Rising Tide

Sitka Sound Science Center

Annual Newsletter 2024

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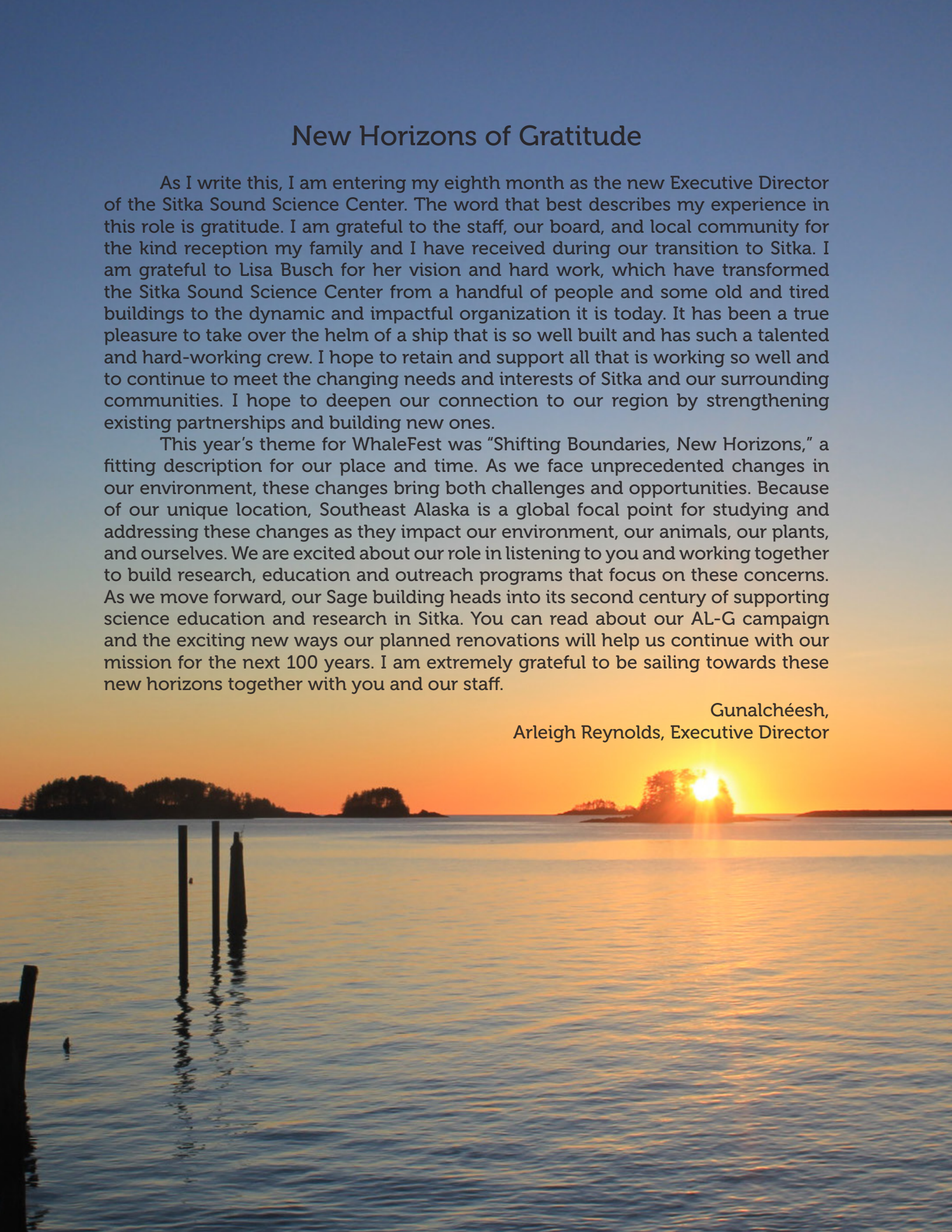
New Horizons of Gratitude

As I write this, I am entering my eighth month as the new Executive Director of the Sitka Sound Science Center. The word that best describes my experience in this role is gratitude. I am grateful to the staff, our board, and local community for the kind reception my family and I have received during our transition to Sitka. I am grateful to Lisa Busch for her vision and hard work, which have transformed the Sitka Sound Science Center from a handful of people and some old and tired buildings to the dynamic and impactful organization it is today. It has been a true pleasure to take over the helm of a ship that is so well built and has such a talented and hard-working crew. I hope to retain and support all that is working so well and to continue to meet the changing needs and interests of Sitka and our surrounding communities. I hope to deepen our connection to our region by strengthening existing partnerships and building new ones.

This year's theme for WhaleFest was "Shifting Boundaries, New Horizons," a fitting description for our place and time. As we face unprecedented changes in our environment, these changes bring both challenges and opportunities. Because of our unique location, Southeast Alaska is a global focal point for studying and addressing these changes as they impact our environment, our animals, our plants, and ourselves. We are excited about our role in listening to you and working together to build research, education and outreach programs that focus on these concerns. As we move forward, our Sage building heads into its second century of supporting science education and research in Sitka. You can read about our AL-G campaign and the exciting new ways our planned renovations will help us continue with our mission for the next 100 years. I am extremely grateful to be sailing towards these new horizons together with you and our staff.

Gunalchéesh,
Arleigh Reynolds, Executive Director



We are on Lingít Aaní – Lingít land. The Lingít people have been Indigenous to these lands and waters for over 10,000 years. Gunalchéesh to the Lingít people for their stewardship of Lingít Aaní since time immemorial and today.

All articles written by SSSC staff.
Cover photo by Zofia Danielson, all photos by SSSC staff unless otherwise noted.

Printed on recycled paper.

Facing page sunset in front of SSSC.

The Legacy of a Wooden Pipe

A Story of Water, Innovation, and Community

Over a century ago, nestled between the peaks of Shee (Baranof Island) and the shores of Sitka Sound, the Sheldon Jackson College began an innovative project. At the heart of this venture was Kaasda Héen (Indian River), the pristine waterway that coursed through the landscape. The college's leaders harnessed Kaasda Héen's power for electricity by diverting some of its waters to a hydro-electric turbine.

This early infrastructure feat involved a remarkable engineering challenge of moving the water over 1,000 feet to the turbine. The solution was a long wooden pipe that snaked its way under the college campus. The turbine powered the campus and surrounding neighborhood, illuminating homes, classrooms, and dorms.

In the 1970s, Sheldon Jackson College began a new project supporting both environmental education and the local fishing industry, and the wooden pipe was key to its success. The college established a small salmon hatchery, where students could study fisheries management and aquaculture. The same wooden pipe that had once powered the turbine now carried water to the hatchery's tanks, nurturing millions of young salmon as they began their lives in the cold, clear waters of Kaasda Héen.

