

**Semi-annual Program Performance Report for NA11NOS0120020
FY 2011-15 Alaska Regional Coastal and Ocean Observing System
For reporting period December 1, 2015 – May 31, 2016**
Prepared by Molly McCammon, Project PI on June 27, 2016

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

- The AOOS DMAC met on March 11 for programmatic updates and a data team report.
- The AOOS Board met on March 16 to review and approve the FY 16 budget and work plan.

2.1.2 Participation in national IOOS activities

- Executive Director Molly McCammon met with other members of the IOOS Association Executive Committee January 12-14 in Washington D.C. to prepare for the IOOS Association spring meeting in D.C., strategize for FY17 funding and plan for the ICOOS Act reauthorization hearings.
- McCammon and Operations Director Carol Janzen joined other IOOS Association members for the spring IOOS Association meeting in Washington D.C. March 1-3.
- McCammon joined IOOS Program Executive Director Zdenka Willis and IOOS Association Chair Ru Morrison (from the Northeast regional OOS) at a PacIOOS strategic planning session with their Executive Committee in Pohnpei, Micronesia from March 22-25.
- AOOS Administration and Outreach Director Holly Kent met with CariCOOS Executive Director Julio Morell on March 11 and shared information on IOOS certification processes.
- Janzen participated in the NOAA IOOS Mooring Workshop at the Stennis Space Center in Mississippi to help in development of a national coastal mooring plan for the U.S.
- Kent participated in regular IOOS Education and Outreach calls.

2.1.3 Partnerships and external affairs - Alaska

- McCammon attended the Cook Inlet Regional Citizens Advisory Council meeting December 3-4. She was reappointed to represent the Municipality of Anchorage by Mayor Ethan Berkowitz. On April 15 the Council also voted Molly to the CIRCAC Environmental Monitoring Committee.
- AOOS partnered with Alaska Sea Grant to host sessions of the Alaska Marine Policy Forum on February 3, March 23 and May 18, 2016.

- McCammon met with others from NOAA and NSF February 25 for the Arctic Research Cruise Visualization Planning to discuss how to display planned research cruise tracks.
- AOS and National Weather Service partners of the Integrated Water Level Observing Network met February 24 to discuss how to spend the \$200k transferred to AOS for water level observations, as well as priorities for potential additional funding.
- AOS added a new webpage for the Alaska Climate Change Executive Roundtable nested within the AOS website: www.alaskaclimatescience.org. ACCER. AOS staff will provide ongoing technical support for the webpage.
- McCammon attended the April 8 meeting of the Alaska Climate Change Executive Roundtable and reported on the results of the last 5 years of efforts by the Alaska Data Integration Working Group (ADIWg).
- McCammon attended the Nome Coastal Resiliency Workshop on May 10-11 sponsored by the Alaska Landscape Conservation Cooperatives and the Aleutian Pribilof Islands Association. AOS is assisting the project with developing a resiliency tool kit for western Alaska's rural communities.

2.1.4 Partnerships and external affairs – national & international

- McCammon attended the U.S.-Canada Shared Interests and Opportunities in the North American Arctic Workshop, hosted by the Arctic Domain Awareness Center, December 14-15 in Anchorage.
- McCammon and Janzen attended the Pacific Anomalies Workshop 2 in Seattle January 20-21. AOS was one of the 4 IOOS regional associations that sponsored the event.
- McCammon participated in a panel on Energy and the Economy and Environment at the University of Washington Law School-sponsored Arctic Encounters Workshop in Seattle January 15-16.
- While attending IOOS Association meetings in Washington DC, McCammon attended the January 14 Arctic Matters public forum sponsored by the National Academy of Sciences.
- McCammon and Axiom's Rob Bochenek met in Seattle with ERMA and Office of Response and Restoration staff to discuss continued collaborations for providing emergency response data products.
- McCammon briefed Thomas Cuff, the National Weather Service's new Director of the Ocean Prediction Center, on the AOS program and our collaborations with NWS February 23.
- McCammon met on February 19 with Doug Causey and Randall "Church" Key, the new PI and Executive Director of the Department of Homeland Security's Arctic Domain Awareness Center.
- Janzen attended an AGU meeting in New Orleans February 22-25 on behalf of AOS and presented a talk on "Expanding Alaska's Remote Ocean Observing Capabilities Using Robotic Gliders and Remote Sensing Technologies" and a poster on the Chukchi Ecosystem Mooring
- McCammon was recently elected as one of the Consortium for Ocean Leadership's trustees representing the Associate Members of COL.
- McCammon has been asked to serve on an external review panel of the international Sustained Arctic Observing Network.
- McCammon and Janzen attended the Arctic Observing Summit & Arctic Summit Science Week meetings in Fairbanks from March 15-18.
- McCammon represented AOS at the April 26-27 Ecological Forecasting Roadmap Workshop in College Park, MD.
- McCammon attended the first meeting of Ocean Research Advisory Panel held since December 2013 in Arlington, VA May 31-June 1.
- AOS PI Jacqueline Overbeck (Alaska Department of Natural Resources) attended the 3rd Sea-Level Rise Summit on AOS' behalf in Ft. Lauderdale, Florida from May 3-5.
- Martin Jeffries and Sandy Starkweather met with McCammon and Janzen May 9 to discuss priorities for the Interagency Arctic Research Policy Committee's next 5-year plan.
- McCammon, Janzen and Bochenek met with Arctic ERMA staff from Seattle via teleconference May 19 for their quarterly meeting to update each other on recent activities.

- McCammon has been participating in planning meetings for the Arctic Incident of National Significance Workshop scheduled for June 21-22 at UAA.

