

**Semi-annual Program Performance Report for NA11NOS0120020
FY 2011 Alaska Regional Coastal and Ocean Observing System
For reporting period December 1, 2014 – May 31, 2015**

Prepared by Molly McCammon, Project PI on June 29, 2015

1.0 Project Summary

The Alaska Ocean Observing System (AOOS) is the regional association for Alaska, managing the statewide and three regional coastal and ocean observing systems for the Alaska region. The mission of AOOS is to provide coastal and ocean observations, forecasts and data and information products to meet agency and stakeholder needs. This project builds upon efforts begun with our initial funding, and takes into account the paucity of real-time observations in Alaska by relying extensively on collaborations and leveraging with other programs. The project represents the priorities identified by stakeholder workshops and adopted by the AOOS Board: 1) Increase access to existing coastal and ocean data; 2) Package information and data in useful ways to meet the needs of stakeholders; and 3) Increase observing and forecasting capacity in all regions of the state, with a priority on the Arctic and the northern Gulf of Alaska (GOA). AOOS has four thematic priorities: sustainability of marine ecosystems and fisheries and tracking of climate change and trends; safety of marine operations; mitigation of natural hazards and their impacts on coastal communities, especially inundation, coastal erosion, and changing sea ice conditions; and regional ocean and coastal partnerships and planning.

2.0 Progress and Accomplishments

2.1 AOOS Regional Management

2.1.1 AOOS Board and Committees

- Executive Director Molly McCammon briefed the Indigenous People’s Council on Marine Mammals on December 1 and asked them to designate a representative to the AOOS Board. The Council would first like to meet directly with the AOOS Board at a future meeting.
- AOOS Data Management Advisory Committee met at the Axiom office in Anchorage on February 25. The committee reviewed the current committee membership list and recommended changes to update the committee’s Terms of Reference.
- The AOOS Board met April 3 to approve the work plan and budget for FY 15, which for AOOS starts June 1, 2015. The Board approved updated Terms of Reference for the Data Management Advisory Committee, and approved two new members to the DMAC: Jim Potemra of the Pacific Islands Ocean Observing System and Zach Stevenson with the Northwest Arctic Borough.

2.1.2 Participation in national IOOS activities

- McCammon joined IOOS Association Executive Director Josie Quintrell and the association's board chair Ru Morrison in Washington DC January 13-15 to brief new Congressional staffers on the IOOS Program, as well as AOS and Arctic issues.
- McCammon attended meetings with the IOOS Association and the IOOS National Program office in Washington DC March 2-4.
- Darcy Dugan participated in regular IOOS Education and Outreach calls.

2.1.3 Partnerships and external affairs - Alaska

- AOS and Arctic ERMA (Environmental Response Management Application) staff met December 18 for a quarterly update.
- AOS partnered with ACCAP, Alaska Sea Grant, the Alaska Marine Conservation Council, and UAF's Ocean Acidification Research Center to host an Ocean Acidification Workshop in Anchorage on December 2.
- Representatives and project partners from the Aleutian and Bering Sea Climate Vulnerability Assessment met in Anchorage on Dec 10-11.
- McCammon briefed the Prince William Sound Regional Citizens Advisory Council in Anchorage January 23 on Prince William Sound (PWS) observing activities and gathered input on future plans for PWS.
- McCammon and AOS Data Team members presented information on the AOS website, Research Workspace and data visualization tools to the Exxon Valdez Oil Spill Trustees Council's Public Advisory Committee in February.
- McCammon participated in a two day Northwest Arctic Borough Science Advisory Committee meeting in February.
- McCammon participated in reviews of applicants for the new Alaska Sea Grant Alaska Fellowship Program and pre-proposals for Sea Grant's research program in February.
- McCammon participated in the 2-day site review of Alaska Sea Grant conducted by Sea Grant's national program office.
- AOS Data Team (Chris Turner and Will Koeppen) attended the meeting of NPRB's Gulf of Alaska Integrated Ecosystem Research Program in Fairbanks April 7-10.
- McCammon attended a joint meeting of the advisory committees to the Northwest Arctic Borough and North Slope Borough science programs Anchorage April 9-10.
- McCammon attended the May 27 meeting of the Alaska Climate Change Executive Roundtable and facilitated a discussion about the group's mission and goals. ACCER continues to sponsor the Alaska Data Integration Working Group, originally initiated by AOS and USGS.
- As a member of Alaska Governor Bill Walker's Arctic/Climate Change transition team, McCammon participated in a May 29 conference call with Alaska Department of Environmental Conservation Commissioner Larry Hartig and Alaska Department of Natural Resources (AKDNR) Commissioner Mark Myers (both of whom are AOS Board members) regarding future state priorities for Arctic and climate change issues

- McCammon and Dugan participated in discussions on May 11 about data collection and data sharing with members of the Alaska LNG Project team from Anchorage and Houston.
- McCammon and Dugan hosted stakeholder engagement meetings to help inform the AOOS 5 year proposal to NOAA. On May 18 and 19, they met in Juneau with representatives of the navigation community and the NOAA team working on ecosystem report cards and integrated ecosystem assessments. On May 26, they convened members of the Prince William Sound Regional Citizens Advisory Council and Prince William Sound Science Center/Oil Spill Recovery Institute to discuss PWS needs.
- McCammon and AOOS staff Holly Kent participated in meetings of the Alaska Center for Climate Assessment and Policy Steering Committee (National Oceanic and Atmospheric Association's Alaska Regional Integrated Sciences and Assessments Program); NOAA's regional collaboration team; and Cook Inlet Regional Citizens' Advisory Council.
- AOOS partnered with Alaska Sea Grant to host sessions of the Alaska Marine Policy Forum on January 14, March 19 and May 20, 2015.

