

Ocean Alaska Science and Learning Center

National Park Service
U.S. Department of the Interior



NPS/Jim Pfeiffenberger

Ocean Alaska Science and Learning Center

Three-Year Report and Accomplishments October 1, 2018 - September 30, 2020



The Ocean Alaska Science and Learning Center promotes stewardship of the marine-influenced ecosystems of Alaska's coastal national parks, through education and research.

Executive Summary and Highlights

Dynamic! If we wanted to encapsulate the most recent years of work, including Fiscal Year 2020 into one word, the best fit might be “dynamic.”

This edition of the Ocean Alaska Science and Learning Center report reflects the work covered during the fiscal years of 2018 – 2020. Of note, this report is written to capture three years, including the highly dynamic and COVID-19 impacted fiscal year 2020. It seemed reasonable to complete a three-year report as opposed to a two-year report for a few reasons.

First, COVID-19 changed everything in Fiscal Year 2020. For the most part it halted critical work, required a reevaluation of project approach and timelines, and afforded everyone a hard stop to assess how work will be approached as the National Park Service, Alaska and the world emerge from the current pandemic.

That being the case, it seemed reasonable to include Fiscal Year 2020 in this report, in order to capture the year’s outcomes and allow the organization to have a new baseline to start from in the coming year. Why would that be important you might ask—because the coming year isn’t just another year!

The OASLC is completing a remarkable milestone—twenty years of service to science, education, outreach and Alaska coastal parks.

Thus, we would like to use this report to highlight some of the transformative work the OASLC has completed, while setting the stage for the future. A future that will include updating the organization’s strategic plan, aligning that plan with the emerging Pacific and Arctic Oceans Strategy, and forging connections to the United Nations Decade of Ocean Science for Sustainable Development efforts scheduled for launch in 2021 and continuing through 2030.



Former OASLC Director Benjamin Pister discusses intertidal invertebrates during the 2019 Floating Teacher Workshop. NPS Photo

These reasons alone may seem like enough explanation for the format of this report. Yet, there is one more reason for giving this report some extra emphasis at this time and that

is, we know how important it is to say, “Thank You!”

The OASLC would like to take this opportunity to offer a very special thank you and recognition to Benjamin Pister who has served as the OASLC Director since 2012.

Benjamin has helped guide the OASLC over the years, has served in a leadership role, provided subject matter expertise, assisted in the field and has supported Alaska coastal parks in innumerable ways. As this year also marks a transition in leadership, it is only fitting to offer up a sincere thank you for Benjamin’s stewardship--from invertebrates to coastal bears, from the icy slopes of tidewater glaciers to the fjords they fill, and to the opportunities provided for interns who have found their way into meaningful careers as well as the attributes of Alaska coastal parks that are now more understood and protected than before—thank you, Benjamin, for your service. It has not gone unnoticed.

Sincerely,
Shauna Potocky
Acting Director
Ocean Alaska Science and
Learning Center

Goal 1: Increase marine science literacy of NPS personnel and partners in order to communicate marine science to the public.

NPS Photo

Objective 1-1: Support NPS and partner capacity to educate the public about marine science.

Five-year target: All Alaska coastal parks recognize OASLC as a major source of marine science information.



Resource Briefs -

Resource Briefs and web articles were written primarily for the general public, park managers and other natural resource personnel. These are 1-2 page documents that summarize a research project or resource-based issue such as seabird die-offs. They were created in cooperation with regional and park-level resource managers, researchers and interpretation staff, as well as input from outside agencies. Benefitting parks are indicated in parentheses.

- [Monitoring a Changing Bay](#) (GLBA)
- [Harmful Algal Toxins in Alaska's Seabirds and Marine Mammals](#) (BELA, CAKR, KATM, KEFJ, GLBA, LACL, WRST)
- [Microplastics](#) (ANIA, BELA, CAKR, GLBA, KATM, KEFJ, KLGO, LACL, SITK, WRST)
- [The Day it Rained Rocks](#) (WRST)
- [Keeping a Finger on the Pulse of Coastal Birds](#) (KEFJ)
- [GLBA Harbor Seal Research Highlights 2019](#) (GLBA)
- [Nearshore Ecosystem Response to Deglaciation Study](#) (KEFJ)
- [Arctic Marine Mammal Vulnerability Study](#) (WEAR)
- [Monitoring a Shrinking Glacier](#) (KEFJ)
- [Ocean Contaminants](#) (SITK)
- Fish of Sitka Sound (To be posted by SITK)
- Coastal Birds (To be posted by (SITK)
- [A Link Between Cultures - Mary Forgal Lowell](#) (KEFJ)
- Tales from the Tides - [For Birds' Sakes](#) (KATM, KEFJ)
- Tales from the Tides - [Beach Bummers](#) (KEFJ)
- [When the Birding Gets Tough](#) (KATM, KEFJ)



An NPS Wildlife Biologist records wildlife sightings during the 2018 Winter Marine Bird and Mammal Survey.
NPS Photo/D. Kurtz

Other Written Media

OASLC Staff contributed to multiple regional and national newsletters, both on-line and in print. Submissions highlight a broad range of completed and ongoing marine and coastal research projects in Alaska's coastal national parks. Examples are listed below.

