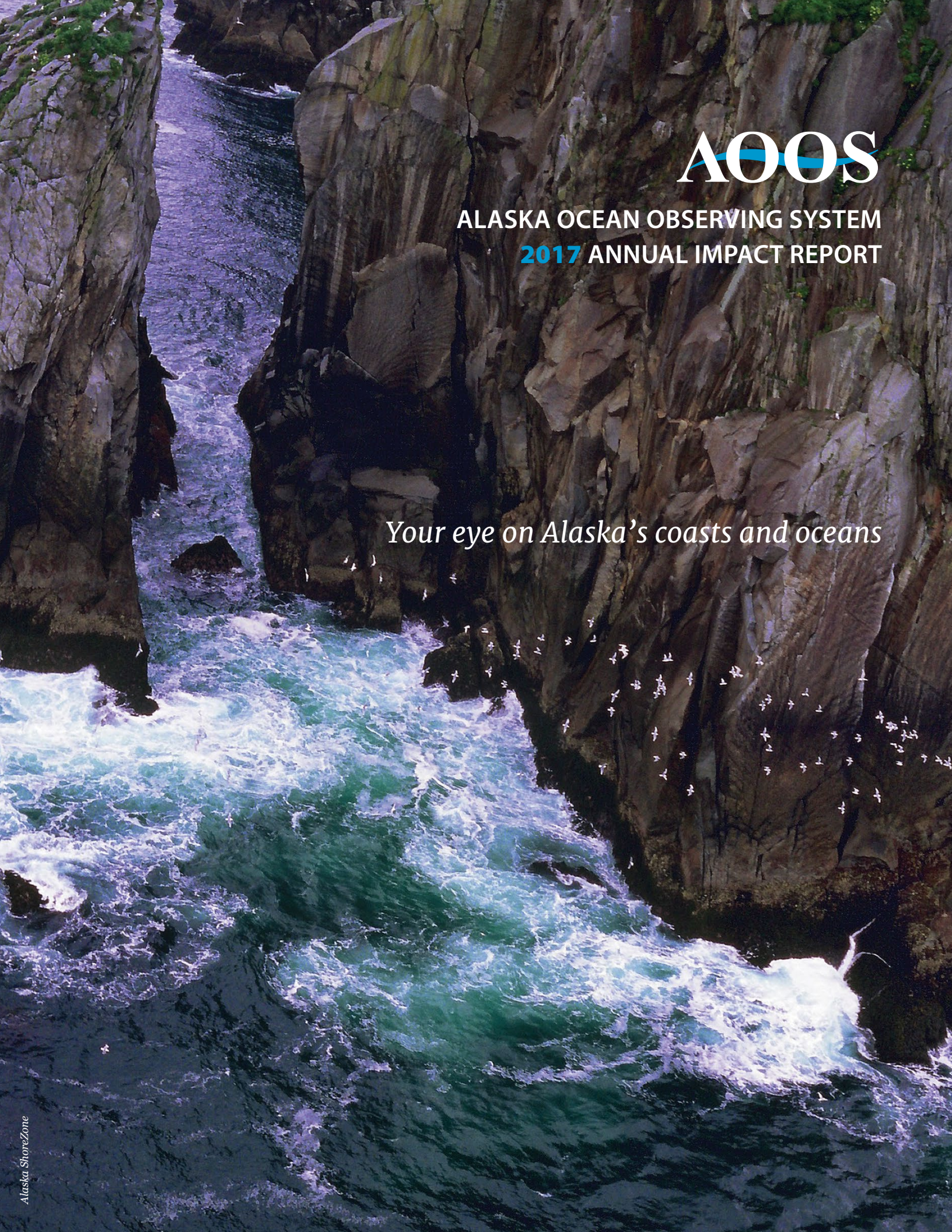


AOOS

ALASKA OCEAN OBSERVING SYSTEM
2017 ANNUAL IMPACT REPORT

Your eye on Alaska's coasts and oceans

Alaska ShoreZone

Letter from Executive Director

2017 was an exciting year for AOOS as we continue to develop new partnerships to help Alaskans meet their needs for ocean and coastal information and data products. Many of these are described in this report. Some additional highlights:

- *AOOS was officially certified as a Regional Information Coordinating Entity (RICE) in September. This means our program – and our data assembly center – meet federal standards for data gathering and management, and that we operate inclusively and transparently seeking user input to determine our priorities.*
- *To better serve our users, we had a team of experts review our newly certified data program to provide external advice on how best to position ourselves for continued excellence in the next decade. We greatly appreciated the team's review and recommendations.*
- *AOOS continues to host the Alaska Ocean Acidification Network, with active participation by new Tribal and commercial fishing working groups, and is co-leading the newly formed Alaska Harmful Algal Bloom Network.*
- *AOOS is expanding its partnership with the National Weather Service to pilot new technologies for measuring water levels that can be used in remote rural Alaska.*
- *I was asked by Alaska Governor Bill Walker to serve on his new Climate Action Leadership Team and help develop new climate actions for Alaska.*
- *The Alaska Marine Policy Forum, started by AOOS and Alaska Sea Grant more than 5 years ago, continues to attract broad participation by Alaskans across the state, as well as our congressional delegation, the governor's office, and state legislators, providing a public forum for sharing information about marine policy, budgets and legislation.*

We know we couldn't do any of this without the support of our partners who share our commitment to bringing the best science and information to Alaskans making decisions about how best to use and manage our resources.

Sincerely,

Molly McCammon

AOOS is your eye on Alaska's coasts and oceans providing a cutting edge data portal of ocean information visualizations. We bring experts from industry, research, and resource management together to identify stakeholder needs and leverage support to fill critical gaps in monitoring and observing our ocean and coast environments. Our work in Alaska increases maritime safety, promotes the economy, and safeguards our environment.

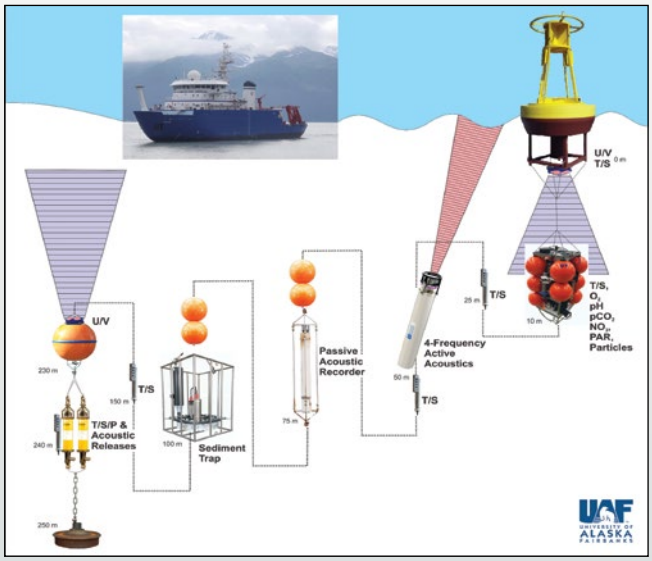
AOOS is one of 11 regional associations that comprise the regional component of the Integrated Ocean Observing System (US IOOS). IOOS is a national-regional partnership working to provide new tools and forecasts to improve safety, enhance the economy, and protect our environment.

The IOOS Association is a non-profit that supports US IOOS to provide quality and timely information about our oceans, coasts and Great Lakes. The Association works with the 11 IOOS Regional Associations and federal partners to advocate for and enhance a national network that meets the needs of marine users nationwide. AOOS Executive Director Molly McCammon serves as the IOOS Chair of the Public Policy Committee.

Supporting Key Observations

Monitoring Ecosystem Change for Fishermen

A new marine ecosystem observatory is being built in the northern Gulf of Alaska (GOA) with primary support from AOOS and the M.J. Murdock Charitable Trust. Year-round autonomous measurements (some in real-time) will include physical, biological, chemical and marine mammal datasets providing unprecedented views into the relationships between major ecosystem components and long-term change. This project will monitor changes to the shelf's nutrient and carbon cycles, and how changing wind, waves, and currents affect the regional oceanography and biology. A similar AOOS-supported observatory has operated in the Chukchi Sea since 2014.



