National Park Service
U.S. Department of the Interior

Ocean Alaska Science and Learning Center

Ocean Alaska Science and Learning Center
2021 Annual Report

Land Acknowledgement

The Ocean Alaska Science and Learning Center (OASLC) recognizes and honors that the coastal parks of Alaska and their adjacent waters have sustained Alaska Native people for generations. Through stewardship of these lands and waters, these areas continue to sustain the people who call them home. The OASLC is dedicated to doing its part in stewarding these remarkable places and supporting collaborations that can ensure their care for future generations.

This page: Gull eggs.
NPS/TANIA LEWIS

Cover: A resting puffin, Kenai Fjords National Park.
NPS/KAY WHITE

From Our Director

Greetings and thank you for taking time to connect with the work, initiatives, and collaborations of the Ocean Alaska Science and Learning Center. As with all National Park Service operations, the past year continued to feel the significant impacts of the global SARS-CoV-2-Coronavirus pandemic and COVID-19. Even with those impacts, I am heartened to report that through the work of our dedicated partners and staff, important initiatives continued and opportunities to address critical needs emerged. It may not look like a "normal" year of programming and technical assistance, but it did afford the opportunity to face new challenges in innovative ways and embrace opportunities none of us could have anticipated just nineteen months ago.

On that note, I am absolutely thrilled to share with you the work of the OASLC, our partners, NPS colleagues, and some of the students connected to our collective efforts.

If there is a gift in these extraordinary times, I feel that it is the unveiling of important areas for meaningful engagement. Rather than focusing on the barriers to connection, we've sought ways to mitigate them. I'm inspired to see the depth of care by our remarkable National Park Service staff and collaborators and their willingness to address today's challenges.

Thank you again for taking time to review the work of the OASLC and the eleven coastal parks of Alaska that we endeavor to steward and support.

All my best,

Shauna Potocky

Shauna Potocky, Director
Ocean Alaska Science and Learning Center

Alaska's Coastal Parks

- Aniakchak National Monument and Preserve
- Bering Land Bridge National Preserve
- Cape Krusenstern National Monument
- Glacier Bay National Park and Preserve
- Katmai National Park and Preserve
- Kenai Fjords National Park
- Klondike Gold Rush National Historical Park
- Lake Clark National Park and Preserve
- Noatak National Preserve
- Sitka National Historical Park
- Wrangell-St Elias National Park and Preserve

About Us

The OASLC is one of 18 Research Learning Centers established by the National Park Service to increase the communication, use, and effectiveness of scientific research in national parks.

We support Alaska's 11 coastal parks, which collectively comprise more than 3,600 miles of coastline and over 32% of the coastline in the entire National Park System.

OUR MISSION is to promote stewardship of the marine-influenced ecosystems of Alaska's coastal national parks through learning, education, and research.

Kamishak Bay.
NPS/JIM PFEIFFENBERGER

Our Priorities

Partnerships

We identify, develop, and strengthen partnerships that enhance science, conservation, and education related to marine and coastal resources.

Education

We facilitate and expand opportunities to increase awareness of Alaska's marine and coastal resources through education, outreach, and communication.

Professional Pathways

We invest in and implement creative and effective approaches to increase professional pathways in marine and coastal stewardship.

Management

We support and enhance park and regional management decisions related to marine and coastal ecosystems and functions and facilitate understanding of cross-cutting issues.

Research

We promote and facilitate innovative and inclusive research to increase understanding of marine and coastal resources.

Learning

We co-create a learning environment, in consultation with communities we live and work with, to improve mutual understanding of marine and coastal resources.

Partnership

Learning more through collaborative archeology at Bering Land Bridge

For millennia, Indigenous Iñupiaq people have lived on and around the barrier islands, beach ridges and dunes of what is now Bering Land Bridge National Preserve in Northwest Alaska. The remains of past villages, houses, activity areas, and caches have the potential to tell a vivid story of past and present life, technology, subsistence practices and climate change.

Today, however, these sites—most of which haven't been well studied by archeologists—are at risk of being lost. Increasing coastal erosion driven by sea level rise and sea ice retreat threatens to damage or wash away the remaining structures and objects. Kawerak, the regional Alaska Native non-profit corporation for the Bering Straits Region, and the National Park Service are collaborating to assess, catalog, and learn from these sites—before it's too late.