- High Latitude Highlights - Marine Debris (GLBA)
- High Latitude Highlights - Qatnut Trade Fair (WEAR)
- High Latitude Highlights - Coordinated Effort Helps Document Bird Die-offs (BELA, CAKR)
- High Latitude Highlights - 2019 Floating Teacher Workshop
- High Latitude Highlights - Monitoring Glacier Bay Harbor Seals (GLBA)
- High Latitude Highlights - Village Outreach: Building Awareness of Coastal Resources (WEAR, KEFJ, KATM, LACL, WRST)
- Annual Service-wide RLC Newsletter - 2015 Taan Fiord Landslide and Tsunami (WRST)
- DOI Quarterly: Newswave - Are Loons Losing their Arctic Breeding Habitat? (WEAR)
- NANA Alaska Native Corporation Newsletter: Qatnut Trade Fair (WEAR)
- Coast Newsletter: Changing Tides video release, Winter Marine Bird Survey, Floating Teacher Workshop
- AK2Day articles: Multiple submissions, including "Seeking Silver" Video release, Changing Tides: The Ocean Connection video release, June Marine Debris trip
- Inside NPS: "Habitat Suitability for Juvenile Pacific Herring, "Seeking Silver" Video, "Changing Tides: The Ocean Connection" video

Social Media

OASLC Staff dramatically expanded its outreach efforts via various social media campaigns including Facebook and Twitter. Posts were created for individual coastal parks in Alaska, as well as for the Alaska Regional pages.

- Regular posts on AK Regional Facebook page: <https://www.facebook.com/AlaskaNPS/>
- Bird die-off series of 5 posts
- Winter Bird Survey series of 6 posts for KATM website
- Series of FB 16 posts highlighting coastal resources for KATM
- Series of FB 7 posts highlighting Nearshore Monitoring for KEFJ
- Series of FB 7 posts highlighting Nearshore Monitoring for KATM
- Multiple posts for LACL highlighting coastal bear work
- Regular FB posts for KEFJ highlighting coastal resources including "Wildlife Wednesdays."
- Series of posts about Winter Bird Survey for KEFJ Science Saturday page
- Series of posts about Glacier Bay missing whales for GLBA
- Series of Science Saturday posts for KEFJ
- Juvenile Pacific Herring project for CAKR
- Series of Twitter posts on a variety of marine resource topics including World Oceans Day, Toxic Algae, humpback whale populations, ocean role in cure for Covid for AK Regional Twitter Page



Inupiat dancers perform a traditional dance at the Qatnut Trade Fair in Kotzebue.
Photo credit: NPS/D. Ochs

Reports:

Three-year Report layout and design; 2019 Bibliography of Marine-Science Papers; Bibliography of OASLC-Funded projects

Alaska SeaLife Center Marine Science Interns

For several years the OASLC has funded three to four marine science interns that are recruited and trained by the Alaska SeaLife Center. The interns spend roughly half their time on tour boats in conjunction with park rangers with the goal of discussing science conducted at the Alaska SeaLife Center with park visitors. The rest of their time they spend at the Alaska SeaLife Center discussing park resources with the visitors there. Costs primarily cover expenses and salaries of Alaska SeaLife Center staff to manage the interns, and are obligated through a CESU agreement.

Gulf Watch Alaska

Most of the outreach products the OASLC has created in support of the marine vital signs for the SWAN I&M program are also used by the Gulf Watch Alaska partnership, including some of the resource briefs above and the ideas mentioned under Objective 1-2. They can be found on the Gulf Watch Alaska website: <http://www.gulfwatchalaska.org/resources/resources-photo-gallery/>

Gulf Watch Alaska consists of 27 principal investigators from several agencies, including NPS, USGS, NOAA, ASLC, UAF and the Prince William Sound Science Center.

Seasonal Training

The OASLC continued to offer training sessions for seasonal staff aimed at increasing their understanding of current marine issues and research taking place in Alaska's coastal parks.

In 2018, the following sessions were presented:

- Ocean Issues-KEFJ, LACL, APLIC
- Motorboat Operator Certification Course – KEFJ

In 2019, the following sessions were presented:
Ocean Issues - LACL, APLIC, KEFJ

The OASLC also produced a [video summary](#) of Ocean Issues from 2019 Alaska Marine Science Symposium.



Images, left to right, top row: NPS Ranger and ASLC intern Anabel onboard the Star of the Northwest, Photo A. Roeder; Intern Anna feeds a giant pacific octopus at the ASLC, Photo A. McNabb. Middle row: An ASLC intern leading a kid's activity onboard the Star of the Northwest, NPS Photo/ D. Highsmith; Bottom row: 2019 ASLC marine science interns Anabel, Evan, and Anna, Photo A. McNabb; NPS Ranger and intern working together onboard the Star of the Northwest – NPS Photo / D. Stanko

Objective 1-2: Develop interpretation and education (I&E) products about marine science with a focus on effective products relevant to multiple parks.

Five-year Target: All Alaska coastal parks are using marine science material provided by OASLC in I&E materials, products and programs.

Videos

Over the last three years, the OASLC has both produced and supported the production of multiple videos addressing resources around the region. OASLC-produced videos include:

Short videos for social media release:

- [Bear/sedge meadow](#), LACL
- [Tlikakila River video highlighting anniversary of Wild and Scenic Rivers act](#), LACL
- [Five short coastal glacier videos](#), KEFJ
- [Valley of Ten Thousand Smokes Timelapse video](#), KATM

Longer Videos

- [Changing Tides: The Ocean Connection](#)
- [Floating Teacher Workshop](#) (shown at AK Forum 2018)
- [Evaluating Nearshore Ecosystems of Lower Cook Inlet](#): BOEM/NPS Study (shown at AK Forum 2019)

Provided footage and imagery for the following projects:

- Storymap on Seabird Dieoffs
- [Arctic Lagoon research video](#)
- ARCN Murre Dieoff video

In addition to directly producing videos, OASLC funding, internships, and staff provided support for the following videos:

- [TAAN Fjord Mega Tsunami](#)
- [Arctic Lagoons](#)
- [Respect the Land](#)
- “Changing Tides” episode for German television show “Kielings Wild World.” The broadcast reached over 5 million viewers in Germany and France in March and April of 2019

In addition, the OASLC coordinated the delivery of 12 short videos from around the region to KTOO TV’s 360 North station in Juneau for statewide broadcast. These videos have been featured in over 200 broadcasts on the channel continue to receive repeated play. Benefitting parks: BELA, WRST, WEAR, LACL, KEFJ.