Providing Information for Industry

Monitoring station onboard the M/V *Columbia*.

Alaska commercial shellfish growers and fishermen concerned about possible impacts of ocean acidification (OA) on their businesses are getting data from projects supported by AOOS to help plan for and adapt to these changing ocean conditions. Four shore-based stations and four offshore buoys are monitoring OA conditions in the Gulf of Alaska, Bering and Chukchi Seas. In 2017 an underway surface seawater monitoring system became operational onboard the M/V *Columbia*, Alaska Marine Highway System's largest ferry running a weekly 1,854-mile round-trip route between Bellingham, Washington and Skagway, Alaska. The ferry data collection is part of an international effort that began in 2014 to understand the variability and impact of OA along the British Columbia and Alaska coasts.

Increasing Maritime Safety

Lower Cook Inlet mariners have come to rely on a wave buoy first deployed by AOOS in the spring of 2011 with support from the Army Corps of Engineers' Coastal Data Information Program (CDIP). The buoy is a key component of AOOS' initiative to improve navigation safety in Cook Inlet to meet the needs of the inlet's many users.

A similar CDIP wave buoy, which will also measure currents, will be deployed outside the Port of Nome in summer 2018.

"This data provides every mariner, commercial, sport charter and private sport vessel operator the opportunity to determine what the sea conditions are before venturing out into these waters."

~ Captain Bob Ward of Homer

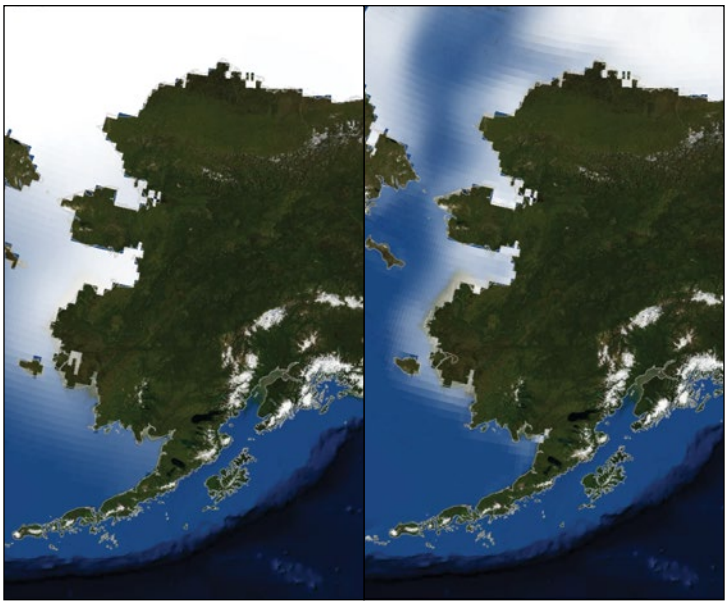
Redeployment of the Lower Cook Inlet buoy by AOOS partners.

