

SITKA SOUND SCIENCE CENTER

# Rising Tide

NEWSLETTER 2022



## Renewal

### Contents

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Research	2
Education	7
Hatchery	10
Aquarium	12
WhaleFest	13
Planned Giving	17



# LAND ACKNOWLEDGEMENT

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We are on Lingít Aaní — Tlingit Land. The Tlingit people have been indigenous to this land for over 10,000 years, living their culture and tribal values. Gunalchéesh to the Tlingit people for their stewardship of Lingít Aaní since time immemorial and today.

## MISSION

The Sitka Sound Science Center is dedicated to increasing awareness and understanding of aquatic, marine, and terrestrial ecosystems of coastal Alaska through education and research.

## VALUES

### *Integrity*

We model scientific integrity through evidence-based research and accessible educational programming.

### *Curiosity*

We believe that a playful curiosity of the world inspires innovation and growth.

### *Respect*

We honor and respect the history of this place and look towards its future to inform our present decisions.

### *Community*

We build relationships across our community in support of a shared appreciation for discovery and overall community well-being.

## SSSC VISION STATEMENT

*To be the leading scientific and educational institution in coastal Alaska through innovative, inspiring, and community-centered programming.*



# RENEWAL

**R**ain creates life in Southeast Alaska. It is the source of the lushness of the rainforest; it fills the streams and rivers where salmon spawn; it provides Sitka with the electricity that brightens our homes in the darkness of winter, and it gives us a reason to come up with creative ways to style Xtratuf boots. The coming and going of rain throughout the days and seasons shapes the rhythms of our lives and gives us periods of both tranquility and activity. The rain renews us and fills our souls.

As the COVID-19 pandemic subsides, there is a sense of renewal around the world as we ask ourselves, “What will return to us the same as it was before? What will be changed forever?” At the Sitka Sound Science Center, we feel this sense of renewal each day as we carry on our research and education. Each research project and education program is infused with a renewed commitment to our values: integrity, respect, community, and curiosity. Through these undertakings, we uphold our twofold mission of research and education.

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*“I could grumble about the rain  
and the discomfort, but after all, rain  
affirms what this country is.”*

—Richard Nelson

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This year, we upgraded our Spawning Platform and Incubation Facility (SPIFy) and watched record numbers of salmon return to our hatchery. We unveiled a new landslide warning dashboard for Sitka and began collaborations across the region to develop landslide monitoring and warning systems in other rural communities. We welcomed a record number of visitors to our campus and saw increased numbers of students participate in our education programs through new and diverse partnerships throughout our community. Uniting all these projects is the deep conviction that by understanding our world, we can make it a better place.

Please consider joining us in this endeavor by renewing your membership or updating your estate plan to include SSSC. These contributions make a real difference to our growing organization, and we hope that you will share our sense of renewal as we move into the future together.





# RESEARCH

## SITKA LANDSLIDE DASHBOARD

YOUR PERSONAL WARNING SYSTEM ON YOUR DEVICE IS LOCATED AT [SITKALANDSLIDE.ORG](https://sitkalandslide.org)

### UNDERSTANDING RISK

#### Low



Landslides unlikely based on historic observations in the last 20 years. Rainfall-induced landslides have not been documented for these rainfall conditions.

#### Medium



Landslides are possible. Isolated landslides have occurred in Sitka with similarly intense rainfall in the past.

#### High



Multiple landslides are very likely to occur. There have been 3 storms in the last 20 years with similarly intense rainfall, and all 3 of them initiated landslides.

### THE DASHBOARD

A tool that communicates the likelihood of a debris flow happening in Sitka at any given time based on a statistical model developed by SSSC and partners.

### RESOURCES

- Oral histories of landslides
- Landslide 101: The science behind landslides
- Report a landslide
- Areas at risk
- Emergency preparedness
- Published work



### PARTNERS

- ✓ Sitka Tribe of Alaska
- ✓ National Weather Service
- ✓ RAND Corporation
- ✓ Azavea
- ✓ And many more!



## SITKA LANDSLIDE WARNING GOES LIVE

This year, we celebrated the end of the Sitka Landslide Research Project and the birth of a tool that's here to stay. A new Landslide Warning System dashboard will help Sitkans make choices about their safety. The website provides real-time and forecasted landslide risk levels. This tool, which was a product of the 5-year NSF funded Sitka Landslide Research project, is powered by a model for landslide initiation that predicts possible landslides based on conditions under which landslides have happened in the past. During periods of elevated landslide risk, community members are encouraged to leave susceptible areas. The website ([sitkalandslide.org](https://sitkalandslide.org)), the first community designed landslide dashboard in the nation, will be maintained and developed as part of the Kutí Project until the dashboard secures long-term funding.





## CO-PRODUCTION BY ANY OTHER NAME: ANSWERING QUESTIONS POSED BY RURAL COMMUNITIES

A geologist, a social scientist, and a community organizer walk into a bar and... No, this is not the start of a joke but rather a guest list for a series of meetings and workshops that kicked off a new regional collaboration involving six other Southeast communities. The 5-year, \$5 million, National Science Foundation funded project — called *Kutí*, the Lingít word for weather — investigates and aims to mitigate the risks associated with natural hazards like landslides, floods, and avalanches in rural Southeast Alaska. The project team includes a partnership with Central Council Tlingit Haida Indian Tribes of Alaska, collaborators at other academic and research institutions as well as local and tribal partners in six communities: Klukwan, Hoonah, Skagway, Yakutat, Craig, and Kasaan.

This work reflects a radical and long-overdue shift toward conducting research in partnership with communities. In summer and fall 2022, *Kutí* researchers met community members in Klukwan, Hoonah and Skagway in a series of meetings and workshops in informal settings like breweries. Knowledge (and food) flowed both ways. Scientists from SSSC and other research institutions shared their perspectives on relevant geologic processes while members of the communities shared local knowledge of those processes and the effects on a specific geographic area.

