photo by Brenda Konar.*

Over the past year, CFOS continued to strengthen its research portfolio in aquatic ecosystems with numerous individual, discipline-oriented research studies and several new large interdisciplinary research programs.

Some of our major programs include the new Established Program to Stimulate Competitive Research (EPSCoR) Fire and Ice project; Long-term Ecological Research (LTER) programs based in the Northern Gulf of Alaska (NGA LTER) and Beaufort Sea Lagoon Ecosystems (BLE LTER); the Arctic Shelf Growth, Advection, Respiration and Deposition (ASGARD) program; and the Arctic Integrated Ecosystem Survey (Arctic IES). Many CFOS research programs are focused on Arctic- and Alaska-specific issues, but our geographically diverse portfolio ranges as far south as the Antarctic.

The broad range of CFOS research has been supported by numerous state and federal agencies and partner organizations. In addition, over the past year, the college administered research projects supported by Alaska Sea Grant (\$850,000), the Pollock Conservation Cooperative Research Center (\$320,000), the Rasmuson Fisheries Research Center (\$250,000), and the Coastal Marine Institute (\$1,000,000 supported by the Bureau of Ocean and Energy Management).

## ***Jellyfish Play Unknown Role in Ecosystem***

Graduate student Heidi Mendoza-Islas and Professor Russ Hopcroft are studying the role that jellyfish play in the Gulf of Alaska ecosystem, which includes the impact they have on commercially important cod. Past research has shown that jellyfish enjoy feeding on juvenile fish and fish eggs. But there has never been a systematic study focused on large jellyfish in the gulf.

“So if there is a huge bloom of jellyfish in the Gulf of Alaska, we don’t know what impact that will have on pollock populations,” Mendoza-Islas said. “By synthesizing data collected from a few different long-term studies in the area and adding some of my own new data, I want to begin answering some important questions about how jellyfish impact the gulf’s ecosystem.”

## ***CFOS active grants as of June 30, 2019***

- Total active grants: **189**
- Total current research funding (awarded): **\$155 million**

# Research Spotlight

## Looking into Seaweed Harvesting

Graduate student Brian Ulaski and Professor Brenda Konar want to understand where seaweeds in Southcentral Alaska thrive, and whether any populations could be harvested for commercial or subsistence purposes.

“Right now, most coastline in Southcentral Alaska falls under nonsubsistence regulations, meaning it is illegal to harvest live and growing seaweed—whether attached, dislodged or even washed up on the beach,” said Ulaski. “We don’t know if the regulations need to be so black and white. There are a lot of details that could determine whether certain species or areas of the coast could be sustainably harvested.”

Few studies have focused on seaweed reproduction in Alaska, but this information would be useful so managers can ensure that harvesting seaweed is not harmful to the wild population. Using a combination of scuba and intertidal surveys and laboratory analysis, Ulaski is mapping the times of year that rockweed, sugar kelp and bull kelp reproduce in coastal waters. He has found that some seaweeds become reproductive as early as March, and that on

average, their ability to reproduce seems to ramp up as summer progresses. Some seaweeds die in the fall when this reproductive phase is complete, while others are able to last through the winter.

Understanding when and how quickly seaweeds are reproducing can provide insight into appropriate harvesting timelines and quantities for different species. The amount of seaweed that can be harvested generally increases throughout the summer.

Ulaski also wants to know how quickly harvested seaweed can grow back. He harvested the same three types of seaweed from six different sites in Kachemak Bay, choosing three sites where regulations prohibit harvesting and three sites where subsistence harvest is allowed. The rates of regrowth varied by species, location and time.

Researchers will need a few more years to fully understand the feasibility of sustainable seaweed harvesting. While there have been success stories, too many variables are still unknown to make regulation changes just yet.

▼ *Brian Ulaski carries seaweed samples to the Kasitsna Bay Laboratory. Photo by Chris Guo.*





## Research Spotlight

▲ Student intern Liza Hasan recovers an ocean drifter. Photo by Brenda Konar.

### Researchers Use Drifters to Investigate Changing Ecosystems

A new 5-year, \$20 million project by Alaska NSF EPSCoR is underway to study two major Alaskan regions undergoing climate-driven changes. The project is called “Fire and Ice: Navigating Variability in Boreal Wildfire Regimes and Subarctic Coastal Ecosystems.”

As part of the team studying coastal ecosystems, Professors Mark Johnson and Brenda Konar, along with students Emily Williamson, Brian Zhang and Liza Hasan, are deploying and tracking ocean drifters to measure surface currents under a range of conditions in Kachemak Bay. The drifter

positions are tracked via Iridium phone, which can then be used to determine current speed. The project is focused on understanding how ocean circulation will change as freshwater input from summertime glacial melt increases due to climate warming, and how different kinds of marine larvae may be transported under changing conditions in Kachemak Bay. This is important to understanding how new marine populations are established, and how existing populations compete to survive. Tracking the circulation pathways of surface ocean drifters will lead to an improved understanding of how larva (and pollutants) are dispersed.