Alaska Marine Highway System

Turning Data Into Information

Providing Information to Industry

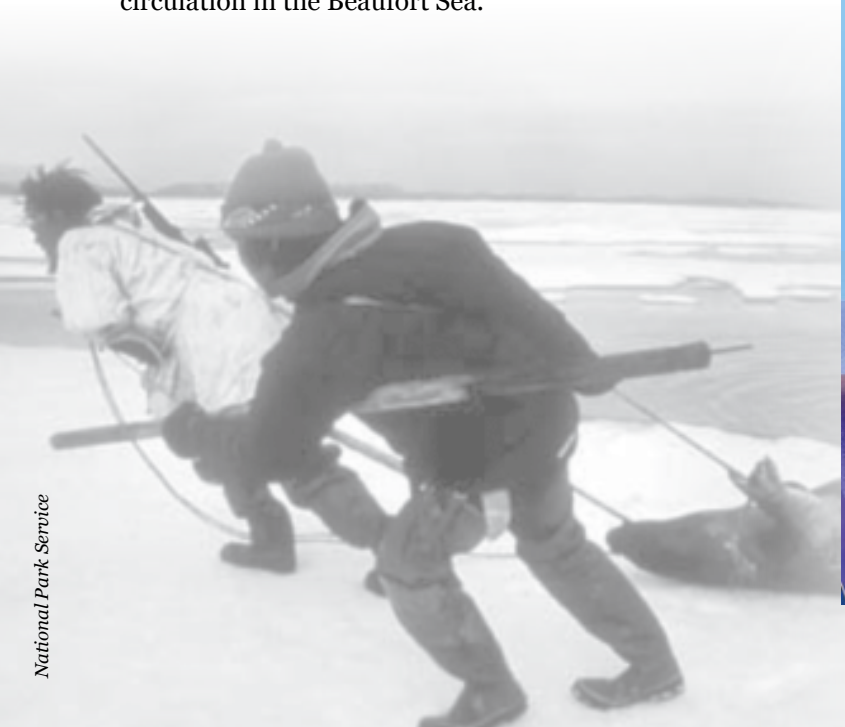
Stakeholders who work in shipping or oil and gas industries, serve with the US Coast Guard, or research Arctic ecosystems can view current and historical sea ice data off the northern coast of Alaska using the Historical Sea Ice Atlas. This project supported by AOOS shows "snapshots" of ice conditions in time based on historical shipping logs and other observations providing a 160-year trend in arctic sea ice cover and extent. The historical data are qualitative, therefore the atlas is not designed for forecasting or prediction.



The Historical Sea Ice Atlas aggregates a wide variety of sea ice observations and measurements, from whaling ship logbooks from 1850 to near real-time passive microwave satellite data in the present. Here the sea ice extent for western Alaska is illustrated for January 15, 1910 (left) and January 15, 2017 (right) showing a dramatic decrease in mid-winter sea ice extent experienced today.

Protecting Vital Marine Resources

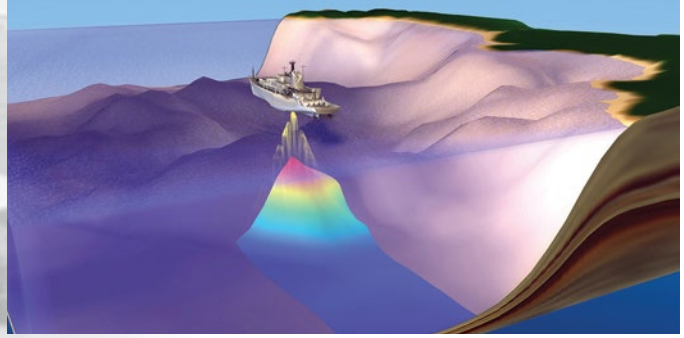
A new community impacts decision support tool is being developed by AOOS in collaboration with Axiom Data Science and Stephen R. Braund and Associates that will help local, state and federal government planning and regulatory agencies, as well as Tribes, better understand the potential impacts from offshore oil and gas operations on Alaska Native communities. The tool will use long term data sets describing subsistence use patterns, marine vessel traffic, oil spill trajectory modeling, subsistence species distribution, and ocean and coastal circulation in the Beaufort Sea.



National Park Service

Making Navigation Safer

Since resources to survey Alaska waters and update navigational charts are limited, using new tools to help prioritize where to focus these efforts will lead to safer navigation for mariners along the western and northern coasts of Alaska. Major sea floor features have caused hazardous navigation with several recent groundings due to old – and inaccurate – navigational charts. A project lead by AOOS is using historical vessel tracking information to help prioritize where modern hydrographic surveys should be made. The data products developed will be used by the NOAA Office of Coast Survey (OCS) Hydrographic Health Model to identify the critical areas for these surveys. A web-based user tool is also being developed that will allow other stakeholders to interactively work with this information for resource management, maritime safety, and route planning activities.