This project grew from the landslide warning system developed in Sitka, but each community has different concerns, cultures, and needs. Led by SSSC Geoscientist Annette Patton, *Kutí* emphasizes building trusted relationships with each community before designing specific research plans.

### Full list of project partners:

Sitka Sound Science Center, Central Council Tlingit and Haida Indian Tribes of Alaska, University of Oregon, University of San Diego, RAND Corporation, Oregon State University, U.S. Forest Service, Chilkat Indian Village, Hoonah Indian Association, Skagway Traditional Council, Yakutat Tlingit Tribe, Craig Tribal, Organized Village of Kasaan.

### Other collaborating agencies:

National Weather Service, State of Alaska, Sitka Tribe of Alaska, U.S. Geologic Survey, Takshanuk Watershed Council, Alaska Avalanche Information Center, Municipality of Skagway, Haines Long-Term Recovery Group

## SSSC BUILDS SCIENTIFIC PARTNERSHIPS

The Central Council of the Tlingit and Haida Indian Tribes of Alaska is an important regional tribal government and research partner. This year, Jacyn Schmidt, formerly the SSSC Geoscience Coordinator, was hired as the Central Council's Regional Geoscience Specialist. Jacyn will continue to work with and refine Sitka's landslide warning system. Her new position involves building trusted relationships between scientists and tribal and rural citizens throughout Southeast Alaska as they produce research that reflects communities' needs.

## GUIDING RESEARCH IN NEW DIRECTIONS

The Sitka Sound Science Center's new Science Advisory Committee brings together a prestigious group of scientists to share their connections, expertise, and strategic thinking to guide SSSC research programs. The Science Advisory Committee consists of five scientists with a broad range of expertise: Dr. Thomas Thornton (Affiliate Faculty Member of the Alaska Coastal Rainforest Center at the University of Alaska Southeast), Dr. Ginny Eckert (Director of the Alaska Sea Grant Program at the University of Alaska Fairbanks), Dr. Colleen Duncan (veterinarian and Assistant Professor in the Department of Microbiology, Immunology, and Pathology at Colorado State University) Dr. Josh Roering (Professor in the Department of Earth Sciences at the University of Oregon), and Dr. Pete Raimondi (Professor of Ecology and Evolutionary Biology at the University of California Santa Cruz).



Left to right: Annette Patton, Josh Roering from University of Oregon and his students, Maryn Sanders, Ian Wachino and Selina Davila Olivera as they take a break from field work in Skagway.

## COVID-19 REVEALS THE RESILIENCE OF SOUTHEAST ALASKANS

COVID-19 research conducted by SSSC, Central Council of the Tlingit Haida Indian Tribes of Alaska, and the RAND Corporation found that the most trusted sources of information about the pandemic were local, and that whatever trust there was in federal and state sources eroded over time. This team conducted a survey in spring of 2020 in Southeast Alaska before COVID came to our island communities, and then after the towns were hit. This spring Dr. Taylor van Doren joined the SSSC staff to evaluate how Southeast Alaskans' perspectives changed during the pandemic. Taylor is a postdoctoral anthropologist whose work explores how people experience pandemics and compares the 1918 influenza and the COVID-19 pandemics.

Results also revealed tribal citizens who were involved in their Native cultural activities stayed physically and mentally healthy during the pandemic. Tribal citizens gathered in virtual settings to share traditional knowledge. They expressed community-centered behaviors that were strongly linked to Native culture and aimed at minimizing the effects of the pandemic on their neighbors and elders. Often these behaviors were at odds with personal feelings. For example, although individual survey respondents were frequently reluctant to get vaccinated, Native

communities nevertheless had high vaccination rates. Findings are being published in *Social Science & Medicine*, *Frontiers in Communication (Health Communication)*, and presented at the Southeast Environmental Conference. Taylor will continue to research COVID-19 and build partnerships with other institutions, such as Southeast Alaska Regional Health Consortium, the Alaska Native Tribal Health Consortium, and the University of Alaska Anchorage to better prepare for pandemics down the line.

## SIMULATING THE OCEAN'S FUTURE

What will our oceans look like in 100 years? Researchers from the University of California Santa Cruz are answering this question, among others, by examining the effects of ocean acidification in Sitka Sound through a multi-year monitoring project. Dr. Kristy Kroeker and her students use the Science Center wet laboratory, where they manipulate oceanic conditions in small tanks to expose kelp, sea stars, abalone, sea urchins, and other species to stressors related to climate change, primarily ocean acidification and temperature. The Kroeker lab's 2022 publication in *Climate Change Ecology* demonstrated that local algae species are becoming more vulnerable in the face of ocean acidification, especially when conditions were manipulated to represent those predicted for Alaskan waters in the year 2100. In addition to lab experiments, the Kroeker team dives throughout Sitka Sound to monitor health conditions of kelp forests. Sitka's highly productive kelp forests are important to marine ecosystems, providing food and habitat for hundreds of species.

## IS THE SUN SETTING ON SUNFLOWER SEA STARS?

Sunflower sea stars are estimated to have lost over 90% of their global population since 2013. Oregon State University postdoctoral researcher Sarah Gravem studies the causes of these losses, as well as sea star wasting syndrome, in Sitka. Sea star wasting syndrome causes sea stars to develop lesions and eventually die by melting away. Gravem's team conducts SCUBA diving surveys of sunflower sea stars throughout Sitka Sound. The data collected shed light on the timing and rates of reproduction among sunflower sea stars, considered Critically Endangered by the International Union for the Conservation of Nature as of 2020.