*A humpback whale feeds on hatchery juvenile salmon. Photo by Madison Kosma. NOAA permit #18529. ►*



▲ *Katrin Iken (right, UAF-CFOS) and Aaron Galloway (left, University of Oregon) prepare to submerge for a research dive along the Antarctic Peninsula. Photo by Ross Whippo.*

## ***Investigating Antarctic Seaweed***

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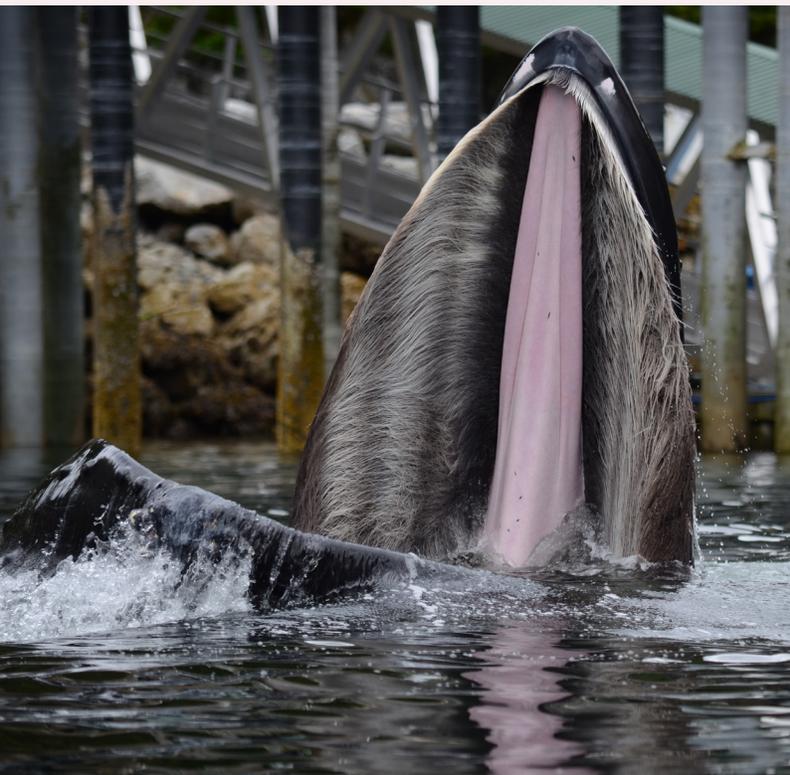
Professor Katrin Iken is part of a team from four US universities investigating seaweed communities along the Antarctic Peninsula. As in many other places in the world, large seaweeds along the Antarctic Peninsula coastline provide important living habitat and food resources to myriad invertebrates and fishes. However, unlike many other locations, the waters surrounding the Antarctic Peninsula are seasonally ice-covered, and this research team seeks to understand how seaweed communities may

change with the seasonal decrease in sea ice cover as a result of ocean warming.

Iken and her team spent four weeks in May 2019 diving along the Antarctic Peninsula, accumulating hours of underwater video footage and bags of collections of these seaweed communities that will be analyzed in the months to come. Iken's particular focus in the project is to assess the role of these seaweeds in the coastal food web.

## ***Hungry Humpbacks Dine at Hatchery***

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At the Hidden Falls Hatchery in Chatham Strait, three whales have tapped into a yearly all-you-can-eat buffet. The whales have learned that the hatchery releases juvenile salmon in the same place each summer, providing a reliable snack for the roaming predators. Graduate student Madison Kosma and UAS Professor Jan Straley are using isotopic analyses to determine how much these hatchery salmon contribute to each humpback whale's diet.

“Our goal was to go out before, during and after releases to get tissue samples from these individual whales to see what proportion of each whale's diet is made up of hatchery salmon during the spring and early summer,” Kosma said. “This is important because it will help us determine how much these animals rely on hatchery fish, which could key us in to the potential impact they are having on the hatchery returns.”



## Research Spotlight

▲ Michael Courtney holds a tagged Chinook salmon in Cook Inlet, outside of Homer.  
Photo courtesy of Andy Seitz.

### Satellite Tags Reveal Predators of Older Chinook Salmon

Associate Professor Andy Seitz needed his detective hat when an alarming number of his fish tags started popping up early to the surface of the ocean.

“At first, we speculated an equipment malfunction,” Seitz said.

Seitz and graduate student Michael Courtney have been using pop-up satellite tags to study Chinook salmon since 2013. A satellite tag is attached to a fish, where it collects data on temperature, depth and ambient light intensity. On a pre-programmed date the tag releases from the fish, pops up to the surface of the ocean and transmits its stored data to satellites.

