

College of Fisheries and Ocean Sciences

ANNUAL REPORT 2022



UNIVERSITY OF ALASKA FAIRBANKS

Message from the Dean

It is an honor and a pleasure to introduce the 2022 annual report of the College of Fisheries and Ocean Sciences. Established in 1960 as the Institute of Marine Science, the college has grown to be one of the largest academic and research organizations in the state, with our faculty, staff and students located across Alaska. CFOS is a major contributor to research and instruction in fisheries, marine biology and oceanography. As highlighted in this report, we are focused on addressing aquatic ecosystem challenges facing Alaska, the nation and the world.

Among the milestones over the past year, we and our colleagues at the University of Alaska Southeast completed the development of a new Master of Marine Policy degree, which opened for enrollment in the fall 2022 semester. We launched a fully asynchronous undergraduate degree in fisheries, marine biology and oceanography. We completed a major redesign of our shoreside infrastructure in support of *Sikuliaq* and *Nanuq* operations and numerous seagoing research programs. And we are building on the efforts of the CFOS Diversity Committee to guide our shared vision of an equitable, diverse and inclusive college.

The college continues to strengthen its research portfolio of both individual investigator projects and large multidisciplinary programs. Notably, we received record funding in support of numerous research grants and contracts. And, as a leading institution dedicated to training new scientists and technicians, we continue to experience strong enrollment in our undergraduate and graduate programs. We also manage major facilities efficiently and effectively, including



Sikuliaq — with the occasional privilege of sitting in the Captain's chair.

Several new faculty appointments were made over the past year. Kristen Gorman was appointed as tenure-track assistant professor in the Department of Marine Biology, Ellen Chenoweth was appointed as research assistant professor in the Department of Marine Biology, and Tyler Hennon was appointed as research assistant professor in the Department of Oceanography. We have an active search to hire several tenure-track faculty in the Department of Oceanography, and discussions are underway to hire a fisheries faculty member with a focus on marine policy.

These are exciting times for CFOS. I welcome and encourage you to learn more about our diverse academic programs and the fascinating research being conducted by our dedicated community of students, staff and faculty.

A handwritten signature in blue ink that reads "S. Bradley Moran".

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

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A water jelly floats in a giant kelp bed on the outer coast of Dall Island, just west of Prince of Wales Island, Alaska. Photo by Carter Johnson.

New Faculty Appointments

Kristen Gorman



Kristen Gorman joined the Department of Marine Biology in 2018 as research faculty. In 2022, she was appointed as a tenure-track assistant professor. As an integrative marine fisheries and wildlife ecologist, Gorman is interested in molecular to ecosystem perspectives on a variety of fish and wildlife systems. Her recent research has focused on the energetics of spawning Copper River sockeye salmon, winter pelagic habitat selection by tufted puffins in the Gulf of Alaska, and how wild salmon and Pacific herring interact with hatchery-produced salmon in Prince William Sound.

Gorman believes that Alaska is the best place to be a biologist. "There is unlimited opportunity for collaboration and research in the state, and everywhere you turn there are really great scientists doing amazing work. It is very inspiring," she said. "At CFOS, the combined expertise between oceanography, fisheries and marine biology allows for a truly unprecedented opportunity to study marine predators and their environment."

Tyler Hennon



Originally from Juneau, research assistant professor Tyler Hennon first joined CFOS in 2019 as a postdoctoral scholar. He is a physical oceanographer who loves living in Alaska "because of the ease of getting into pristine wilderness." Hennon enjoys "working with bright, kind and engaging people at CFOS, and being at the forefront of subpolar and polar science." He is leading a citizen-science monitoring program in Southeast Alaska, where scientific instruments are provided to trolling vessels to measure upper ocean temperature, salinity and chlorophyll. Hennon is also leading

an effort to collate physical oceanography datasets within Cook Inlet in order to better describe the circulation patterns.

Ellen Chenoweth



Ellen Chenoweth was appointed to the Department of Marine Biology as a research assistant professor in fall of 2022. For the past 13 years, Chenoweth has lived, studied and worked primarily in Sitka, Alaska. A CFOS alumna, she completed her Ph.D. in fisheries in 2018 with a dissertation on bioenergetic and economic impacts of humpback whale depredation at salmon hatchery release sites. She is currently the principal investigator and director of the Rural Alaska Students in One-Health Research project, a National Institutes of Health-funded program responding to the

underrepresentation of Indigenous and rural students in biological science. She is also research advisor at the UAF Biomedical Learning and Student Training program. "I aim to bring a unique perspective to the Department of Marine Biology by strengthening UAF's connection to rural Alaska, providing opportunities for local residents to access higher education, and facilitating increased opportunities for community-responsive research," Chenoweth said.

Academics

New Programs and Curriculum Changes

Over the past year, CFOS academic programs grew as a result of several ongoing initiatives.

A degree program was approved that allows students to sequentially complete an occupational endorsement, certificate, and Associate of Applied Science in fisheries technology at the University of Alaska Southeast Sitka. Students may then transfer to the Bachelor of Science in fisheries and marine sciences degree program at CFOS.

The Blue Master of Business Administration degree, a science, technology, engineering and math concentration, was approved by the UAF Faculty Senate. A collaboration between CFOS and the College of Business and Security Management, the Blue MBA is the only fully online, asynchronous program in the world that melds an accredited MBA with courses focusing on fisheries and marine sciences.

The Master of Marine Policy, a joint graduate degree between CFOS and the UAS School of Arts and Sciences, was approved by both UAF and UAS faculty senates, the UA Board of Regents and the Northwest Commission on Colleges and Universities.

For undergraduates, the Bachelor of Science in fisheries and marine sciences program now has a fully asynchronous concentration, which allows students to complete coursework at their own pace within a predetermined schedule.

Finally, the UA-wide scientific diving program has more than 81 active divers across campuses who have logged over 630 science dives so far in 2022. Last spring, 11 new divers completed training through the UAF Scientific Diving field course.

[Michael Kim, Jennifer Tustin, Emily Reynolds and Samantha Allen](#) deploying drifters in Kachemak Bay. Photo by Brenda Konar.



Internships and Awards

Over the past year, undergraduate students Samantha Allen, Bryce Bateman, Rachel Heimke, Anthony Jaster, Roger Maldonado, Lillian Nelson and Kalynn Workman completed their internships at external agencies and organizations and at UAF, working on field and lab-based projects in fisheries and marine biology.

Several CFOS undergraduate and graduate students received awards for exemplary academic, research, leadership and service achievements. Congratulations to these individuals and all CFOS students for their hard work.

Brenda Konar and Mack Hughes identify a fish caught in a photarium. Photo by Christina Bonsell.



