

AOOS

The Eye on Alaska's Coasts and Oceans

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Update
Summer 2015



Investigator Kate Stafford
(University of Washington)



Investigator Mark Baumgartner
(Woods Hole Oceanographic
Institute)



Investigator Peter Winsor
(University of Alaska Fairbanks)

AOOS Increases Observing Activities in the Arctic

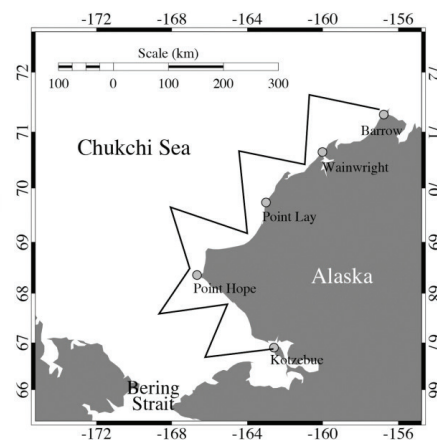
Marine Mammal Monitoring Using Undersea Glider is Underway off Alaska's Arctic Coast

A robotic underwater glider is now flying off the northwest coast of Alaska monitoring marine mammal distributions and their relationship with oceanographic conditions in the Chukchi Sea. The glider was deployed in mid-July by the University of Alaska field team for the third year of a multi-year monitoring study funded by AOOS.

The buoyancy-controlled glider is equipped with a passive acoustic device called DMON (digital acoustic monitoring instrument), which is installed inside the glider while a hull-mounted hydrophone monitors frequencies between 10 and 7500 Hz (the frequency range for both marine mammals as well as background noise).

In previous years, the glider was successful at making spatial marine mammal surveys lasting at most ten days. This year, the glider is equipped with lithium batteries that will allow it to operate unattended for an entire Arctic summer season. Over the course of two months, it will zigzag unsupervised inshore and offshore from south to north in the eastern Chukchi Sea.

The glider is tracking several species of Arctic marine mammals, including fin, bowhead, and beluga whales, as well as bearded seals and walrus. While underway, it also samples the vertical and horizontal temperature and salinity structure in the water column. This allows scientists to investigate how marine mammal distribution is related to water column conditions and mixing fronts.



Planned glider trajectories for summer 2015.

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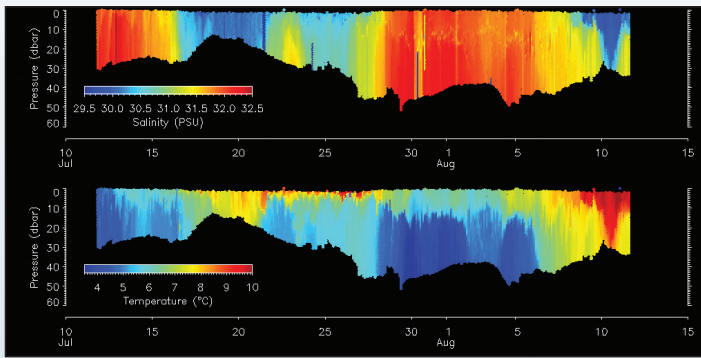


The AOOS-funded University of Alaska Fairbanks Slocum G2 glider is readied for deployment, with assistance from the RV *Norseman II* shown in the background. Photo courtesy of Dr. Peter Winsor, UAF

Alaska Ocean Observing System

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This plot shows depth in the vertical axis and time along the zigzagging glider transect on the horizontal axis. The data reveals salty (red) offshore waters in the top panel corresponding with colder (blue) waters in the bottom panel.

Developing and applying this cutting edge autonomous technology also benefits others monitoring Arctic regions, where shipboard access is not only expensive, but limited to fair weather conditions during the open water (ice free) season of summer and early fall. Collecting data using autonomous platforms, such as gliders, also allows for better spatial and temporal marine observations in the Arctic because of their ability to operate continuously without being attended by a nearby ship. AOOS hopes to continue these longer endurance glider surveys annually as part of a comprehensive Arctic Ocean observing system.