2.1.4 Partnerships and external affairs – national & international

- McCammon met with Simon Stephenson at the White House Office of Science and Technology Policy, Laura Cantral from the Joint Ocean Commission Initiative, IOOS staff and Gerry Meyers from Stantec in Washington DC January 13-15.
- McCammon attended meetings with the Consortium for Ocean Leadership's Arctic Policy Forum, and Alaska's Congressional offices in March.
- McCammon attended the Joint Ocean Commission Initiative's Arctic Ocean Leadership Roundtable in Fairbanks April 27-28.
- McCammon attended the May 5-6 Pacific Anomalies Workshop at Scripps Institute of Oceanography in San Diego along with five other Alaskans. The meeting was used to exchange information about the unusually warm ocean temperatures in the Pacific this past year – from Baja to the Bering Sea – and potential biological impacts.
- AOOS Data Team member Will Koeppen represented AOOS at a joint Alaska-Norway Experts Group Roundtable May 27 and discussed data sharing and monitoring systems for Safety and Preparedness in the Arctic. Will also attended the luncheon honoring the King of Norway during his visit to Alaska.

2.1.5 Program management, administration, fundraising and financial oversight

- Proposal action:
 - AOOS/Axiom and UAF/International Arctic Research Center submitted a proposal to the National Science Foundation to provide data management archive and access services for NSF's Arctic programs.
 - The AOOS/Axiom data team is part of the Stantec group that was recently awarded the contract by BOEM to conduct the Marine Arctic Research Ecosystem Study (MARES) in the Beaufort Sea. AOOS will provide data management services for the project

- AOS received approval for a proposal to enhance NOAA's Beluga Sightings Database by adding other data layers to create a Cook Inlet Beluga Ecosystem Portal.
- AOS staff worked to develop a conceptual 5 year proposal to present to the AOS Board in June.

2.2 Marine Operations

2.2.1 Maintain Snotel stations in Prince William Sound (PWS) and Cook Inlet (CI)

- Subaward to PWS Science Center.
- Annual maintenance conducted by National Resources Conservation Service.

2.2.2 Pilot AIS dissemination of weather data

- Subaward to Marine Exchange of Alaska (MXAK).
- An AtoN (Aids to Navigation) AIS (Automatic Identification System) installation was completed at Prudhoe Bay.
- Four marine weather station installations were completed in the Aleutian Islands (Port of Adak and Adak mountain), Southcentral Alaska (Kenai) and Southeast Alaska (Tenakee Springs). All data are provided on the AOS data portal, in NWS products and to vessels via AIS and/or the pda and smartphone display products.
- A survey of Yasha Island (proposed marine weather station site) found this site to be unsuitable so an alternate was identified in Southeast Alaska at Point Gardner. Permit applications were submitted and await approval.
- Authorization to transmit from all AIS AtoN stations was granted by the United States Coast Guard (USCG) and Federal Communications Commission. The USCG is using the Anchorage AtoN transceiver to transmit two Virtual AtoNs in Upper Cook Inlet.
- Phase II development of AIS/WX software configuration is underway to provide interface for system monitoring and configuration management.

2.2.3 Provide public access to High-Frequency Radar (HFR) data in Chukchi Sea & plan for future HFR

- Field sites at Point Barrow and Cape Simpson were winterized until the 2015 field season.
- Preparations for the 2015 field season began with permitting and indemnity for landowners.

2.2.4 Weather Research and Forecasting (WRF) wind model for PWS and CI

- This subaward concluded.

2.2.5 Maintain operational Regional Ocean Modeling System (ROMS) model for GOA

- Subaward with YI Chao for maintenance with daily update schedule.
- Continued to run real-time PWS ROMS modeling system on daily basis and uploaded daily output to AOS data portal. Supported AOS DMAC team for web interpretation and visualization.

2.2.6 Validate hydrological model for PWS

- Subaward to Prince William Sound Science Center.
- Model evaluations are ongoing although funding is complete.

2.2.7 Ingest ROMS models for Bering Sea into JPL data assimilation system

- This project has been completed.

2.2.8 *Beaufort Sea wave measurements*

- Subaward to UAF (Weingartner).
- A new deployment location and ship time for deploying the waves mooring for an additional year was identified.
- Instrument batteries and replacement equipment were prepared for mooring turnaround for deployment year 2 in August 2015.

2.2.9 *Kenai River web cam*

- Cook Inlet Regional Citizens Advisory Council, city of Kenai, and Marine Exchange of AK provided ongoing maintenance.

2.3 Coastal Hazards

2.3.1 *Monitor prior Alaska Harbor Observation Network (AHON) pilot projects in Seward and Kodiak and assess further expansion of AHON*

- Prior award with Alaska SeaLife Center.
- Meetings were held in Seward and Kodiak with Harbor Directors in anticipation of transferring equipment to the Marine Exchange.

2.3.2 *Maintain Coastal Data Information Program (CDIP) wave buoy in Cook Inlet*

- Buoy deployed in April and is now streaming real-time data.

2.3.3 *Produce electronic sea ice atlas*

- Subaward to ACCAP.
- Script for updating Atlas developed, and data for 2014 obtained from NSIDC and included. The digital atlas is now complete through December 2014.
- Obtained access to Shell digital sea ice data and now assessing value that could be added by this high-resolution information.
- Conducted survey of atlas users.
- Work is underway on a publication summarizing Alaskan sea ice variations of the past 160 years based on the Alaska sea ice atlas.