Othe past 100 years, the wooden pipe gradually succumbed to the ravages of time and water. The pipe suffered punctures, splits, and cracks. As cracks appeared and sections of the pipe buckled with age, the surrounding community felt the effects. Flooded job sites, streets, and even the Stratton Library became unintended casualties. Still, for most of its life, the pipe performed its essential duty—delivering water to the turbine, and later, to the hatchery—without fanfare.

In 2024, after years of temporary fixes, the Sitka Sound Science Center (SSSC) took up the mantle of progress. With the hatchery's water supply becoming more and more unreliable, SSSC worked with engineers and local contractors to replace the failing wooden pipe with more durable HDPE (high-density polyethylene). The new pipe would ensure a reliable water supply for the hatchery for years to come.

As workers slid the new HDPE pipe inside of the old wooden one, there was a sense of reverence for the history of those old wooden timbers. The pipe had been more than just a conduit for water—it had been a lifeline for the community. It had powered the lights, nurtured the fish, and connected generations of students and townspeople to the waters that defined their lives. The new HDPE pipe serves as a modern solution, but the legacy of the wooden pipe lives on in the stories told by the people who had seen it, repaired it, and relied on it for so many years.

Sunlight illuminates the interior of the wooden pipe.

Grow AL-G *with Sitka Sound Science Center*

Help us open the doors to updated research laboratories, an inspiring new aquarium, and fully accessible grounds.

Since its construction in 1929, the Sage building has served our community as a hub of learning and connection. The Aquarium, Laboratories, and Grounds (AL-G) project will create spaces that students, scientists, and visitors from Sitka and beyond will use to build a deeper understanding of our world. Bring coastal Alaska into the next century of science research and education with a donation to the AL-G project.

Phase 1:

Expand the Sage building's research capabilities with state-of-the-art laboratories and updated infrastructure.

Phase 2:

Honor the Sage building's historic character with a refined interior. Create comfortable and functional spaces for students and community members.

Phase 3:

Take a deep dive into an aquarium transformation that reflects the true expansiveness of the ocean.

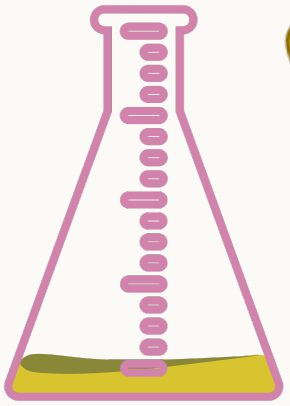
Phase 4:

Maximize the potential of our grounds for uses ranging from class visits to scientific research.

www.sitkascience.org/about/support/al-g

Help us meet our goal

$250,000



Donate today

Shifting Boundaries New Horizons

The 28th annual Sitka WhaleFest was a resounding success thanks to our speakers, science symposium committee, workshop facilitators, attendees, volunteers, donors, and SSSC staff. S p e a k e r s shared research and knowledge on the theme of Shifting Boundaries, New Horizons: How Life is on the Move in a Dynamic Ocean. We were honored to host a diverse group of speakers, from scientists to whaling captains. Thank you to Deana Crouser, Elizabeth Siddon, Lori Quakenbush, Donna Hauser, Roberta Tuurraq Glenn-Borade, Kimberly Pikok, Kari Lanphier, Marie Zahn, Richard Glenn, Lee Kayotuk, Peter Westley, Lauren Wild, John Moran, and Mike Miller. The presentations and panel discussions illuminated the major shifts occurring in our ocean and the diverse knowledge systems that are at the forefront of the response to these changes. Nearly 90 high school and undergraduate students from across Alaska gathered in Sitka for the festival weekend. Students attended symposium presentations, Q&A sessions with presenters, and a variety of workshops.

Marie Zahn presents at Sitka WhaleFest 2024.

Adults of all persuasions could find a workshop to suit their interests, from the tried and true marine mammal necropsy with local teacher Stacy Golden to the brand new Behind the Scenes of Science tour that guided participants through the evolution of the Science Center and officially launched our AL-G (aquarium, laboratories, and grounds) capital campaign (pg. 3).

We are proud and grateful to have helped create a space where people of all ages and backgrounds could come together to celebrate our shared connection to the ocean and its creatures. We would like to give special thanks to our donors whose generosity helped make this event possible: John Craighead "Umigmuk" George Family, Sandra Kincheloe, Janet Clarke and Dan Gray, Rachel Myron and Steve Lewis, Grenold and Dorothy Collins, Alaska Airlines, Saltchuk, North Pacific Research Board, Allen Marine Tours, Alaska Ocean Observing System, Southeast Alaska Regional Health Consortium, Harbor Mt. Brewing, BEAK Restaurant, University of Alaska, BLaST program, University of Alaska Southeast, Sitka campus, Oregon State University OPEnS Lab, Prince William Sound Science Center, and the Alaska Whale Foundation. Your support allowed us to bring these inspiring speakers, workshops, and events to life. Everyone's contributions, whether through time, knowledge, or financial support, have made a lasting impact on Sitka WhaleFest 2024. Together, we are helping to ensure that the wonders of the natural world continue to inspire and educate future generations. We can't wait to see what lies in store for Sitka WhaleFest 2025.

Sitka WhaleFest artwork by Crystal Worl

Summer in Southeast Alaska

Revolution Campers put their boards to the test in Sitka Sound waters.

Summer in Southeast Alaska – heaven. Long days, sometimes sunny. Low tides reveal wide expanses of sand in pocket beaches or stretches of rocky and eelgrass habitat for finding and viewing glorious intertidal creatures. For hardy Sitkan kids, these conditions allow raucous water play in the cold Sitka Sound waters. Zofia Danielson, Research Coordinator at Sitka Sound Science Center, remembers summers in Sitka as a girl running nimbly around barnacle encrusted rocks on the forgiving sand of Sandy Beach with her boogie board tucked under her arm to jump with wild abandon into the waves. Later, the boogie board became a surfboard, and Zofia participates in the Sitka surfing scene as an adult. So, when the education team mentioned that we had a crazy idea to host a Design a/Build a Boogie Board summer camp, she said, "Count me in."

Our summer camp teenagers had signed up for the Revolution engineering camp imagining that we would be building models together, an activity that these promising young engineers thought would be really fun. The campers nodded along happily as camp leaders described all the activities of the "Design It" week. Their faces changed into confusion and astonishment when we described the "Build It" week which included the construction of a real boogie board that would be tested in the waves of Sandy Beach, and they said, "We're going to build WHAT?"