## GOOD CHEMISTRY

Two researchers from Rutgers University, Kaycee Coleman and Nicole Waite, brought the latest technology in ocean acidification monitoring to the Science Center this summer. They launched an autonomous glider to measure pH in the ocean in Southeast Alaska. Over the course of 45 days, the self-propelled glider traveled from Sitka to Ketchikan to collect data. Spearheaded by Dr. Grace Saba, this mission supplements ocean acidification monitoring coordinated and funded by the Alaska Ocean Observing System and strengthens our understanding of how Sitka Sound's waters are changing.

## WHOSE FAULT?

A survey of the Queen Charlotte Fault, which took high resolution pictures of the tectonic feature 30 miles off the coast of Sitka,

will contribute to our understanding of geohazards in Southeast Alaska. The information collected in the years-long study funded by the National Science Foundation, in collaboration with the United States Geological Survey (USGS) and Canadian Geological Survey will specifically answer questions about the volcanic history of the Mt. Edgecumbe Volcanic Field and provide information about possible underwater landslide hazards. The Sitka Sound Science Center contributed to the effort by engaging with the community: one of the investigators, Gary Greene, conducted a week of outreach activities. Dr. Greene delivered a Natural History seminar, met students at Mount Edgecumbe High School, and took community members on a "fault walk" along the Sawmill Creek Road rock exposures to describe the forces associated with shifting tectonic plates.



## MT. EDGECUMBE NO LONGER A SLEEPING BEAUTY

On an early morning this April, Sitkans woke up to a new normal. One of our most prominent landmarks, the so-called "dormant" Mt. Edgecumbe volcano, was beginning to stir: a swarm of tiny earthquakes caused seismic unrest on Kruzof Island, where the volcano is located. Increased seismic activity can be an indicator of volcanic activity (i.e., an eruption) which captured the attention of SSSC and the Alaska Volcano Observatory (AVO). The Science Center worked quickly to host researchers from AVO for a week of community engagement and education. Worries of imminent destruction were eased by a series of community events connecting concerned citizens with State geologists and volcanologists.

Scientists explained that an eruption is not around the corner. However, it did warrant a change in status. Mt. Edgecumbe went from being "dormant" to "historically active," meaning it experienced recent seismic activity, deformation, or an eruption within the last 300 years. As a result, Mt. Edgecumbe is getting more monitoring equipment so AVO can monitor seismic activity and deformation changes. With the help of AVO and the Science Center, Sitkans can sleep easy knowing that we are keeping an eye on the still slumbering Mt. Edgecumbe.

## SITKA TOURISM TODAY

This summer was one for the books in terms of tourism! An influx of tourists brought Pardee RAND Graduate School students Priya Gandhi, Sabrina Lee, Samantha Matthews, and Peggy Wilcox to town to undertake a community assessment on the impacts of tourism on Sitka residents. Residents were surveyed about the increase in cruise tourism and how it affects businesses, housing, and other public amenities. Survey results will allow our community to better meet residents' needs.





## THE CHUM PROJECT CELEBRATES DOUBLE DIGITS

For ten years, SSSC has partnered with Alaska Department of Fish and Game to help answer questions about genetic and ecological interactions between hatchery-raised and wild salmon. The State and the aquaculture industry fund this work, which examines the effects of straying of hatchery-raised salmon into Southeast Alaska streams on the reproduction of wild salmon. The Chum Project team collects data on ancestry of Southeast Alaska salmon populations.

This year, twelve hardy field technicians surveyed over 300 miles of streams for this long-term study. They surveyed three streams around the Juneau area (Fish Creek, Sawmill Creek, and Prospect Creek) every day for six weeks when chum salmon were returning to the streams. The team uses two methods of data collection: carcass surveys and mark/recapture surveys. During smelly yet crucial carcass surveys, they collected otoliths (ear bones), scales, and DNA samples from deceased salmon.



In addition, the crew gathers DNA samples to identify each salmon's ancestry. The crew conducted a mark/recapture study by tagging live salmon and waiting to see how many of those salmon spawned in the stream, which provides an estimate of the proportion of the chum salmon run sampled for each stream. The team collects otoliths because hatchery fish can be identified by a unique pattern associated with each hatchery and year. Salmon scales also show patterns that indicate the age of a fish.

This year, field crew members battled a rainy start to the season that hampered their ability to survey during the first two weeks. However, the drier days of August enabled solid data collection. Our tenacious Chum Crew sampled over 2,000 chum salmon — around 1,000 more than last year. Samples are sent to labs in Anchorage and Juneau for analysis, with preliminary results showing that chum returns for Southeast Alaska are stronger this year compared to 2021. Over the past ten years, results have started to indicate that straying hatchery-raised salmon have a reduced number of offspring compared to their wild counterparts. If a hatchery stray spawns with a wild salmon, there is a reduction in the number of offspring. In the future, the State will investigate the reasons for this disparity in reproduction.



*A rare and quiet moment at Prospect Creek.*



# SIRF'S UP IN SITKA!

The Scientist in Residency Fellowship (SIRF) at Sitka Sound Science Center brings scientists to Sitka for a one-month mini sabbatical. Scientists from a breadth of disciplines learn how to engage with rural Alaskans. This program is funded in part by the University of Alaska Fairbanks National Science Foundation Established Program to Stimulate Competitive Research (EPSCoR).

This year, we were honored to host four amazing Scientist in Residency Fellows: Courtney Hart, Dr. Julie Schram, Dr. Joanna Young, and Dr. Scott Gabara.



**COURTNEY HART** (PhD Candidate at the College of Fisheries and Ocean Sciences, University of Alaska, Fairbanks) leads a meet and greet in Sitka, in addition to hosting a Science After Hours for adults that highlighted the biology and culinary world of local shellfish.