2.3.4 *Develop coastal flooding, storm surge and sea level rise products.*

- Developed agreement with Norton Sound Economic Development Corporation (NSEDC) for future deployments of Wave buoy in Norton Sound.
- Subaward continued with ADNR/DGGS to provide coastal hazard and vulnerability tools and products.
- Seeding data into the Alaska Coastal Profile Tool continues. Archived datasets are being incorporated to the interactive database, and the format has been adjusted to accommodate historical datasets and measurements collected by local observers.
- The color-indexed elevation map series has been presented at several conferences and community meetings.
- In preparation for 2015 water level station developments, the calibration was checked on the sensor installed in Unalakleet last fall; DGGS participated in an Integrated Water Level Network workshop in May; and instrumentation components were purchased and permits secured for real-time sensor installations in Goodnews Bay, Port Heiden and Kaktovik.

2.4 Ecosystems/Fisheries and Climate Trends

2.4.1 Maintain Arctic Research Assets Map

- Transitioned map to HTML. Continued to maintain.

2.4.2 Support sampling along Seward Line

- Subaward to University of Alaska Fairbanks (UAF).
- Anomalously warm temperatures observed in fall 2014 have persisted throughout the winter along the Seward Line.
- Average upper-100m temperatures for the GAK stations were 0.9-1.3°C above the 18-year mean for those stations, with the largest anomalies at the offshore end. Averaging 1°C along the line, this anomaly is very close to those observed during the 1998 and 2003 El Niños.
- The line was extended offshore to encompass stations GAK14 & GAK15. All offshore stations were sampled to 1000 m with the CTD.
- The PI partnered with other Gulf of Alaska researchers to present findings on the 2014 anomaly at the Pacific Anomalies Science and Technology Workshop held at the Scripps Institute of Oceanography May 5-6.

2.4.3 Use AOOs glider for high-latitude observation node in Chukchi & test glider use for monitoring marine mammals

- Subaward to UAF/Woods Hole/University of Washington to record, detect, classify, and remotely report marine mammal calls in real time from autonomous platforms. Calls are picked up by a digital acoustic monitoring (DMON) instrument and the low-frequency detection and classification system (LFDCS), using previously developed (AOOS funded) Arctic-specific call library.
- PIs extracted acoustic and environmental data from the 2014 glider and manually double-checked real-time detections with acoustic data. They used the 2014 data to improve and expand upon the current Arctic call library.
- PIs developed a new software add-in to the LFDCS system to display at sea reported pitch tracks and spectrograms for more efficient post-deployment.
- PIs presented 2013 and 2014 glider deployment results at the Alaska Marine Science Symposium Jan 2015: "Real-time marine mammal and noise monitoring from ocean gliders."

2.4.4 Support Distributed Biological Observatory

- Subaward to University of Alaska Fairbanks (UAF) for NE Chukchi mooring.
- PI ordered new mooring sensors: DO, PAR, Fluorescence/CDOM/OBS and received the sediment trap, AZFP, SUNA, and DO, PAR, Fluorescence/CDOM/OBS sensors.
- PI supervised ongoing construction of the Chukchi ecosystem moorings. Two moorings will be deployed in 2015, the sediment trap and a passive acoustic recording device.
- The 2015 mooring will measure temperature, salinity, pressure, ice draft, significant wave height and direction, particles (sediment trap), acoustic backscatter at four frequencies, water speed and direction, dissolved oxygen, turbidity, PAR, chlorophyll fluorescence, colored dissolved organic matter, optical backscatter, and passive acoustic recordings of marine mammals.

2.4.5 Maintain ocean acidification (OA) sampling along Seward Line; support OA sensors on moorings in Chukchi, Gulf of Alaska and Bering Sea; conduct OA monitoring at Alutiiq Shellfish Hatchery; and develop OA forecast for Gulf of Alaska.

- Subaward to UAF.
- Results from the PWS/GOA OA glider project completed in 2014 have been discussed at a number of conferences and manuscript preparation is underway. Major results of this work were; the ability to describe acute and chronic impacts on the marine carbonate system across the coastal ocean continuum from the tidewater glacier terminus to the continental shelf break; documentation of intense near-shore CO₂ exchange with the atmosphere that is not accounted for in climatologies of sea-air CO₂ flux in this setting and the role of these intense sea-air CO₂ fluxes in setting calcium carbonate saturation states.
- A manuscript describing the first 10-months of data from the Alutiiq Pride Shellfish Hatchery has been accepted for publication. The new Burkolator pCO₂/TCO₂ system was installed in August 2014 and is still in operation.
- Samantha Sedlecki is still working on the GOA forecast, focusing on the surface aragonite fields and comparing approaches – algorithm vs tic and Ta model. The next step is to do a freshwater removal experiment to test the sensitivities. Everything is on track for a December paper submission.

2.4.6 Test use of conductivity sensors at Cordova tide station

- Subaward to PWSSC.
- A second conductivity sensor was modified for operation at the tide station replacing the old sensor.
- The old and new conductivity sensors were calibrated so that there are 2 sensors available for use.

2.4.7 Support mooring turnovers for biological monitoring

- Subaward to PWSSC.
- Data uploaded from the Ocean Tracking Network array in February and May.