This summer, an archeological team began initial assessments of the site. Using low-impact techniques, they seek to better understand past lifeways of Iñupiaq families in the area while keeping the sites and objects intact. Ultimately, they will use what they learn to determine whether any of the sites are eligible for listing in the National Register of Historic Places, a status that could support future preservation efforts.

Kawerak and archeologist Justin Junge (Western Arctic National Parklands and Bering Land Bridge National Preserve) recently finalized a multi-year agreement to partner on the project and support paid internships for individuals from local Iñupiaq communities. Their goal is to help interns build skills and knowledge through hands-on experience and training and facilitate reciprocal sharing of knowledge between local Iñupiaq communities and National Park Service staff.

Many Iñupiaq people residing communities surrounding Bering Land Bridge National Preserve are direct descendants of those that lived on these lands hundreds or thousands of years ago. They have deep knowledge of the land that has been passed down through generations: who lived there, when they lived there, and what their homes, tools, and subsistence practices were like. This generational knowledge complements and extends beyond what we can learn from contemporary archeological studies.

Example of erosion of coastal dunes that are locations of pre-contact Inupiaq settlement and activity areas, facing north.
NPS/JUSTIN JUNGE

Kawerak and Junge are figuring out ways to make the project as inclusive and collaborative as possible. For example, they plan to house collections from the project in Nome, AK, where Iñupiaq people with direct ancestral ties to the sites can see and interact with objects collected during the field season. They also plan to engage Iñupiaq Elders in the process of identifying traditional uses of objects, thereby connecting deep place-based relationships and multi-generational knowledge with the scientific process.

By working together, everyone can help each other—and get more out of the project in the long-term. Everyone can learn more.

—Justin Junge, Archeologist

Education

At the OASLC, we seek to facilitate and expand opportunities to increase awareness of Alaska's marine and coastal resources through internal and external education, outreach, and communication. We accomplish this in a variety of ways: by offering training sessions and materials for interpretation staff, writing web articles and resource briefs, contributing to regional and national newsletters, contributing content to Alaska's regional social media accounts, and producing video and photo content showcasing ocean science in parks across the state.

We've worked hard to connect educators and students with up-to-date, scientifically accurate, and relevant information on coastal and marine resources throughout the state.

Teacher workshops go virtual

Since 2004, the OASLC has offered teacher workshops in collaboration with the Alaska SeaLife Center in Seward, Alaska. The workshops are an opportunity for teachers and scientists to interact directly, and they provide educators with first-hand knowledge of current marine issues and research in Alaska.

During the COVID-19 pandemic, we adapted our workshops to a virtual format. This year, we conducted a series of six virtual workshops that showcased distance education offerings throughout the region and offered teachers the opportunity to discuss their virtual education needs. A total of 170 teachers and informal educators from 13 Alaska cities and villages, six other states, the District of Columbia, and Australia attended the workshops.

We look forward to returning to in-person workshops in the future, but our virtual workshops have been a success!

This has been a phenomenal presentation. Thank you.

My students love otters and are always asking questions.

Looking forward to doing some otter learning with my class and will definitely recommend this training to others!