Seitz and Courtney were testing whether the tags are an effective tool for studying Chinook salmon ecology and behavior. They focused on understudied late-stage marine salmon that have spent more than a couple of years at sea. “It has been assumed that the early stage in the ocean is more dangerous,” Seitz said, “and that fish become safer as they grow.”

Early in this project, a number of the tags began transmitting data sooner than expected. The

researchers had tagged big Chinook salmon off the coast of Dutch Harbor in December, when temperatures in the Bering Sea are about 4 to 6 degrees Celsius. But in many of these premature datasets, the researchers noticed a sudden spike in temperatures days before the data was transmitted.

“The depth records of these tags were still moving up and down, sometimes down to 400 meters, and remaining at this 25-degree [77°F] temperature,” Seitz said. “The only place that can happen is in the stomach of a warm-blooded salmon shark.”

Between 2013 and 2017, satellites received data from 35 tags. Based on these data, researchers found that marine predators including warm-blooded salmon sharks, cold-blooded fish, and marine mammals consumed 19 of the 35 tagged fish.

“These results do show that pop-up satellite tags are an effective tool for learning about Chinook salmon ecology and behavior—and mortality, too,” Courtney said. “There aren’t any other research methods that allow you to continue to collect data after a fish has been consumed.”

# Research Centers, Institutes and Facilities

## **Alaska Blue Economy Center**

The interdisciplinary Alaska Blue Economy Center (ABEC) was formed this past year with the goal of boosting Alaska's blue economy by serving as a resource and support center for research, instruction and outreach related to Alaska's vast aquatic resources and ecosystems.

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## **Coastal Marine Institute**

The Coastal Marine Institute supports studies associated with the development of natural resources in Alaska's coastal waters and outer continental shelf. Currently funded projects include studies in Cook Inlet and the Chukchi and Beaufort Seas focused on physical and chemical oceanography; fish communities; microbial degradation of crude oil; food web structure and carbon sourcing; and the vulnerability of fishing communities to change.

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## **Kasitsna Bay Laboratory**

The Kasitsna Bay Laboratory continues its strong partnership with NOAA. The laboratory currently is home to two large programs: Gulf Watch Alaska is conducting long-term monitoring of marine habitats in Kachemak Bay, and the NSF EPSCoR Fire and Ice program is examining how coastal communities vary in watersheds with different glacial coverage in this region.

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## **Kodiak Seafood and Marine Science Center**

The Kodiak Seafood and Marine Science Center conducts research focused on seafood science and fisheries oceanography. Projects include developing pollock skin for pet treats, alternate market development for pollock roe, and juvenile cod winter ecology.

## **Lena Point Fisheries Facility**

Assistant Professor Curry Cunningham joined the Lena Point fisheries faculty in 2019 to lead the new NOAA Quantitative Ecology and Socioeconomics Training (QUEST) program. Also, Lena Point hosted an advanced course on size-structured stock assessment, which was attended by CFOS students and faculty as well as state and federal biometricians. CFOS students also presented at the annual American Fisheries Society Student Symposium, which was video-delivered from Sitka to Juneau and Fairbanks and throughout the state.

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## **Ocean Acidification Research Center**

The Ocean Acidification Research Center (OARC) continues to serve the state and nation by analyzing water samples and is working to expand its monitoring and experimental research programs. The OARC open ocean group monitors ocean acidification (OA) by maintaining long-term mooring platforms, applying new technology to collect data on research cruises and remotely operated vehicles, and validating ocean acidification predictions to apply to bioeconomic models. The coastal OA monitoring group completed the first year of high-frequency, high-quality pH monitoring in Kachemak Bay. In addition, a new OA laboratory was installed at the Kasitsna Bay Lab in Kachemak Bay, increasing experimental OA capacity for Alaska.

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## **Pollock Conservation Cooperative Research Center**

The Pollock Conservation Cooperative Research Center (PCCRC) supports research projects and graduate student fellowships.

Since its inception in 2000, PCCRC has received nearly \$16 million in gifts from industry engaged in the at-sea fishery for pollock. Current projects focus on pollock byproducts, pollock growth and productivity, and ship-side salmon stock identification.

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## **Rasmuson Fisheries Research Center**

The Rasmuson Fisheries Research Center continued to generously support CFOS graduate student research. Newly funded research topics include a study on movement patterns of Pacific halibut in the northern Bering Sea, the effects of sea otters on Dungeness crab abundance and catch in southeast Alaska, and the sensitivity of the Pacific razor clam to ocean acidification.