U.S. Navy

Fostering Collaborations

Leveraging Resources to Respond to Coastal Hazards

AOOS is working to fill water level data gaps and provide accurate real-time water level monitoring through innovative and unique collaborations with ASTRA, a private company, and UNAVCO, a private research organization. Storm surge issues are pervasive along Alaska's western coastline, yet water level information is sparse in this region. ASTRA manufactures GPS receivers used for space weather research and UNAVCO uses commercially available GPS/GNSS receivers to measure ground movements for seismic research. This same GPS technology can be used to collect high quality water level data. Through these partnerships and following testing in 2017, AOOS has three planned installations in 2018 in remote, unmonitored regions of Alaska.

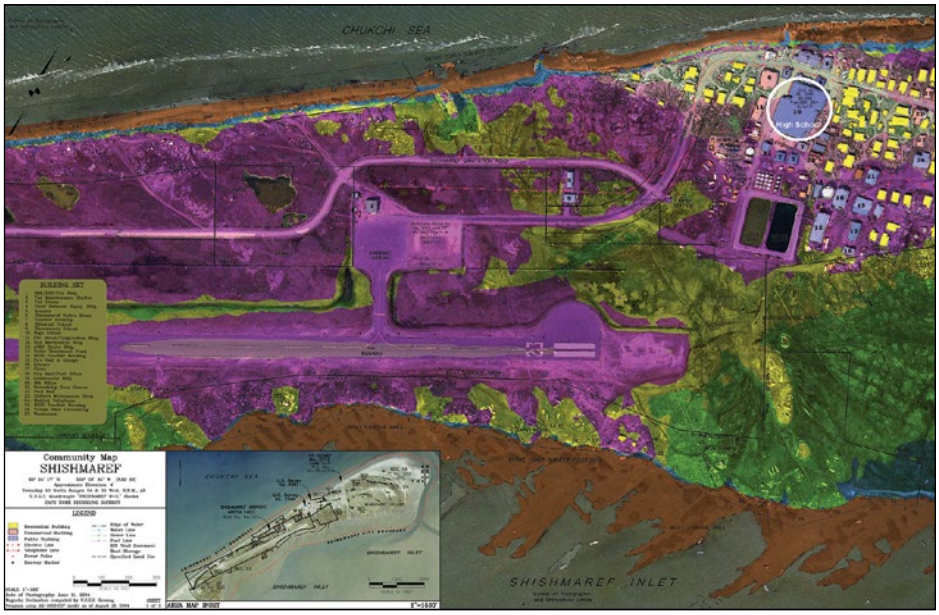
A UNAVCO GPS/GNSS installation on the Aleutian Chain.

Networking for the Environment

Alaskans now have a network of diverse coastal stakeholders addressing human and wildlife health risks from toxic algal blooms. The Alaska Harmful Algal Bloom (HAB) Network was launched in 2017 by co-facilitators AOOS and Alaska Sea Grant to provide a statewide approach to HAB awareness, research, monitoring and response in Alaska. The network's website provides visitors with information, resources and a data portal tool for recreational harvesters of shellfish that provides advisories on shellfish and phytoplankton observations in several areas of the state.

Strengthening Coastal Resiliency

Remote coastal communities in Alaska are getting color-indexed elevation maps to help them plan for coastal flood events through a project partnership between AOOS, Alaska Department of Natural Resources, and the National Weather Service - Alaska Region. This collaborative partnership was developed through the Water Levels Working Group initiated by AOOS to address the lack of water level instruments in western Alaska.



Alaska Department of Natural Resources

The color-Indexed Community Elevation Map for Shishmaref, Alaska.