The OASLC also put significant effort into bringing video products produced in the last five years into compliance with accessibility standards by producing audio-described versions. This included 15 longer videos benefitting KEFJ, GLBA, KATM and LACL, as well as 12 short videos benefitting KEFJ.



Document Field/Research Projects

In addition to work completed by the media interns described below, Education Coordinator Jim Pfeiffenberger provided extensive photo documentation of the following research projects:

- Extensive photo documentation of BOEM/NPS Nearshore project in Lower Cook Inlet
- Photo documentation of winter bird survey work in KATM and KEFJ
- Photo documentation of Marine Debris work in KEFJ



Researchers head to a transect during the 2019 Marine Bird and Mammal Survey in KEFJ
NPS Photo/Deanna Ochs

NPS Media Internships

The OASLC sponsored three media interns in 2018 (KLGO, KATM and OASLC) and four in 2019 (WEAR, BELA, WRST, and OASLC). The interns produced videos on subjects such as seabird die-offs in the arctic, lagoon ecology in Bering Land Bridge, the traditional trade fair in Kotzebue, the teacher workshop in Kenai Fjords, invasive species at KLGO, and ongoing field work with bears and seabirds in Katmai. They also provided photo documentation of several research projects and park events.

They cost roughly \$10,000 for 12 weeks, through an SCA agreement, and represent some excellent value for the quality of the work. The OASLC recruits and pays for interns at parks who request them and can provide housing space (at OASLC expense) and local supervision. Benefitting parks: WEAR, KLGO, WRST, BELA, KATM, KEFJ.

FY18 Cost: \$27,415.00 (3 interns)

FY19 Cost: \$48,620.00 (4 interns)



Renata Harrison, KLGO 2018



Riley McAvoy, KEFJ 2019



Alisa Chen, WEAR 2019



Savannah Glasscock, BELA 2019

Objective 1-3: Provide information and support park education specialists in educating school students about marine science.

Five-year Target: Transition from OASLC providing direct instruction to students in classrooms, to providing marine science literacy and techniques to park education specialists to implement instruction.

- Developed “Marine Primer” resource documents aimed at Education Specialists and Interpreters for LACL, WRST, and BELA
- Developed program for school delivery introducing marine resources for LACL, WRST and BELA
- Developed program for school delivery on coastal resources and climate change for WRST
- Developed program for school delivery on lagoon ecosystems for BELA
- Initiated work on Marine Primer for KATM

Teacher Workshops

June 2018 – Field-based Floating Teacher Workshop in Kenai Fjords in conjunction with SWAN Inventory and Monitoring program

October 2018 – Coastal Hazards and Ocean Literacy Workshop in Nome in conjunction with Kachemak Bay Research Reserve, Center for Alaskan Coastal Studies, Alaska SeaLife Center, and Defenders of Wildlife and Bering Strait School District

June 2019 – Second field-based Floating Teacher Workshop in Kenai Fjords in conjunction with SWAN I&M program

October 2019 – “Ocean Tech” Teacher workshop for elementary teachers in conjunction with Alaska SeaLife Center, presenters included Alutiq traditional kayak builder and carver Alfred Naumoff

January 2020 – Seabird Teacher Workshop in Nome in conjunction with COASST Program, BELA, and Bering Strait School District



National Ocean Science Bowl

The [National Ocean Science Bowl](#) (NOSB) is an academic competition that engages high school students in ocean science, prepares them for ocean science-related and other STEM careers, and helps create knowledgeable citizens and environmental stewards.

The [Tsunami Bowl](#) is the regional round of NOSB for Alaska, held in Seward each February. Each year the OASLC sponsors the Tsunami Bowl and participates in the event as judges. Our money has been used for prizes and other aspects of running the event.

FY18 Cost = \$1500

FY19 Cost = \$1500

FY20 Cost = \$1500 support; \$2500 student travel

Images: Participants in the 2019 Floating Teacher Workshop learn to identify intertidal invertebrates. NPS/Deanna Ochs



Students in Port Graham explore the intertidal zone during a 2019 village outreach program. NPS/Jim Pfeifferberger

Village Outreach

The 2018 - 2019 Village Outreach season was again a successful collaboration of complimentary missions and objectives between the Alaska SeaLife Center and the National Park Service. ASLC educators made outreach visits to villages in the BELA, KEFJ, GLBA, and the LACL/KATM parks area. Approximately 1,000 people were connected to this special programming from seven different schools, on five different trips across the state! The following is a summary of the project:

Bering Land Bridge National Preserve area – Educator: Laura Woodward

Visit dates: February 4 – 8, 2019
 Schools visited: Savoonga
 Savoonga School, 173 contacts

Programs:

- Scientist-in-Action: Veterinarian
- Animal Disguises
- Scoop on Poop
- Ocean Animal Perceptions
- Bioluminescence
- There and Back Again
- Watching Walrus
- Cephalopods

Nome Schools, 0 contacts

- Due to a weather delay we were not able to visit Nome schools, however did offer distance learning programs.

Glacier Bay National Park area – Educator: Laura Woodward

Visit dates: March 11 – 15, 2019
 Schools visited: Gustavus, Haines, and Klukwan
 Gustavus, 107 contacts

Programs:

- There and Back Again
- Cephalopods
- Bioluminescence
- The Scoop on Poop
- Beaks, Bubbles, and Burrows

Haines, 250 contacts

Programs:

- Ocean Animal Perceptions
- Beaks, Bubbles, and Burrows
- Scientist-in-Action: Veterinarian
- Cephalopods
- Bioluminescence
- Marine Mammal Adaptations

Klukwan, 19 contacts

Programs:

- Marine Mammal Adaptations
- Cephalopods
- Ocean Animal Perceptions

Bering Land Bridge NP – Educator: Laura Woodward

Visit dates: April 10 – 12, 2019
 Schools visited: Shishmaref school for Inupiaq days,
 204 contacts

Programs:

- Marine Mammal Adaptations
- Watching Walrus

Lake and Peninsula – Educator: Alex Havens

Visit dates: April 16 – 18, 2019
 Schools visited: Newhalen (only one school was physically visited. However, since we visited the school during their SNAP week when all the secondary students come together, we were able to contact all middle and high school aged students in the district)

SNAP Program, 144 contacts

Program: Cephalopods

Newhalen School, 46 contacts

Programs:

- Bioluminescence
- Marine Mammal Adaptations
- Beaks, Bubbles, and Burrows

Kenai Fjords NP area – Educator: Melissa Biggs

Visit dates: April 22 - 24

Schools visited: Port Graham, 37 contacts

Programs:

- Bioluminescence
- Watching Walrus
- Marine Mammal Adaptations

As this five-year agreement comes to completion we are all able to reflect on the fantastic partnership between the National Park Service and the Alaska SeaLife Center's Education department. On average, this work has led to education and outreach in approximately nine schools per year with contacts to over 5,800 people from all over the state.

School administrators and teachers often express their gratitude for these learning opportunities for their students and the interactions we have with the locals and our audiences demonstrate the importance of the conservation work we are doing and how all of us play a role in the successful management of our precious natural resources. Educators at the Alaska SeaLife Center often comment that village trips are some of the highlights of their year and getting to work with the National Park Service is always a great learning opportunity.

Virtual Field Trip Development

With the emergence of COVID-19 and the immediate impact to schools and students, there was a rapid shift to virtual learning opportunities. In light of the long-term effect the pandemic will have on schools and learning opportunities, as well as a necessary shift in project funding in Fiscal Year '20, the OASLC had the opportunity to reengage with the Kachemak Bay Research Reserve in Homer (KBRR) and provide support for the development of a Virtual Field Trip. Currently

in the pilot stage, the Virtual Field Trip is a combination of hands-on experiential learning combined with an education program delivered through a distance learning platform. How is the hands-on element delivered? By mail! Each student / participant receives a package filled with wrapped mystery items that are then used throughout the education program and activities. These items require engagement with the senses and foster inquiry and discovery. The OASLC is very excited to support this innovative approach to hands-on learning during this unique and challenging time for education and program delivery.



Discovery Labs

Discovery Labs are hands-on science based activities focused on a central theme and presented to the public or school children. They are designed by the Kachemak Bay Research Reserve in Homer (KBRR). In 2017, the OASLC sponsored a Discovery Lab on the Changing Tides Project in collaboration with the Kachemak Bay Research Reserve. The lab was developed with assistance from OASLC Education Coordinator Jim Pfeiffenberger. In August 2017 the lab was presented to the public on four separate days by KBNERR at the Islands

and Oceans Visitor Center in Homer, leading to 322 visitor contacts.

During November 2017 the program was offered to Homer school groups in grades 4-6 at Islands and Oceans and served 215 student contacts.

In May 2018 a scaled down traveling version was taken to the following villages by KBNERR staff and the OASLC Ed Coordinator:

Naknek:

12 students in the 9th & 10th grades

25 students in the 6th-8th grades.

14 students in the 4th & 5th grades

Kokhanok:

12 students in grades 6 - 10

Benefiting parks: LACL, KATM

Photo: A student in Naknek compares his hand size to the size of a bear paw during a 2018 village outreach program. NPS/Jim Pfeiffenberger



NPS Photo

Goal 2: Support and increase the use of marine science in park management decisions

Objective 2-1: Provide parks with, or facilitate access to, marine science information to support management and policy decisions.

Five-year Target: Every substantial decision in Alaska coastal parks regarding marine management has the best science available.

OASLC staff provided park managers and researchers access to marine research in Alaska’s coastal national parks with articles, slide and video presentations and online publications. Following is a partial list:

- Multiple High Latitude Highlights articles, incl: Marine Debris Cleanup, Qatnut Fair, OA Studies in GLBA, Village Outreach, Harbor Seal studies
- Annual RLC Newsletter: Taan Fiord Tsunami, Counting Birds, AK Youth in Denali
- Coast Website articles: Changing Tides video, Winter Marine Bird Survey, Floating Teacher Workshop

- AK2Day articles: “Seeking Silver” Video, Changing Tides: The Ocean Connection video, announcement re: “Habitat Suitability for Juvenile Pacific Herring, June Marine Debris trip, GLBA Whale research report Article on Qatnut 2019 for Alaska Native Corporation Newsletter for WEAR parks
- Inside NPS announcements: “Habitat Suitability for Juvenile Pacific Herring, “Seeking Silver” Video, “Changing Tides: The Ocean Connection” AMSS slide presentation to KEFJ staff
- AMSS video presentation for website
- Update KATM website, including creating links to park-related ocean science research projects



NPS Photo

Objective 2-2: Increase the marine science literacy of Alaska coastal park managers, to support park management.

Five-year Target: The OASLC is recognized as a source of marine science information and training to support park management decisions.

Alaska Marine Science Symposium

Each year the OASLC sponsors the Alaska Marine Science Symposium (AMSS) on behalf of the National Park Service. Sponsorship includes exhibit space during poster sessions; recognition in the printed program, website, in-program slideshows and displayed on screen during break times; and free registration for one attendee, per thousand dollars. One or two OASLC staff usually attend and the event provides the single best chance to keep abreast of the latest marine science relevant to the parks, as well as networking and partnership opportunities with the scientific community. In 2018 we summarized information from the symposium of relevance to coastal parks and presented that to park staff.

FY18 Cost = \$2,000

FY19 Cost = \$2,000

FY 20 Not funded

Goal 3: Promote and facilitate marine scientific research in Alaska's coastal parks

Objective 3-1: Support marine scientific research in coastal parks, with priority given to projects that leverage park capacity.

Five-year Target: All Alaska coastal parks recognize the OASLC as a source of support for marine science projects.

Five-year Target: Science that is supported by OASLC is used for park management.