Investigators include Kate Stafford (University of Washington), Mark Baumgartner (Woods Hole Oceanographic Institute), and Peter Winsor (University of Alaska Fairbanks)

HF Radar Monitoring of Surface Currents Underway in the Chukchi Sea

This year's high frequency radar monitoring array was deployed along the northwest coast of Alaska with much appreciated help from the community of Point Lay. This remote technology allows researchers to estimate surface currents without installing current meters in the ocean or making measurements from a ship. Surface currents are used in oil spill trajectory modeling as well as defining areas for search and rescue operations.

The array is currently reporting real-time data from Point Lay to Barrow and will soon be adding a station to the east, extending coverage to Cape Simpson. Part of the array is being powered by renewable energy.

This project is funded by the Shell Oil, the North Slope Borough/Shell Baseline Studies Program, and the Alaska Ocean Observing System/U.S. Integrated Ocean Observing System. The Principal Investigator is Tom Weingartner. Research Staff include Rachel Potter and Hank Statsewich. Ying-Cbih Fang is a graduate student working on the project.

Using Real-time Sensors to Detect Freeze-up on Arctic Shelves

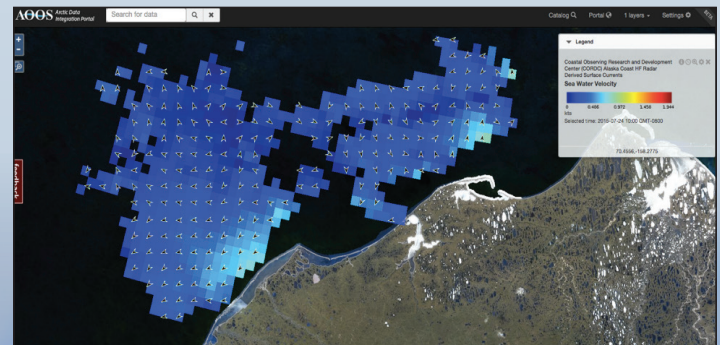
In late summer 2015, a new type of mooring and sensor package was deployed in the Chukchi Sea that will document sea ice freeze-up along with the water column conditions prior to and during the freeze-up stage in late fall and early winter. Funding was provided from the national Integrated Ocean Observing System's Marine Sensor Technology program. AOOS is a co-investigator on this project.

The mooring package is unique in that it will remain in place as the sea ice forms, rather than being recovered. The surface sensor package will self-detach prior to actual freeze-up, while the rest of the mooring remains beneath the ice. The ability to detect the onset of fall sea ice formation in real-time will provide information important to stakeholders, such as the oil and gas industry and subsistence users.