—Comments from participating teachers

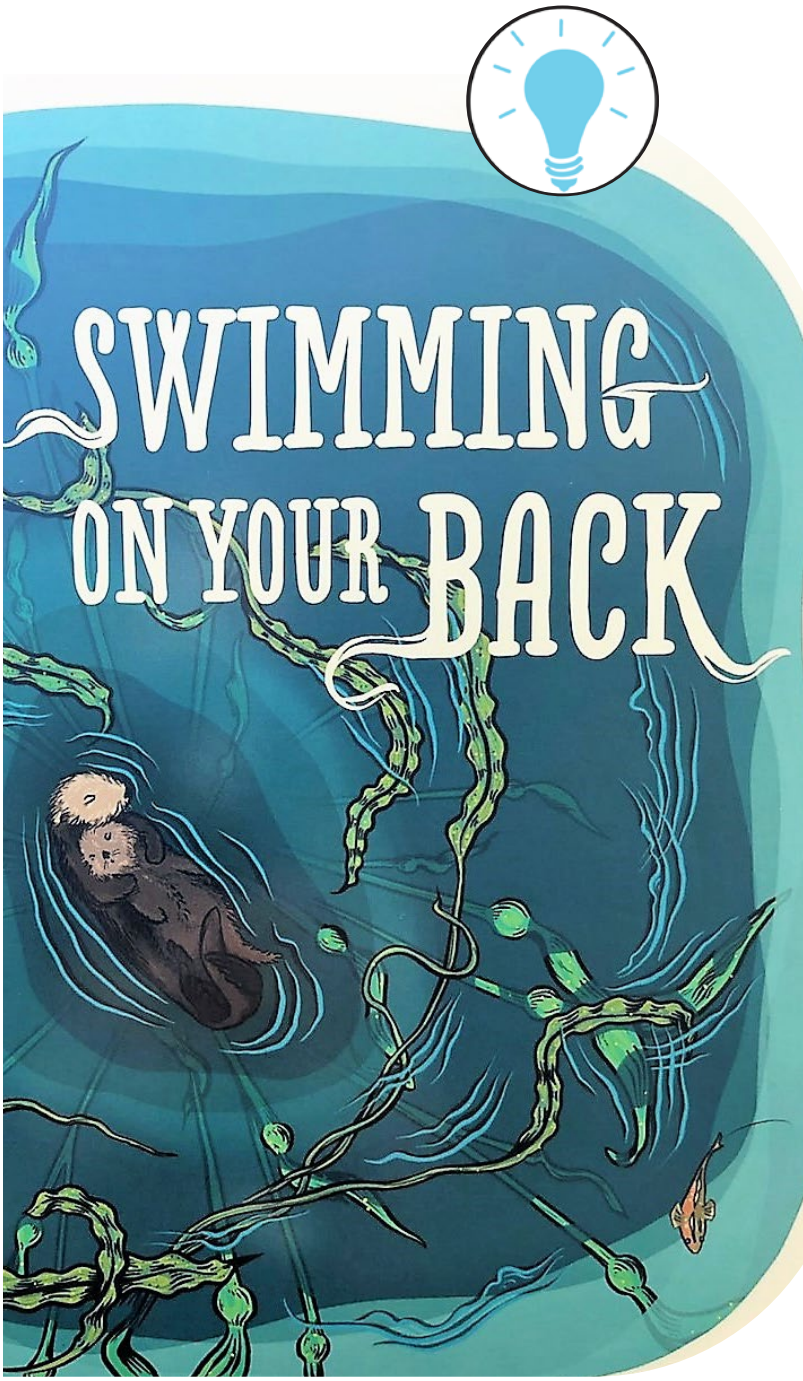
Hybrid learning with *Swimming on Your Back*

When learning in Alaska went virtual during the COVID-19 pandemic, Jim Pfeiffenberger, OASLC's Education Coordinator, sprung to action. Recognizing the diverse needs of students that may be learning in a classroom or at home, and with or without an internet connection, Pfeiffenberger developed new, portable educational materials that were accessible in a variety of formats.

The result was *Swimming on Your Back*, a K-4 educational package focused on the natural history and ecology of sea otters. Formats include a hard copy book with engaging illustrations and scientifically accurate content, song lyrics and recordings so the book can be used as a sing-along, coloring sheets, and additional background information about sea otters. To date, the OASLC has distributed nearly 400 copies of *Swimming on Your Back* to teachers and educators throughout the state.

Jim received the 2021 regional Freeman Tilden Award for *Swimming on Your Back*. The Freeman Tilden Award recognizes excellence, achievement, and innovation in interpretation, education, and visitor engagement by a National Park Service employee.

Swimming on Your Back was so successful that we've decided to produce a second book in the series for 2022. Stay tuned for updates!



Jim has done tremendous work over his career and this is very well-deserved recognition. It also really highlights Jim's ability to create fun, engaging learning tools that work all over Alaska and adapt to the virtual classroom students and teachers were thrown into during the last year.