**DR. JULIE SCHRAM** (Assistant Professor at University of Alaska Southeast) accompanies local divers in search of nudibranchs, which became the source of inspiration for the crochet workshop that she led.



**JOANNA YOUNG** (Glaciologist and Postdoctoral Fellow in the University of Alaska Fairbanks International Arctic Research Center) shares her work on local radio.



**SCOTT GABARA** (Postdoctoral researcher with the College of Fisheries and Oceans Science, University of Alaska, Fairbanks) dons rain gear and zombie makeup to perform in this year's Haunted Hatchery event during Halloween week.



# EDUCATION

## PACKING LIST: SQUID, SURFBOARD, AND SCIENCE

When biologist Ben Burford comes to Sitka, he packs coolers of squid and a surfboard. A Scientist in the Schools favorite, Ben challenged fifth grade students with squid morphology questions as the students compared the relative size of squid eyes to their own (spoiler: squid eyes are much bigger). Between classes, he hit Sandy Beach with his surfboard and wetsuit and caught some awesome autumnal waves. Then he moved over to Sitka High and Pacific High School aquaculture classes where he engaged students in some innovative research about salmon behavior. Ben is interested in how salmon fry make decisions, specifically how bold they are in exploring new environments.

Ben is just one of many unforgettable scientists hosted this year by our schools. The Scientists in the Schools program allows scientists to build connections with Sitka's K-12 students and provides rare and authentic experiences for rural and Alaska Native students in Sitka every year in every classroom. By senior year of high school, Sitka students have worked side by side with a variety of extraordinary scientists working on a range of science topics. Scientists receive science communication training tailored for classroom settings and community engagement.

## ROYAL TREATMENT

This year, Royal Caribbean Cruise Lines (RCLL) committed to underwriting our flagship educational program, Scientists in the Schools. RCCL's support brings scientists like Ben Burford and their diverse current research topics to every classroom in Sitka every year in every grade level. Students learn new perspectives about careers in scientific fields and get hands on practice with authentic scientific issues. We are grateful to Royal Caribbean and to the collaborative team of K-12 teachers who contribute to its annual success.

## JUST ASK WARREN

"I'd rather be working" is not an uncommon phrase for SSSC's newest Facilities Assistant. Warren White, a senior at Sitka High School, can be found in the Mill Building whenever he is able to



*10th grade students from Sitka High School conduct field research during an SIS activity on ocean chemistry facilitated by EPSCoR researcher, James Currie.*

work. "He is on time and ready to go every day with a positive attitude," says Blake Conaway, Facilities Manager and Warren's supervisor.

Warren is currently the Mary and Bob Purvis Field Station Work Student and is getting on-the-job training in maintenance and hatchery technology. Warren first came to the Science Center as a student in Stacy Golden's field science class. During the field science class, Warren and his classmates visited the Sheldon Jackson hatchery each week through a work development partnership funded by the National Science Foundation called the Aquaculture Science Knowledge (ASK) grant.

The Aquaculture Science Knowledge program consists of four projects that aim to engage high schoolers in place-based science and support the development of workforce skills: the aquaculture "course-within-a-course," paid research and work experience opportunities, a paid summer hatchery internship, and a special fisheries-focused career fair called Futures Connect. Warren has now been part of three of the four elements of this project, making him the poster student for all things aquaculture.

Through ASK, Warren was selected to be a summer intern. He pulled pipe, moved salmon fry and learned about the rhythms of a hatchery technician. Warren worked right alongside Bill Coltharp, Aquaculture Director, and Haley Jenkins, Fish Culturist, in projects that were critical for the functioning of the hatchery. Then he landed the Facilities Assistant position for the school year.

## FROM SEA TO CULTURALLY STEM

"Think like a robot" may not sound like a call for creativity, but to middle school students involved in SeaSTEM, a program funded by Sealaska Corporation, it was meant to get them thinking critically. The Fab Friday Techno after-school club has students examining what it looks like to test, evaluate, and improve design. EdisonBots (small, adorable robots) provided hours of challenging fun as Fab Friday kids programmed their Bots to traverse a simulated course based on Sitka's topography and designed a carrier to safely transport a "deer"

*Blake Conaway instructs Warren White on the protocols for dismantling a chop saw in the SSSC Mill Building Workshop.*





from a successful hunt (the “deer” was a small plastic dinosaur which students found delightful for devising mountain rescue scenarios). The students are guided by the Tlingit cultural values of working together, humility, and focus so that recognizing each other’s work results in shared solutions.

SeaSTEM’s high school program, called “Field Technician,” is guided by thoughtful input and encouragement from our SeaSTEM Advisory Group: Hillary Nutting, Dan Littlefield, Brandon Littlefield, and Tyler Garrity. Whether they are experts in their field or young people at the beginning of their careers, each of our advisors shared their perspectives on what it is like growing up in Sitka and trying to figure out your future. These insights are invaluable in creating and delivering worthwhile instruction. The Field Technician modules consist of both direct instruction and practice related to monitoring field instruments and activities that build field camp skills.

### PHYSICS ON PADDLEBOARDS

The stand-up paddleboard is an iconic symbol of summer athleticism and fun on the water; even on the chilly waters of Sitka Sound. Additionally, our new fleet of paddleboards, purchased with a donation from Sitka Salmon Shares, also proved to be very effective—and exciting—for making firsthand observations of physics concepts. Buoyancy, anyone?