The "Design It" week flew by as campers did what engineers do when faced with a construction challenge – research, experiment, and model. Understanding buoyancy through experiments in the water with Paddleboard Physics and a Floating Bridge Challenge helped summer camp designers appreciate the boogie board dimensions. Hearing from surfing master and surfboard builder Mr. Charlie (Charlie Skultka, teacher of Traditional Northwest Arts at University of Alaska, Southeast and

Revolution Camp was established in 2017 through a grant from the Juneau Economic Development Council to support engineering experiences for youth. Every year since, SSSC has elected to offer a Revolution engineering camp with different projects guided by visiting experts for teen participants.

Sitka High School) about understanding waves, respecting the ocean, and the inner structure and finishing of boards inspired campers to observe the features of Sandy Beach and to work carefully on their designs. Each student built their own scaled model of a boogie board and tested it with weights for performance in the water of one of the hatchery tanks. Campers learned boogie board riding techniques with Zofia the Wave Master (and made lots of memories along the way).

"Build It" week was hard work. Camp leaders became technical assistants while campers created their templates, cut their board shapes, built the support structures, and glued the cardboard shapes together. Campers experimented with papier-mâché and epoxy – both materials they would use to finish their boards. Model testing revealed that sealing the cardboard completely was the distinction between success and failure. Campers put in long hours of papier-mâché work followed by application of epoxy, which covered each camper's personalized board art.

After two weeks, the boogie boards were ready for public presentation and the final test. On the beach, these engineers described their process and what they learned to family, friends, and local press. Mr. Charlie complimented them publicly for their tenacity. Zofia led the group in warm-up exercises and team chanting. And then, wild and boisterous boogie board builders charged into the water to christen their boards in the waves of Sandy Beach.

How did the boards work out? Well, some got a little soggy. Each builder could identify the weak spot on their board. No one wasted any time mourning their soggy board. They simply grabbed another boogie board and threw themselves back in the water to enjoy the experience. Revolution Camp revealed life lessons important in our community and for the growth of young scientists: Respect different perspectives. Know that expertise exists right here at home. Revel in opportunities to meet challenges. Immerse yourself in the outdoors. By those standards, we can celebrate 100% success.

Revolution Camp

Week One - Design It

Filled with field trips, experiments, interviews of experts, modeling, and other experiential activities that address the engineering processes of "Identify the Problem" and "Design".

Week Two - Build It

Direct teaching and practice of technical skills like measurement, use of tools, and other construction techniques are built into fun challenges for campers.

Capstone Celebrations

invite family and friends to see the accomplishments of our hardworking campers.

Science After Hours

In 2024, local adults had the opportunity to explore the intersections of science, art, history, and language in Science After Hours Programs. We uncovered the etymology of the scientific names of animals in our aquarium, experimented with watercolor painting techniques with local artist Pat Kehoe, got an update on research on kelp forests from University of California Santa Cruz students, went on a journey through history and literature by diving into the story of Jack Calvin and Sasha Kashevaroff's 1929 voyage by canoe from Tacoma to Juneau, stretched our creativity in a four-part environmental writing workshop, and more.

"The Science Center's writing workshop remains one of my favorite experiences of living in Sitka. I loved how we were encouraged to make writing about more than just putting words on paper (or screen). Each session we stretched the ways we are conditioned to take in the world around us and it really helped unlock my motivation to create." - Brandon Saiz, participant in Writing Our Worlds workshop series

Tank Techs

As one reaches into the Science Center's intertidal tank to touch an anemone, one might ask, "Where does this water come from? Where does it go? What does this creature eat? Does it even know I'm here? AND WHY IS IT STICKY?"

Eighth graders in the Tank Techs afterschool program had all the same questions, and they are working hard at figuring out the answers.

Every Monday, the group takes a deep dive into a new topic such as taxonomy, aquarium tools, fish health and anatomy, and tank maintenance.

In November, we learned about the materials required to build an aquarium system: filters, aerators, pumps, refractometers, valves, t-joints, bubble wands, air stones, heaters (and more!). We first calculated which type of bubble - small or large - was best suited for oxygenating water systems. Then, students were challenged to build a two-tank system with different salinity levels, aeration types, and temperature differences.

In addition to delighting in the aquarium's residents and equipment, these students often stop to talk about the ethical dilemmas of keeping an aquarium.

Tank Techs work together to siphon touch tanks.

In October, a kelp greenling was quarantined in the basement while recovering from an injury. The students have claimed this fish as their own and frequently request updates on his condition. They refuse to formally name the fish, as it is a coworker, not a pet. Although the tank is not on display, it was the first tank that students wanted to clean so that the greenling could see out of clear glass. They worry about his socialization; they ask when he will return to the Molly tank; they wonder what he does when no one is around to say hello.

It's more than fish - they're investigating why it's important to care for animals that have no brain, animals that don't move, algae and rocks that provide habitat, even the worms and the slugs who sneak their way up through the pipes.

These eighth graders are gaining a firsthand understanding of the interconnectedness of ecosystems and the responsibilities that come with caring for living creatures. By fostering curiosity, empathy, and problem-solving skills, this program is not only helping students grapple with building aquarium systems, but also becoming a person who is a part of a system bigger than themselves.

Bella from Water Power drills a hole into her water blaster.

Summer Interpreter Mathias Bowers explores the intertidal (photo by Emma Spies)

Dreaming of Tidepools

Mathias Bowers dreamed of tidepools – couldn't stop talking about them, in fact. This is what one of his references, a supervisor at a Kwik Trip convenience store in Altoona, Wisconsin, said over the phone sometime in February 2023. Mathias had applied to work at the Science Center with a cover letter that began, "I saw Sitka Sound Science Center was hiring for seasonal tour guides, which is exactly the type of job I have been searching for."

Mathias was young – he had graduated from high school in 2022 – but even in a Zoom interview, he had a clear gift for connecting with people. He would have a lot to learn once he arrived, but we suspected that the Science Center might be the right place for him. We hired Mathias for summer 2023.

He hadn't always been engaged in school, but a particularly interesting subject or teacher could draw him in. Mathias found both in the aquarium that summer. He recalled, "When I started working here, we were tasked with learning a few things in the aquarium. Like three things, was it? And by mid-year, I'd say I could name everything that was bigger than your finger." Back home in Wisconsin, he had watched endless YouTube videos of people exploring tidepools all over the world. Soon after starting work in Sitka, he was leading tidepool tours of Sage Beach. He worked closely with SSSC's aquarist, Matt Wilson. Mathias said in fall 2024, "I view Matt as a mentor and the person who helped me find the thing I'm most passionate about in life."