Graduate Awards

CFOS DEAN'S CHOICE AWARDS

Outstanding Graduate Student: Lauren Sutton

DEAN'S GRADUATE RESEARCH ASSISTANT AWARD

Katja Berghaus

UAF UNDERGRADUATE RESEARCH AND SCHOLARLY ACTIVITY MENTOR AWARDS

Jonah Bacon, Hannah Myers, Jennifer Questel

RASMUSON FISHERIES RESEARCH CENTER FELLOWSHIP AWARDS

Shelby Bacus, Sonia Kumar, Kevin Siwicke, James Crimp, Amber Perk

UA FOUNDATION SCHOLARSHIPS AND AWARDS

Alfred and Frances Baker Scholarship: Alex Sletten

Dieter Family Marine Science Research Scholarship:

Jaide Phelps, Hannah Myers, Liza Hasan

Francis "Bud" Fay Memorial Scholarship: Sonia Kumar

Donald Hood Memorial Scholarship: Sydney Wilkinson

Northern Gulf of Alaska Research Award: Sonia Kumar,

Garrett Dunne, Shelby Bacus, Andy Rothenberger

Ken Turner Memorial Fellowship: Annie Malinguine,

Lauren Sutton

Sport Fish Conservation Award: Will Samuel

Crowley Scholarship: Gwendolyn Bunch, Aleutia Peters

Undergraduate Awards

CFOS DEAN'S CHOICE AWARD

Outstanding Undergraduate Student: Sadie Oswald

OUTSTANDING CFOS STUDENT ACADEMIC AWARDS

Freshman: Kilie Jacques

Sophomore: Linnaea Doerner

Junior: Rachel Heimke

Senior: Brian Zhang

UAF UNDERGRADUATE RESEARCH AND SCHOLARLY ACTIVITY PROJECT AWARDS

Lillian Nelson

UAF URSA RESEARCH AND ACTIVITY DAY DEAN'S CHOICE AWARDS

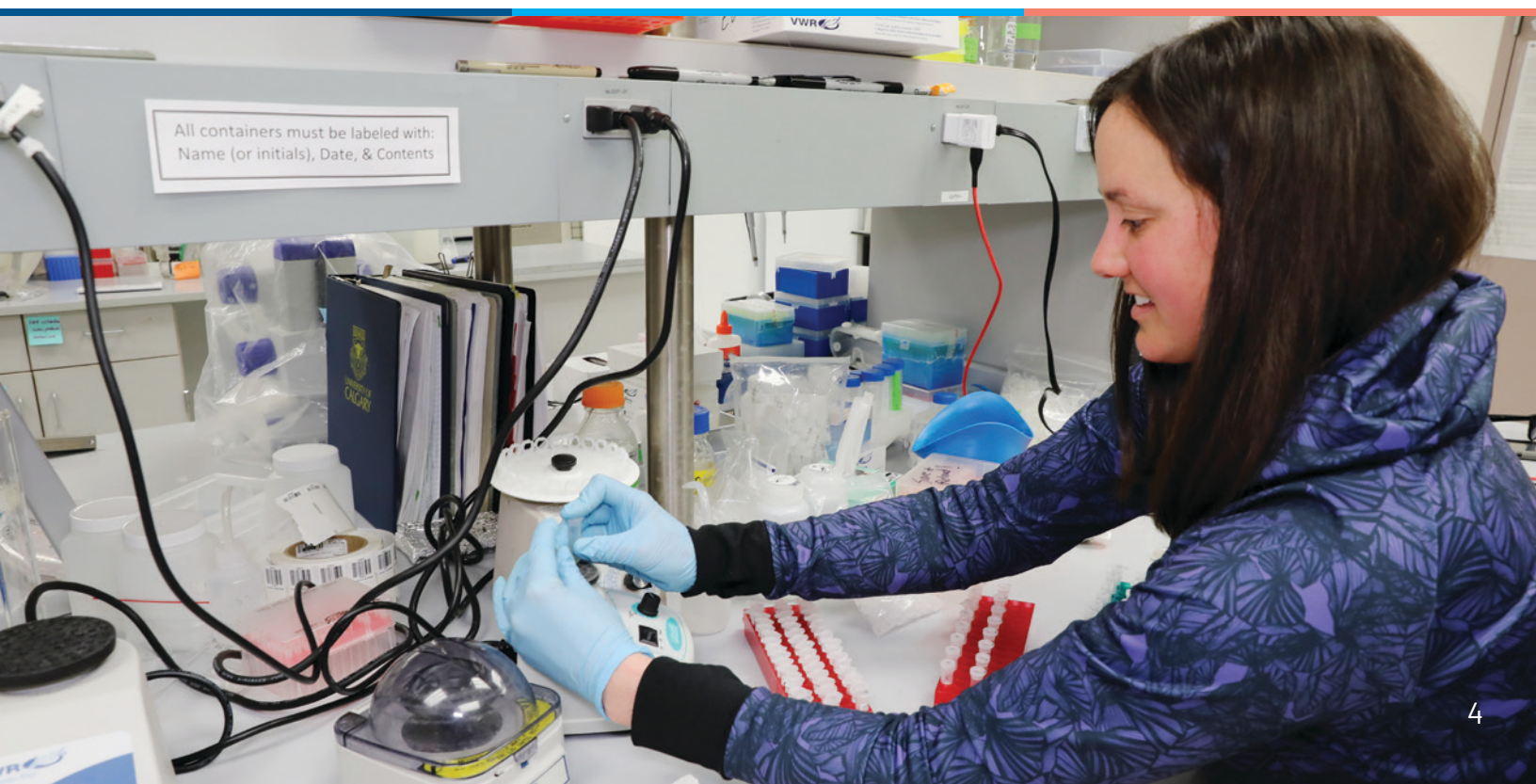
Dean's Choice: Kimberly Williams

Honorable Mention: Feyne Elmore

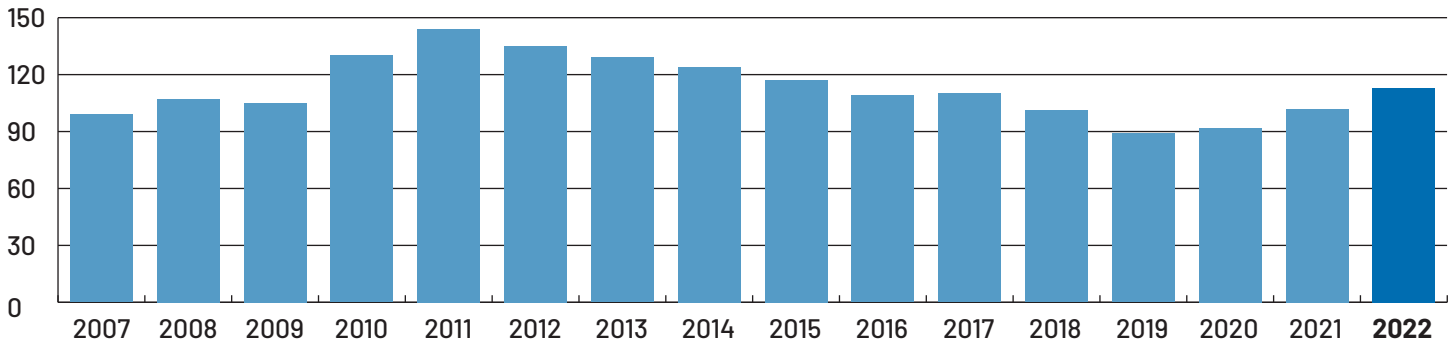
CROWLEY AWARD

Aleutia Peters, Gwendolyn Bunch

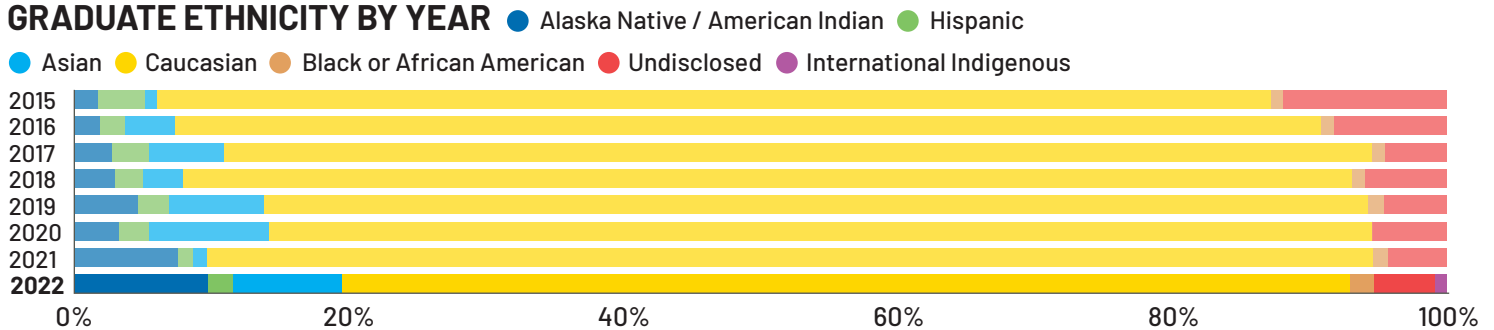
Maggie Harings uses a vortexer as part of the process of isolating Yukon River salmon DNA from sediment and other particles found in each sample. Photo by Alice Bailey.