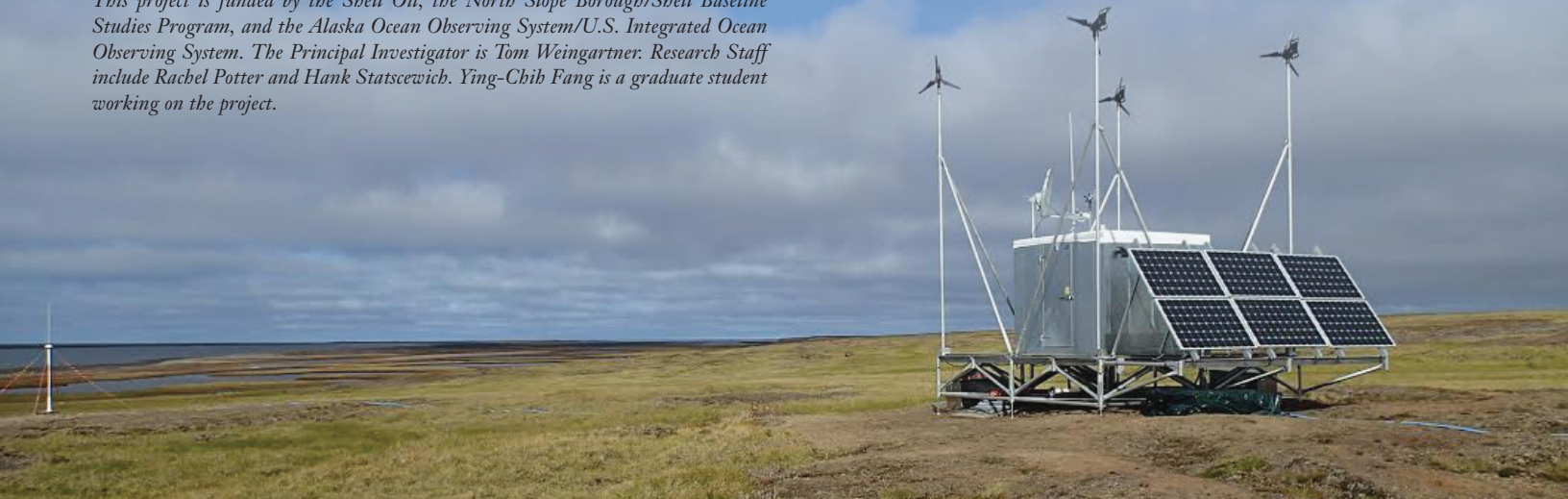
Data on the vertical temperature and salinity structure of Chukchi waters will help validate NOAA and National Weather Service sea ice forecast models, since the accuracy of these models depends upon their ability to represent the seasonal evolution of local oceanic density conditions.

If successful, the package will provide an inexpensive and reliable method to use in determining fall ice formation in real-time at remote, hard to sample locations. Stay tuned to the AOOS website for updates on this mooring, and access to the freeze-up data this fall.

Investigators include Peter Winsor (University of Alaska Fairbanks), Tom Weingartner (University of Alaska Fairbanks), Andy Sybrandt (Pacific Gyre), and Molly McCammon (AOOS).



This screenshot from the AOOS Real-time Sensor Map shows the magnitude and direction of sea surface currents in the Chukchi Sea tracked by HF Radar.



Wind and solar energy help power remote HF Radar stations along the North Slope.

Photo courtesy of Hank Statsewich, UAF

Chukchi Sea Ecosystem Mooring

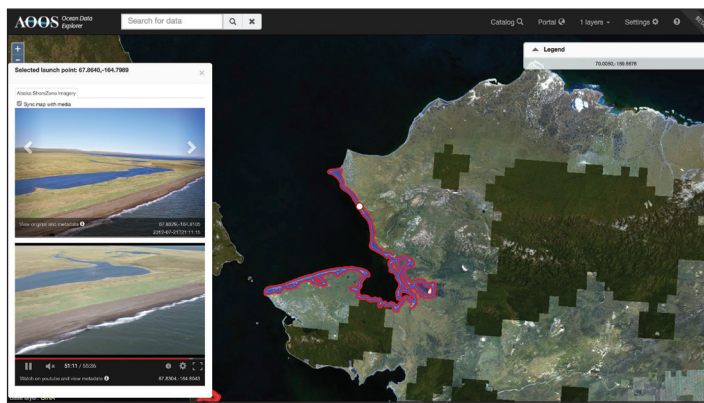
The Chukchi Sea Ecosystem Mooring, funded by AOOS and the North Pacific Research Board, was serviced with new instruments and redeployed in late August. It will overwinter for the second year, providing a full suite of physical, chemical and biological measurements at multiple depths throughout the water column and across four seasons. The mooring is the only one of its kind in the Arctic and includes sensors monitoring temperature, salinity, pressure, ice draft, significant wave height and direction, currents, optical properties, and many more.

Investigators include Seth Danielson, Claudine Hauri, Russ Hopcroft, Andrew McDonnell, Peter Winsor (all with University of Alaska Fairbanks); Kate Stafford (University of Washington); and Catherine Lalande (Université Laval).

