



**AOOS**

ALASKA OCEAN OBSERVING SYSTEM  
**2016** ANNUAL IMPACT REPORT

# Letter from Executive Director

*2016 has been an exciting year of growth and opportunity for AOOS. Other programs, agencies and marine users are increasingly turning to AOOS to help meet their needs for ocean and coastal information and data products. Many of these projects are described in this annual report. Some additional highlights:*



- *AOOS continues to facilitate workshops and presentations on Alaska marine and climate change science, with special sessions this year for Arctic Council-related audiences.*
- *AOOS was tapped to head the new Alaska Ocean Acidification Network, as well as the Water Level Observations Working Group and an ad hoc group sharing observations about “The Blob” – the anomalous warm waters experienced in the Pacific over the past 3 years.*
- *AOOS represents Alaska on three national boards related to ocean research and observing.*
- *The AOOS data team at Axiom Data Science was contracted to provide data services for the national IOOS program, other federal programs, and two additional IOOS Regional Associations in California and southeastern U.S.*

*We are deeply grateful to all our new and continuing partners who share our commitment to ensuring Alaska’s marine-dependent communities have the best information possible for making decisions and managing our resources.*

*Sincerely,*

A handwritten signature in black ink that reads "Molly McCammon". The signature is fluid and cursive.

*Molly McCammon*



AOOS helps fill key gaps in ocean and coastal observations in Alaska waters, and facilitates networks to increase monitoring and respond to emerging issues. We also provide the public with a wide variety of ocean observational data and data products through an interactive, map-based data portal on our website at [www.AOOS.org](http://www.AOOS.org), the clearinghouse for ocean and coastal data for Alaska.



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 Association Treasurer.



# Fostering Collaborations



## Alaska Ocean Acidification Network

In 2016, AOOS launched the Alaska Ocean Acidification Network which is a collaboration of scientists, resource managers, fishing industry representatives, Tribes, and others who are committed to expanding the understanding of ocean acidification processes and consequences in Alaska. The network facilitates interaction between scientists to maximize research efforts, helps connect stakeholders with researchers to answer local questions, and strategizes on how best to synthesize OA information for use by decision makers and the public.



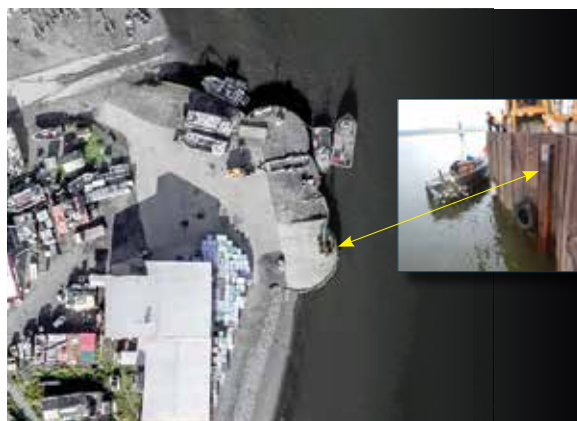
© Corey Arnold

## Water Level Observations Working Group

AOOS, the National Weather Service and a host of other partners are testing the use of low-cost sensors, land-based technologies and rapid deployment strategies to increase and improve coastal water level and inundation observations for Alaska. These efforts are the result of a working group formed by AOOS following a multi-agency workshop in 2015 that developed a set of priority observation requirements to respond to immediate emergency situations as well as longer-term planning.



A new low-cost water level sensor was installed in Bethel to produce high quality, real-time data.



A new National Water Level Observation Network (NWLON) tide station, considered the gold standard of observations, was installed at the Unalakleet city dock in July 2016.



**Rapid Deployment Inundation Platforms** such as those pictured will be deployed in coastal communities at risk for flooding from fall storms. Pressure sensors on these platforms will measure inundation levels, providing data to improve forecast models.

# Supporting Key Observations



## Shore-based Radar Stations Track Surface Currents

AOOS is part of a consortium supporting four High Frequency Radar (HFR) sites along the Chukchi and Beaufort Sea coastline. Operated by a team at the University of Alaska Fairbanks, the sites are part of the National Surface Current Mapping Data Network and represent AOOS' work to fill critical gaps in ocean observations. Surface current data are vital in developing oil spill trajectory modeling, defining areas for search and rescue operations and providing clues to ecosystem function and change.