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## **Seward Marine Center**

The Seward Marine Center (SMC) supports R/V *Sikuliaq* operations and a variety of research, education and outreach activities. SMC continues to support the Northern Gulf of Alaska Long-term Ecological Research (NGA LTER), which greatly expands the breadth of work conducted as part of the long-term Seward Line research program. Last summer, SMC welcomed the delivery of our newly commissioned coastal research vessel, *Nanuq*, which is outfitted to support research, training and outreach programs. The vessel has the capacity to host field operations ranging from Prince William Sound to Kamishak Bay, along the Kenai Peninsula, and south to the Kodiak Archipelago.

# R/V *Sikuliaq*



▲ *Sikuliaq* in Resurrection Bay. Photo by Sarah Spanos.

Working from high-latitude polar waters to regions off southern California, and from the North American continental coastline west to the international dateline, *Sikuliaq* provided a resilient platform this past year for scientists and students to conduct research in the North Pacific Ocean and Arctic Ocean.

In her third full year of operation, *Sikuliaq* supported a total of 11 science cruises and spent nearly half of her time at sea in Arctic waters. And she successfully completed the 5-year regulatory inspection by the US Coast Guard. We also emblazoned *Sikuliaq* with official UAF logos on the wing bridge and rear winch

house, indicating our pride as operator of the ship and as an important part of Nanook Nation.

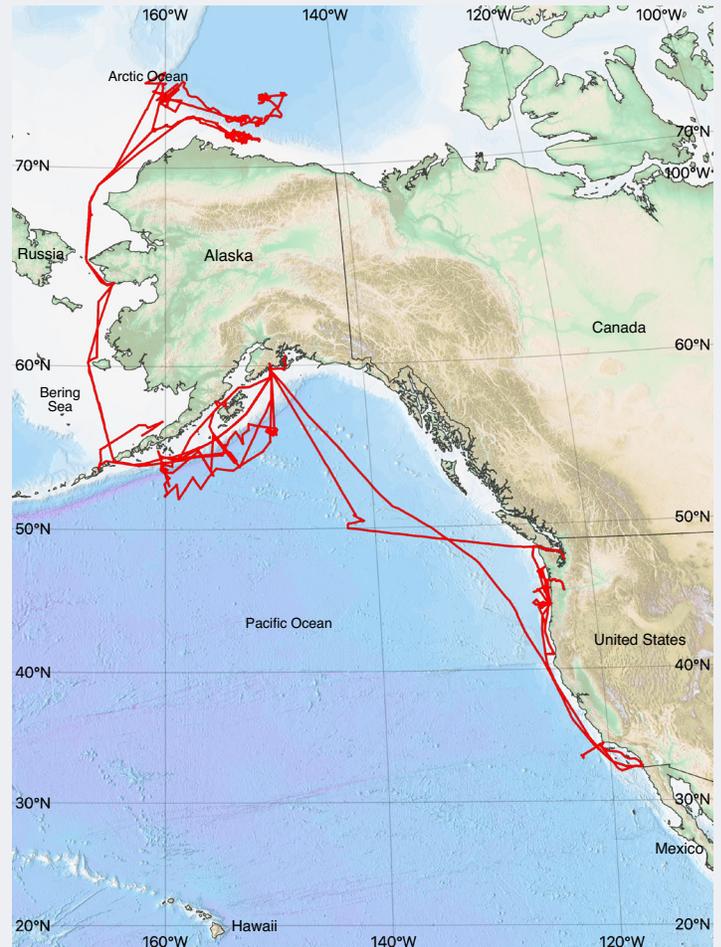
*Sikuliaq* started the year supporting jellyfish research in the Bering Sea and ended the year helping researchers study the role of freshwater plume dynamics on the physical and biogeochemical variability of the northern Gulf of Alaska. For this past year, UAF faculty, staff and students participated in approximately 60 percent of *Sikuliaq* science days at sea, again highlighting the active seagoing research and education programs at CFOS and UAF.

## ***FY19 Sikuliaq Statistics***

**24,738** nm traveled • **203** total ship days • **160** days of science (not including mob/demob days)  
**74** days in the Arctic (as defined by the Arctic Research and Policy Act of 1984) • **332** CTD casts  
**8** XBT casts • **205** net tows • **201** moorings deployed • **169** moorings recovered • **13** gliders deployed  
**13** gliders recovered • **33** buoys/floats deployed • **32** buoys/floats recovered

## New Tools to Explore Under-Ice Habitat

Rapidly changing sea-ice conditions create challenges not only for mammals that use ice as a platform for breeding, resting and feeding, but also for plankton and fish that rely on under-ice habitat. To expand the research capability of R/V *Sikuliaq* to conduct fisheries research, CFOS recently acquired a custom-built Surface- and Under-Ice Trawl (SUIT). After shore-based trials in Newport, Oregon, the SUIT was deployed from *Sikuliaq* as part of the western Arctic GO-WEST expedition. This expedition is a collaboration between Franz Mueter, Alexei Pinchuk, the Alfred Wegener Institute and the University of Washington, and is partially funded by the international Arctic Research Icebreaker Consortium (ARICE). These researchers seek to understand the role of newly formed ice as habitat for zooplankton and Arctic cod (*Boreogadus saida*), a key prey species that occurs throughout the circumpolar North. The overall goal is to test the hypothesis that entrainment of young Arctic cod into sea-ice habitat is an important part of their survival strategy.