2.4.8 Conduct Conductivity/Temperature/Depth (CTD) surveys in Kachemak Bay and lower Cook Inlet

- Conducted monthly shipboard oceanographic surveys with CTD profiler at mid-Kachemak Bay transect (Homer Spit line) in December 2014 and January, February, March, April and May 2015. Air and water temperatures continue to be significantly above normal in Kachemak Bay, consistent with the Pacific-coast wide warm temperature anomaly.
- Conducted seasonal shipboard oceanographic surveys with CTD profiler at outer Kachemak Bay transect in February and April 2015.
- Provided CTD data to NOS/NCCOS researchers for harmful algal bloom (paralytic shellfish poisoning) studies and to AOOS for upload to Gulf of Alaska data portal and to CSDL for model validation.
- Cook Inlet oceanography data included in draft Gulf Watch Alaska science synthesis report submitted to the Exxon Valdez Oil Spill Trustee Council in December 2014, with final report to be submitted in June 2015: “Quantifying temporal and spatial ecosystem variability across the northern Gulf of Alaska

to understand mechanisms of change”. Results were also presented to the EVOSTC Science Panel by Kris Holderied at the February 2015 joint science workshop between the EVOSTC-funded Gulf Watch Alaska and Herring Research and Monitoring programs.

- The warm water temperatures observed in Kachemak Bay in 2014 were highlighted as part of an oral presentation given by Kris Holderied at the Alaska Marine Science Symposium in January 2015, entitled “Gulf Watch Alaska: Monitoring the Pulse of Changing Ecosystems in the Gulf of Alaska”.

2.5 Regional Ocean and Coastal Partnerships and Planning

2.5.1 Expand data management capacity to integrate data

- Ongoing. See Section 2.6 below.

2.5.2 Create spatial visualization tools for AK through STAMP project - “Spatial Tools for Arctic Mapping and Planning”

- Acquired and formatted data layers that were prioritized by STAMP (these are now in the AOOS system and will be publicly accessible by July 2015).
 - ShoreZone imagery and characteristics for northern Alaska
 - Historic vessel tracks from AIS data in queryable format
 - Updates to the Arctic Synthesis layers synthesized by Audubon/Oceana.
- Made progress on an “AOOS lite” version of the AOOS Arctic Portal that can run efficiently on low-bandwidth computers.
- Reviewed, updated and expanded metadata for existing Arctic Portal data layers.

2.6 Data Management & Products – Subaward to Axiom Consulting

2.6.1 Support AOOS website, data portal & applications. Maintain & provide access to products developed in this project. Explore developing multi-regional products with other RAs.

- Advanced filtering established for catalog; users are now able to apply spatial and temporal filters.
- Improved data catalog usability by refining metadata page for compound data layers.
- Added interoperability web service endpoints to AOOS catalog.
- Enabled model legend scale adjustment for all gridded data.
- Enabled advanced module grouping so that numerical models on different temporal scales can now be logically grouped together.
- Core CSV output for sensor data archives improved and convergent with NDBC standards.
- Historical sensor archives now persisted to netCDF files.
- SciWMS implemented in AOOS cyberinfrastructure so unstructured grids can now be served to users.
- Providence, RI East Coast data center fully functioning. Data and web services geo-replicated. AOOS is now a high availability Data Assembly Center (DAC).

2.6.2 *Ingest prioritized datasets, support warehouse and archive functions & provide access through query and mapping tools*

- Statewide ShoreZone data and imagery ingested.
- New Alaska regional bathymetry datasets now exposed.
- Cook Inlet beluga sighting database exposed through hex binning interface.
- Animal telemetry data sets exposed through IOOS biological data services and hex binning.
- Approximately 122 new sensors, 2 model ensembles (18 variables) and 22 marine GIS data layers have been added in last 6 months.
- 2014 GEBCO bathymetry data ingested.
- OA project data exposed through AOOS catalog.

2.6.3 *Continue ADF&G (Alaska Department of Fish & Game) partnership*

- AYK salmon data set complete and made available for ADF&G review.

2.6.4 *Support of 2014 APOP portal for support of the BSAI LLC*

- APOP portal being supported for 2015 field season.

2.6.5 *Collaborate with other state, regional, national and international data management programs*

- Attended ADIWG (Alaska Data Integration Working Group) meetings to assist in data integration across Alaska entities.

2.6.6 *Continue to develop IOOS SOS service and assist other RAs in deployment and begin work on IOOS Systems Integration Test.*

- Completed next year IOOS special project work plan.
- Working with several RAs to develop implementation strategy for QARTOD involving GLOS and SCCOOS.
- Second milestone of Scalability Experiment met in February of 2015. Project is now complete and a demonstration was provided to IOOS national office.
- 52 North software stack has met milestone 1.0 in April of 2015 and deployed to IOOS github repository.

2.6.7 *Develop new products and applications*

- AOOS smartphone application started for NWAB.
- Hex Binning visualization technique optimized for large spatial time series and taxonomic filtering.

2.6.8 *Provide Data Management services for integrated research programs with separate funding: EVOSTC Long Term Monitoring & Herring Research and Monitoring Programs; NPRB's Gulf of Alaska Integrated Ecosystem Research Program; RUSALCA program; Arctic Ecosystem Integrated Survey; and Distributed Biological Observatory.*

- Currently supporting programs with Research Workspace application.
- Participating in monthly and other PI meetings as needed.
- Gulf Watch Alaska project data exposed through AOOS catalog.
- MBON projects kicked off in AK, CA and FL.

2.6.9 *Serve up oil & gas industry data on AOOS portal*

- Annex 4 data received in early 2015.
- All data being served out through Research Workspace.
- Currently 87 users have requested access to industry-provided datasets.