Annual Funding Call

The OASLC committed to an annual funding call in the 2016-2020 Strategic Plan, with an emphasis on funding fewer, larger projects that address cross-cutting issues in multiple parks. The funding call evolved, beginning in FY17, with the OASLC devoting two

years of funding to projects in an effort to fund larger multi-year proposals. A secondary purpose to this change included reducing the administrative workload on OASLC staff and technical committee.

In FY20 the OASLC solicited proposals emphasizing both research as well as outreach and education. In order to assure that the OASLC is addressing both research and education, each research proposal is required to have a strong outreach or education component, which must be funded in the proposed budget. In addition, knowledgeable and capable staff must be identified. All proposals were evaluated on the merit of their proposed research project / design as well as their outreach or education component. This focus on both the research as well as the outreach element strengthens the overall communication and outcome of the project.

The OASLC is excited to announce that three projects were selected for funding in Fiscal Year 21 and 22.

They include:

Where the land meets the sea: A case study of bear use of intertidal invertebrates during a period of sea otter recovery: LACL FY21 \$89,064; FY22 \$87,950

Summary of Project: Presently there are substantial razor clam beds at LACL, that support important personal use and commercial fisheries and provide abundant prey for coastal bears. Sea otters are currently expanding their range along the LACL coast, and as they move north, razor clam densities will decrease from sea otter predation, leading to potential impacts on the harvest of razor clams. Bears may shift their diets and habitat use as razor clams decline, potentially impacting the distribution of bears and current bear viewing opportunities for visitors.

Because of the unique history of sea otter extirpation and impending reoccupation, and the presence of razor clams and bears, the LACL coast provides a unique opportunity to begin to study the cascading effects of sea otter reoccupation on the nearshore habitat and the marine/terrestrial food web connections among sea otters, bears, and humans. This project seeks to acquire baseline data prior to the establishment and growth of a sea otter population along the LACL coastline. Establishment of this baseline will improve park management abilities to assign causes of observed change.

SeeBird: High School Citizen Scientists monitor seabirds:
KEFJ FY21 \$14,689; FY22 \$17,205

The SeeBird program is a community science project in Seward, engaging high school students in a project with hands-on data collection on bird communities and their habitats. This successful environmental sciences and stewardship program was initiated as a pilot project in 2018, as a way to enhance marine bird survey data collection and science education in our community. SeeBird has resulted in fine scale data to complement data from the only year-round marine bird survey in Alaska that has been conducted in the Resurrection Bay area since 2011, and extended to a year-round survey in outer bay along the Kenai Fjords National Park coastline in 2019.

The SeeBird program has established a foundation for methods and collaborations, and is now poised to develop into a long-term partnership to foster community based science and education programs. This partnership benefits local students and community mentors with educational opportunities and insight into environmental stewardship. In addition, this project benefits researchers by providing complementary and fine-scale data that would otherwise not be feasible to obtain. Kenai Fjords National Park benefits from additional data regarding the condition of natural resources in the park and from building educational and engagement relationships within the local community. The overall goal of the proposed project is to fledge the citizen science program to its next phase, continuing observations and outreach programs over a 2-year period and solidifying a base for long-term partnership among the school, researchers, educators, Kenai Fjords National Park and its resource managers, and other engaged community members. A second long-term goal is to provide a replicable template protocol and lesson plan, that can be implemented in other interested coastal communities.

Determination of Significance of Threatened Coastal Archeological Sites: BELA and WEAR FY21 \$46,080; FY22 45,504

Previous research identified threatened archeological sites along the BELA and WEAR coast that were subject to partial or complete loss due to coastal erosion. Recent Inventory and Monitoring work has outlined areas of erosion that will be completely lost in the coming years. Without the completion of archeological assessments and data collection, the cultural history of this coastline will be lost. The goal of this

project is to better understand the significance of the highly threatened sites and refine protocols developed for threat assessment recommendations. Bering Land Bridge National Preserve (BELA) has some of the oldest documented evidence of human occupation and migration in the region. This project will collect significant information about some of the most significantly threatened sites so the park and community will have valuable information regarding these sites before they are gone. This project addresses a high park priority, specifically, threatened coastal resources and will have the potential to continue into future years and expanding to other coastal parks in Western Arctic National Parklands (WEAR).



NPS Photo

Research projects supported

Developing Standards of Care for Cruise Tourism in the Bering Strait Region

Initially funded in FY16, this project partnered with the Wildlife Conservation Society to develop a voluntary Standards of Care for cruise ship operation in Arctic waterways. The guidelines have been developed with industry stakeholders through the Arctic Waterways Safety Committee. This ensures Arctic cruise practices will be consistent with protecting NPS resources and values that may be impacted by air and water pollution, oil spills, invasive species, disturbance to marine mammals and seabirds, and subsistence users. The OASLC continued to support this project in FY20 with science communication and technical assistance.

Parks: CAKR, NOAT, BELA

Products to Date/Highlights:

The project schedule was pushed back a year due to the length of time needed to get an agreement with WCS signed. The Arctic Waterways Safety Committee endorsed the effort in March 2017. Leveraged resources included \$89,593 in non-federal funds.

Assessing the Influence of Cruise Ships on Harbor Seal Activity Budgets in Wrangell-St. Elias National Park and Preserve, Alaska

Initially funded in FY16, this project uses satellite tagged harbor seals in Disenchantment Bay to examine the impacts of cruise ships on harbor seal activity budgets (e.g. how much time they spend in the water). OASLC funds were used to purchase the proper number of tags after the price increased between when the original SCC project was funded and the funding was received (four years).

Parks: WRST

Products to Date/Highlights:

- Tags were deployed in June of 2016 and tracked some surprisingly far ranging seal pups.
- Outreach efforts included presentations to the Yakutat Tlingit Tribe, Yakutat City Council, Yakutat schools, and the public in Yakutat.
- Field work for this project continued through FY18 with subsequent highlights to be updated here.
- Leveraged funds included \$373,044 from PMIS Project #196384. Substantial in-kind support was also contributed by the National Marine Mammal Laboratory in both personnel and vessel time. In-kind support was also provided by WRST park staff.