▲ R/V *Sikuliaq* FY 19 ship track.





# Alaska Sea Grant

▲ *Fishing boats unload salmon into processor boats near Valdez. Photo by Dawn Montano.*

Alaska Sea Grant’s statewide mission is to enhance the sustainable use and conservation of Alaska’s marine, coastal and watershed resources. A partnership between the National Oceanic and Atmospheric Administration and CFOS, Alaska Sea Grant serves the public through research, outreach and education. It is one of 33 Sea Grant programs in coastal states and territories of the United States.

## Using Drones to Free Whales

Alaska Sea Grant and partners are pioneering the use of drones to help NOAA better respond to large-whale entanglements. Humpback whale entanglements are becoming increasingly common in Unalaska. Since 1998, there have been more than 140 reports of large whales in Alaska entangled in marine debris including fishing gear and mooring lines. In October, Melissa Good partnered with

Aleutian Aerial LLC and Oceans Unmanned Inc., with support from drone maker DJI, to provide aerial support for whale disentanglement efforts using small drones. This innovative use of technology in Alaska will help responders to more safely and effectively free endangered whales and other marine animals involved in life-threatening entanglements.

## Supporting the Blue Economy

Alaska’s oceans support multibillion-dollar fisheries that employ more than 55,000 workers. Seafood-related employment and subsistence fishing form the economic backbone of many rural coastal communities. Because of the economic and cultural importance of fishing to our state, Alaska Sea Grant works to ensure the growth and sustainability of this key sector. Alaska Sea Grant continues to partner with businesses and university campuses around the state to build the Maritime Technical Training program: classes and workshops for fishermen, processors and maritime industry workers in the repair and maintenance of their equipment.

Starting with outboard engine maintenance and repair in 2014, training now includes diesel engine maintenance and repair, marine

hydraulics, and marine refrigeration. Workshops involve both classroom instruction and hands-on activities with equipment. New classes and training under development include marine refrigeration maintenance and repair, marine fabrication, and a distance-delivered class on marine electrical systems.

▼ *Taku Fisheries plant, Juneau. Photo by Deborah Mercy.*



## Helping Alaska Adapt to Climate Change

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Adapt Alaska is a resource for communities, tribes, agencies, academics and nonprofits that facilitates the sharing of information on how to monitor changes and mitigate impacts. Its ultimate goal is to enable communities to build resilience and successfully adapt to rapidly changing ocean and climatic conditions and changing terrestrial landscape across our vast state. The Adapt Alaska project resulted from a series of resilience workshops held in 2016 in communities from the Aleutians to the Chukchi Sea to Southeast Alaska.

“There are many great websites for coastal resilience on a national scale, but nothing that articulates the unique challenges facing Alaska. Adapt Alaska is an Alaska-specific tool to expand existing collaboration and support ongoing networking, supplementing and strengthening the benefits of face-to-face meetings and helping to link people in communities facing shared challenges,” Davin Holen said.

Adapt Alaska is a partnership between CFOS, Alaska Center for Climate Assessment and Policy, National Oceanic and Atmospheric Administration, Aleutian and Bering Sea Islands Landscape Conservation Cooperative, Southeast Alaska Tribal Ocean Research, Sitka Tribe of Alaska, and Central Council of Tlingit and Haida Indian Tribes of Alaska.

## Keeping Mariners Safe

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Alaska Sea Grant collaborated with Bristol Bay Regional Seafood Development Association and Alaska Marine Safety Education Association to provide four drill conductor safety workshops for 65 commercial fishermen in Dillingham and Naknek before the start of the 2019 salmon fishing season. These workshops were also used to begin collecting data on the use of wearable personal flotation devices in this fishery in response to recent person-overboard fatalities.

*Students gather at Westchester Lagoon to study macroinvertebrates as part of the Alaska Seas and Watersheds curriculum. Photo courtesy of Alaska Sea Grant.* ►

## Encouraging Culturally Appropriate Outreach

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Marine education specialist Marilyn Sigman partnered with the North Pacific Research Board and Arctic Research Consortium of the United States to convene a working group this spring focused on developing best practices for culturally responsive outreach to indigenous Alaska K–12 students.