2.7 Modeling & Analysis

2.7.1 Initiate statewide circulation model exchange & ensemble modeling

- Continued to discuss possible opportunities for AOS to add value to existing modeling efforts and how to incorporate modeling in next AOS 5-year proposal.

2.8 Communication, Education & Outreach

2.8.1 Support COSEE Alaska partnership

- Supported distribution of Community Based Monitoring handbook developed as product of CBM Workshop held in April 2014.

2.8.2 Support AOS website, Facebook and publications

- Continued to add content to website and Facebook page, including news, featured stories, and explanations for new data tools.
- Produced monthly updates.
- Circulated bi-monthly e-newsletter to listserve of over 500 recipients.
- Produced hard copy winter newsletter.
- Highlighted 2014 AOS film contest films on the AOS homepage, Facebook page, and at other venues.

2.8.3 Scope out potential Alaska Oceans & Coast Report

- Report will be considered in next 5-year proposal.

2.8.4 Interact with stakeholders and partners

- Gave presentations at these events:
- McCammon and AOS Data Team members presented information on the AOS website, Research Workspace and data visualization tools to the Exxon Valdez Oil Spill Trustees Council's Public Advisory Committee in February.
- McCammon presented AOS 101 at the April 10 meeting of the Alaska Marine Conservation Council board. AOS collaborates with AMCC on ocean acidification and marine debris activities.
- McCammon and Rob Bochenek demonstrated the AOS Ocean Data Explorer tools to Moore Foundation staff April 30.
- Will Koeppen represented AOS at the Alaska/Norway Experts Group Roundtable May 27.
- Partnered with the Cook Inlet Regional Citizens Advisory Council to provide a 1-day hands-on workshop for resource managers on the Cook Inlet Response Tool (CIRT) in Homer in March.
- Partnered with the Cook Inlet Regional Citizens Advisory Council to provide a shorter version of the workshop for resource managers on the Cook Inlet Response Tool (CIRT) in Kenai in May.
- A new exhibit launched on May 1 at the Anchorage Museum highlights Arctic Sea ice, and will be up through the summer. The exhibit showcases several animations of historic and predicted sea ice concentration in the AOS data portal, and also streams two Arctic-related films from the 2014 AOS Short Film Contest.

- AOS, NOAA, and the ADNR, hosted Exploring Options for an Integrated Water Level Observation Network in Alaska workshop in Anchorage May 27-28.
- AOS co-hosted an Ocean Film Festival on March 25 with Alaska Geographic at the Beartooth Theater & Pub, highlighting 13 films from the AOS 2014 film contest. Over 240 people attended.

3.0 Scope of Work (Priorities for next 6 months, June 1 2015 – November 30, 2015, and anticipated changes to SOW)

3.1 AOS Regional Management

3.1.1 AOS Board and Committees

- Full board meeting planned for June 29.
- Data Management Advisory Committee informal meeting planned for June 25.

3.1.2 Participate in national IOOS

- Continue to participate in IOOS Association activities.

3.1.3 Partnerships and external affairs – in Alaska

- Continue to participate in partnership activities.

3.1.4 Partnerships and external affairs – national & international

3.1.5 Program management, administration, fundraising and financial oversight

- Work on additional funding proposals.
- Finalize 5 year FY16-20 proposal.
- Finalize subawards for FY15.
- Develop plan for certification implementation.

3.2 Marine Operations

3.2.1 Maintain Snotel stations in PWS and CI

- Maintain Snotel stations.

3.2.2 Pilot AIS dissemination of weather data

- Upgrade power supply to remote weather stations in Southeast Alaska (Guard Island and Little Island) and in Southcentral Alaska (Rocky Island) where solar power alone is insufficient to meet power demands in winter.
- Install an AIS AtoN transceiver in Southeast Alaska (Gustavus).
- Install weather sensors in Southeast Alaska (Haines) and the Northern Coast of Alaska (Prudhoe Bay and a nearby barrier island).

3.2.3 Provide public access to HFR data in Chukchi & plan for future HFR

- Deploy and maintain HFR systems at Icy Cape, Wainwright, Point Barrow, and Cape Simpson.
- Provide real-time data feed by posting to the NOAA IOOS National HFR Data server as well as on our project website at www.chukchicurrents.com.

3.2.4 Maintain WRF wind model for PWS and CI

- This project is completed.

3.2.5 Maintain operational ROMS model for GOA

- Continue operating ROMS model at basic level.

3.2.6 Validate hydrological model for PWS

- Report results.

3.2.7 Ingest ROMS models for Bering Sea into Jet Propulsion Laboratory (JPL) data assimilation system

- No activity. Completed.

3.2.8 Deploy bottom-mounted pressure sensors in Beaufort

- The mooring will be retrieved from Harrison Bay in early August 2015 and then redeployed in the eastern Alaskan Beaufort Sea as part of a collaborative mooring array between WHOI, ASL nc. And UAF/SFOS.
- Use of the wave observations for validation of area WaveWatch III forecasts will be investigated.

3.2.9 Install Kenai River web cam

- Monitor.

3.3 Coastal Hazards

3.3.1 Monitor prior AK Harbor Observation Network pilot projects in Seward and Kodiak and assess further expansion of AHON

- Implement MXAK takeover.

3.3.2 Maintain CDIP wave buoy in Cook Inlet

- Buoy to be retrieved in fall.

3.3.3 Produce electronic sea ice atlas

- Atlas will be updated on semi-annual basis.