—Jeff Mow, Acting Regional Director

Professional Pathways

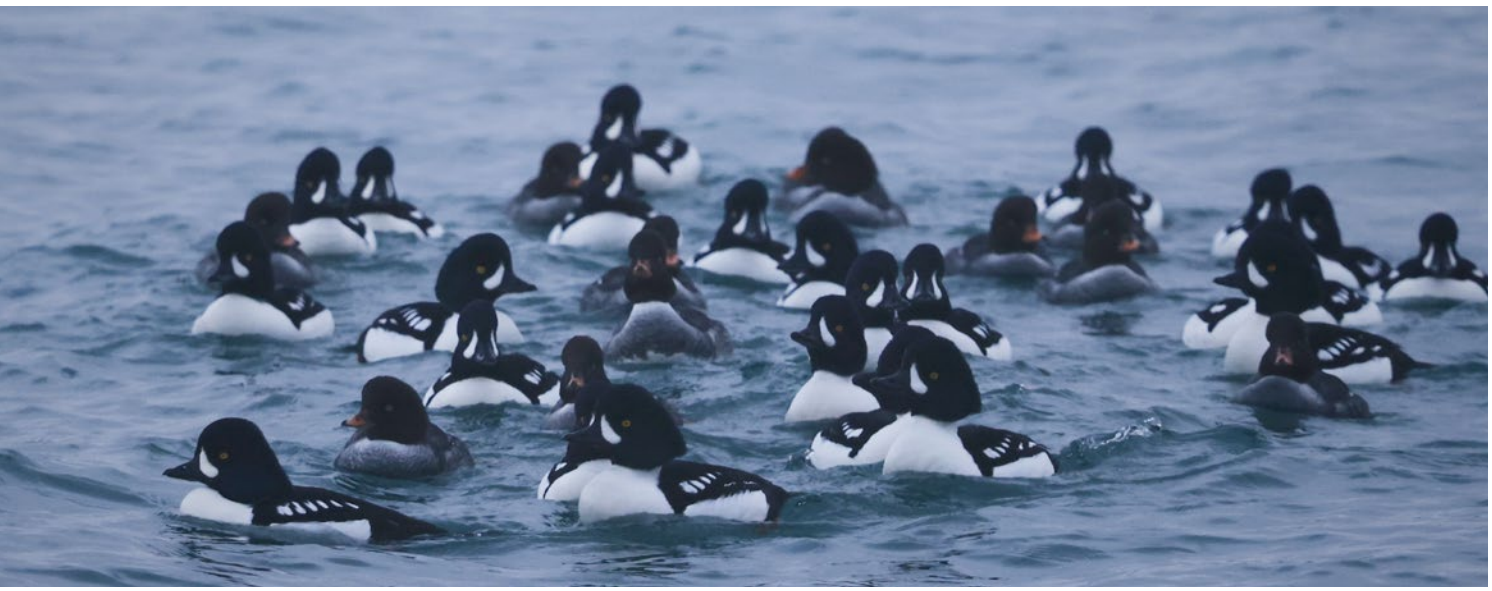
SeeBird: Fostering the next generation of stewards

During recent years, changing marine conditions have been linked to unprecedented seabird die-offs in Alaska. Understanding the causes and scope of these die-offs has become a critical scientific and management question in Alaska's coastal national parks.

In 2018, scientists at the Alaska SeaLife Center (ASLC) began partnering with students at Seward High School to monitor seabird populations. Throughout the school year, students work with ASLC scientists and mentors to collect weekly data on seabirds, weather, and water quality. At the end of the year, they analyze, interpret, and present their findings.

The program is called SeeBird and its goal is two-fold: to engage students in real-world science to support seabird conservation in and around Kenai Fjords National Park.

For Seward's students, SeeBird is more than just a break from the classroom—it's a transformative experience. The students learn fundamental skills of biology: how to observe nature, collect data based on observation and measurement, and distill meaning. They also learn valuable communication skills, like how to present their work in front of their community and have a dialogue with their audience about that work.



Barrow's goldeneyes, Kenai Fjords National Park.
NPS/JIM PFEIFFENBERGER

With the support of an OASLC grant, SeeBird continues to offer students this experience in 2021 and 2022. SeeBird's principal investigator, Dr. Tuula Hollmen (ASLC/University of Alaska Fairbanks), is currently writing a paper incorporating student monitoring data with monthly and annual data collected by the ASLC and NPS Southwest Alaska Inventory & Monitoring Network, respectively. She's also working on a paper describing the benefits and lessons learned from the project and is developing mapping tools with park staff to visualize seabird hotspots and die-offs. She hopes SeeBird can be a template for other communities seeking to engage students in real-world science.