The working group included scientists and educators—both Alaska Native and non-Native—who are engaged in culturally responsive science and STEM education. The recommendations will bolster guidelines for ethical research and focus on improving STEM education in remote Alaska communities, and will help grantors and researchers improve community engagement in ways that are culturally appropriate.

Methods for accomplishing these goals include encouraging collaborative relationships between researchers and educators through the grant process, using best practices for community-centered engagement and for indigenous students in STEM education, involving local students and young people in the collection of data, incorporating local and traditional knowledge (LTK) in research projects, and affording LTK and science equal weight. The group’s report will be available in September.





## Development

*A harbor seal rests on an ice floe near Valdez. Photo by Dawn Montano. ▲*

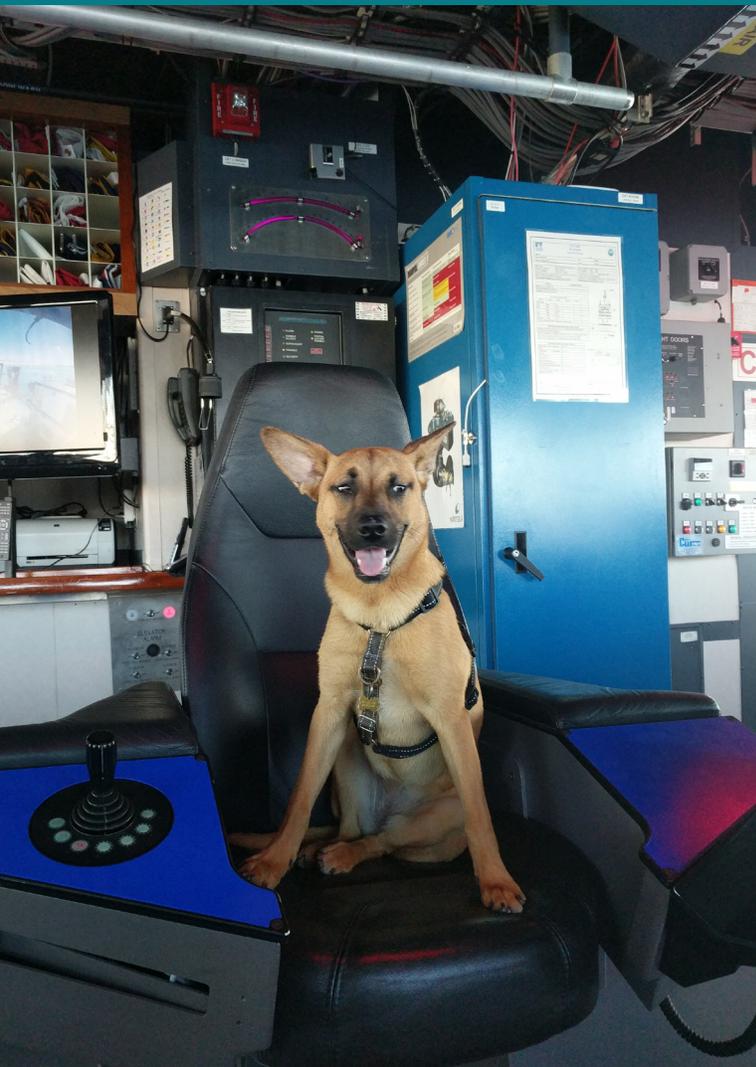
For fiscal year 2019, CFOS received \$860,518 in charitable gifts. These generous gifts from new and returning donors help the College establish scholarships and fellowships and increase support for student and faculty research.

We thank you for your commitment in helping UAF fulfill our mission of teaching, research and service and look forward to exploring opportunities for new philanthropic giving to CFOS.

*Sikuliaq relief captain Lana considers whether full-open throttle would wake up the crew. Photo by Aisha Bouziane. ►*