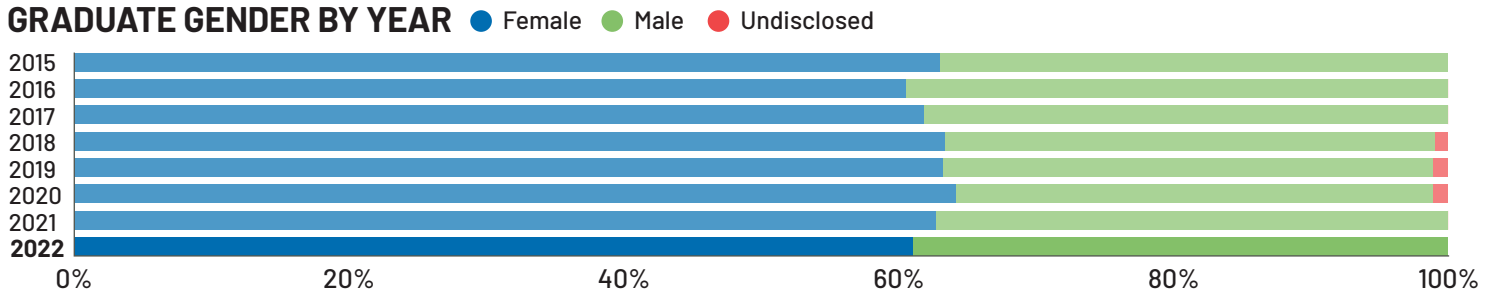
GRADUATE STUDENT ENROLLMENT BY YEAR



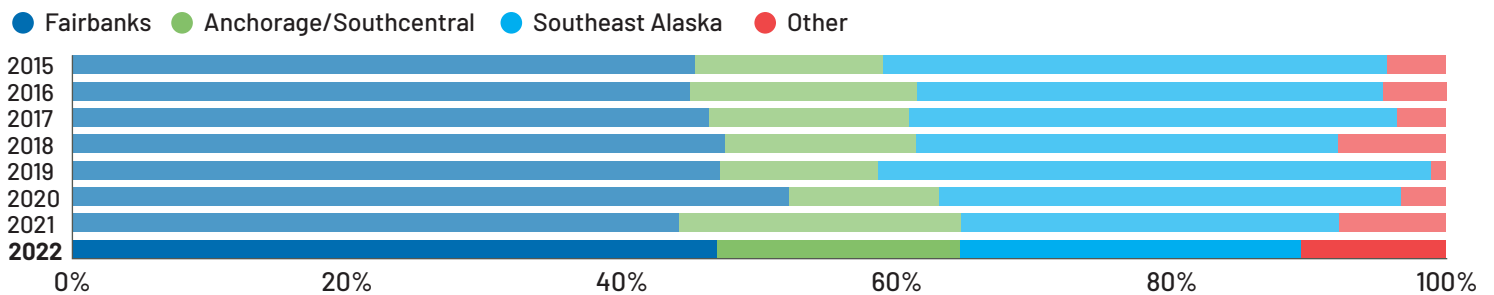
GRADUATE ETHNICITY BY YEAR



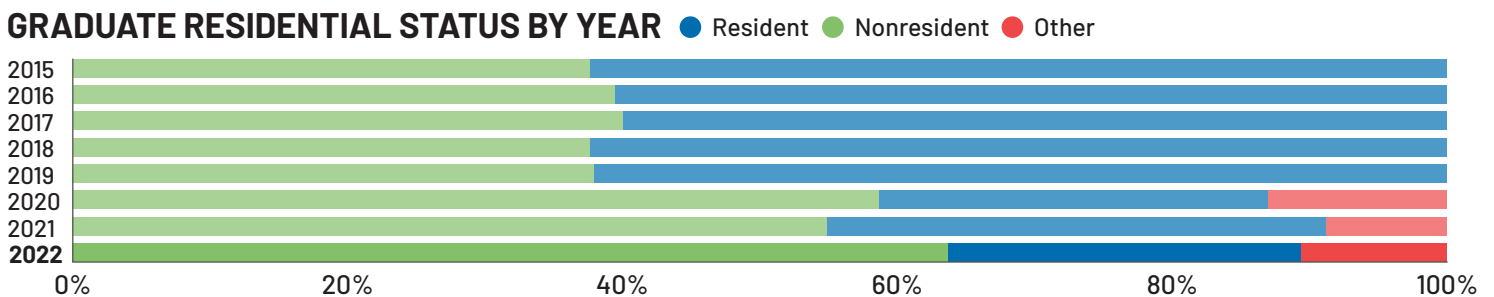
GRADUATE GENDER BY YEAR



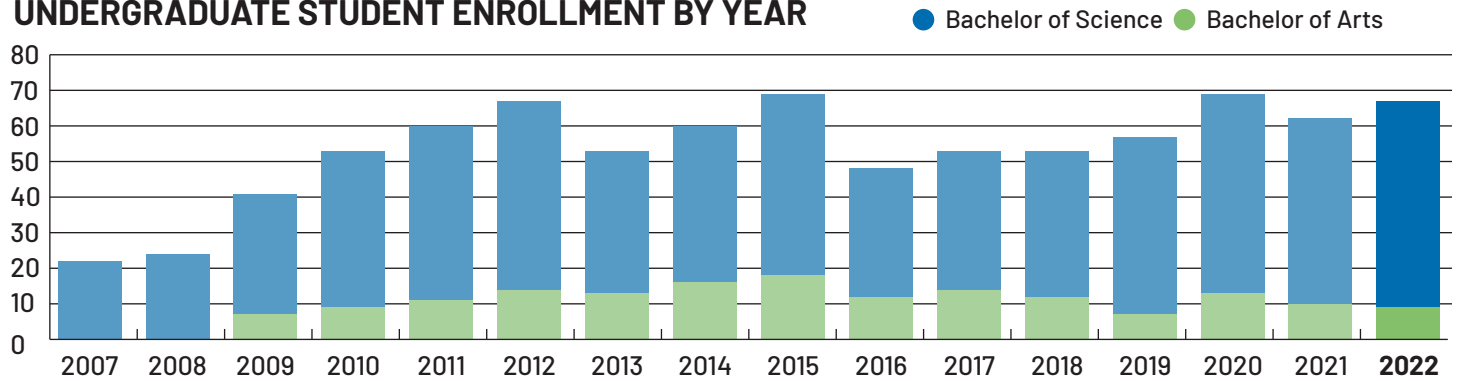
GRADUATE LOCATION BY YEAR



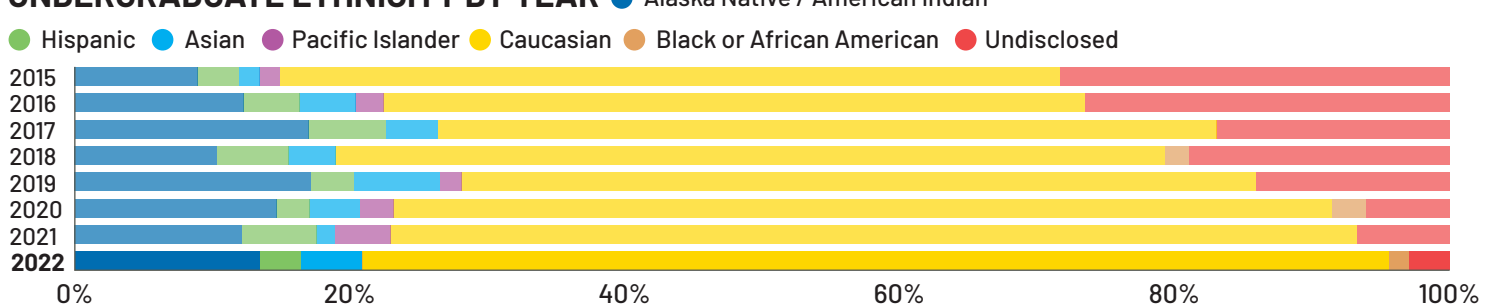
GRADUATE RESIDENTIAL STATUS BY YEAR



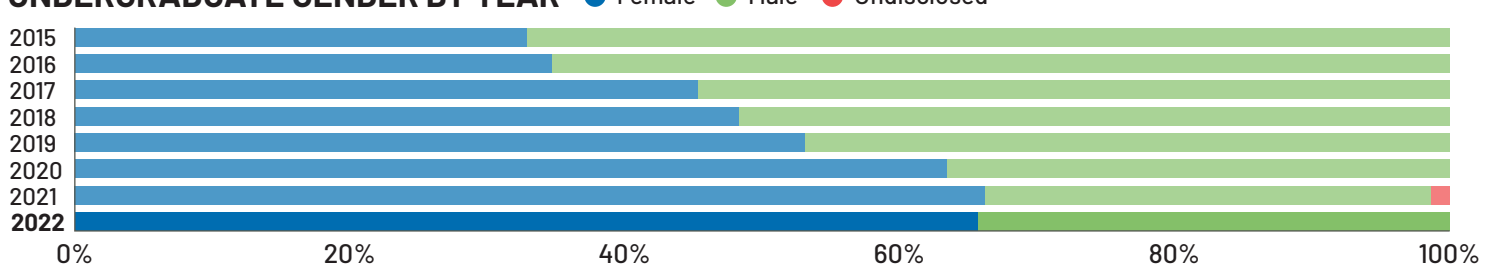
UNDERGRADUATE STUDENT ENROLLMENT BY YEAR



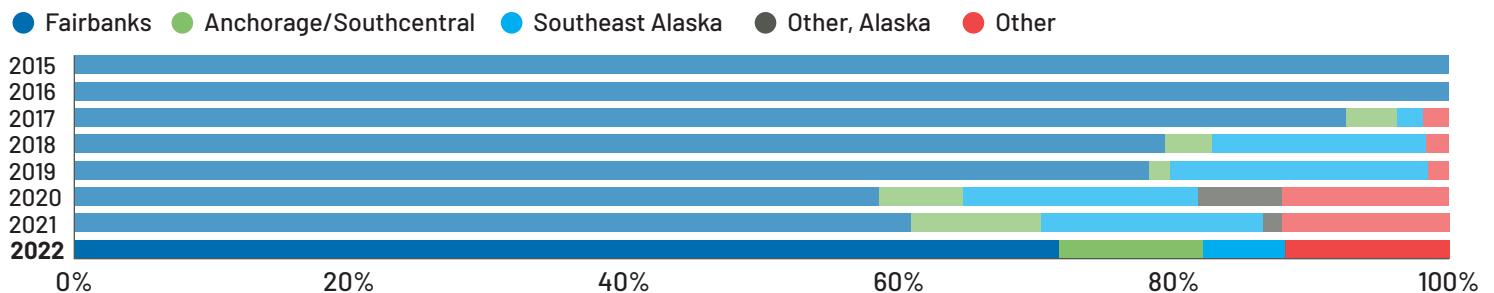
UNDERGRADUATE ETHNICITY BY YEAR



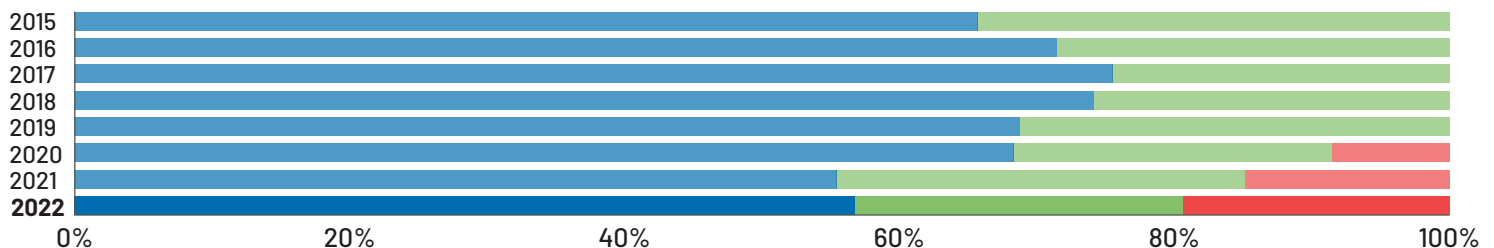
UNDERGRADUATE GENDER BY YEAR



UNDERGRADUATE LOCATION BY YEAR



UNDERGRADUATE RESIDENTIAL STATUS BY YEAR



Tamamta program builds relationships

Tamamta, a National Science Foundation-funded research training program for graduate students, is now in its second year, with 13 Indigenous graduate fellows. The program focuses on Indigenous peoples and knowledge systems and bridging the gap between Indigenous and Western fisheries and marine sciences. Student fellows supported by the program are from across Alaska and are pursuing a range of research topics, from salmon management and biology to traditional whaling practices in the Arctic. Connie Melovidov, Elizabeth Mik'aq Lindley, Kendrick Hautala, Janessa Esquible, Tazia Wagner, Keith Herron Ivy, Kimberly Kivvaq Pikok, Natasha Hayden and Nicholas Jacuk entered the program in 2021 as the first cohort of students. Janessa Newman, Vernae Angnaboogok, Eugene Peltola III and Mary Hostetter began the program this year as the second cohort.

In August, the second annual Tamamta graduate program retreat was held at the Howard Luke Gaalee'ya Spirit Camp on the Tanana River near Fairbanks.

The first two days of the Tamamta retreat featured the class Indigenous Fisheries of Alaska, the first CFOS course focused on Indigenous peoples' history, knowledge systems and governance of fisheries. The last two days of the retreat focused on developing personal connections between Tamamta students and faculty participating in the program. During the retreat, two elders from the region, Eliza Winfrey and Chief Donald Charlie, shared their knowledge.

CFOS faculty participating in the Tamamta retreat included Courtney Carothers, Peter Westley, Amanda Kelley, Andy Seitz, Jessica Glass, Seth Danielson and Gwenn Hennon. CFOS post-doctoral fellow Sonia Ibarra, research associate Danielle Ringer and graduate students Alex Reich and Isaac Nyameke also participated as part of the leadership team.

The retreat culminated with a feast of salmon, caribou, moose and other foods given by faculty and leadership involved in the Tamamta program.