Two Seward High School students collect and record water quality data during a weekly SeeBird monitoring field trip.
NPS/JIM PFEIFFENBERGER

Management

Tackling marine debris in Kenai Fjords National Park

Picture a remote, coastal beach in an Alaska wilderness surrounded by high mountains, glaciers, and vast coastal plains. Does your picture contain man-made materials or trash?

It probably doesn't. But should it?

Up to 20 million tons of plastic ends up in the world's ocean each year. Plastic and other refuse (including rubber, netting, rope, Styrofoam, and metal) intentionally or accidentally discarded in the ocean is known as *marine debris*. Ocean currents and storm surges can transport marine debris hundreds of miles and wash it ashore and even on the most remote coastlines. Marine debris harms sea mammals and birds when they ingest, become entangled in, or are strangled by it.

Since 2009, Kenai Fjords National Park staff, volunteers, and partners have removed 38,000 pounds of marine debris from its approximately 400 miles of coastline. This year, park and OASLC staff partnered with two neighboring landowners—Port Graham Corporation and the Alaska Maritime National Wildlife Refuge (NWR)—to clean trash from catcher beaches in and around Kenai Fjords National Park.

Over the course of a week, the team removed nearly 4,000 pounds of debris from six beaches in the park and neighboring Port Graham Corporation and Alaska Maritime NWR lands. Their collaborative effort builds on more than ten years of coastal cleanups in the park and lays the foundation for coastal stewardship for many years to come.

Partnering with park interpretation staff to spread the word about marine debris. Through a grant provided by the National Oceanic and Atmospheric Adminisstration, the OASLC is coordinating the installation of a new marine debris mural at the park's visitor center! The mural will be on prominent display in front of the visitor center and is part of a larger educational exhibit aimed at engaging visitors in understanding the impacts of marine debris in—and beyond—our coastal parks.

OASLC staff, park staff, and volunteers scoured the coast to collect marine debris.
NPS/BENJAMIN PISTER

Research

Through a biennial funding call, OASLC supports innovative and timely coastal and marine research projects that reflect a diversity of science, traditions, and Alaska Native knowledge. In 2020, we awarded over $300,000 to three new projects for fiscal years 2021-2022. The projects span a range of topics including seabird population dynamics (see Professional Pathways section), sea otter reoccupation (see below), and threatened archaeological resources (see Partnerships section). The projects address cross-cutting issues and strategic knowledge gaps throughout Alaska's coastal parks.

Understanding a keystone quandary

Sea otters are a well-documented keystone species in nearshore ecosystems of the north Pacific Ocean. Once hunted to near extinction in the region, sea otters are now slowly recolonizing much of their former range. They've rebounded in several bays neighboring Lake Clark National Park and Preserve, but they haven't recolonized the park's coastline… at least not yet.

NPS staff filter, wash, and measure razor clams on Lake Clark's coast. NPS/DAN YOUNG

How would sea otters' return to Lake Clark reshape the park's nearshore ecosystems? Heather Coletti, coastal ecologist with the Southwest Alaska Inventory & Monitoring Network, is starting to answer this question with the support of OASLC funding. This summer, she began collecting baseline data on sea otters (there aren't many in the park yet!), razor clams (sea otters love to eat them and they have flourished in the otters' absence), and black and brown bears (that appear to be taking advantage of the abundant, easy-to-access clam beds as a food source).

The project builds on Coletti's ongoing "Changing Tides" project in Katmai National Park and Preserve, where sea otters have recently begun to reoccupy the coast. Here, Coletti's team has found decreasing razor clam populations and brown bears that are "prey-switching" (e.g., starting to rely more on sedges than clams) as razor clams become less abundant. But this response may be more nuanced in Lake Clark, because of the extensive soft-sediment habitat, ideal for clam beds, and abundant brown bears and black bears.

By collecting these baseline data now—before the sea otters return—Coletti hopes to help managers at Lake Clark National Park and Preserve decide how to best provide recreational, subsistence, and commercial opportunities, while minimizing impacts to natural resources, in the future. "Think about the 1989 Exxon Valdez oil spill," she says. "We didn't really know what [natural resources] we had before the spill. But wouldn't it have been nice if we had?"