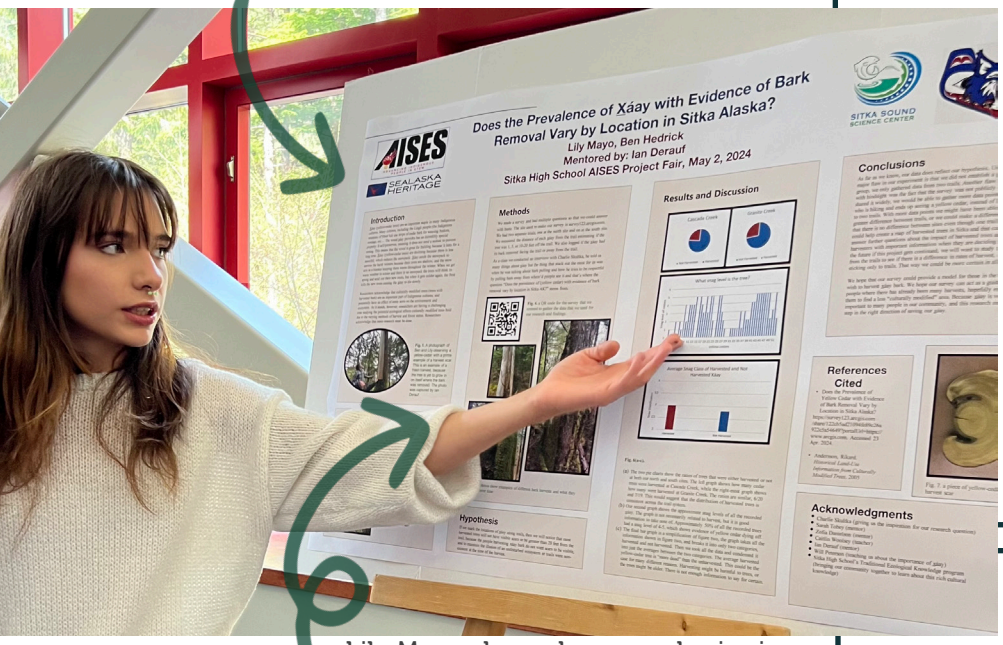
Mathias is now applying to study biology as an undergraduate at the University of Alaska Fairbanks, but this wasn't always his plan. He had been interested in philosophy since high school and dreamed of becoming a philosophy professor. However, he could not ignore his interest in science, and Mathias decided to stay for a second summer at the Science Center. He said that another season of learning and teaching about the ocean "made me realize I really, really could do this for the rest of my life, like one hundred percent."

Mathias might not become a philosophy professor, but his chief aim remains the same: "Still to this day, like end goal, I want to be teaching people." In the aquarium, the hatchery, and on the beach, he taught others every day at the Science Center: "For example, on one of those tidepool walks," he said, "I met these two nice older ladies, who were so sweet and so nice and so interested. And they were like, 'I never want to go down to the beach again without Mathias!'" Visitors regularly praised his knowledge and welcoming attitude, sometimes going so far as to email us to make doubly sure that someone got the message.

As he prepared to leave the Science Center this year, I asked him what he thought it means to be a scientist. "One thing I've learned is that scientists [or] pretty much anyone who is smart on any subject, in my eyes, is just passionate," he said. For the first time in a while, Mathias is looking forward to going to school. "I learn here," he said, "but during school you learn so much that your brain is just filled. My brain is still kind of bare and I need more." When assured that there was plenty of knowledge in his brain already, he was resolute: "I need more."

The Art of Questioning:
High School Students Take an Interdisciplinary Approach to Local Environmental Changes

Cultivating Curiosity: Quality science education empowers students to ask questions and seek answers beyond the curriculum. This was Sitka School District high school teacher Caitlin Woolsey's goal in her classes *Traditional Ecological Knowledge* at Sitka High School and *Aas Kwaani: Tree People* at Pacific High School. Students read *Braiding Sweetgrass* by Robin Wall Kimmerer, heard traditional stories of x̲áay (yellow cedar), and spoke with elders and knowledge holders about the cultural and ecological importance of the tree. The students used this information to piece together the story of the decline of x̲áay in Southeast Alaska.



Lily Mayo shares her award-winning project at the Indigenous Science Fair

Hands-on Learning in the Elements: After developing research questions, students worked with mentors from the Sitka Sound Science Center to determine what information they needed from the field. In small groups, they collected their data in forest, muskeg, and hillside cedar stands. Rain or shine, they recorded observations, measurements, and interpretations using environmental monitoring tools such as quadrats, increment borers, rangefinders, temperature probes, pH strips, and, of course, Rite-in-the-Rain paper.

Investigating x̲áay: Next, students developed their own research questions about yellow cedar decline. Throughout this process, they learned about two-eyed seeing: that is, how to incorporate both Indigenous and Western science practices into research projects to understand yellow cedar more holistically. Students first got hands-on with x̲áay by weaving the bark with cultural educators Will Peterson and Charlie Skultka. Discussions with these traditional artists and other knowledge holders from Sitka Tribe of Alaska inspired inquiry about yellow cedar trees in relation to weather patterns, cultural use, and other aspects of forest health. The resulting research questions from students considered how cedar trees are impacted by factors like soil pH or soil moisture and how the forest is responding to their decline.