### A PATTERN OF SUMMER FUN

An engineering mindset infused this year’s science camps. The youngest campers created products inspired by nature in a camp led by our very favorite biomimicry scientist, Lara Roketenetz, AKA Dr. Rocket (pictured below). Older campers applied ideas related to the electromagnetic spectrum in high energy activities like Dino Laser Tag. High school campers explored traditional boat building with cultural educator Chuck Miller and traditional carver Will Peterson. Expanding on those ideas, campers experimented with the physics of buoyancy to design and build their own cardboard boats—large enough for two people to paddle across a pool! Funding from Alaska Community Foundation’s Open for Summer grant allowed us to throw open the doors for youth and families to enjoy adventuring, culture, and engineering together.



### A CRUISE WITH A HEART OF SCIENCE

A new partnership between SSSC and American Queen Voyages was sealed over our mutual love of science. American

Queen wants to provide its passengers with scientifically infused experiences and hired the Science Center to create four kits filled with materials for hands-on activities and relevant background information to be used by onboard naturalists to lead mini workshops throughout the cruise. The kits provide unique Southeast Alaska-specific learning opportunities for American Queen passengers.

### THEY START SO YOUNG

Normally thought of experiences for undergraduates, field courses at the Science Center were also provided to high school students from California this year. Maybeck High School, from Berkeley, California, visited in March, just in time to see the whales bubble-net feeding to catch herring. Sequoyah High School from Pasadena, California joined us in April. Students met with local experts to better understand how small communities find local solutions to global issues like climate change. Field courses are experiences that immerse students in a culture and an ecology different from their own, and Sitka provides the perfect community and outdoor laboratory for these kinds of opportunities. This year, SSSC also welcomed undergraduates from Williams-Mystic; Exeter University; University of San Francisco; Johns Hopkins; and University of California, Santa Cruz.

### WHALEFEST ENHANCEMENTS

On the first weekend of November, undergraduates, high school students, and adults from around the region and beyond participated in workshops that enhance their WhaleFest experience. This fall, Oregon State University’s OPEnS lab (Openly Published Environmental Sensing) had students and adults translate weather data patterns into sounds using the monitoring device called “Weather Chimes.” Our sister science center, the Prince William Sound Science Center (PWSSC), traveled to Sitka to involve high schoolers in a fabulously fun “ROV Challenge” with remotely operated vehicles. An obstacle course was established in a concrete raceway behind the Sage Building. Each of the challenge activities mimics the type of work submersible ROVs accomplish in research or industry: the final activity is to redesign the ROV to become a skimmer in a simulated oil spill response.

### SHOWING RESPECT

SSSC now offers free admission to Sitka Tribe of Alaska members. The Sage building, the Mill building, and the Sheldon Jackson Hatchery are all located on Lingít Aaní. In a dual effort to both acknowledge our placement on this land and to make the aquarium a more welcoming place for our community, we offer memberships to Sitka Tribe of Alaska members. We are humbled by the families who have already signed up and hope to continue to increase opportunities for our community.

This idea was developed by the Justice, Accessibility, Inclusion, Diversity, and Equity (JAIDE) committee, established to provide direction for our organization’s efforts in diversity issues in science. The committee meets to discuss and work on ways to expand the STEM family and make our workplace more welcoming and inclusive.



# STORMING THE BEACHES FOR MARINE DEBRIS



*Group efforts to collect marine debris off remote beaches around Sitka.*

SSSC was honored to have planned the second annual marine debris cleanup in honor of beloved surfer, friend, and community member, Jamie Gorman. Over 50 volunteers trekked across the shores of Kruzof Island to reach the black sand beach south of Shoals Point to collect debris from one of Jamie's favorite surf spots. While there was quite a bit of debris, there was significantly less (about 2,000 pounds less!) than the year before when we cleaned the exact same beach.

From the sea surface to the seafloor to the most remote beaches in Alaska, marine debris is everywhere. Scientists estimate that over 11 million metric tons of plastic enters the ocean each year.

Marine debris education and awareness is woven into many SSSC programs. In 2021, SSSC piloted a new Scientists in the School unit with fifth graders called "Stream to Sea" that explored waste pathways, sources of marine debris, problems, and solutions. We were invited to share this program with 9th — 12th graders at Sitka High School and Port Alexander High School in 2022. Students participated in a beach cleanup, collected and analyzed data on what they found, and created a one-of-a-kind art piece using the marine debris collected.

Partnerships are the backbone of the marine debris program at SSSC. With over 44,000 miles of shoreline, marine debris in Alaska is expansive and expensive. We wouldn't be able to carry out this important work without our amazing partners who support us through funding and volunteer power. SSSC thanks Alaskan Brewing Company's Coastal



CODE Program, the US Coast Guard Air Station Sitka, Sitka High School, the Alaska Alexander Archipelago Tongass to Tidal Science Academy, and Ocean Conservancy for sponsoring cleanups in 2022. We would also like to thank the amazing individuals who have donated to the Jamie Gorman Marine Debris fund and over 150 volunteers who helped clean Sitka's shores.



*US Coast Guard air station in Sitka assists with marine debris removal.*



# HATCHERY



*Seiner, Lucy-O, nets record breaking salmon catch for SSSC.*

## EPIC YEAR FOR COST RECOVERY

We didn't think the return of pink salmon could get any better than it was last year, but this year shattered all records. Managers expected 248,000 pink salmon to return to the Sheldon Jackson hatchery for 2022, but instead over 500,000 fish came back. This was great news for the hatchery cost recovery program. Cost recovery is when a hatchery hires a commercial fisherman to catch some of the returning fish and sell them to a seafood processor to recoup some of the cost of operations. This year's cost recovery saw multiple hauls over 100,000 pounds. Lucy-O, owned by Nic Olney-Miller, fished seventeen times—the highest number to date. Not only were the pink salmon abundant, but the individuals were big, with weights exceeding 4.5 pounds.