A scientist holds a razor clam sampled this summer on Lake Clark's coast.
NPS/DAN YOUNG

A sea otter eats a bivalve harvested from the intertidal zone.
NPS/JIM PFEIFFENBERGER

Learning

Changing climate, changing access for Arctic Indigenous harvesters

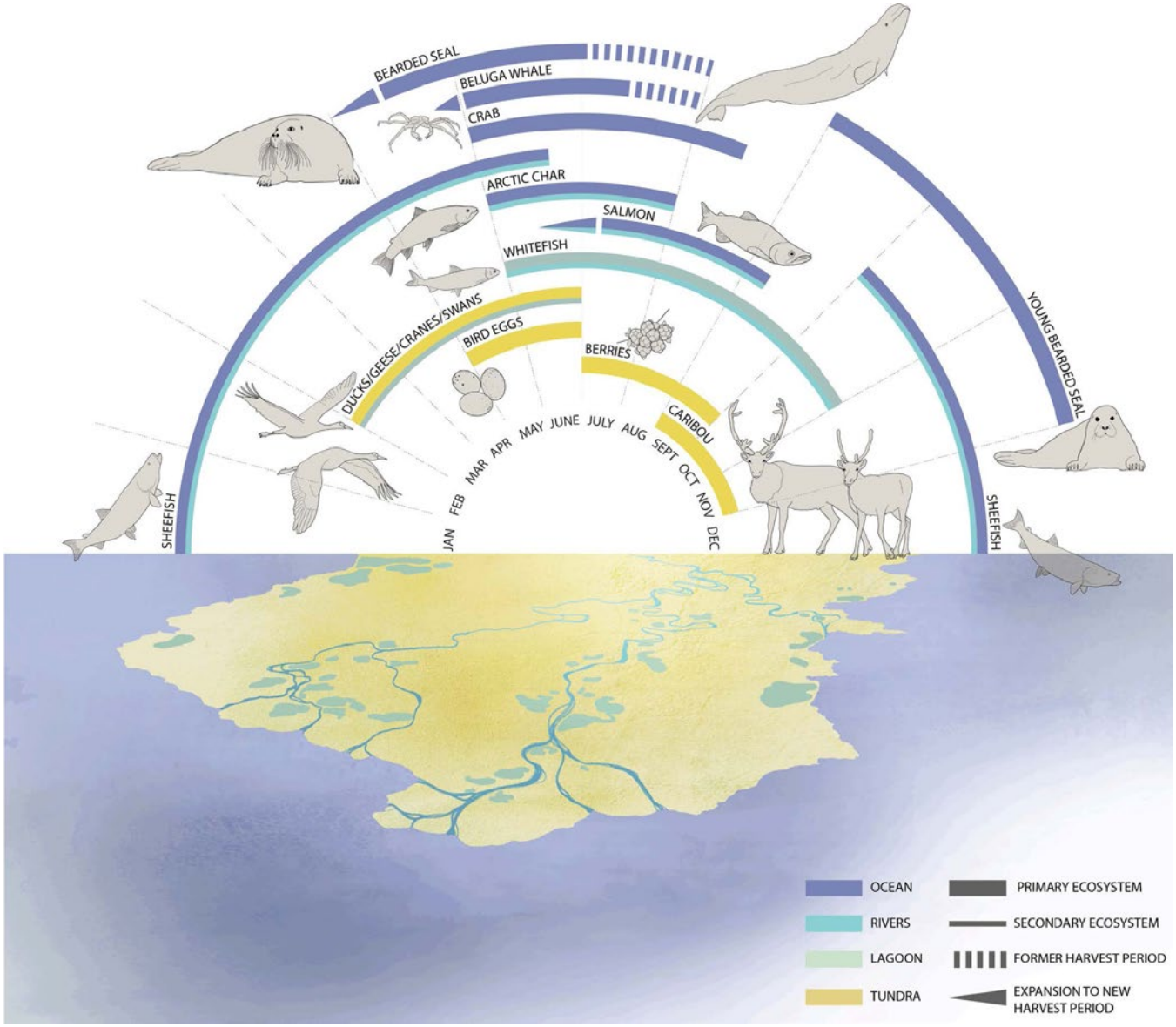
How is climate change impacting Indigenous communities' access to subsistence coastal resources in and around Western Arctic National Parklands? Recently published research supported by an OASLC grant examines this question.