AOOS by the Numbers

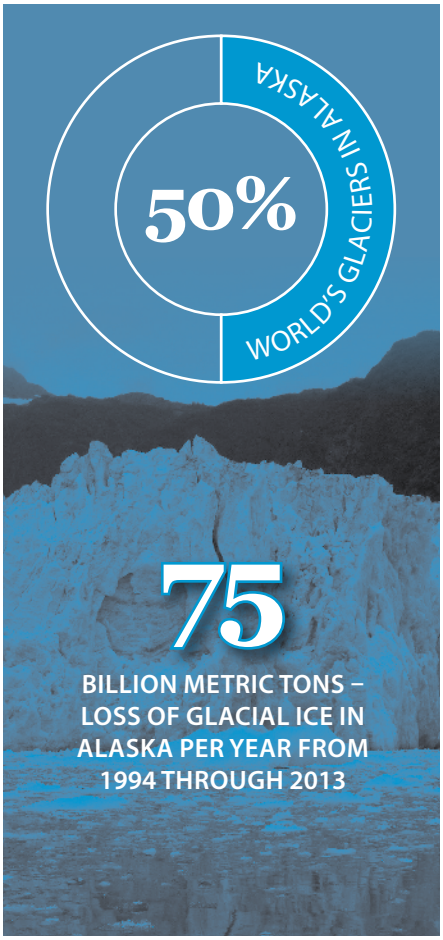
ALASKA COMMERCIAL FISHERIES LANDINGS

2.5 METRIC TONS

$1.5 BILLION

60% OF TOTAL US CATCH

1850 EARLIEST DATA ON SEA ICE OBSERVATIONS SERVED ON THE AOOS DATA PORTAL



Wiki Commons

90% MIGRATORY SHOREBIRD SPECIES IN THE WESTERN HEMISPHERE WITH BREEDING POPULATIONS IN ALASKA

44,000 MILES OF TIDAL SHORELINE IN ALASKA

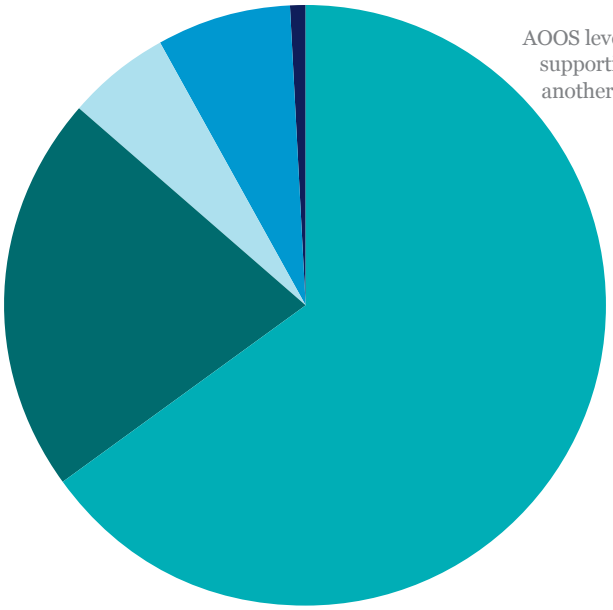
INDIGENOUS LANGUAGES SPOKEN IN ALASKA

887 NUMBER OF UNIQUE DATA LAYERS AVAILABLE FOR PUBLIC ACCESS AND DISCOVERY WITHIN THE AOOS DATA PORTAL

21,453 NEW AOOS WEBSITE USERS IN 2017

Financials

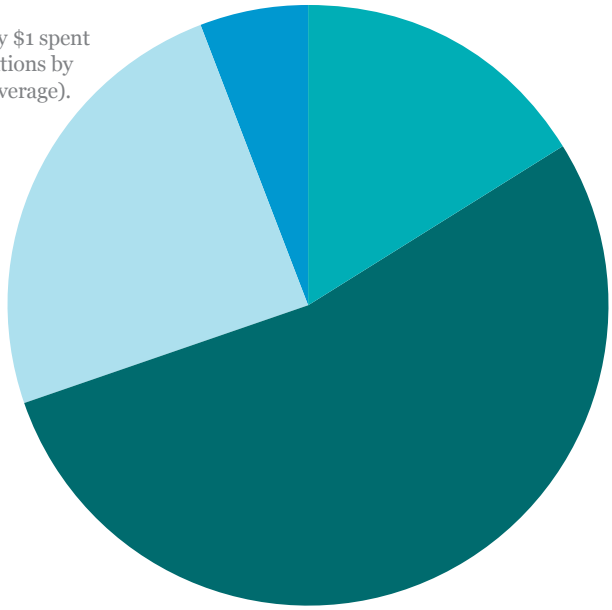
AOOS leverages every $1 spent supporting observations by another $3-4 (on average).