Changing Tides: A Virtual Field Trip

Initially funded in FY17, this project seeks to create an online curriculum-based outreach tool that will focus on research conducted along the KATM and LACL coasts. A draft of the virtual field trip was presented to October of 2017. During FY20 the project was on hold and has been subsequently extended for one more year in order to reach completion.

Parks: KATM and LACL

Paleo- Sea Level and Glacier Extent as Related to Human Occupation of the Outer Coast of Glacier Bay National Park and Preserve (\$36,070 in FY18)

This project is attempting to untangle the timing of glaciation, sea level change, and tectonic uplift to determine when the Northwest Coast Route (along the outer coast of Glacier Bay) may have been passable by humans migrating from Alaska to the rest of the Americas. Originally a different project was funded through the OASLC funding call. However, when the principal investigator abruptly resigned the project fell apart. This ongoing project had been funded by CRAC using SCC funds (PMIS#154137), but was not slated to be funded again until FY19. We deemed it a suitable replacement since it had been peer reviewed at the regional level, fit the OASLC funding call requirements, and was a similar dollar amount.

Parks: GLBA

Products to Date/Highlights:

- Work funded with OASLC dollars commenced in the summer of 2017.
- This work is anticipated to significantly inform future archaeological work in the region with peer reviewed manuscripts as part of the project outcomes.
- Additional outreach includes a video, multiple conference presentations, and several public talks including in Hoonah to tribal members there.

Near-term biological consequences of ocean acidification in the Arctic coastal parks (\$38,500 in FY18)

This project attempts to document community composition of plankton in arctic lagoons; look for structural anomalies over time due to acidification; document changes in size structure within the plankton community over time; and develop outreach focused on a key but out-of-site component of a food web supporting subsistence.

Parks: CAKR, BELA

Products to Date/Highlights:

- The total cost of this project is estimated at \$290,000 of which OASLC contributed \$95,000 for a single piece of equipment called a FlowCam, and the software to run it.
- The FlowCam was purchased in August of 2017.
- The FlowCam can be used for other projects around the region

Climate change impacts on access to coastal resources by subsistence harvesters in Arctic National Parks: Implications for NPS management (\$35,330 in FY18)

This project takes a sociological approach to documenting changes in access to subsistence resources due to climate change and attempts to reconcile the perceptions of NPS staff, the public, NPS policies and a changing environment. Coastal sites in both BELA and CAKR will be ranked according to their historical and contemporary importance and the vulnerability of access to them from climate change.

Parks: CAKR, BELA

Products to Date/Highlights:

- OASLC funds were combined with approximately \$173,00 from other sources and additional in-kind support.
- OASLC funds were not used to conduct interviews of non-NPS staff to avoid a lengthy OMB approval process (leveraged funds were).
- Literature searches and background information gathering commenced in summer 2017.
- Multiple trips to Kotzebue and Sisaulik with dozens of interviews conducted, including 9 with NPS staff
- Outreach efforts includes a growing collection of images and video, a broadcast about the project on public radio in Kotzebue in June 2017, and an oral presentation at AMSS in 2018 and forthcoming publications and presentations.

Observing climate change in Bering Land Bridge National Preserve and Klondike Gold Rush National Historical Park (\$30,112 in FY18)

This project is using oral histories from two different parks to highlight changes due to climate change on resources and the cultural impacts of those changes.



Spectacled eider USFWS/L. Whitehouse

The end result will be a project hosted on the Project Jukebox website of UAF, and will allow viewers to draw comparisons between two distinct regions of Alaska.

Parks: BELA, KLGO

Products to Date/Highlights:

- UAF staff has met with reps from both parks to kick-off the project
- The group is working on a document to expand on the climate change themes to be pursued
- UAF staff has been assigned for each location and trip planning as early as fall 2017 is underway
- Finished products will include (among others): an educational based product, entitled, 'Observing Climate Change in Alaska's National Parks Project Jukebox' which will become part of the Project Jukebox suite hosted by the UAF (www.jukebox.uaf.edu)
- A journal publication on unique ways to engage youth in climate change education will be written and submitted to an open source peer reviewed journal through the National Science Teachers Association
- Two lesson plans designed to further engage audiences in exploring how climate change is affecting two distinct coastal regions of Alaska.

Citizen Science for cluing into the health of Alaska's coastal parks: Engaging local communities in tracking seabird mortality (FY19 \$53,557.00)

In recent years the North Pacific and Arctic coastlines of the US have witnessed six seabird mass mortality events with three occurring in Alaska. These events have been evident in at least five of Alaska's coastal parks, including the largest of these events. Part of the NPS mission is to increasing public awareness regarding the status of park resources as well as create ways for meaningful engagement in order to steward these resources. The Coastal Observation and Seabird Survey Team (COASST) and participating local communities of Alaska have been key in documenting recent die-offs; however baseline data for most of the state is still needed. Through this project, COASST is able to further engage resident communities in documenting mass seabird mortality events. This project

provides important support for tracking, detailing and educating the public regarding such events and creates structured opportunities for information sharing between key organizations and the community.

Bringing the outside in: Using controlled studies to inform results from coastal monitoring in National Parks (FY19 \$48,876.00; FY20 \$48,875.50)

During 2015 and 2016, field studies were conducted to assess the health of Pacific razor clam (*Siliqua patula*) and bay mussel (*Mytilus trossulus*) populations at intertidal sites in KATM and LACL using a combined approach of biomarkers and gene transcription. Both species play important roles in nearshore ecosystems of these parks and as prey for both marine and terrestrial animals. A variety of mussel species have been shown to be very effective in environmental monitoring and a large body of data is available upon which to build studies specific to the Alaska bay mussel. This project uses a combined approach, of biomarkers and gene transcription, to evaluate physiological responses of bay mussels and razor clams to selected stressors under controlled conditions.