Tamamta fellows and UAF faculty and staff introduce themselves at the 2022 retreat. Photo by Alice Bailey.



Kyle Dilliplaine collects samples of sea ice near the geographic North Pole as part of the U.S. Arctic Geotraces project in 2015. Photo courtesy of the U.S. Coast Guard.



Research

This year saw full-scale resumption of research cruises and other field programs after the end of pandemic restrictions. Our researchers are collaborating with U.S. and international scientists, Alaska citizen scientists and policy experts on a range of freshwater and marine ecology topics throughout Alaska and the Arctic.

One notable example of CFOS research is the Northern Gulf of Alaska Long-Term Ecological Research program, part of a national NSF network. The NGA-LTER research will help us to understand the drivers in the Gulf of Alaska ecosystem and how it responds to variability in natural conditions. The three NGA-LTER cruises per year, in spring, summer and fall,

are a collaborative effort by many CFOS oceanography faculty and students.

Another example is the wide range of salmon research conducted across CFOS. Salmon are an iconic part of Alaskans' identity and a prized catch in commercial, sport, personal use and subsistence fishing. CFOS researchers aim to promote the health of Alaska salmon populations, approaching this from many angles. In particular, they study management and co-management practices, develop methods of tracking salmon in the open ocean, investigate salmon behavior and response to environmental changes, and work to reduce salmon bycatch and enhance hatcheries.

CFOS Active Grants as of June 30, 2022

Total current research funding (awarded): **\$118 million**

Total active grants: **164**

Students use genomics to study the ocean

A number of CFOS graduate students are using DNA as a tool to improve understanding of the impact of climate change on organisms.

Shelby Bacus is using genetics techniques to study the health of Kodiak Tanner crabs. She collects juvenile crabs and exposes them to different conditions in the lab. Molecular analysis shows how the crabs' gene expressions change in response to stressors, such as increased temperature and ocean acidification. "Understanding how crab populations fluctuate under the influence of climate change will allow us to better manage the Tanner crab fishery in Alaska and associated ecosystems," she said.


Maris Goodwin is using DNA found in the environment to assess how coastal ecosystems

in the northern Gulf of Alaska are affected by increased glacial melt and related environmental conditions. She measures biodiversity at different sites by comparing eDNA found in water and sediment with organisms she catches with a seine net. "My project addresses the need to develop rapid, accurate and cost-efficient tools to monitor potential ecosystem shifts caused by a warming climate," said Goodwin.

Jake Cohen is using genomics to see how the northern Gulf of Alaska's microbial community structure responded to the recent North Pacific marine heat wave. Bacteria can be difficult to identify under a microscope, so he uses genomic sequencing to catalog microbes in water samples. By comparing the DNA sequences to known databases, he can

determine which microbes are present in the water at a given time.

Kyle Dilliplaine is interested in how changing conditions in the Arctic affect diatoms, a type of phytoplankton that can live in water and sea ice. He collects algae living on the bottom of sea ice, then exposes it to different levels of light in the lab, which could be caused in nature by decreased snow cover, as well as crude oil contamination. He then uses transcriptome sequencing to determine how sensitive the organisms are to these changing environmental conditions. "There will be some species that are unaffected, and perhaps even prefer certain conditions, whereas others will be negatively impacted," he said.

A photograph of Maris Goodwin, a graduate student, standing in shallow water near a rocky shore. She is wearing a blue beanie, glasses, a dark jacket, and grey waders. She is holding a blue and white cooler. The background shows a dense forest of evergreen trees and a misty or foggy atmosphere. The water is calm, reflecting the surrounding landscape.

Maris Goodwin
collecting water
samples in Jakolof Bay
near Homer. Photo by
Emily Reynolds.

Surface and Under-Ice Trawl improves understanding of Arctic cod ecology

Arctic cod are an important food source for seals and Arctic birds. In 2019, Franz Mueter and a collaborating international scientist team used *Sikuliaq* to tow the Surface and Under-Ice Trawl net along the outer shelf and slope regions of the Beaufort and Chukchi seas. The Go-West cruise took place in November, which in recent years is when sea ice usually begins to form. The purpose of this international cruise was to test the hypothesis that young Arctic cod rely on newly formed sea ice as habitat, which would make them particularly vulnerable to sea ice declines.

However, when *Sikuliaq* returned from the Go-West expedition in late 2019, the world was about to change due to the pandemic. Frozen samples of Arctic cod (*Boreogadus saida*) collected during the cruise were stranded due to COVID-related shipping delays, which caused a backlog in analysis. Three years later, Mueter and his colleagues have a better idea of how these important fish survive in the Pacific Arctic. In particular, and much to their surprise, the trawl net caught young Arctic cod at every station. "This confirmed that some portion of young Arctic cod associate with sea ice soon after it begins to

form," said Mueter.

Genetic metabarcoding of stomach contents confirmed that fish were feeding on a variety of ice-associated zooplankton, as well as zooplankton in the upper water column below the ice. Acoustic backscatter showed that larger fish (almost certainly Arctic cod) migrated from deeper waters (100–400 meters) toward the surface, presumably to eat zooplankton.

"The use of ice-associated habitat may be one strategy to obtain much-needed food in late fall and winter," said Mueter.



R/V *Sikuliaq* tows the Surface and Under-Ice Trawl net in search of Arctic cod. Photo by John Guillote.

Ocean gliders track changes in aquatic ecosystems

CFOS has a fleet of autonomous underwater vehicles known as gliders as part of a collaborative program with the Alaska Ocean Observing System. Equipped with measuring devices, four gliders successfully “flew” throughout Alaska’s oceans collecting data this past year.

“Our glider fleet has been busy and we do not expect to slow down anytime soon,” said Hank Statscewich, who oversees the glider program and does most of the piloting.

The gliders’ batteries last six to 12 weeks, depending on how many sensors are powered on. During each

mission, they occasionally surface so that data can be transmitted via satellite to a public web portal managed by A00S.

According to Statscewich, the instruments had to do something of note to earn a name. For instance, the glider Gretel was named after the fairy tale “Hansel and Gretel” when it retraced its swim to return to safety after being stuck under an iceberg.

In February, Gretel swam in a zig-zag pattern from Resurrection Bay toward the Seward Hydrographic Line and back to Seward. During the journey, the glider helped map the distribution of Pacific salmon and measured the onset of the spring phytoplankton bloom. Later in the spring, it was deployed near Yakutat and was recovered by *Sikuliaq* as part of the Northern Gulf of Alaska Long-Term Ecological Research cruise.


This past summer, in collaboration with the Alaska Department of Fish and Game, the glider named Shackleton was deployed near Kodiak to track 35 acoustically tagged Tanner crabs for two weeks.

In July, Loki the glider was deployed from the research vessel *Norseman II* north of the Bering Strait. The glider’s passive acoustic sensor recorded marine mammal activity as it glided north toward Utqiaġvik.

“It’s an exciting time to work with underwater gliders because the piloting technology and types of sensors that we can use are constantly evolving,” said Statscewich.

R/V *Nanuq* retrieving the glider Shackleton in Resurrection Bay. Photo by Hank Statscewich.





Researchers perform vertical tows with a bongo net to catch zooplankton during the Pan-Pacific High Seas Expedition. Photo by Steve Lindley.

International research team investigates Pacific salmon ecology during winter

Last winter, research professor Alexei Pinchuk joined an international team of scientists on the 2022 Pan-Pacific High Seas Expedition to study the ecology of Pacific salmon. He spent 38 days aboard *Bell M. Shimada*, a National Oceanic and Atmospheric Administration research vessel and one of five participating in the expedition.