In addition to the pinks, SSSC had about 800 adult Chinook salmon return to the hatchery out of the 400,000 that we released. Those 400,000 Chinook salmon were reared at Northern Southeast Regional Aquaculture's Medvejie hatchery, but they imprint on Sheldon Jackson Hatchery water so that they return to SSSC. In response to such a large return, the hatchery crew assembled an in-house cost recovery team and caught about 100 Chinook with a gillnet and a skiff.

## SPIFY SPAWNING

Even with some hard winter conditions, supply chain issues, an unexpected oil spill, and other construction hiccups, the new Spawning Platform and Incubation Facility (SPIFY) was able to show off her capabilities this summer and fall. The SSSC hatchery staff were shocked to collect all pink, chum, and coho eggs in record time. With support from the Murdock Trust, Rasmuson Foundation, The Pacific Salmon Treaty's Northern Fund, Northern Southeast Regional Aquaculture Association, Douglas Island Pink and Chum, Cargill Inc., a grant from the US Department of Agriculture secured by Senator Lisa Murkowski, and a loan from the State of Alaska, the Science Center has been able to construct a state-of-the-art fish rearing facility to replace the 1970s student-built "spawning shed."

We are excited to fully complete the facility in the coming months and start preparing to incubate our baby salmon in the new building next fall. The facility includes dedicated spaces for spawning, incubation, education programs, and viewpoints for visitors.



*Construction almost complete on new spawning facility.*



### LEARNING BY DOING

Working in the hatchery is often the best way to try out aquaculture for a career and it's a wonderful teaching tool. In the spring semester, we had students from different educational entities learn by doing: Mary Simeon from Mt. Edgecumbe High School, Macee Steinson from Sitka High School, and Rebecca Qiu from Outer Coast (a new post-secondary education program based on the historic Sheldon Jackson Campus) joined the hatchery team. These three students learned about pink and chum rearing on the net pens and coho rearing in the round ponds. They also helped us release these fish into the wild at the end of their terms.

With funding from the National Science Foundation-funded Aquaculture Science Knowledge (ASK) program, Marina Olney-Miller and Warren White were paid high school summer interns. They learned by working in the hatchery, rearing young coho and working on special projects.

This fall, Jeremia Ferguson, a Sitka High School student, helped with spawning, egg picking, and feeding. The University of Alaska Southeast (UAS) Sitka aquaculture class led by Angie Bowers, got experience with spawning, feeding, and weighing fish. One of those UAS students, Suzie O'Neill, is a hatchery intern this semester.

*Below: Mary releases the coho fry. Right: Jeremia takes eggs from a pink salmon.*



*Marina and Warren clean the water treatment system.*





# AQUARIUM



*Aurelia labiate*



*Cyanea ferruginea*



*Polyorchis penicillatus*

## THAT'S HOW JELLIES ROLL

A new piece of equipment enabled visitors to the Molly O. Ahlgren Aquarium to get a close view of jellyfish and related species. A renovated pseudokreisel, a unique tank that keeps water moving in a circular current, allows us to keep animals that drift on currents. So far, the pseudokreisel has been home to red-eye medusa, lion's mane jellyfish, and moon jellies.

The response to our new animals has been overwhelmingly positive, and we look forward to welcoming more visitors and jellyfish to the aquarium.

## A FRILLING DISCOVERY

It takes a trained eye and a sensitive spirit to tell the difference between octopus species. SSSC's current octopus X'aan (the Lingít word for fire), was caught in a longline pot west of Juneau and was initially identified as a giant Pacific octopus last year. However, as X'aan continued to grow, aquarist Matt Wilson noticed a continuous frill that ran all the way around his mantle (the bulbous part of the body above and behind the eyes). As its name suggests, this frill is the most distinctive feature of the newly described frilled octopus (a sister species to the giant Pacific octopus). This species was identified in 2017 by David Scheel at Alaska Pacific University.

Evidence in hand, Matt contacted Scheel, and they agreed: X'aan is definitively a frilled octopus. This species' lifestyle and behavior remain largely unknown, even in captivity: as far as we know, X'aan is the only frilled octopus on display in the world right now. X'aan's presence in our Aquarium marks an unprecedented opportunity to study this species.

## VISITOR EXPLOSION

Summer 2022 marked Sitka's largest ever tourism season. Over 24,000 visitors from all over the world flocked to the Science Center, and a dynamic team of new guides led by Interim Visitor Experience Manager Emily Scott and Interpretive Lead Lilli Garza, led tours of the hatchery, and developed programs to help visitors understand Sitka's unique ecosystem and community.



*Sporting Ray Troll t-shirts: Back row, left to right: Emily Scott (Interim Visitor Experience Manager), Emma Young, Lilli Garza (Interpretive Lead), Tahvo Wilson. Front row, left to right: Rachel Podell-Eberhardt, Devon Camillieri, Juliette Levy.*

## HAUNTED AQUARIUM FROM THE DEAD

Aided by a guide with theater experience, a willing Scientist in Residence Fellow with a penchant for zombies, and a new hatchery apprentice with a wicked scream, the Haunted Aquarium returned this year for community members of all ages. Creepy crafts and experiments and a zombie-filled "haunted hatchery" made for a delightfully spooky evening of Halloween fun.