3.3.4 Develop coastal flooding, storm surge and sea level rise products.

- Assist NSEDC in deployment of Norton Sound buoy.
- Seed Interactive Coastal Profile Tool with remaining archived database at DGGs and solicit format feedback from stakeholders.
- Work with NWS to expand the Color-Indexed Elevation Map Series to more communities and into more formats for use in effective coastal storm impact forecasting.
- Calibrate the Kaktovik water level sensor during 2015 fieldwork.
- Adjust water level records to appropriate datum post-sensor retrieval in September/October.
- Deploy 3 real-time water level sensors in summer 2015 (Goodnews Bay, Port Heiden, and Kaktovik,).
- Complete a white paper on water level data gaps in Alaska, agency-specific priorities and sensor type/location feasibility following the May 2015 Integrated Water Level workshop.

3.4 Ecosystems/Fisheries and Climate Trends

3.4.1 Maintain Research Assets Map

- Continue to maintain.

3.4.2 Support sampling along Seward Line

- Process Spring 2015 samples.
- Next cruise is scheduled for early September.
- Carbon flux rates may begin along the Seward Line in September (through NSF support).

3.4.3 Use AOS glider for high-latitude observation node in Chukchi & continue testing use of gliders for other uses

- Deploy Slocum G2 glider in the Chukchi in early July 2015 for 2+ months long deployment.
- Monitor detections in near-real time.

3.4.4 Support Distributed Biological Observatory: Chukchi Ecosystem mooring

- Support DBO team travel for meetings.
- Final mooring construction and testing in Seward at UAF mooring shop and mooring equipment to be loaded on deployment vessel 11 June 2015.
- 2014 mooring will be recovered and 2015 moorings deployed in August or September.

3.4.5 Maintain OA sampling along Seward Line & OA mooring sensors

- Manuscript preparation and submission from the PWS/GOA OA Glider project.
- Submit manuscript based on eight years of data from the Seward Line cruises to the Journal of Geophysical Research.
- Conduct coastal Gulf of Alaska wide OA survey aboard the NOAA R/V Ron Brown.
- Continue supporting OA monitoring activities at the Alutiiq Pride Shellfish Hatchery in Seward
- In September of 2015, we will conduct the autumn Seward Line cruise.

3.4.6 Test use of conductivity sensors at Cordova tide station

- Calibrate sensor.

3.4.7 Support mooring array for biological monitoring

- Ongoing.

3.4.8 Conduct CTD surveys in Kachemak Bay and lower Cook Inlet

- Conduct monthly CTD surveys at mid-bay transect in Kachemak Bay.
- Conduct two seasonal CTD surveys at outer bay transect in Kachemak Bay.
- Provide CTD data to CSDL, AOS and others as requested.

3.5 Regional Ocean and Coastal Partnerships and Planning

3.5.1 Create data management capacity to integrate data

- Ongoing. See section 3.6 below.

3.5.2 Create spatial visualization tools for AK: STAMP

- Complete adding relevant data layers to the STAMP/Arctic portal.
- Complete augmenting and refining metadata for Arctic data.
- Produce an “AOS lite” version tailored for Arctic communities.
- Close out project.

3.6 Data Management & Products

3.6.1 Support AOS website, data portal & applications. Maintain & provide access to products developed in this project. Explore developing multi-regional products with other RAs.

- Implement AOS lite application for lower bandwidth users.
- Develop methods for visualizing gliders and floats.

- Deploy prototype Smartphone application.
- 3.6.2 *Ingest prioritized datasets, support warehouse and archive functions & provide access through query and mapping tools*
- Expose Western Alaska unstructured grid models from Rob Grumbine through AOOS portals.
 - Ingest and expose Shorezone HD video for all of Alaska.
 - Expose updated Marine Arctic Synthesis data layers.
 - Expose next generation AIS data set from Marine Exchange of Alaska.
- 3.6.3 *Continue ADF&G partnership*
- Schedule and hold meeting with ADF&G steering committee to wrap up project.
- 3.6.4 *Collaborate with other state, regional, national & international data management programs*
- Coordinate with SECOORA and CeNCOOS to Draft next 5 year proposal.
 - Develop relationship with UAA DHS center of excellence.
 - Work with Arctic cyber infrastructure groups on collaborative proposals.
 - Continue to develop Scalability Experiment and integrate into IOOS catalog.
 - Work with RAs to develop QARTOD implementation strategy.
 - Work with IOOS and NCEI to develop improved submission pathway.
- 3.6.5 *Continue to develop/support IOOS SOS service and assist other RAs in deployment and conduct System Integration Test.*
- Initiate development on 52 north SOS 2.0 specification.
 - Update 52 North web harvesters.
 - Add additional data sources to IOOS scalability map.
 - Expose high level application programmer interface (API) to scalability map
 - Integrate Scalability map into IOOS catalog.
 - Support the Animal Telemetry Network with Research Workspace instance.
 - Support the national HF Radar group with Research Workspace instance for radial data.
 - Support national MBON effort with Research Workspace and data coordination activities.
- 3.6.6 *Develop new products and applications*
- Transition AOOS portal to next generation HTML5/WebGL framework.
 - Implement multidimensional data model (Ocean in 4D).
 - Extend the virtual sensor to produce histograms to convey distribution of hypothetical measurements across values.
 - Extend virtual sensor to provide depth profiles so that users can visualize data through the water column.
 - Enable complex GIS datasets (ones with large numbers of feature types) to provide intelligent information for users during roll over events. This will be extremely useful for habitat classification data sets and other complex datasets.
 - Apply hexagonal binning techniques to densely packed data sets such as Shorezone to convey regional trends for habitat types and other features.