Using stress and stable isotope signatures to infer environmental conditions linked to the unprecedented die-off of Common Murres wintering in National Park waters (FY19 \$48,954; FY20 \$73,437)

The largest and longest seabird die-off event was the 2015-2016 Common Murres (*Uria aalge*) die-off in the Gulf of Alaska. All dead murres analyzed have tested negative for disease and toxins, so starvation is largely accepted as the proximate cause of death. This project seeks to identify whether coastal parks contain critical overwintering habitat for Common Murres by addressing when birds encountered food limitations and identifying the colony of origin for dead birds. Understanding the colony of origin would reveal to what extent national park waters provide critical wintering habitat to murres from breeding colonies in the North Pacific and Bering Sea. These results would then inform Alaska's coastal parks on possible ways to scale up stewardship tactics to large seascape scales.

Researchers walk along the shoreline in the Lower Cook Inlet in the BOEM/NPS Nearshore Ecosystem study. NPS Photo



Technical Support/Assistance

OASLC staff time and technical support/expertise is available for research based field work or outreach, education and interpretation related projects. Below is a brief summary of how we provided this support from 2018 - 2020.

Deanna Ochs, Science Communicator, provided the following support:

- 2018: Assisted with SWAN Winter Bird Survey, KATM
- 2018: Assisted with Marine Debris beach survey and cleanup
- 2019: Assisted with SWAN Winter Bird Survey, KEFJ
- 2019: Assisted with Qatnut Trade Fair, WEAR
- 2019: Assisted with Marine Debris beach survey and cleanup
- 2020: Assisted with outreach planning for the following research proposals: Understanding the Terrestrial-Marine Connection of Foraging Bats; Marine Terrestrial Connectivity by Foraging Black Bears

Jim Pfeifferberger, Education Coordinator, provided the following support:

- 2018 and 2019: Conducted marine debris surveys in KEFJ
- 2019: Assisted with SWAN Winter Bird Survey, KEFJ
- 2019: Provided logistical and planning support to COASST program for Teacher Workshop in Nome
- 2020: Served on invitation review committee for Exxon Valdez Oil Spill Trustee Council Request for Proposals
- 2020: Assisted in planning of Marine Debris exhibit at BELA
- 2020: Provided input into the Kachemak Bay National Estuarine Research Reserve Coastal Science and Information: Market Analysis and Needs Assessment

Shauna Potocky, Acting Director, provided the following support:

- 2020: In collaboration with the University of Alaska Fairbanks, Shauna provided guidance focused on various ways to reestablish the National Science Bowl art and science exhibit in order to reach beyond the students who are able to directly participate in the team competition.
- 2020: Provided input into the Kachemak Bay National Estuarine Research Reserve Coastal Science and Information: Market Analysis and Needs Assessment.



Assisting with the 2018 Marine Debris Survey in KEFJ. NPS/Deanna Ochs



NPS Photo

Objective 3-2: Through beneficial partnerships with academia and other research entities, increase marine science research important to parks.

Five-year Target: All Alaska coastal parks will utilize assistance by the OASLC to increase capacity and partnership as a means to conduct marine scientific research to address park needs.

Peer-Reviewed Publications

The following is a partial list of research papers relevant to marine and coastal areas of Alaska's national park units funded by the OASLC. For the purpose of brevity we have included only those papers authored, entirely or in part, by NPS researchers.

Counihan, K.L., L. Bowen, B. Ballachey, H. Coletti, T. Hollmen, B. Pister, and T.L. Wilson. 2019. Physiological and gene transcription assays to assess responses of mussels to environmental changes. PeerJ Marine Environmental Research, PeerJ 7:e7800. <https://doi.org/10.7717/peerj.7800>

The goal of this study was to develop and test a monitoring strategy for nearshore marine ecosystems in remote areas that are not readily accessible for sampling.

Hilderbrand, G.V., D.D. Gustine, K. Joly, B. Mangipane, W. Leacock, M.D. Cameron, M.S. Sorum, L.S. Mangipane, J.A. Erlenbach. 2019. Influence of maternal body size, condition, and age on recruitment of four brown bear populations. Ursus, 29:2. <https://doi.org/10.2192/URSUS-D-18-00008.1>

In this study, authors investigated the relationship between maternal body size, body condition, and age and recruitment of dependent offspring in four Alaska brown bear populations using logistic regression.

Konar, B., T.J. Mitchell, K. Iken, H. Coletti, T. Dean, D. Esler, M. Lindeberg, B. Pister, and B. Weitzman. 2019. Wasting disease and static environmental variables drive sea star assemblages in the Northern Gulf of Alaska. Journal of Experimental Marine Biology and Ecology 520:151209. <https://doi.org/10.1016/j.jembe.2019.151209>

In this paper, researchers examine spatial and temporal patterns in sea star assemblages across regions in the northern Gulf of Alaska and assess the role of static environmental variables in influencing sea star assemblage structure before and after decline.

Piatt, J.F., J.K. Parrish, H.M. Renner, S. Schoen, T. Jones, K. Kuletz, B. Bodenstern, M. Arimitsu, M. Garcia-Reyes, R. Duerr, R. Corcoran, R. Kaler, G. McChesney, R. Golightly, H. Coletti, R. M. Suryan, H. Burgess, J. Lindsey, K. Lindquist, P. Warzybok, J. Jahncke, J. Roletto, W. Sydeman. Accepted. Mass mortality and chronic reproductive failure of common murrelets during and after the 2014-2016 northeast Pacific marine heatwave. *PLOS One*.

In this report authors hypothesize that bottom-up and top-down forces created an “ectothermic vise” on forage species resulting in mass mortality of murrelets and many other fish, bird and mammal species in the region during 2014-2017.