*A volunteer awaits her next victim.*



# SITKA WHALEFEST 2022 IN PERSON: A “WHALE” COME CHANGE



Participants pose during the Snorkel & Sauna adult workshop

Sitka WhaleFest returned in person in November to explore this year’s theme of “How It’s Made: Courting, Babies, and Growth.” We were thrilled to welcome 28 undergraduate students, over 100 high school students from throughout Southeast Alaska, and over 500 attendees from all over the country. This year, Sitka WhaleFest hosted nine scientists who gave this year’s symposium talks on topics ranging from albatross to food sovereignty. The scientists were Crissy Huffard (Monterey Bay Aquarium Research Institute), Joanie Van de Walle (Woods Hole Oceanographic Institution), Joana Augusto (Let’s Talk Science), Dara Orbach (Texas A&M University, Corpus Christi), Desiree Jackson (Goldbelt Heritage Foundation), Amy Bishop (University of Alaska Anchorage), Schery Umanzor (University of Alaska Fairbanks), Andy Szabo (Alaska Whale Foundation), and the Science Center’s very own Matt Wilson, whose lecture on jellyfish reproduction was a crowd favorite.

2022 experimented with a balance of old and new traditions. New to the roster of events was a Marine Trivia Night for adults at Mean Queen. The Student Photography Contest also



made its debut: middle and high school students from Southeast Alaska submitted nature photographs for the chance to be featured in the 2023 SSSC calendar, which is available for sale in person and online. After the successful launch of Adult Workshops in 2021, it’s clear that they are here to stay. This year the workshops include the Marine

Tlingit elder and herring expert, Harvey Kitka, addresses the audience during the guest panel at Film Fest.



Mt. Edgecumbe High School’s Yup’ik Dance Group performs during the Maritime Grind.

Mammal Mashup (an exploration of marine mammals’ adaptations to cold water as compared to the equipment used by SCU-BA divers), Snorkel and Sauna, data visualization for weather patterns with Oregon State University, and a marine mammal necropsy. There were plenty of other opportunities for people of all backgrounds to bump elbows: scientists and community members gathered to enjoy all manner of performing arts at the Maritime Grind and got to know each other at the Marine Mingle reception. Athletes and whale enthusiasts pounded the pavement at the annual WhaleFest Run. Community members came together to discuss the importance of herring during the Film Fest viewing of *Yáa at Wooné: Respect for All Things*, by the Herring Protectors.

Sitka WhaleFest brings people together from all corners of our small community and our vast country. It is a program of the Sitka Sound Science Center, made possible by the incredible sponsors, donors, volunteers, and staff members that dedicate their time and resources to celebrating science. Our sponsors are North Pacific Research Board, Alaska Airlines, Saltchuck Family Foundation, American Queen, Sitka Salmon Shares, Alaska EPSCoR, Visit Sitka, Sitka Rotary, Sitka Sound Tours, and Allen Marine.

## VOLUNTEER: NO EXPERIENCE NECESSARY

Want to engage people in what you think is important? Come volunteer at the Science Center.

This summer we experimented with a new program in which volunteers engaged visitors by just being themselves. Volunteers helped out in the aquarium and outside the building by fielding questions about life in Sitka, where to take the best pictures and what it’s like to live here in the winter. If you want to volunteer in this way, in the aquarium, or with education programs, please contact Lina Kapp at [lkapp@sitkascience.org](mailto:lkapp@sitkascience.org)









# One Can One Cent One World



Silver Bay Seafoods proudly donates one cent per can of salmon to science research and education.



The Sitka Sound Science Center is helping to promote critical thinking and better understanding of the world of salmon.



Together through generosity, education, and research, the Sitka Sound Science Center and Silver Bay Seafoods strive to build a world where science and sustainability are celebrated.



Silver Bay Seafoods was born from the passion of hardworking and dedicated fishers wanting to advance and grow the fishing industry, while giving back to programs that work toward improving Alaskan communities.



The Sitka Sound Science Center is a non-profit organization dedicated to increasing understanding and awareness of terrestrial and aquatic ecosystems of Alaska through education and research.



# MEMBERSHIPS

**SEEDLING**  
\$30

Unlimited admission for 1 person for 1 year

**SEASTAR**  
\$50

Unlimited admission for 2 people for 1 year

**GRIZZLY**  
\$75

Unlimited admission for 3 people for 1 year

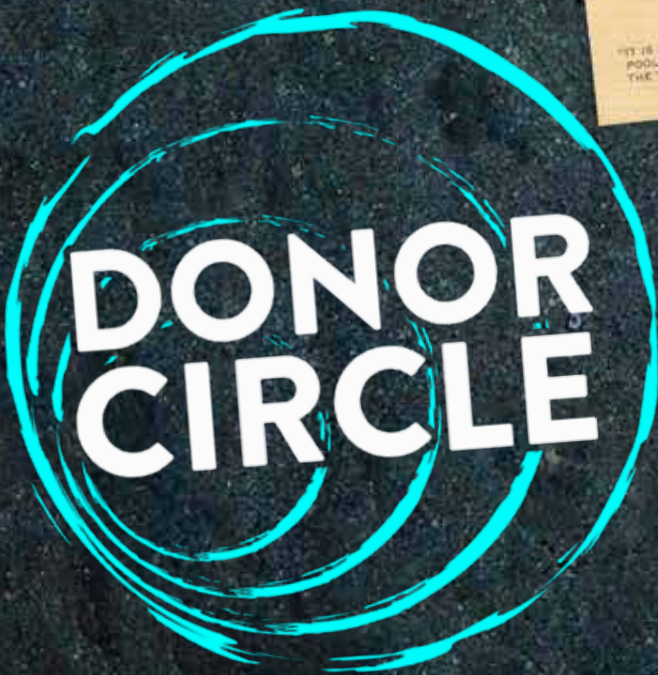
Love to visit the Science Center or have your kids participate in our Summer Camps? We've got a membership level that's right for you!

**SALMON**  
\$100

Unlimited admission for 5 people for 1 year & 25% discount on Summer Camp registration

**HUMPBAC**  
\$200

Unlimited admission for 8 people for 1 year, SSSC water bottle & 25% discount on Summer Camp registration



Want to take your Sitka Sound Science Center membership to the next level? Become a member of our Donor Circle. This program is for those who go above and beyond for the Sitka Sound Science Center. Your support helps maintain our facilities and programs, such as the aquarium, hatchery, Sprouts, WhaleFest and many more.