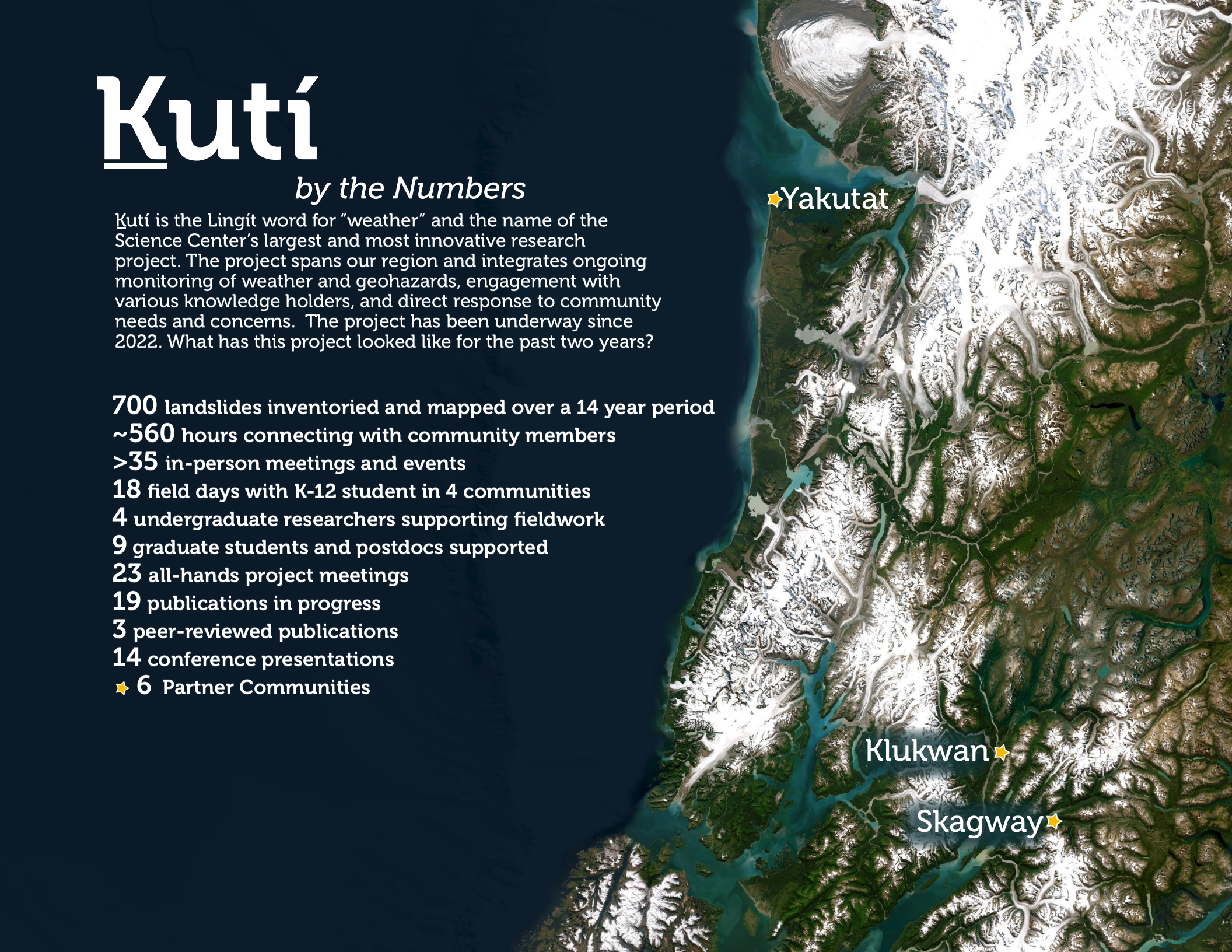
Creative Communication: The Yellow Cedar course culminated with a project that summarized the students' research findings. The projects were presented at the Indigenous Science exhibition for the Sitka community; the American Indian Science and Engineering Society (AISES) National Conference in San Antonio, TX in front of other high school students, college students, and professionals; and the WhaleFest student Art Show, which was open to Sitka Whalefest participants and community members. Using tree cores, drawings, Venn diagrams, and posters to display their work, the projects showcased the information that student researchers have contributed to our understandings of x̲áay in Sitka.

Kutí

by the Numbers

Kutí is the Lingít word for "weather" and the name of the Science Center's largest and most innovative research project. The project spans our region and integrates ongoing monitoring of weather and geohazards, engagement with various knowledge holders, and direct response to community needs and concerns. The project has been underway since 2022. What has this project looked like for the past two years?

700 landslides inventoried and mapped over a 14 year period
~560 hours connecting with community members
>35 in-person meetings and events
18 field days with K-12 student in 4 communities
4 undergraduate researchers supporting fieldwork
9 graduate students and postdocs supported
23 all-hands project meetings
19 publications in progress
3 peer-reviewed publications
14 conference presentations
6 Partner Communities



Southeast Alaska Landslide Working Group

Southeast Alaska's mountainous landscape and heavy precipitation put landslides and other geohazards at the front of many people's minds. Communities in our region have been coming together informally for years to address concerns about geohazards, and this year we strengthened this network by collaborating with the Central Council of Tlingit and Haida Indian Tribes of Alaska to host the first meeting of the Southeast Alaska Landslide Working Group in March. The attendees of this two-day meeting represented federal and state agencies, Tribal governments, municipalities, universities, and non-profits. Their concerns varied: some wanted to hear more about how landslides occur and how to prepare, and others were interested in how state and federal agencies reduce risk. All attendees agreed that improved communication was critical. To learn more about geoscience at SSSC and to get involved, please email landslides@sitkascience.org or scan the QR code.

Southeast Alaska landslide working Group March meeting. Photo by James Poulson

Revising the Research Paradigm

SSSC leads the way in community-informed research and accessible science communication. And, as diligent scientists, we are always looking to improve upon our methods. These initiatives represent our work to shift the paradigm of how research is conducted in our community, our region, and beyond.

Conducting Research with "CaRE": Communication and Reciprocal Exchange

Scientists from Western academic backgrounds typically are not educated on how to genuinely engage with the people who live where they seek to do research, especially Indigenous populations. This lack of awareness has historically led to distrust, disrespect, and harm to the people and their lands. Today, many researchers seek a different approach, but aren't sure where to start.

To address this need within Southeast Alaska, SSSC Research Director Lauren Bell and partners at the Central Council of Tlingit and Haida, the Sitka Tribe of Alaska, and a regional advisory board are developing a new education program to improve and strengthen the relationships among scientists, Tribal governments and Indigenous people in our region. SSSC will help convene a 3-day workshop in March 2025 to pilot an interactive training in principles of Communication and Reciprocal Exchange (CaRE) such as cultural awareness, transparency & consent, reciprocity & benefit sharing, and community engagement.

Participants in the Hatchery Summit visioning session.

Hatchery Summit

Alaskans are distinctly attentive to how aquaculture and mariculture activities can contribute to or conflict with wild food safety, security, and sovereignty. Anyone eavesdropping on chatter in the grocery aisles, coffee shops, and docks around Southeast Alaska today will hear the collective concern of a coastal population whose economy and wellbeing are tied to the future health of their changing environment.

Recognizing that the SSSC hatchery is uniquely situated to explore these new horizons, in the spring we convened a diverse group of local scientists, industry and agency personnel, fishermen, educators, Tribal staff, Sheldon Jackson College alumni and others for a "Hatchery Summit" visioning session. We asked participants to share their wildest dreams about how we can embed cutting edge research and interactive education into the SSSC hatchery in the future. The grassroots brainstorming from this session is spawning the development of new studies and workforce development programs to serve our community's current interests.

Yellow cedar stand in Sitka, AK

October SIRF:

Scales of nutrients in Southeast Alaska's yellow cedar stands

October's SSSC Scientist in Residency Fellow, Dr. Gavin McNicol, is an assistant professor at the University of Illinois in Chicago. He specializes in the biogeochemistry of wet ecosystems, including wetlands, muskegs, and temperate rainforests. In Sitka, Dr. McNicol deepened his understanding of southeast Alaska's forest ecosystems and established connections for an upcoming project focused on nutrient cycling in areas with yellow cedar decline by meeting with Sitka Tribe of Alaska, USFS, local botanists and naturalists, and other community members. In addition to building the foundation of a new research project, Dr. McNicol was an exemplar of the outreach that is so integral to the SIRF program by paying many visits to high school classes, giving interviews on the local radio station, and sharing a lecture at the University of Alaska Southeast Natural History Seminar Series. Dr. McNicol looks forward to visiting Sitka in summer to continue his research and deepen his connections to this community.