Ramey A.M., C.A. Cleveland, G.V. Hilderbrand, K. Joly, D.D. Gustine, B. Mangipane, W.B. Leacock, A.P. Crupi, D.E. Hill, J.P. Dubey, M.J. Yabsley. 2019. Exposure of Alaska brown bears (*Ursus arctos*) to bacterial, viral, and parasitic agents varies spatiotemporally and may be influenced by age. *Journal of Wildlife Diseases* 55:3. <https://doi.org/10.7589/2018-07-173>

For this study, authors collected blood and serum from 155 brown bears (*Ursus arctos*) in five locations in Alaska and tested samples for evidence of exposure to a suite of bacterial, viral, and parasitic agents.

Dufresne, A., M. Geertsema, D.H. Shugar, M. Koppes, B. Higman, P.J. Haeussler, C. Stark, J.G. Venditti, D. Bonno, C. Larsen, S.P.S. Gulick, N. McCall, M. Walton, M.G. Loso, M.J. Willis. 2018. Sedimentology and geomorphology of a large tsunamigenic landslide, Taan Fiord, Alaska. *Sedimentary Geology* 364, 302–318. <https://doi.org/10.1016/j.sedgeo.2017.10.004>

In this study, researchers investigate the massive 17 October 2015 landslide in Taan Fiord, Alaska.

Higman B, D.H. Shugar, C.P. Stark, G. Ekström, M.N. Koppes, P. Lynett, A. Dufre, P.J. Haeussler, M. Geertsema, S. Gulick, A. Mattox, J.G. Venditti, M.A.L. Walton, N. McCall, E. Mckittrick, B. MacInnes, E.L. Bilderback, H. Tang, M.J. Willis, B. Richmond, R.S. Reece, C. Larsen, B. Olson, J. Capra, A. Ayca, C. Bloom, H. Williams, D. Bonno, R. Weiss, A. Keen, V. Skanavis, M. Loso. 2018. The 2015 landslide and tsunami in Taan Fiord, Alaska. *Scientific Reports* 8(1). <https://doi.org/10.1038/s41598-018-30475-w>



NPS Photo/ Jim Pfeiffenberger

Field observations documented here provide a benchmark for modeling landslide and tsunami hazards and call attention to an indirect effect of climate change that is increasing the frequency and magnitude of such natural hazards.

Hilderbrand, G.V., D.D. Gustine, B. Mangipane, K. Joly, W. Leacock, L. Mangipane, J. Erlenbach, M.S. Sorum, M.D. Cameron, J.L. Belant, T. Cambier. 2018. Plasticity in physiological condition of female brown bears across diverse ecosystems. *Polar Biology* 41:773. <https://doi.org/10.1007/s00300-017-2238-5>

In this study, authors investigated physiological plasticity in the spring body composition of adult female brown bears (*Ursus arctos*) across four diverse Alaskan ecosystems.

Goal 4: Assess and evaluate OASLC activities and adapt as necessary to achieve the Mission

Objective 4-1: Implement an annual process to evaluate if OASLC is meeting targets.

Five-year Target: Annual evaluation has occurred each year.

This report along with supporting materials serves to meet this objective.

Objective 4-2: Implement a process to evaluate the effectiveness and nimbleness of OASLC activities to reach objectives under each goal. (“Are we taking the right actions and adapting as needed?”)

Five-year Target: All OASLC activities are evaluated (at an appropriate level of detail) and adapted as necessary to achieve the objective.



NPS Photo

In FY17 an evaluation process was built into both the Teacher Workshop and the Village Outreach programs in conjunction with the Alaska SeaLife Center. Those evaluation processes are still running their course, and results will be compiled over the 2017-2018 school year.

This report and supporting materials also serve to meet this objective. Additional opportunities to address evaluation and effectiveness of OASLC activities will be revisited in the upcoming iteration of the strategic plan.

Objective 4-3: The OASLC Board operates as a forum, in consultation with the coastal park superintendents and the Technical Advisory Committee, to evaluate emerging marine resource threats and develop shared solutions.

Five-year Target: Board meets annually to address this objective and provides a report on emerging threats to the OASLC and to park staff.

The OASLC is proactively exploring ways to meaningfully address this objective both in the short and long-term. There are clear opportunities with the goals outlined in the emerging Arctic – Pacific Ocean Strategy that will create a strong nexus in the next iteration of the OASLC strategic plan, both of which will serve to address this objective in tangible ways.

Fiscal Year 2020 Summary

Due to the unexpected emergence of the coronavirus SARS-CoV-2 and COVID-19, all areas of the OASLC operation and associated projects were affected. Impacts included travel, field work, progress on projects and associated timelines. Thus, it was necessary to adjust current projects, submit modifications to agreements and adapt or delay project work. The team worked with project leads to mitigate impacts and, in some cases, completely shift work until Fiscal Year 2021.

The list of projects impacted during Fiscal Year 2020 and their current status include:

- Alaska SeaLife Center / NPS Marine Science Internship: Projects shifted to FY21.
- Climate change impacts on access to coastal resources by subsistence harvesters in Arctic national parks: attempting to complete project without final site visits.

- Changing Tides: A virtual field trip received a modification to extend the project.
- Engaging Alaska Teachers through Field-based Teacher Workshop: Project shifted to FY21.
- Connecting Teachers to Parks Professional Development Workshop: Adapted to virtual platform and delivery.
- Media Outreach Internship: Project shifted to FY21.
- Alaska Rural Village Outreach: Project will shift to virtual platform and delivery.



Former OASLC Benjamin Pister in the field. NPS Photo



OASLC Education Specialist Jim Pheiffenberger lays out a transect for the marine debris survey. NPS Photo



OASLC Education Specialist Jim Pheiffenberger and Acting Director Shauna Potocky at Aialik Glacier. NPS Photo/Shana Potocky



OASLC Science Communications Specialist Deanna Ochs poses in front of the KEFJ Visitor Center during the June 2019 Grand Re-opening ceremony. NPS Photo