The impacts of climate change, such as marine heat waves and marked declines in Yukon River and other spawning-ground fish migrations, underscore the need for a better understanding of where fish travel during the winter and what food is available to them.

“The reason why this cruise was so exciting is there is very little data on the winter ecology in the Gulf of Alaska,” said Pinchuk. In reference to the weather, he added, “Now I know why firsthand.”

Bell M. Shimada was rocking and rolling as it traveled over 6,000 miles through winds up to 50 knots and waves up to 15 feet high. Temperatures were low, winds were strong, seas were high and daylight was short, but the science team persevered. Because salmon disperse in the high seas, the research team towed a 100-foot-wide trawl net to collect samples. Aboard the ship, researchers preserved samples of salmon,

examined stomach contents to determine the food source and collected DNA from the seawater.

Pinchuk’s focus was on the zooplankton that become prey for salmon and other fish. “At this point, our data is still being analyzed; however, the interesting observations to date are well-defined differences in spatial distribution of zooplankton communities within the Northern Alaska Gyre, relatively low number of predatory zooplankton, and a substantial amount of older copepodite stages that indicate potentially faster than expected growth rates,” he said.

R/V *Sikuliaq*

In its sixth year of operation, the research vessel *Sikuliaq* supported 12 science cruises led by researchers from UAF and other institutions, sailing more than 29,000 nautical miles throughout the Pacific and Arctic oceans. UAF faculty, staff and students were involved in 45% of *Sikuliaq* science days at sea.

The ship provided a comfortable and effective platform for scientists and students to carry out a variety of research missions. *Sikuliaq* started the past year hosting the Northern Gulf of Alaska Long-Term Ecological Research project and ended the year sampling iron distributions in waters of the North Pacific Ocean. On a cruise led by UAF researchers, the ship traveled farther north than ever before (just shy of 80 degrees North latitude) and successfully navigated through heavy ice conditions.



Sikuliaq in the Beaufort Sea. Photo courtesy of Luc Rainville.

Sikuliaq supports collaborative ocean monitoring

Last November, *Sikuliaq* supported multiple long-term monitoring programs during a two-week cruise in the Bering and Chukchi seas. Projects represented on the cruise included the Distributed Biological Observatory, the Chukchi Ecosystem Observatory, the Arctic Marine Biodiversity Observation Network, and the Ecosystems and Fisheries Oceanography Coordinated Investigations. These are all multi-investigator programs variously supported by the North Pacific Research Board, the Alaska Ocean Observing System, NSF, NOAA and the Bureau of Ocean Energy Management.

“The Pacific Arctic marine ecosystem is responding to significant levels of disruption from warming waters — including northward range extensions of subarctic species and new predation pressures that they place on the endemic Arctic populations,” said associate professor Seth Danielson.

Danielson led cruise activities for the Chukchi Ecosystem Observatory, which involved deploying an oceanographic mooring roughly 70 miles offshore near Hanna Shoal. The area is a hotspot for walrus, seals and whales that feed on abundant clams, crabs and other seafloor animals.

The CEO mooring records data and collects water and particle samples autonomously for an entire year, including under sea ice when ship-based studies are impossible. The scientists conducted marine mammal



R/V *Sikuliaq* ship track from July 2021 through June 2022.

and fisheries acoustics surveys, collected water samples for nutrients, sampled benthic animals using bottom grabs, and towed nets to collect zooplankton.

“In the face of receding sea ice, these monitoring programs are designed to track environmental change and ecosystem changes in productivity and species abundance and distribution,” said Danielson.

FY22 *Sikuliaq* Statistics

29,050 nautical miles traveled • 255 paid ship days • 217 days of science (not including mob/demob days)
 97 UAF principal investigator and participant days • 131 days in the Arctic (as defined by the Arctic Research and Policy Act of 1984) • 65 days in the ice • 2 ice station days • 265 conductivity/temperature/depth casts
 50 trace metal CTD casts • 16 expendable bathythermograph casts • 389 net tows • 38 moorings deployed
 36 moorings recovered • 6 gliders deployed • 5 gliders recovered • 100 buoys/floats deployed • 7 towed cameras
 6 ocean-bottom seismometers deployed • 6 ocean-bottom seismometers recovered • 29 bottom samples collected
 6 sediment traps deployed • 6 sediment traps recovered • 24 multichannel seismic survey lines completed

Research Centers, Institutes and Facilities

Seward Marine Center

The Seward Marine Center is the homeport of two state-of-the-art research vessels, *Sikuliaq* and *Nanuq*. *Sikuliaq* is a major research facility operated by UAF and CFOS that supports oceanographic, marine biology and fisheries research conducted by scientists and students from around the world. *Nanuq*'s third year of research operations included a two-week project studying seabirds, monthly trips to long-term monitoring sites, and numerous sea glider tests, deployments and recoveries. SMC's mooring shop was used to build and repair anchored systems of instruments used by a growing network of ocean observatories. The education building was used for community events such as the Tsunami Bowl, which is part of the National Ocean Sciences Bowl. The seawater system in the D.W. Hood Laboratory was repaired this past year and supported the Northern Gulf of Alaska Long-Term Ecological Research program, two sea glider projects and modular power generation over the last year.

Coastal Marine Institute

The Coastal Marine Institute is a cooperative program between the federal Bureau of Ocean Energy Management and the University of Alaska, with participation by the Alaska Department of Fish and Game. The institute operates as a competitive scientific research program focused on expanding our understanding of Alaska's outer continental shelf environment and addressing future information needs related to offshore oil and gas.

Research projects that commenced in 2020 and 2021 are just beginning to report results, including several studies of oil degradation products, impacts of oil spills on microbes and seaweed, and baseline ecology of marine mammals and several fish species.

In 2022, a new research project will define and track water circulation in Cook Inlet using satellite images of ocean color. Another will study communication networks among coastal communities on Alaska's northern coasts in an effort to manage risks from increased ship traffic and hydrocarbon development. New graduate student projects include acoustic studies of whales in the Gulf of Alaska region and changing Arctic fish populations in Beaufort Sea lagoons.

Photo by Christina Bonsell.

Ocean Acidification Research Center

Founded in 2008, the Ocean Acidification Research Center continues to observe the intensity, duration and extent of ocean acidification events throughout Alaska's marine ecosystems. OARC data are collected during research cruises and autonomously at shoreside stations, moored platforms and underwater sampling platforms. In 2022, marine carbonate sampling was added to NOAA's Bering Arctic and Subarctic Integrated Surveys to help us better understand how ecosystem processes affect fisheries. The Gulf of Alaska Ocean Acidification cruise sailed in August 2022 as a follow-up to the 2015 gulf-wide ocean acidification assessment. The OARC Samples of Opportunity program supported marine carbonate sampling as part of student research projects conducted in Kachemak Bay, off St. Paul Island and in Lynn Canal.

Pollock Conservation Cooperative Research Center

The Pollock Conservation Cooperative Research Center supports research projects and graduate student fellowships that focus on pollock biology and resource utilization, fisheries management and incidental catch, habitat and ecosystems, and protected species. In 2021-2022, PCCRC supported nine research projects, eight of which are ongoing. In addition, the PCCRC Advisory Board contributed to the support of a research proposal submitted to the North Pacific Research Board, which is the first project co-funded under a memorandum of agreement between PCCRC and NPRB.