Dr. McNicol (photo provided)

Morag Clinton, BVMS, PhD: Fish Doctor

"I think it's fair to say I am a fish doctor!.. I study fish health to understand how their organs and cells respond to different stressors… Right now I am collaborating on different projects, including work to understand what factors influence when and how Pacific salmon can become infected by different parasites"

How has it felt joining the SSSC team?

"This is my first time working for a non-profit. I'm really excited about our shared goals in studying fish in the state of Alaska."

What is it like working remotely out of Fairbanks?

"Although I miss the ocean… it's pretty magical in winter with the aurora and the snow. I've always enjoyed fishing so ice fishing has been a really fun new interest for me to explore."

What excites you about your work?

"My favorite type of research is definitely histopathology - looking down a microscope at stained pieces of thinly cut tissue to look for changes in cells or presence of pathogens like parasites… I also love the collaborative nature of my work, working with different communities and researchers to answer important and interesting questions"

How does living in Alaska compare to your home back in Scotland?

"I do miss Scotland (not so much the food, but the landscape, the history of the cities, the price of the whisky…). It was hard to move away from my friends and family… but luckily I was moving to one of the most beautiful places in America. I am also lucky to be able to visit my family often, and if I close my eyes in Sitka it feels just like a normal rainy day on the Isle of Lewis."

Gale McCrary processing salmon berries.

Berry Project Blooms in New Directions

Over the past three summers, SSSC has collected a salmonberry and blueberry phenology dataset using trail cameras to address regional concerns about climate change impacts on berry health. Gale McCrary, a Tsalagi Wolf Clan member and Mount Edgecumbe High School senior, participated in the Sealaska Heritage Institute's STEAM Opening the Box Internship program, hosted at the Sitka Sound Science Center. During his internship, he expanded this project by testing salmonberry sugar content at four Sitka elevations.

What were your research findings?

"I figured salmonberries at higher elevations would have a lower sugar content due to more environmental stressors- being colder, maybe less sun, more wind exposure… ? It was really cool, because [the results] were the complete opposite of what I thought we would find…The highest sugar contents [were at] salmonberries from the highest elevations." Gale presented his research at the SHI STEAM Intern showcase in Juneau, Alaska at the end of July and brought homemade salmonberry jam to share with other interns.

What was a highlight of this internship experience?

"A highlight was getting to come into the Science Center, because I loved being able to help with the different things happening around SSSC… helping with a Science Center camp, entering data." McCrary was nervous when he first arrived at SSSC, unsure what to expect at a research field station. By the end of six weeks, he requested a two-week extension to continue his research. "One thing I can really appreciate is how at the Science Center there are times where we're serious, because we're doing research, but we also have a lot of fun."

What skills or lessons will you take forward from this internship?

"The thing that I'm going to take forward with me is the confidence I gained [during] this experience… I had done different things in science, but I wasn't sure what a career in science could look like. I had some uncertainty about entering science spaces because I was worried that I wouldn't be taken seriously or be disregarded. I feel like one of the most valuable things is being able to come into this space where I was respected."

Thank you to Sealaska Heritage Institute for developing and supporting this internship program, which empowers Indigenous students with skills to pursue careers in STEAM fields.

Salmon berries

Volunteers and staff from Jamie Gorman Cleanup.

Tides, Trash, and Treasure

In Sitka Sound, storms bring marine debris, logs, and the occasional glass ball to shore. SSSC picked up over 3500 pounds of marine debris in 2024 with the help of over 80 volunteers.

Tug Powhatan Restoration Marine Debris Cleanups

SSSC has been awarded a contract as part of the NOAA Restoration settlement for the Tug Powhatan Oil Spill. From 2024-2026, an SSSC marine debris cleanup crew will survey and remove approximately 38000 lbs of marine debris or restore approximately 26 miles of coastline. Cleanup efforts will take place from Salisbury Sound to the mouth of Necker Bay in areas adjacent to herring spawn.

Marine debris impacts

Little is known about impacts on habitats and ecosystems once marine debris washes ashore. Zofia Danielson, SSSC Research Coordinator, will conduct research about the impacts of marine debris on services that intertidal and nearshore ecosystems provide through support from a NOAA contract in 2025.

Community cleanups

34 volunteers removed over 1240 pounds of marine debris from Shoals Point on Kruzof Island during the Jamie Gorman Memorial Cleanup. SSSC is grateful for support from the U.S. Coast Guard for air-lifting the collected debris from this remote black sand beach. SSSC and the Ocean Conservancy also removed 680 pounds of debris from Biorka Island with 20 high school students. We are grateful to Jamie Gorman Marine Debris Fund donors, the Alaska Brewing Co. Coastal CODE Program, and volunteers who helped clean Sitka's shores this year.

Visiting Researchers 2024

USGS Marrowstone Lab — March
Pacific herring sampling for population health

US Santa Cruz/Oregon State University — June-Sep
Research on sunflower sea star scent cues used in predation to investigate role they might play in kelp forest ecosystems

Cal Poly Humboldt — August
Research investigating ocean acidification impacts on cold-water orange cup coral

Oberlin — August
Research comparing California mussel and blue mussel shell structure between current and historical specimens as a measure of the effects of climate change

Outer Coast College — Aug-Dec
Research investigating the role microbes may play in breaking down salmon carcasses for use by plants near salmon streams

KU Leuven — Sep-Oct
Anthropological research on relationships with killer whales and identity among Sitkans and Lingít people

University of Illinois Chicago — October
Meeting with Sitkans to develop research questions and site choice for upcoming yellow cedar decline project

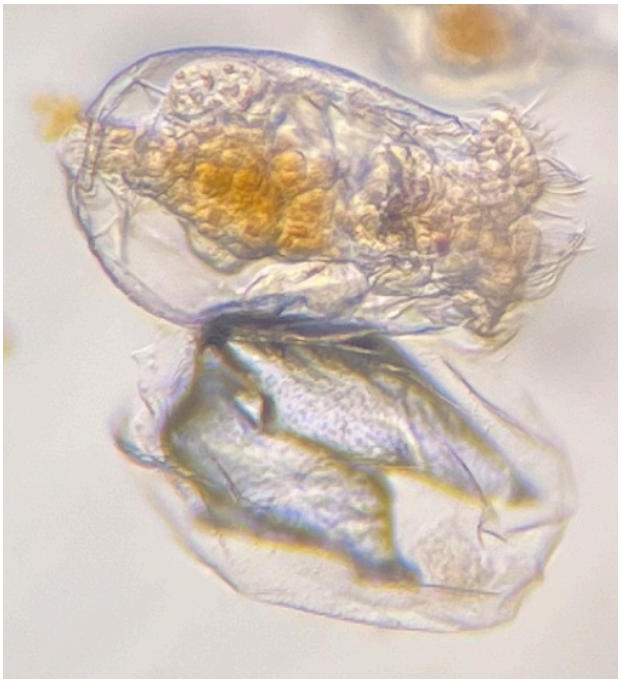
Moon jellies (Aurelia labiata)

What Grows Beneath

Did you know the Science Center has a basement? The basement of the Sage building has served many functions, hosting hatchery equipment, laboratory space for visiting researchers, and, most recently, a hub of aquaculture to support the aquarium. One of the unique things about our aquarium is that we don't ship in any food for our animals: all of it is sourced locally or grown in our labs. This includes cultures of plankton such as algae, rotifers, and brine shrimp. This means that we have foods of varying sizes to feed our many planktivore (plankton eater) species. Growing our own food ensures that we have a reliable supply of highly nutritious live food. Many species need the movement of their prey to stimulate a feeding response, so a meal that wiggles can be crucial!