## Vessel Tracking Stations Add Weather Observations

A collaboration between AOOS and the Marine Exchange of Alaska has funded the installation of weather sensors at 23 Automatic Identification Systems (AIS vessel tracking) receiving stations, as well as 10 additional independent weather stations, all of which are transmitting data to the AIS network. The initiative is increasing the amount and quality of real-time weather data transmitted directly to mariners transiting Alaska waters.



## Gliders Monitor Marine Mammals

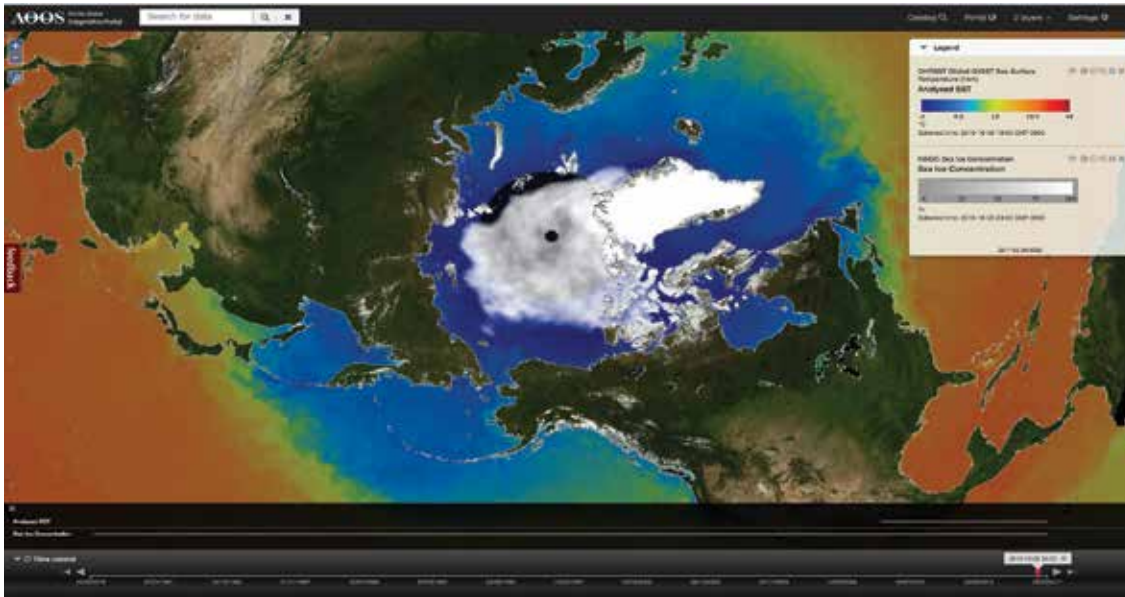
Together with the University of Alaska Fairbanks, Woods Hole Oceanographic Institute, and the University of Washington, AOOS is testing the use of a subsurface glider equipped with passive acoustic sensors to monitor marine mammals in conjunction with surrounding environmental conditions in near real-time. The glider recently operated unattended for 86 continuous days along the Bering and Chukchi Sea coastline, completing the 5th year of a long-term sustained observing initiative.



# Providing Access to Data

## AOOS Data Assembly Center is Largest in Alaska

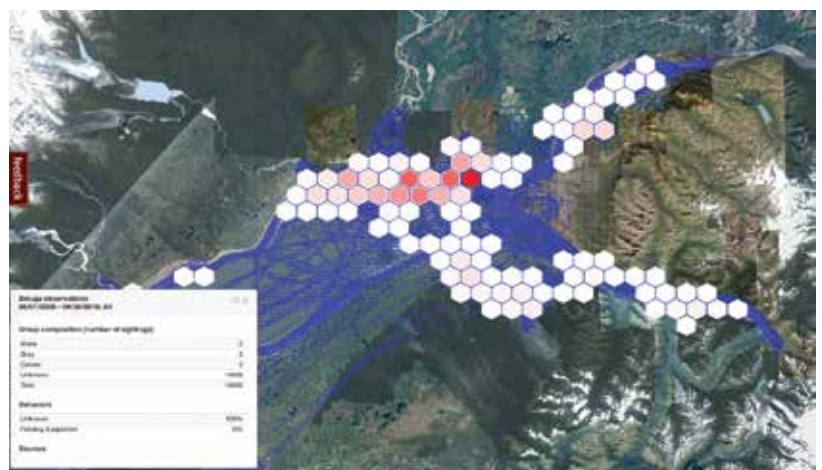
AOOS provides easy access to real-time conditions, model forecasts and a variety of other marine and coastal data. Data are presented in a state of the art interactive mapping platform enabling the user to quickly view multiple data layers and download data in multiple formats. The AOOS data team is based in Anchorage and supported by a high performance computing center in Portland, Oregon, which is home to thousands of processing cores that have the capacity to host over a petabyte of scientific data. These resources enable AOOS to provide advanced data management and analysis services for our growing user base.