The paper, written by Stanford University PhD candidate Kristen Green and colleagues, highlights how changes in sea ice, coastal erosion, weather patterns, and snow cover are altering access to coastal subsistence resources for northwest Alaska Iñupiat communities. Sea ice retreat, for example, has shifted the window of harvest opportunity for bearded seal, beluga whale, and chum salmon—important for subsistence and cultural uses—two to three weeks earlier.

The research also discusses mechanisms that mediate changes in access and availability. For example, the use of boats will be increasingly important as sea ice retreats and the open-water boating season lengthens. The sharing of knowledge among community members of how to harvest safely and efficiently in changing weather conditions will also help maintain access despite climate stressors, as will the continued practice of sharing harvested food among family and friends.

The researchers collaborated with harvesters in Kotzebue and Kivalina to learn how climate change is affecting access to harvesting areas and how harvesters are responding. Harvesters described several factors as key to resilience of Alaska Native food systems, including maintaining a diverse portfolio of harvested species, adaptation to changing harvest conditions, and reliance on social networks for sharing of food. But they also highlighted ways that communities are exploring alternatives to harvest, including growing a seasonal vegetable garden or relying more on store-bought foods, both of which would require additional capital, knowledge, skills, and time.

Read the full paper and watch *Respect the Land (Kamaksriłiq Nunam Irrusianik)*, a video supported by OASLC funding that highlights this project.



By understanding these impacts and potential adaptations to climate change, Western Arctic National Parklands can also adapt their policies, programs, and support mechanisms to help ensure food sovereignty and resilience in Indigenous Arctic communities.

The window of harvest opportunity for bearded seal, beluga whale, and chum salmon has shifted two to three weeks earlier. ILLUSTRATION COURTESY OF CECIL HOWELL

More 2021 Highlights

The OASLC invested significant time and funds into our strategic planning effort this year and we're pleased to announce that we're on the home stretch of finalizing a new five-year plan. A big shoutout to our board of directors and the Denver Service Center for all their hard work on this effort!

We added two "long-view" resource briefs to raise awareness on the intimate connections between humans and the ocean, how the ocean supports us, and how our actions affect it. Follow these links to read our Ocean Literacy Principles and World Oceans Day resource briefs.

We provided project funding to Mike Loso (Physical Scientist at Wrangell-St. Elias National Park & Preserve) to develop 3-D models of the Tyndall Glacier for a new interpretive panel to help visitors understand how glaciers change over time.

A model of Tyndall Glacier.
NPS/MIKE LOSO

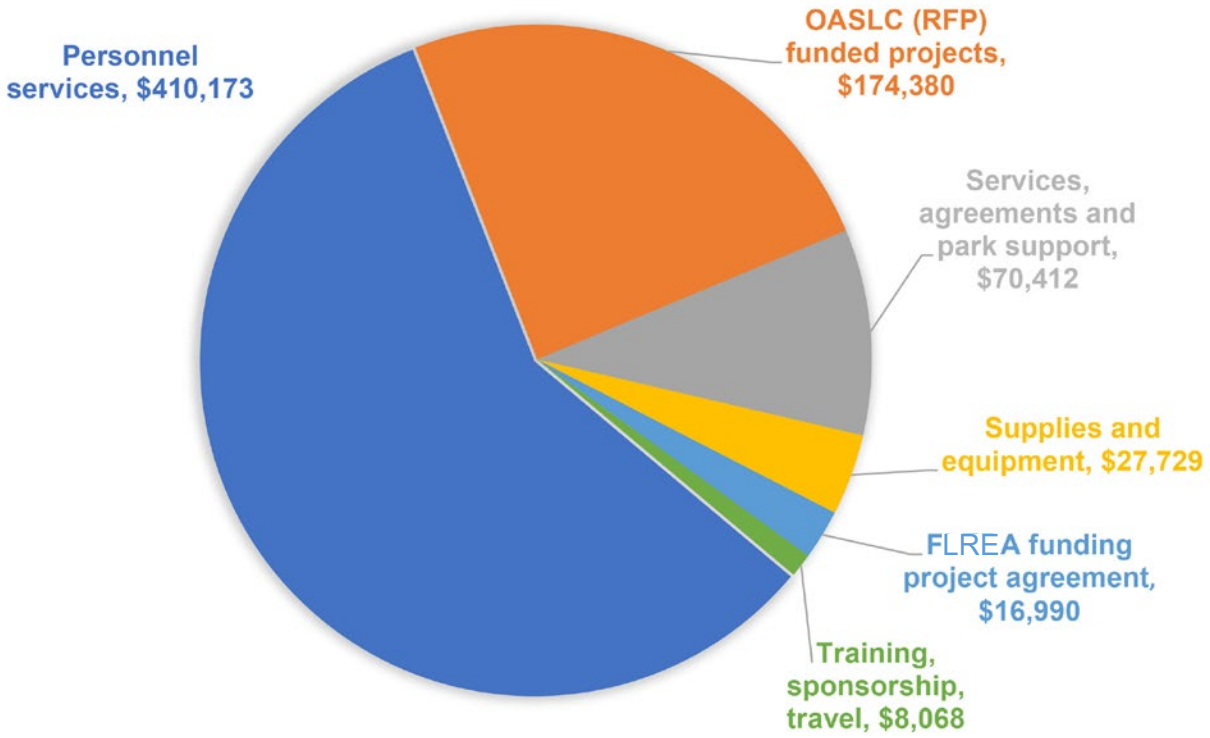
***Ocean Growth* by Leesa Murph was awarded Best in Show.**