Perhaps most excitingly, a ready supply of home-grown plankton allows us to grow jellyfish. We love jellies, but they can be tough to keep. Jellies' fragile bodies and big appetites are a real challenge, and because of their short seasonal lifespans and bad habit of picking up parasites in the wild, it's best to grow your own jellies if you want to display them year-round. Baby jellies need special food, and the rotifers we grow make the perfect first meal for these tiny jellies. Our new lab can produce enough food for all the baby jellies every single day.

The new lab is currently home to two species of jellies, moon jellies (*Aurelia labiata*) and lion's mane jellies (*Cyanea ferruginea*), and we are hoping to bring northern sea nettles (*Chrysaora melanaster*), a highly understudied species, into the aquarium as well. If we succeed, we will be able to study the sea nettles' unknown lifecycle. The new aquarium lab has laid the foundation for further study of a variety of small, delicate, and mysterious animals. We are thrilled to shed light on the unknowns that are all around us.



A rotifer next to its freshly shed exoskeleton.

Just ASK Annan and Gwen

Annan Weiland and Gwen White were summer hatchery interns this year through the Aquaculture Science Knowledge (ASK) program, funded by the National Science Foundation. Gwen has continued to develop her hatchery skills by doing a work experience internship this fall. As a graduating senior, Annan was awarded the Cunningham-Ahlgren scholarship by the Science Center to continue his passion for biology at Cornell College in Iowa.

Gwen White

Annan Weiland

Hidden Skills at Hidden Falls

The Hatchery Summit in the spring left us with a question: as an educational hatchery, what do students need to learn to be ready for work in an aquaculture-related field? To investigate, fish culturist Haley Jenkins headed to Hidden Falls hatchery. Hidden Falls is a remote salmon hatchery located on the east side of Baranof Island. As Haley found out, hatcheries require the very attributes that we develop in our high school aquaculture classes. Teamwork, enthusiasm for learning, and a willing work ethic are essential to a thriving salmon hatchery. When the high school students come to the Sheldon Jackson hatchery for class, they know that the lives of the fish are in their hands. As they are getting soaked while spawning chum salmon, reaching into cold water to sample the coho fry, or working together to tie buoys, they are practicing skills that are valuable in many natural resource career fields, and having fun doing it.

A Spiffy First Year in SPIFy

The first year of operations within the new Spawning and Incubation Facility represented a huge step forward for aquaculture at the Science Center. The hatchery crew had the cleanest incubation to date, with low hatch mortality and therefore low fungal growth. The new space also offers an efficient layout, allowing the staff to more quickly and effectively incubate, transport, and provide life support to all the baby salmon. SPIFy is also equipped with new fish safety features that can alert the hatchery staff when water flow is disrupted. With the installation of automatic valves, the incubation room can now instantly turn into an emergency recirculation system if water flow is restricted at the freshwater intake point on Indian River. This gives the crew time to fix any flow issues without having to worry about the fish staying alive. Staff rejoice at the new ease of their work, and local students from elementary school age all the way through college have the chance to learn about salmon in a cutting-edge facility.

Where are they now?

Annette Patton, PhD
former Lead Geoscientist
now with Oregon State University

Ian Derauf
former Jesuit Volunteer
now with Sitka Tribe of Alaska

Emma Spies
former Hatchery Apprentice
now with City of Sitka

Changing of the Guard

Not one member of staff has ever known the Sitka Sound Science Center (SSSC) without the visionary Lisa Busch as Executive Director. So, it was headline news when Lisa handed the directorship over to incoming director Arleigh Reynolds in April of 2024.

Lisa Busch's tenure as the Executive Director of the Sitka Sound Science Center from 2010 to 2024 has been marked by remarkable growth and transformation driven by Lisa's unwavering commitment to scientific inquiry, community engagement, science communication, and fun.

Lisa originally came to Sitka as a reporter for Raven Radio, Sitka's public radio station, and later produced a nationally distributed radio program called *Encounters,* hosted by Richard Nelson, which explored the intersection between natural history and Indigenous knowledge. This effort foreshadowed her accomplishments as Executive Director at SSSC in fostering meaningful partnerships that are the foundation of SSSC's research and education programs. By actively engaging with residents of coastal Alaska, Lisa ensured that SSSC remains responsive to the needs and priorities of its communities. As SSSC's reach has grown, so has its campus. Where many people saw dilapidated structures, Lisa saw opportunities. That vision and dynamic optimism continues to shape SSSC's campus to include updated and innovative facilities that serve students, visitors, and community members.

Lisa Busch's tireless commitment to SSSC's mission and her belief in the Science Center as an incubator of people and ideas has positioned SSSC as a leading hub for scientific research and education within the region and beyond.

The Karsh Family Foundation gifted the Sitka Sound Science Center with a pledge of one million dollars for science education in Lisa's honor. The Lisa Busch STEAM Education Fund will support place-based, Community-inspired, and interdisciplinary science education programs. The Busch STEAM fund also honors Lisa's legacy of science communication by supporting a summer intern each year who will be immersed in opportunities to listen, learn, and communicate about science topics that matter to our community. Sitka Sound Science Center intends to build on the Karsh Family Foundation gift to extend the impact through the next decade and beyond. We are grateful for the generosity and vision of Martha and Bruce Karsh.

(left to right) Lisa Busch, Amelia Nightingale, Kristina Tirman, Tory O'Connell

SITKA SOUND SCIENCE CENTER

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.

Vision

The Science Center envisions a region where community members, scientific innovations, and Indigenous knowledge and values work together to enable our marine ecosystems, people, and economy to thrive for generations to come.

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 wellbeing.