Kasitsna Bay Laboratory

The Kasitsna Bay Laboratory is a marine research and teaching facility located on Kachemak Bay, operated in partnership with NOAA's National Centers for Coastal Ocean Science. Among several shorter-term research projects, the lab currently supports two large programs: Gulf Watch Alaska, which conducts long-term monitoring of marine habitats in Kachemak Bay, and the Fire and Ice program, funded by the NSF Established Program to Stimulate Competitive Research.

While limitations are still in place for the use of the lab due to the global pandemic, the careful monitoring, preparation and caution of users allowed continued use for research and educational purposes.

Several UAF faculty, staff and students spent the past summer at the lab processing samples and conducting a variety of long-term monitoring projects. For example, researchers based at the lab studied intertidal community composition, the impacts of glacial discharge on nearshore ecosystem functioning and the role of changing carbon chemistry on the bay's coastal waters.



Lena Point Fisheries Facility

The CFOS Department of Fisheries in Juneau is housed at the Lena Point Fisheries Facility, which is co-located with the NOAA Ted Stevens Marine Research Institute. Lena Point is the homeport of the CFOS research vessel *Ishkeen*, named after the Tlingit word for sablefish. The 26-foot vessel supports fisheries and diving research throughout Southeast Alaska. CFOS students gain valuable experience working aboard *Ishkeen* on a variety of projects.

This past year, researchers at Lena Point continued to work on a number of large statewide projects, such as Gulf Watch Alaska and the NSF EPSCoR Fire and Ice project. Other research included estimating temperature-dependent growth of walleye pollock and Pacific cod stocks off Alaska, establishing baseline physiology measurements in humpback whales in southeast Alaska, workforce development related to monitoring algal toxins for subsistence species, and large-scale offshore mariculture of sugar kelp.

Rasmuson Fisheries Research Center

The mission of the Rasmuson Fisheries Research Center is to promote excellence in research related to fisheries and to develop young fisheries scientists. The center generously supported six CFOS graduate students this year. They are researching snow crabs, Pacific sleeper sharks, Cook Inlet beluga whales, sablefish, Pacific lamprey and Pacific oysters.



Schery Umanzor measures kelp at an experimental farm in Coghlan Island, Juneau. Photo by Muriel Dittrich.

Schery Umanzor recognized for mariculture innovation

Assistant professor Schery Umanzor received the 2021–2022 Inspiration Award for her Mariculture Site Assessment Toolkit as part of the UAF Innovative Disclosures and Entrepreneurial Activities Awards. Umanzor, who is based at the Lena Point Fisheries Facility, received a grant from UAF's Center for Innovation, Commercialization and Entrepreneurship Seed Fund to develop the toolkit, which helps farmers select sites for kelp farming.

"Suitable site selection reduces or eliminates the chance of farmers requesting lease amendments due to the selection of sites with unfavorable conditions for kelp growth," said Umanzor.

UAF's Office of Intellectual Property and Commercialization licensed two of Umanzor's toolkits to a California small business, Reed Mariculture Inc. The company will produce toolkits for farmers to use in Alaska and around the country.

Development

For fiscal year 2022, CFOS received \$476,718.76 in charitable gifts. We thank our donors for their continued help to fulfill our mission of teaching, research and service. These donations provide scholarships and fellowships and increase support for student and faculty research.

This year we celebrate 15 years since the Ted Stevens Distinguished Professorship of Marine Policy was fully endowed by the Pollock Conservation Cooperative. This professorship has offered CFOS the opportunity to conduct research and teach courses on several topics in fisheries, including economics of salmon aquaculture in Alaska and mathematics for fisheries economics. In addition, the generous contributions from the cooperative contributed to the development of the new Master of Marine Policy degree this past year.

Major Donors

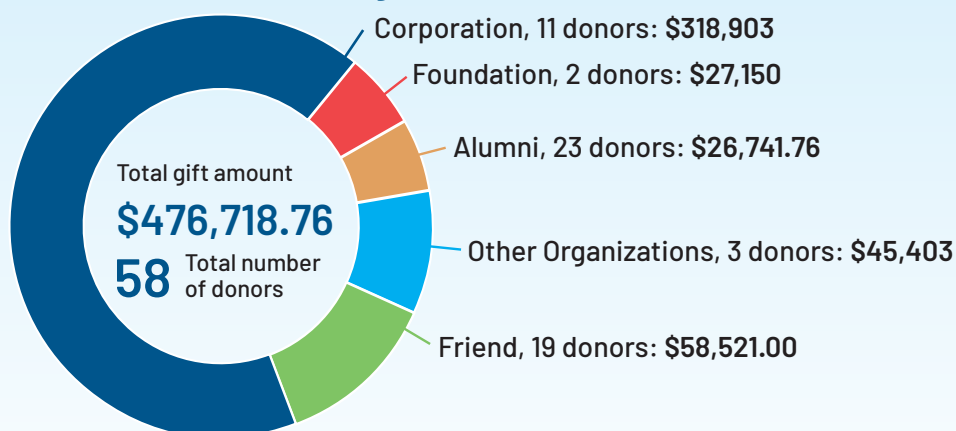
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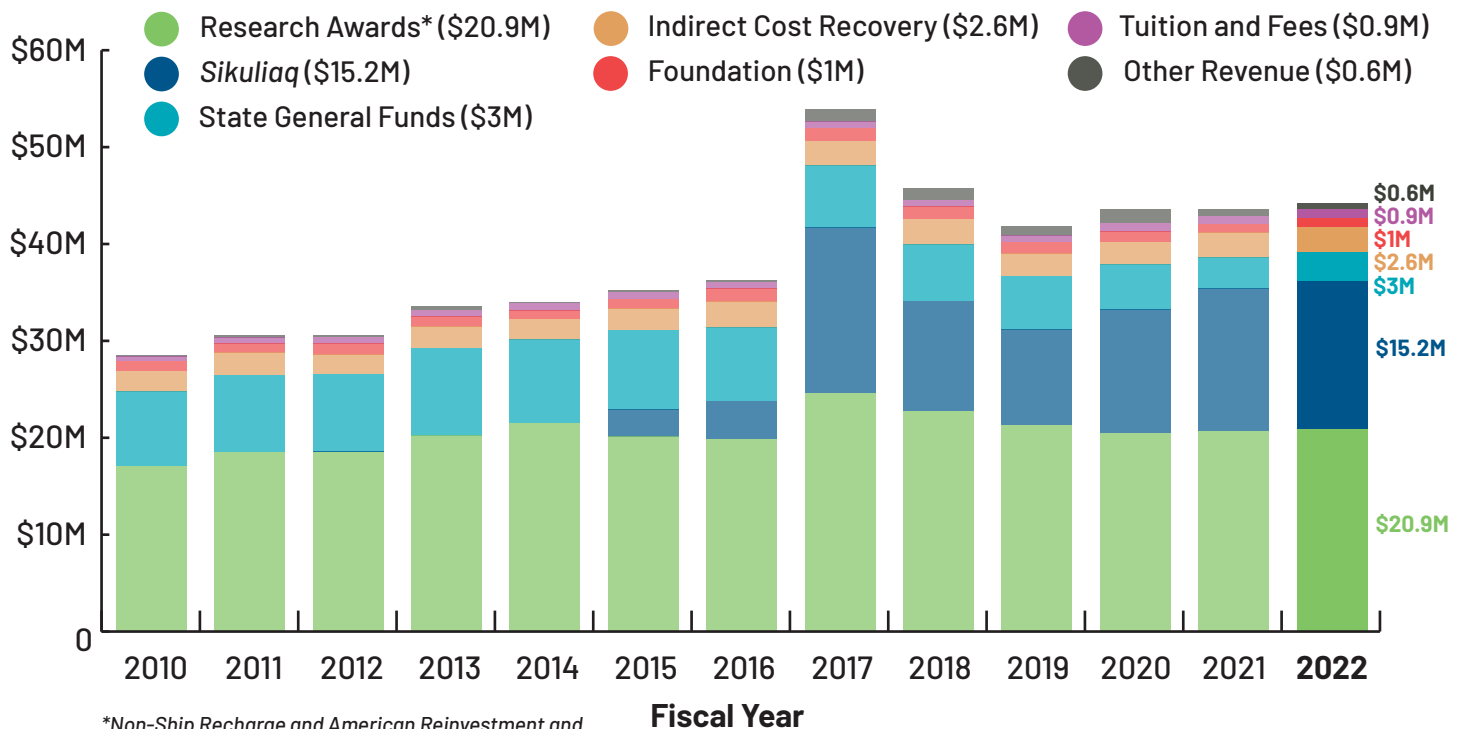
FY22 CFOS Fundraising