This year, we partnered with the University of Alaska Fairbanks to host a virtual Ocean Connections Art Show, part of the Alaska regional National Ocean Sciences Bowl. High school students from across Alaska submitted their ocean-themed artwork to a Facebook-based exhibit for voting. The award ceremony, which was also virtual, increased attendance and access to the event.

Deanna Ochs retired in August after serving as OASLC's science communicator from 2017 to 2021. Deanna drew on her interpretative background to tell engaging stories of scientists and their work through different media. Throughout her 24-year career in interpretation with the NPS, Deanna's passion, creativity, and ability to bring natural and cultural resources to life connected people to parks on a deep and visceral level.

This winter, Alix Pfennigwerth joins the OASLC as acting science communicator. She comes to us from Great Smoky Mountains National Park with ten years of experience in research, monitoring, and science communication. Alix is currently working on a marine primer for Katmai's interpretation staff, writing articles about OASLC-funded projects, and highlighting marine science and conservation through social media.

FY21 By the Numbers



Category	Amount
Personnel services	$410,173
OASLC (RFP) funded projects	$174,380
Agreements and park education program support	$35,877
Services	$34,535
Supplies	$20,288
FLREA funding project agreement	$16,990
Equipment	$7,441
Training	$5,738
Sponsorships	$1,500
Travel	$830
TOTAL	**$707,752**

Ocean Alaska Science Learning Center
Kenai Fjords National Park
Seward, Alaska

December 2021

FY21 Projects Receiving Direct OASLC Support

Project	Benefiting Park(s)*	Amount
NPS Floating Teacher Workshop (Prince William Sound / Alaska Geographic / OASLC)	All coastal parks	$14,750
NOAA Marine Debris Exhibit Support	KEFJ	$1,580
Education and Distance Learning Programming Support to NPS Sites	WEAR, GLBA, FAPLIC, WRST, KEFJ, BELA, KLGO, SITK	$15,547
Kachemak Bay National Estuarine Research Reserve (KBNERR) Education Program Support	N/A	$2,000
SeeBird: High school citizen scientists monitor seabirds**	KEFJ	$28,425
Where the land meets the sea: A case study of bear use of intertidal invertebrates during a period of sea otter recovery**	LACL, KATM	$59,330
Determination of significance of threatened coastal archeological sites**	BELA	$77,725
Understanding the Changing Kennicott Glacier Through an Interpretive Panel**	WRST	$8,000
TOTAL		**$207,357**

**BELA: Bering Land Bridge National Preserve, FAPLIC: Fairbanks Alaska Public Lands Information Center, GLBA: Glacier Bay National Park & Preserve, KATM: Katmai National Park & Preserve, KEFJ: Kenai Fjords National Park, KLGO: Klondike Gold Rush National Historic Park, LACL: Lake Clark National Park & Preserve, SITK: Sitka National Historic Park, WEAR: Western Arctic National Parklands, WRST: Wrangell-St. Elias National Park & Preserve.*

***Project funded through biennial OASLC Request for Proposals (RFP).*

Ocean Alaska Science Learning Center
Kenai Fjords National Park
Seward, Alaska

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