Wave Gauge Moorings Recovered; New Ones Deployed

The AOOS wave gauge mooring, deployed in the Beaufort Sea in 2014 by Dr. Jeremy Kasper at UAF, was retrieved in August. Data from the mooring will be used to provide additional information to the UAF Chukchi/Beaufort Sea circulation models, as well as to validate NOAA's Wave Watch III forecast. Data recorded during late fall storms will be especially valuable and will assist with research on coastal erosion rates. Additional AOOS moorings will be deployed in the fall in the eastern Beaufort to provide new data on water levels. ■

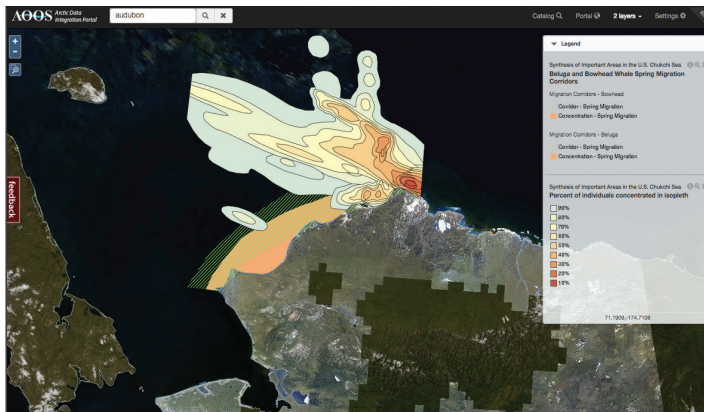
Latest Additions to the AOOS Data Portal



Additional ShoreZone imagery

Thanks to the ShoreZone Alaska project, AOOS users can now “fly the coast” through a number of new regions including Prince William Sound, the Alaska Peninsula, Bristol Bay, Southeast, and the northwest Arctic. After clicking on the flight line in the AOOS Ocean Data Explorer, two windows appear and begin streaming video and still photos. Users have the option of changing the video resolution depending on bandwidth, and can hop to a new area of coast at any time. The ShoreZone imagery can be overlaid with any other data in the AOOS portal (e.g. real-time sensors, species distribution, forecast models, land ownership, etc).

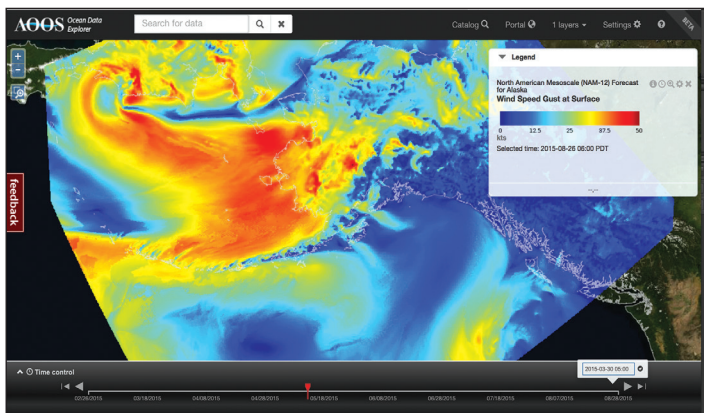
This screenshot shows the ShoreZone flight line along the Northwest Arctic Borough region. Imagery from the North Slope will be available this fall.



New Arctic Data

A variety of new Arctic data layers, provided to AOOS from Audubon Alaska and Oceana through the STAMP project, are now available in the AOOS Arctic Portal. These range from beluga migration corridors and aerial surveys of bowhead whales to petroleum potential and seafloor depth. This “Synthesis of Arctic data” was generated from animal tracking data, aerial and boat surveys, maps and area descriptions in published studies, scientifically documented local and traditional knowledge, and personal communications with experts. You can find these layers in the Arctic portal under “study catalogs”, or by searching for a parameter of interest.

This screenshot shows beluga and bowhead whale spring migration corridors, as well as bowhead fall density.