Income by Source

IOOS · Other NOAA and Federal · Exxon Valdez Oil Spill Trustee Council · Non-profits · Tribes and Local Government

Total: **$3,742,207**



Expenses by Subsystem

Program Management · Data Management · Observations and Modeling · Outreach, Coordination and Facilitation

AOOS Members

State Agencies
- Alaska Department of Environmental Conservation
- Alaska Department of Fish and Game
- Alaska Department of Natural Resources

Federal Agencies
- Bureau of Ocean Energy and Management
- NOAA
- U.S. Coast Guard
- U.S. Geological Survey

State/Federal Agencies
- Alaska Sea Grant

Research Entities
- Alaska SeaLife Center
- NOAA Alaska Fisheries Science Center
- North Pacific Research Board
- Prince William Sound Science Center / Oil Spill Recovery Institute
- University of Alaska
- U.S. Arctic Research Commission

Industry
- North Pacific Fishery Management Council
- Marine Exchange of Alaska
- Hilcorp Alaska

Non-Governmental Organizations
- World Wildlife Fund

Tribal
- Indigenous Peoples Council on Marine Mammals

AOOS Board Officers
- Chair: Katrina Hoffman, Prince William Sound Science Center / Oil Spill Recovery Institute
- Vice Chair: Ed Page, Marine Exchange of Alaska
- Secretary: Cheryl Rosa, U.S. Arctic Research Commission
- Treasurer: James Kendall, Bureau of Ocean Energy and Management

AOOS Staff
- Molly McCammon, Executive Director
- Carol Janzen, Director of Operations and Development
- Holly Kent, Director of Administration and Outreach
- Darcy Dugan, Director of Alaska Ocean Acidification Network

AOOS
Alaska Ocean Observing System

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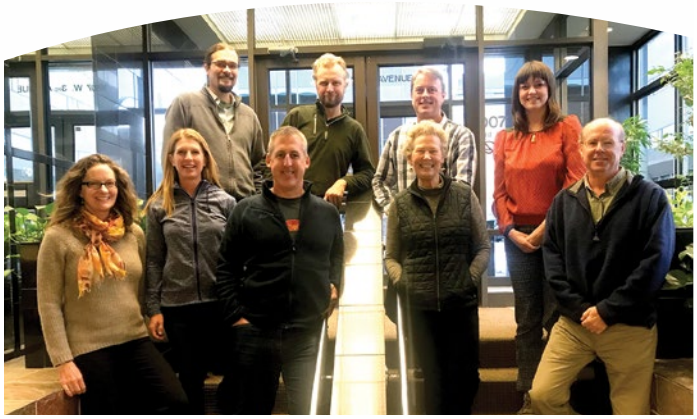
AOOS worked with the Western Alaska Landscape Conservation Cooperative to present a series of Coastal Resiliency workshops in 2017 like this one in Unalaska, Alaska.

Executive Director Molly McCammon introducing keynote speakers Lt. Governor Byron Mallott and Nainoa Thompson at the Marine Technology Society's Oceans'17 conference in Anchorage in September.

AOOS hosted a regional workshop of the U.S. Animal Telemetry Network in December to identify priorities for regional telemetry observations of aquatic species.

NOAA dignitaries, AOOS board members, and staff celebrate becoming a certified Regional Information Coordination Entity under the authority of the Integrated Coastal and Ocean Observation System Act of 2009.



AOOS convened an outside expert panel to conduct a review of the AOOS Data Management System in December. The panel concluded that "The AOOS Data System is a remarkable set of capabilities that AOOS should be proud of."

The Alaska Ocean Acidification Network shared an informational booth with the Alaska Marine Conservation Council in November at the Pacific Marine Expo in Seattle.