New Staff Members

Arleigh Reynolds
Executive Director

Morag Clinton
Research Scientist

Luka Silva
Interdisciplinary Science & Community Integrator

Brenna Haakinson
Hatchery Technician Apprentice

Ruth Johnson
Research Facilities Technician

Juliette Langley
Jesuit Volunteer

Staff

Janet Clarke
Lauren Bell
Nagham Sabah
Bill Coltharp
Chance Gray
Ron Heintz
Blake Conaway
Amy Rowe
Lina Kapp
Brooke Rivera
Matt Wilson
Zofia Danielson
Ella Neumann
Kari Paustian
Sarah Tobey
Maia Carter
Lisa Teas Conaway
Haley Jenkins
Lena Keilman

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Drew Wilson
Laurel Stark

Science Advisory Committee

Colleen Duncan
Ralph Goos'k' Wolfe
Peter Raimondi
Thomas Thornton
Ginny Eckert
Josh Roering

Make the world brighter by supporting the curious:

A donation to the Sitka Sound Science Center increases our ability to learn and teach about the lands, waters, and living things that are so important to life in coastal Alaska. We envision a region where community members, scientific innovations, and Indigenous knowledge and values work together to enable our marine ecosystems, people, and economy to thrive for generations to come. Your contribution makes it possible to sustain our mission of science research and education.

Donate today

Assure Science is Sustained

In this changing world, you can help assure that some things – science research and education – remain. By setting aside assets through your estate planning, you will nurture the spirit of scientific inquiry for future generations. Planned giving creates a legacy by setting aside a specific dollar amount or percentage of assets to Sitka Sound Science Center's Sustainable Development Endowment Fund, which will support science education and research in years to come.

Let's begin with a conversation.

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

Arleigh Reynolds,
Executive Director
907-738-3004
areynolds@sitkascience.org

Tutu's Tidepool

Our new mobile aquarium was made possible through a generous donation from the family of Liz Bodine in her memory. Liz Bodine, affectionately known as Tutu, was a beloved mother and grandmother to locals Bette, Wyatt, and Theo Gray.

Tutu's Tidepool will make marine science more accessible and fun to a wide range of audiences by allowing education staff to bring the intertidal zone along with them. This unique gift will cultivate the love of exploration and discovery in the next generation.

Tutu's Tidepool paid its first official visit to kindergarten and first grade classes at Xóots Elementary School this fall. We are grateful to Tutu and her family, and we are so excited for the mobile touch tank's future adventures.

Bette and Theo Gray exploring Tutu's Tidepool.

One Cent for Salmon

Silver Bay Seafoods proudly donates one cent to science research and education at SSSC for every can of salmon they sell.

Explore Membership Benefits

Sign up for a full year of access to the aquarium, subscription to our newsletters, exclusive email invitations to special events, 25% discount on summer camp enrollment (Salmon level and above), and 10% discounts on all Science Center Retail!

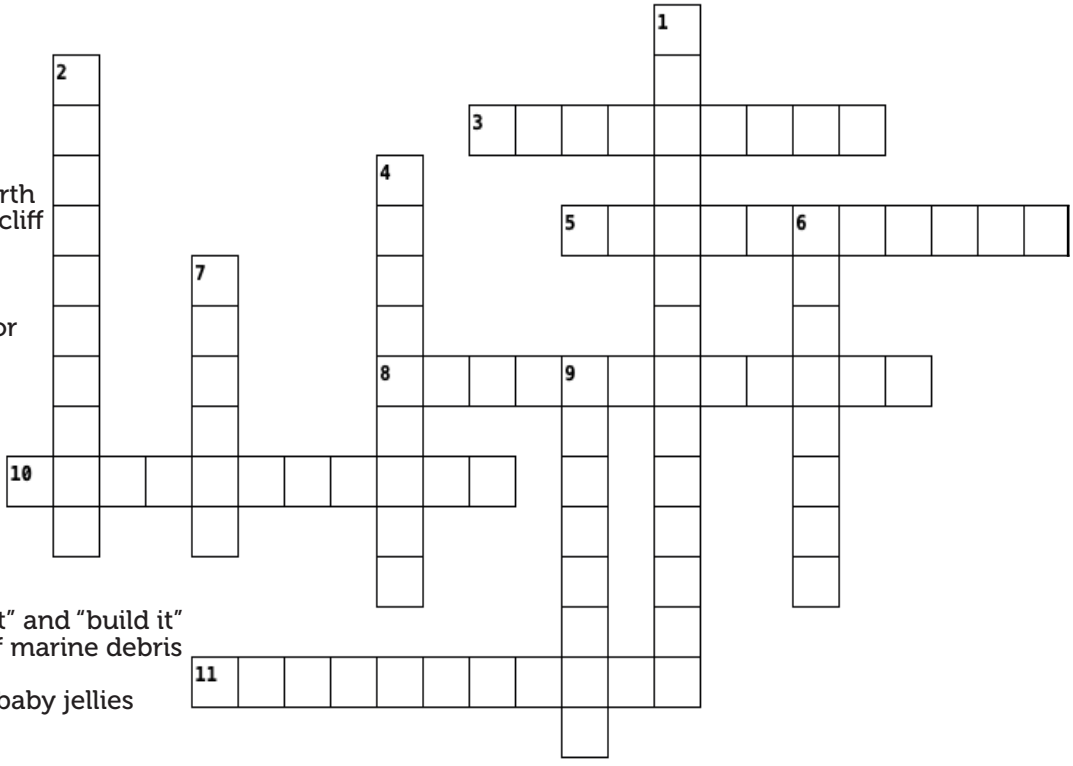
Join today

For more information about Compass Memberships for Tribal citizens or Octopus Memberships for families who qualify for free and reduced lunch, please contact information@sitkascience.org.

Special thanks to our lifetime members:

Robert Allen	Janet Clarke	Mary Hames	Steve Lewis	David Steward
Chris Balovich	Dan Gray	Martha Karsh	Mary Purvis	John Tisdale
Marilyn Blanck	Valerie Edwards	Bruce Karsh	Bob Purvis	Trish White
Murray Bodine	Sharon Gmelch	Lorraine Inez Lil	Linda Schmidt	Dirk White
Iris Busch	Barbara Hames	Hunter McIntosh	Sam Skaggs	Russ Wilson
Jordan Busch	Roger Hames	Rachel Myron	Margaret Steward	Nancy Yaw Davis

Science Words



Across

3. Sliding down of a mass of earth or rock from a mountain or cliff
5. Vehicle for summer fun and riding waves (2 words)
8. L in the AL-G project
10. Upcoming research focus for Dr. McNicol (2 words)
11. Berry species studied for sugar content

Down

1. Morag Clinton's favorite type of research
2. River that feeds fresh water intake (2 words)
4. K in the ASK program
6. Person who likes to "design it" and "build it"
7. Island where over 1240 lbs of marine debris was removed
9. Aquarium labs grow to feed baby jellies

Sitka Sound Science Center
834 Lincoln Street
Sitka, Alaska 99835

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