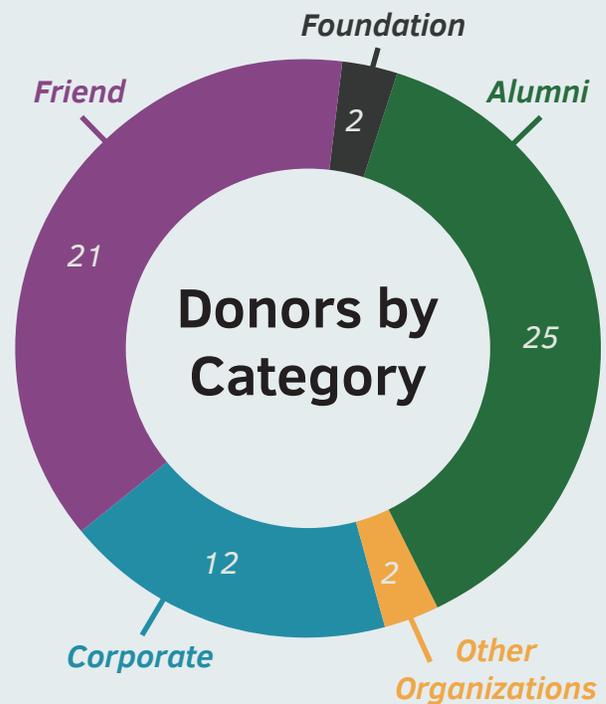
## Major Donors

57 Degrees North	Douglas Island Pink & Chum	Prince William Sound Science Center
Alaska Ocean Seafood	Ardella P. Follmann	Elmer and Mary Louise Rasmuson*
Dr. Vera Alexander	Glacier Fish Company	Rasmuson Foundation
American Seafoods Company	The Glostén Associates	William S. Reeburgh
Arctic Storm	John J. Goering*	Santa Monica Seafood
AT&T	Highland Light Seafoods	Shell Exploration and Production Company
Frances S. Baker*	Hilcorp Alaska	Solaster Science
Bering Sea Fisheries Research Foundation	Holland America Princess Alaska	Starbound
Blue Evolution	Icicle Seafoods	Trident Seafoods
Robert and Kathleen Byrd	Kanaway Seafoods	United Catcher Boats
Shirley A. Carlson	William F. Meek*	Usibelli Coal Mine
Coastal Villages Region Fund	Gordon and Betty Moore Foundation	Frankie Wakefield*
CoBank	M. J. Murdock Charitable Trust	Wards Cove Packing Company
Consortium for Ocean Leadership	Nelbro Packing Company	<i>*Deceased</i>
Crowley Marine Services	Northrim Bank	
E. R. Dolly Dieter	Ocean Beauty Seafoods	
	Phoenix Processors	