Data layers showing satellite derived sea surface temperatures are overlaid with satellite derived sea ice concentration, October 6, 2016.

## Customized Data Products

AOOS creates applications within the data portal at the request of specific user groups. An example is the Cook Inlet Beluga Whale Ecosystem Portal which highlights data that can help practitioners better manage this endangered population. Data layers within the application include Cook Inlet beluga sightings, anadromous rivers, historical vessel tracks, historical sensors, real-time sensors, beluga whale prey availability, bathymetry, and environmentally sensitive areas – all within Cook Inlet.



The AOOS Cook Inlet Beluga Whale Ecosystem Portal provides relevant data layers such as this one showing aerial survey tracks with Beluga Whale sightings.





# AOOS

## by the Numbers

283

web cams visible on the AOOS data portal

43

partnership activities conducted by AOOS

86

continuous AOOS glider days along the Bering and Chukchi Sea coastline

84% of Alaskans live on the coast

3

active water level gauges along 3,000 km of coastline in Northwest Alaska (compared to 3 active gauges along 50 km of coastline in Delaware)

1,300

real-time sensor stations reporting to the AOOS data portal

65

new or updated data layers added to the AOOS data portal

50,000

separate AOOS Website hits

18

AOOS subawards funded to fill observing gaps

\$14.6 billion

in economic output created by the Alaska seafood industry

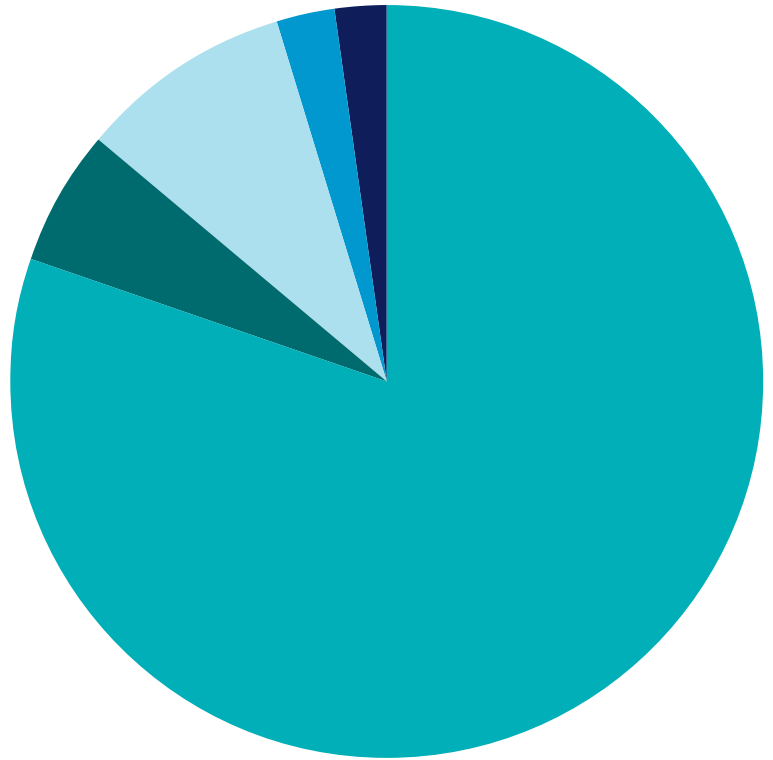
51.4 ft highest wave height measured in Alaska in 2016. 230 Nautical Miles SW of Dutch Harbor

# Financials

## Income by Source

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

Total: **\$3,046,017**



## 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
- Barrow Arctic Science Consortium
- 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 / Other

- North Pacific Fishery Management Council
- Marine Exchange of Alaska
- Shell Oil

## Non-Governmental Organizations

- World Wildlife Fund

## Tribal

- Indigenous Peoples Council on Marine Mammals

## AOOS Board Officers

- Chair: Ed Fogels, Alaska Department of Natural Resources
- Vice Chair: Katrina Hoffman, Prince William Sound Science Center / Oil Spill Recovery Institute
- 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



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