- Extend the capabilities of the Model Explorer to perform model-to-model and model-to-observation comparisons.
- Develop new and extend existing search indexes to support more advanced querying by space, time, taxonomy and parameter.

3.6.7 Develop advanced visualization system for time series (RUSALCA, Seward Line, GAK 1, Fisheries Data).

- Process and stage additional zooplankton data sets for RUSALCA and other CBMP Arctic datasets for next generation data visualization.
- Explore data visualizations for Seward Line, ocean moorings and ocean acidification data.
- Publish staged BASIS, PacMARS, RUSALCA and CBMP data sets for public use.

3.6.8 Provide Data Management services for integrated research programs: EVOSTC Long Term Monitoring & Herring Research and Monitoring Programs; NPRB's Gulf of Alaska Integrated Ecosystem Research Program; BOEM's MARES; RUSALCA program; Arctic EIS program; and Arctic Marine Biodiversity Observing Network – all with separate funding

- Cultivate and expand capabilities of AOOs Research Workspace.
- Attend all PI meetings.
- Kick off MARES project.

3.6.9 Serve up oil & gas industry data on AOOs portal

- Manage access to industry data and facilitate updates to the resource.
- Incorporate data into public AOOs Ocean Data Explorer.
- Work with NCEI to streamline archive process.

3.7 Modeling & Analysis

3.7.1 Initiate statewide circulation model exchange & ensemble modeling

- Continue discussion on future AOOs modeling efforts.

3.8 Communication, Education & Outreach

3.8.1 Support COSEE Alaska partnership

- This program will close in late July.

3.8.2 Support AOOs website and publications

- Produce summer newsletter, bi-monthly e-news, and monthly ED updates.
- Implement observing project pages on website.
- Work with partner institutions to include link to AOOs on their website.

3.8.3 Scope out potential Alaska Oceans & Coast Report

- Begin planning for this report.

3.8.4 Interact with stakeholders and partners

- Continue providing demos of AOOs tools to interested organizations and agencies.
- Reach out to local media contacts to improve frequency of earned media.
- Host the second annual AOOs Ocean Film Contest. Compile submissions, organize review panel, award prizes, and help publicize films statewide.
- Engage new stakeholder communities.

4.0 Personnel and Organizational Structure

Hired Holly Kent as the new Program Coordinator (began March 27) and Carol Janzen as new Operations Director (begins June 29).

5.0 Budget Analysis

All financial reports are up to date and have been submitted on time.

6.0 Issues

None at this time.

7.0 Special Report: Regional Ocean Governance Organization Activities

AOOS received a competitive grant in 2012 from NOAA's Regional Ocean Partnership Program to "*Create spatial visualization tools for Arctic Mapping and Planning.*"

- Continued to update the interactive web-based data integration and visualization tool for the Alaskan Arctic based on AOOS data infrastructure, which now includes over 250 data sets from a wide variety of sources
- Refined priorities from April 2014 stakeholder workshop and developed revised work plan and target data sets for ingestion.
- Acquired and formatted the following data layers (these are now in the AOOS system and will be publicly accessible by July 2015).
 - ShoreZone imagery and characteristics for northern Alaska
 - Historic vessel tracks from AIS data in queryable format
 - Updates to the Arctic Synthesis layers synthesized by Audubon and Oceana
- Made progress on an "AOOS lite" version of the AOOS Arctic Portal that can run efficiently on low-bandwidth computers.
- Reviewed, updated and expanded metadata for existing data layers.

8.0 Special Report: Efforts to Leverage IOOS Funding

AOOS actively seeks to leverage IOOS funding in three ways: by submitting multiple proposals for funding from additional sources, by joining forces with other entities to support observing activities, and by providing data management services for other research programs.

AOOS Proposals:

- AOOS is involved in the following successful proposals: 1) AOOS and Axiom with a UAF group to develop an Arctic Marine Biodiversity Observing Network; 2) with Stantec for BOEM-funded Marine Arctic Research Ecosystem Study in the Beaufort Sea; 3) National Fish and Wildlife Foundation project to enhance the Beluga Sightings Database into a Cook Inlet Beluga Ecosystem Data Portal;
- One proposal submitted is pending: AOOS and Axiom with UAF to support National Science Foundation Arctic Programs' data archive and access;

- Several unsuccessful proposals were submitted during this period: a proposal with Axiom Consulting and other IOOS regions on data management for the Marine biodiversity Observing Network and one to NSF Data Infrastructure Building Blocks with University of Colorado.

Observing Consortia:

- Most of our observing activities are highly leveraged. Two examples are the ocean acidification moorings: AOOS contributes \$15k a year to a \$45k a year OA mooring consortium; and the Seward Line: AOOS contributes \$100k a year to a consortium that totals \$400k a year.

Data Management Services for related programs:

- Exxon Valdez Oil Spill Trustee Council’s Long Term Monitoring & Herring Research and Monitoring Programs
- North Pacific Research Board’s Gulf of Alaska Integrated Ecosystem Research Program
- Russian-US Long-term Census of the Arctic (RUSALCA) program
- Arctic Ecosystem Integrated Study (EIS)
- Distributed Biological Observatory (DBO) program
- Serve up oil & gas industry data on AOOS portal
- BOEM’s Marine Arctic Research Ecosystem Study

9.0 Special Report: Updates to RA Board Membership

- Dan White replaced Mike Castellini as University of Alaska representative. A replacement for Lyman Thorsteinson as the USGS representative is currently being discussed, since he retired.
- The Barrow Arctic Science Consortium is no longer active.
- We are still seeking a statewide tribal representative, but are in discussion with several possibilities. See IOOS governance template below.