## FY19 CFOS Fundraising

Total giving: **\$860,518**



Total number of donors: **62**



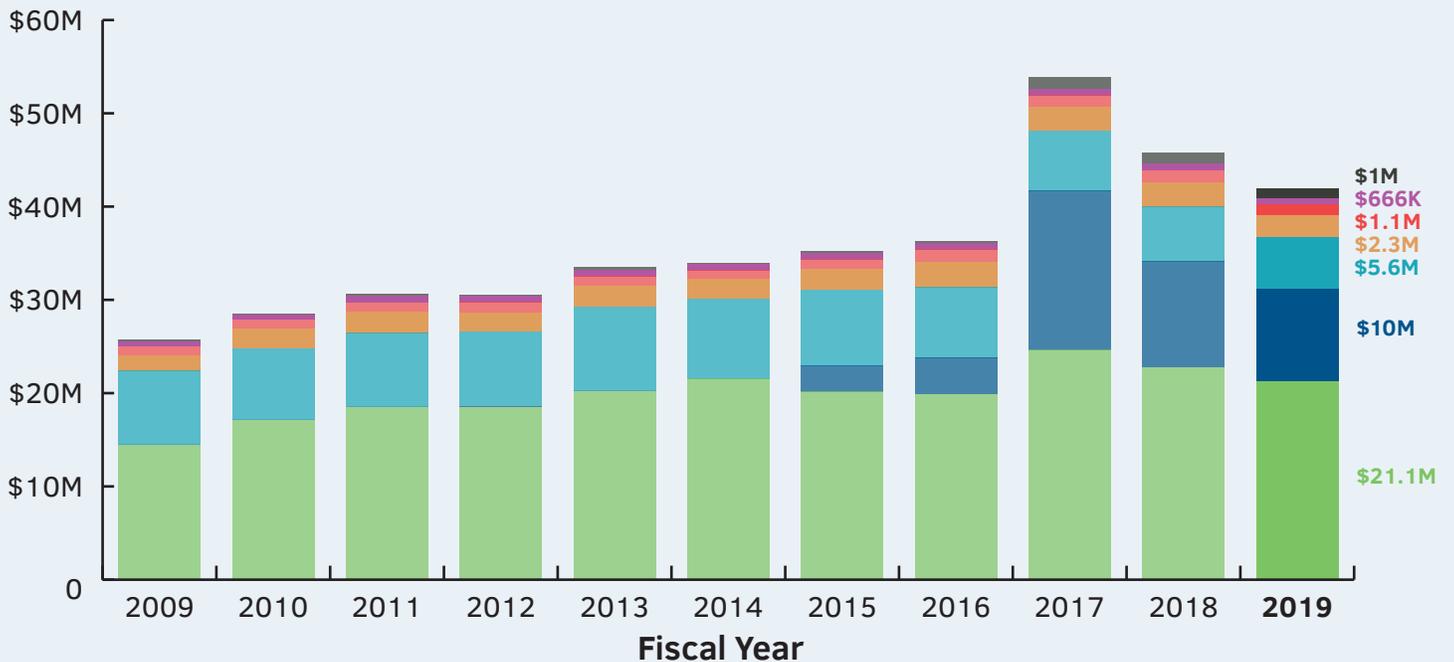
# Budget and Finance

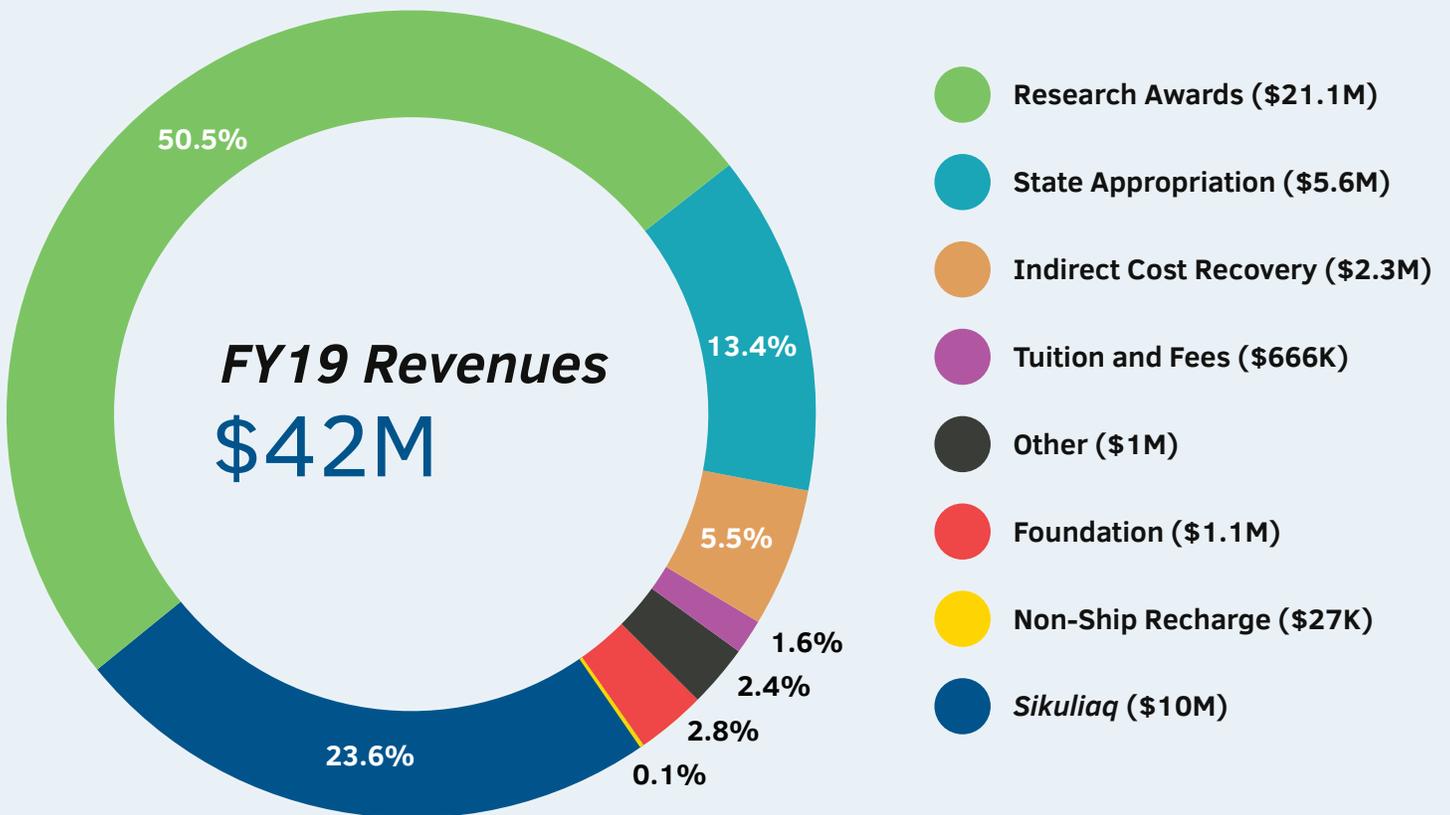
▲ Calm weather and sunshine welcomes researchers at the northern Antarctic peninsula. Photo by Katrin Iken.

## CFOS Revenue Trend

\*Non-Ship Recharge and American Reinvestment and Recovery Act funding (2011–2016) excluded.

- Research Awards\*
- Sikuliaq
- State Appropriation
- Indirect Cost Recovery
- Foundation
- Tuition & Fees
- Other Revenue





## College of Fisheries and Ocean Sciences

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Sunset just outside Resurrection Bay. Photo by Andrew McDonnell. Published in December 2019. UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: [www.alaska.edu/nondiscrimination](http://www.alaska.edu/nondiscrimination).

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