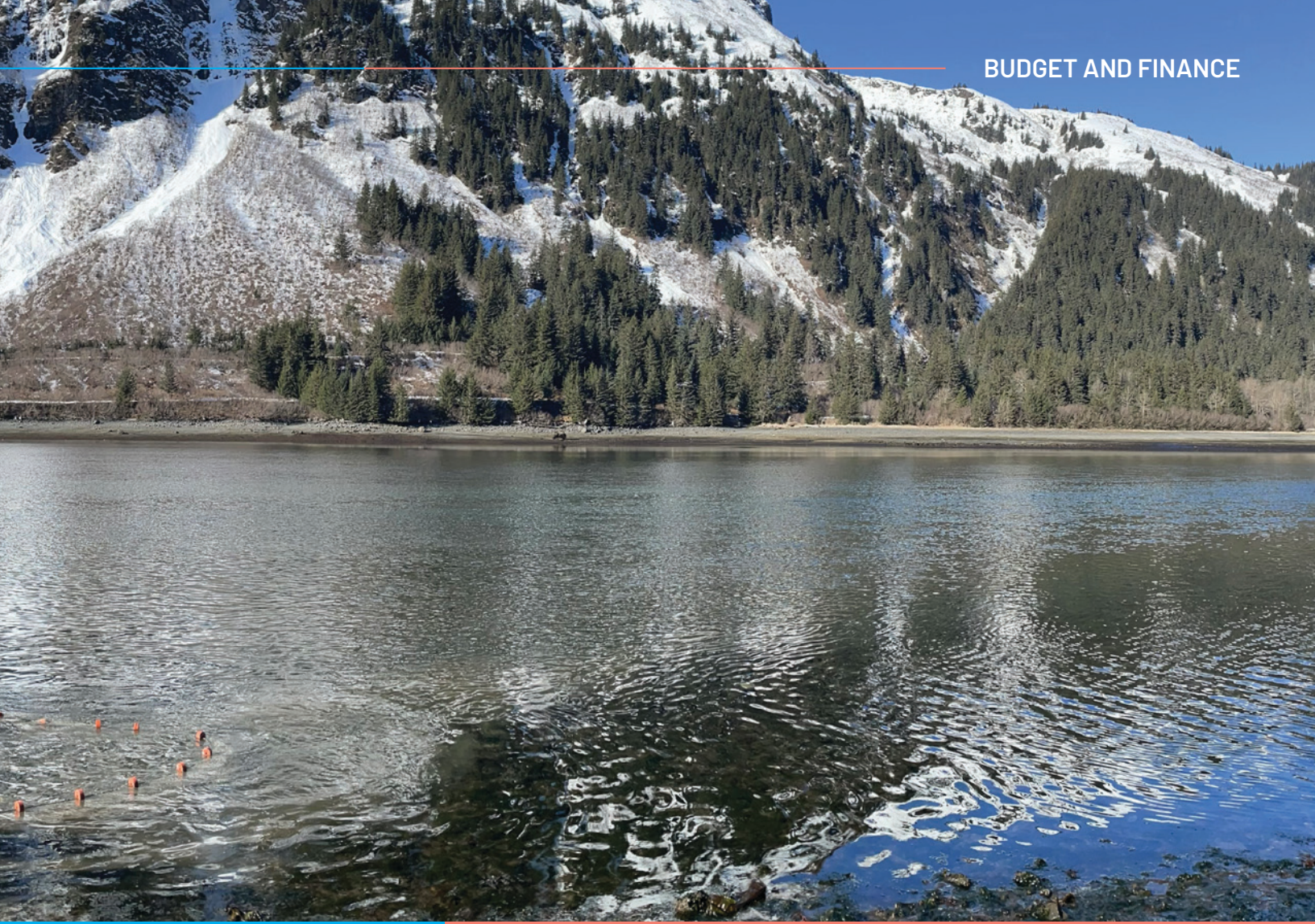


Budget and Finance



CFOS Revenue Trend





- Research Awards* (\$20.9M)
- Sikuliaq (\$15.2M)
- State General Funds (\$3M)
- Indirect Cost Recovery (\$2.6M)
- Foundation (\$1M)
- Tuition and Fees (\$0.9M)
- Other Revenue (\$0.6M)
- Non-Ship Recharge (\$168K)

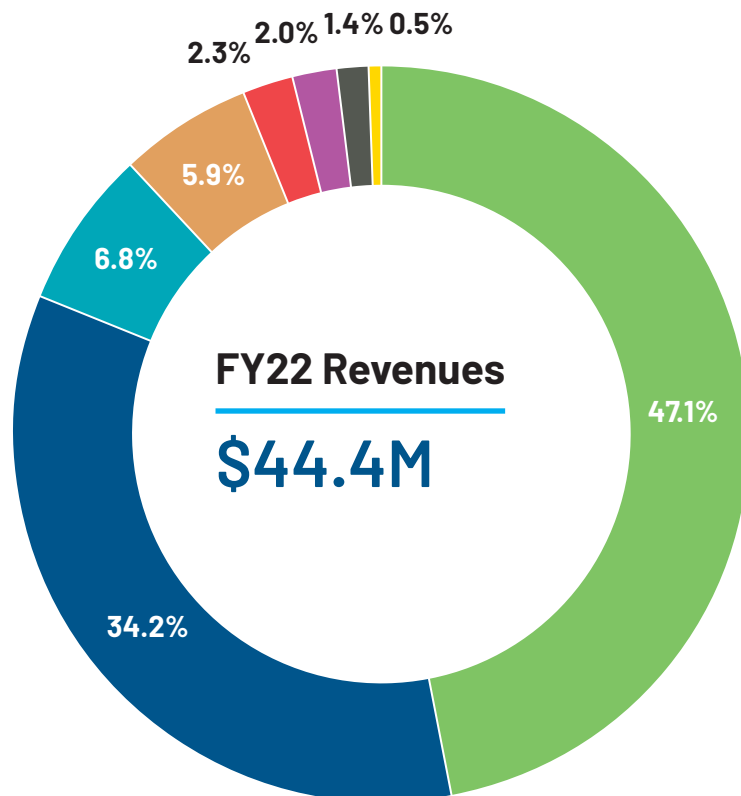


Photo: Emily Reynolds, Karen Grosskreutz and Lindsey Stadler use beach seines in April 2022 to collect DNA from invertebrates, fishes, seabirds and marine mammals to understand biodiversity in Kachemak Bay. Photo by Jessica Glass.



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The Ivishak River in the eastern Arctic, where Beaufort Sea Dolly Varden spawn and overwinter. Photo by Alice Bailey.

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