Latest Weather Model

AOOS recently ingested the North American Mesoscale Forecast System model (NAM-12), which is a major regional weather forecast model run by NOAA's National Centers for Environmental Prediction (NCEP). The model includes 14 sublayers ranging from air and sea surface temperature to precipitation and snow depth. Users can find the model in the Ocean Data Explorer or AOOS Model Explorer. ■

This screenshot shows wind speed at the surface. Users can scroll back in time starting in early 2015.

Two New AOOS Team Members



Welcome Holly Kent

AOOS welcomes new Program Coordinator Holly Kent. Holly is a long-time Alaskan, former executive director of the Anchorage Waterways Council, and was most recently with the Alaska Community Action on Toxics. She has strong skills in fundraising, grant writing and stakeholder outreach and communications. Holly's focus areas will include maintaining the AOOS website and other communications as well as special projects, including ocean acidification and coastal hazards.



Welcome Carol Janzen

Carol joins the AOOS staff this month as AOOS Operations Director. With a Ph.D. in Physical Oceanography, Carol brings more than 20 years of marine science experience spanning the private, public and academic sectors. Most recently with Seabird Electronics in Bellevue, Washington, Carol is very knowledgeable about Alaska issues as well as those of the IOOS program, having been involved with both the Gulf of Maine Ocean Observing System and the Pacific Northwest system. ■

AOOS Welcomes New Board Members

Two new members will be joining the board as representatives of existing Member Agencies:



Dan White was appointed by UA President Pat Gamble as the new university representative on the AOOS Board. Dan is the UA Vice President for Academic Affairs and Research.

Dan White replaces Mike Castellini for the UA Board seat.

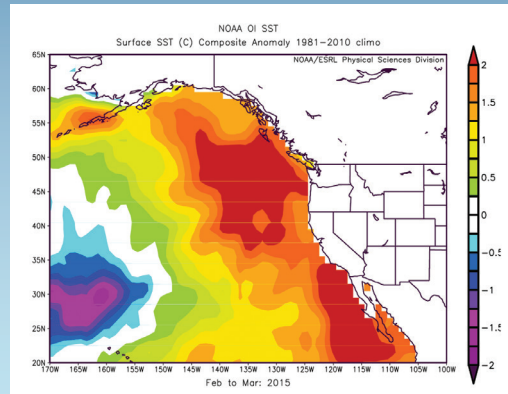


Chris Zimmerman is a fisheries research biologist with the U.S. Geological Survey's Alaska Science Center in Anchorage.

Chris Zimmerman replaces Carl Markon for the USGS Board seat. ■

AOOS Hosts Second Annual Ocean Film Contest

Keep an eye out this fall for the next set of films from the AOOS Ocean Film Contest. For the second year, AOOS welcomed films 10 minutes or less relating to any aspect of Alaska's coast or oceans. Prizes will be awarded in October, and the films will be shown at venues across the state, as well as highlighted on the AOOS website. Learn more at <http://www.aos.org/film-contest/> ■

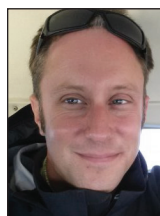


AOOS Launches a Blog about the Blob

Curious about the big pool of unusually warm water in the North Pacific that people keep talking about? AOOS is now hosting the Alaska "Blob Tracker" – a new blog with the latest information on the "blob" from a variety of contributing scientists. Find more at <https://alaskapacificblob.wordpress.com/> ■

AOOS Welcomes New Data Management Committee Members

The Board confirmed the appointment of two new members of the AOOS Data Management Advisory Committee.



Zach Stevenson is the coordinator of the Northwest Arctic Borough Planning Department's Subsistence Mapping Project. He is based in Kotzebue and brings experience with managing data on traditional and ecological knowledge.



Jim Potemra is the Manager of the Asia-Pacific Data-Research Center and Manager for the International Pacific Research Center. He is the data management lead for PacIOOS, AOOS' sister organization in the Pacific Islands, and is based in Honolulu. ■



Molly Schouweiler