Region	Type of Governance	Distribution of Governance Board Membership							Total Number of Board Members	
		Government				Non-Government				
		State*	Local	Tribal	Federal	Research Institute	Industry	NGO**		Foreign (all sectors)
AOOS	MOU	4			4	7	2	2		19
CaRA	MOA	3				1	6	2		12
CeNCOOS	MOU	2			2	8		3		15
GCOOS	MOU	2			2	3	5	3		15
GLOS	501(c)(3)		1		3	1	4		1***	10
MARACOOS	501(c)(3)	2			3	8		2		15
NANOOS	MOA	2		2	2	4	3	2		15
NERACOOS	501(c)(3)	5			2	6	4	1	2	20
PacIOOS	MOA	5			2	1	3	1	2	14
SCCOOS	MOU				1	7		1	2	11
SECOORA	501(c)(3)	2			1	13	6	3		25
ACT						4	1			5

* includes Sea Grant and territorial governments

** includes Fishery Management Councils

*** "bi-national" International Joint Commission

10. Special Report: Governance Activities and Accomplishments

- AOS celebrated its 10th anniversary at a special event November 19 at the Anchorage museum. Board chair Ed Page and IOOS program director Zdenka Willis helped with the festivities.
- AOS Data Management Advisory Committee met September 25 in Anchorage to review current activities. IOOS Data Lead Derrick Snowden attended – his first visit to Alaska – and discussed data certification issues. The committee also met February 25 and reviewed the current committee membership list and recommended changes to update the committee’s Terms of Reference. The committee met by teleconference July 11 to review the annual Axiom work plan.
- AOS Board met in Anchorage October 17 to review and re-elected Ed Page as board chair and Ed Fogels as vice-chair, and elected Cheryl Rosa as secretary and Jim Kendall as treasurer. IOOS Association Executive Director Josie Quintrell attended and discussed annual budget and planning initiatives. The Board also met April 3 to approve the work plan and budget for FY 15, which for AOS starts June 1, 2015. The Board approved updated Terms of Reference for the Data Management Advisory Committee, and approved two new members to the DMAC: Jim Potemra of the Pacific Islands Ocean Observing System and Zach Stevenson with the Northwest Arctic Borough.
- Executive Director Molly McCammon briefed the Indigenous People’s Council on Marine Mammals on December 1 and asked them to designate a representative to the AOS Board. The Council would first like to meet directly with the AOS Board at a future meeting.

11. Special Report: Education and Outreach Activities

11.1 Education

- The Community Based Monitoring (CBM) Handbook developed as a product of the CBM Workshop hosted by AOS and Alaska Sea Grant last April was released at the 2015 Alaska Forum on the Environment.
- Continued to support COSEE Alaska partnership as this program concludes.
- Co-hosted Communicating Ocean Sciences Workshop at AMSS in January.
- Supported the student poster process at the Alaska Marine Science Symposium (through COSEE).

11.2 Outreach

- Hosted an AOS 10th Anniversary event at the Anchorage Museum in November to celebrate a decade of ocean observing. Included winning film contest films, keynote speaker, and director remarks.
- Gave AOS overview and data portal presentations to the following audiences:
 - CIRCAC Environmental Monitoring Committee, demo of Cook Inlet Response Tool, Sept 2014

- 2 hour informational webinar on the Gulf Watch Alaska Program geared toward agency managers, Sept 2014
- Overview of AOS capabilities to NOAA National Weather Service visitors John Murphy and Helmut Portmann on October 2014
- AK Arctic Policy Commission Research Needs Listening Session, participated October 2014
- World Wildlife Fund's Russian Arctic contingent – Arctic Portal Demo, Nov 2014
- Moore Foundation staff – AOS data portal demo, April 30
- Alaska Marine Conservation Council Board, live demo & meeting, April 2015
- Cook Inlet LNG Project team, live demo and briefing May 2015
- Alaska-Norway Experts Group Roundtable on data sharing and monitoring systems for Safety and Preparedness in the Arctic, presentation and panel participation, May 2015
- Exxon Valdez Oil Spill Trustees Council's Public Advisory Committee, demo and update on Research Workspace and data visualization, Feb
- Developed and deployed a user survey in January to assist in guiding planning efforts.
- Developed and deployed a user survey to lower Cook Inlet boaters to gauge feedback on deployment timing for a popular wave buoy.
- Partnered with the Cook Inlet Regional Citizens Advisory Council to provide a 1-day hands-on workshop for resource managers on the Cook Inlet Response Tool (CIRT) in Homer in March.
- Partnered with the Cook Inlet Regional Citizens Advisory Council to provide a shorter version of the workshop for resource managers on the Cook Inlet Response Tool (CIRT) in Kenai in May.
- Opened entries for the second annual AOS Film Contest.
- Continued to add content to AOS website, including news stories, top features, animations and new pages.
- Produced monthly Executive Director updates.
- Initiated bi-monthly e-newsletter to list serve of over 500 recipients.
- Produced press releases for the media on AOS-funded projects.
- Expanded the reach of AOS Facebook page, continued posting several times per week.
- Regularly check Google Analytics to assess website and data portal viewership.
- Partnered with Alaska Geographic to present an afternoon of ocean films featuring short films submitted to AOS for the 2014 Film Contest at the Beartooth Theater & Pub to an audience of over 240.
- Highlighted short films from entries submitted to the 2014 Film contest on the website weekly.
- Co-sponsored Anchorage Coastal Cleanup in June 2014. Planned for 2015 cleanup.