**TECHNICIAN**  
\$300

**CRITICAL THINKER**  
\$1,000

**MENTOR**  
\$2,000

**INNOVATOR**  
\$5,000

Visit [www.sitkascience.org/donate](http://www.sitkascience.org/donate) for more information on membership and donor circle benefits



# Curiosity is Calling

## Sustain Science with your Planned Giving

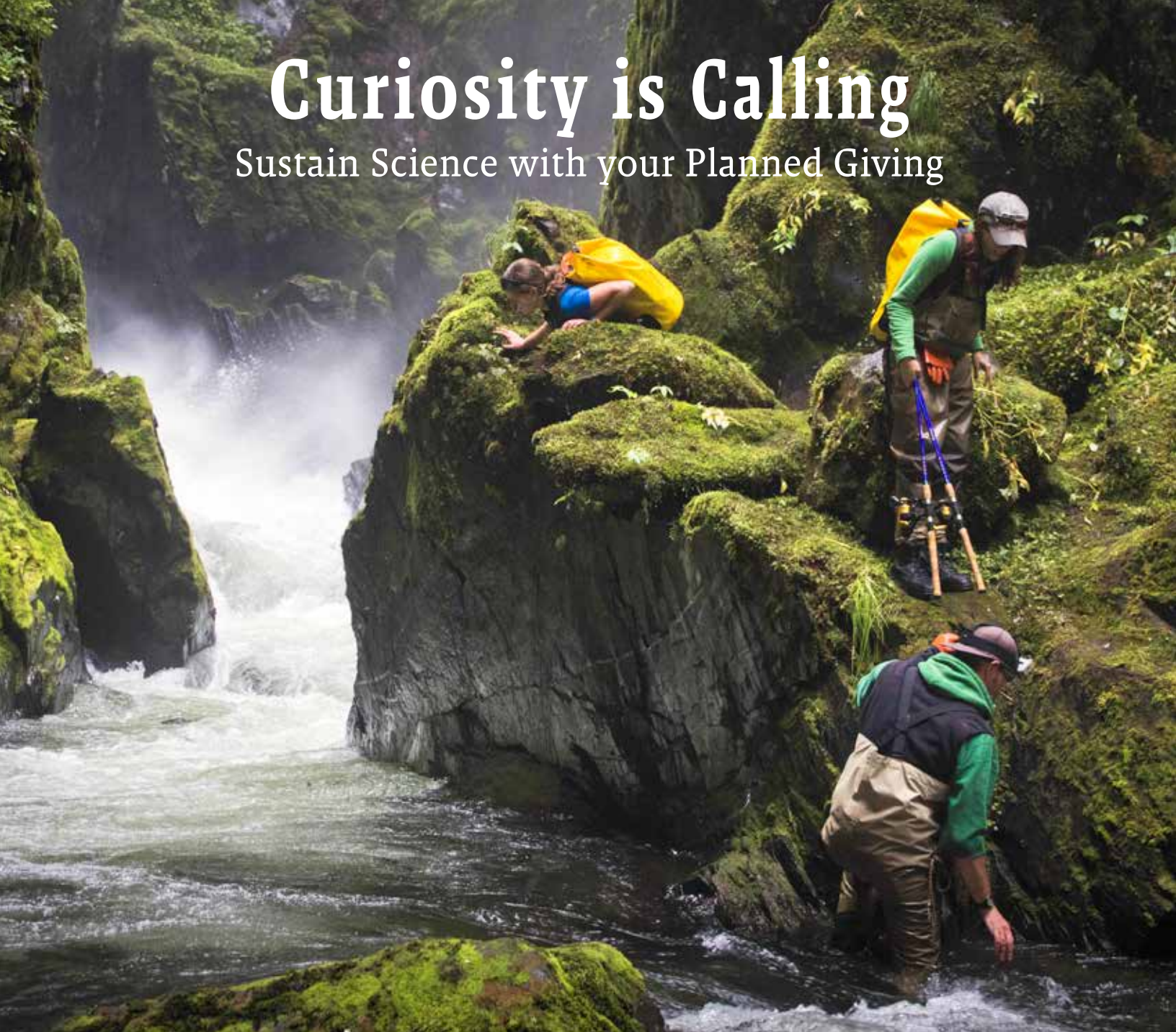


PHOTO: Ben Adams

### INVEST IN A LEGACY OF CRITICAL THINKING

The Sitka Sound Science Center celebrates and supports human curiosity through scientific research and science education. Our programs are designed to prepare and support those willing to look for answers.

### HOW TO IGNITE FUTURE GENERATIONS

A will that includes the Sitka Sound Science Center (SSSC) as a charitable beneficiary includes simple bequest language to benefit SSSC. The bequest can be structured in a variety of ways. Some donors elect to leave a specific dollar amount or a percentage of their estate. Others choose to designate

a particular asset such as real or personal property. After providing for friends and family, you can elect to give a portion of your remaining estate to SSSC. In this way, the donor's specific distributions are handled first, and whatever is left sustains science education and research into the future. Your contribution will go into the Sitka Sound Science Center Sustainable Development Endowment Fund which is managed by the Juneau Community Foundation.

### LET'S BEGIN WITH A CONVERSATION

You can contact us any time to discuss your ideas or to answer questions. We are here to work with you through the details of how your gift will be used and what options are available.

Lisa Busch, Executive Director • Sitka Sound Science Center  
907-738-3004 • [lbusch@sitkascience.org](mailto:lbusch@sitkascience.org)



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