2.1.5 Program management, administration, fundraising and financial oversight

- Davin Holen was hired in January as a Sea Grant Marine Advisory Program agent with a focus on community coastal resiliency, a position partially funded by AOOS.
- AOOS received word March 29 that we were awarded \$15K per year for the next two years from the NOAA Ocean Acidification Program to support developing an OA Network in Alaska.
- Proposal action:
 - AOOS partnered with National Marine Fisheries Service's (NMFS) Auke Bay Lab in Juneau on a small proposal to NOAA's Big Earth Data Initiative (BEDI) to increase the usefulness of and access to NMFS fisheries oceanography data collected in Alaska. UNSUCCESSFUL.
 - AOOS submitted a proposal to the Bureau of Safety and Environmental Enforcement (BSEE) to provide community web access to modeling efforts and atmospheric and meteorological data collected by the Bureau of Ocean Energy Management (BOEM) in the Beaufort and Chukchi Sea regions. PENDING.

2.2 Marine Operations

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

- Subaward to PWS Science Center.
- Routine maintenance was performed on Snotel stations.

2.2.2 Pilot AIS dissemination of weather data

- Subaward to Marine Exchange of Alaska (MXAK).
- AtoN (Aids to Navigation) AIS (Automatic Identification System) installations were completed at Sitka, Seward, Cordova, and Kodiak.
- Six marine weather station installations were completed at Skagway, Seward Harbor, Kodiak Gull Island, Sitka, Cordova Harbor and Scotch Cap on Unimak Island.
- Authorization to transmit from all AIS AtoN stations was granted by the United States Coast Guard (USCG) and Federal Communications Commission.
- MXAK has provided a number of test AIS Data Reports to AOOS and came to an agreement on future report formatting, intervals and reporting areas.

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

- Subaward to UAF SFOS.
- Due to sea ice cover, HFR systems did not collect data over this reporting period.
- In lieu of operations, preparations were made for the 2016 field season, which begins in June 2016. This includes ordering replacement parts, planning logistics, and renewing permits and indemnity agreements.

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.
- Ran the real-time PWS ROMS modeling system on a daily basis.
- Uploaded the ROMS model output daily to the AOOS DMAC web site and supported the AOOS DMAC team for web interpretation and visualization.
- Performed the ROMS sensitivity to a new fresh-water forcing provided by Prof. David Hill at OSU and carried out comparisons with the existing fresh-water forcing being used.

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.
- 2 Seabird Seacat (SBE 16+V2 with digiquartz pressure sensors) CTDs were purchased, and one prepared for deployment.
- An ultrasonic sensor, datalogger and pressure sensor were purchased for surveying absolute water levels during the deployment of the Seacat sensors.

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. Equipment has been transferred to the Marine Exchange.

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

- Buoy remained moored over the winter with no problems or issues.

2.3.3 Produce electronic sea ice atlas

- Subaward to ACCAP.
- The downloadable database has been updated through December 2015 (completed April 2016).

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

- Subaward continued with ADN/DGGS to provide coastal hazard and vulnerability tools and products, including seeding data into the Alaska Coastal Profile Tool and preparation of digital surface models collected in 2015 to extend the map series.
- Gap priorities document is written and out for external review.
- Sites for 2016 installations have been chosen.

2.4 Ecosystems/Fisheries and Climate Trends

2.4.1 Maintain Arctic Research Assets Map

- Continued to maintain.

2.4.2 Support sampling along Seward Line

- Subaward to University of Alaska Fairbanks (UAF).
- Anomalously warm temperatures from 2015 have persisted over the winter.
- The line was again extended offshore to encompass stations GAK14 & GAK15. All offshore stations were sampled to 1,000 m with the CTD. All GAK stations were sampled. PWS sampling was confined to the western Sound.

2.4.3 Use AOS 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.
- DMON acoustic recordings were analyzed for all occurrences of marine mammal and anthropogenic sounds.
- Glider CTD data were quality controlled to account for errors in the conductivity measurements.
- Statistical analyses were performed to compare the distributions of fin, humpback, killer whales and walrus to water masses in the Chukchi Sea.

2.4.4 Support Distributed Biological Observatory

- Subaward to University of Alaska Fairbanks (UAF) for NE Chukchi mooring.
- Ordered and took delivery of new mooring components.
- Post-deployment AZFP calibration and refurbishment accomplished.

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.
- Large scale coastal OA cruise in Gulf of Alaska was completed in July.
- The SEAK mooring in Port Conclusion, AK was recovered in January 2016 and the KODIAK mooring in Chiniak Bay, AK was recovered in April 2016. The GAKOA (Resurrection Bay) and M2 (Bering Sea) moorings will continue to collect OA data in 2016.

2.4.6 *Test use of conductivity sensors at Cordova tide station*

- Subaward to PWSSC.
- Routine maintenance was performed on the conductivity sensor.

2.4.7 *Support mooring turnovers for biological monitoring*

- Subaward to PWSSC.
- Retrieval of non-functioning acoustic sensors in Port Gravina failed. Developing new retrieval procedure.

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

- Conducted monthly and seasonal shipboard oceanographic surveys with CTD profiler.
- Conducted along-bay oceanographic surveys with CTD profilers in Kachemak Bay and extending into southeast Cook Inlet entrance in May 2016. Extended the transect to improve assessment of warm ocean conditions and leveraged NCCOS-funded harmful algal bloom project to also collect nutrient data.
- Conducted additional intensive CTD and nutrient measurements in Tutka Bay and Sadie Cove fjords (Kachemak Bay sub-bays) in May 2016 to measure the environmental conditions associated with an unusually large and early bloom of Alexandrium phytoplankton, a HAB species which produces the toxin that causes paralytic shellfish poisoning. Leveraged an NCCOS-funded HAB project to also assess vertical phytoplankton and nutrient distributions..

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"*

- STAMP Arctic Portal data layers and metadata updated and reviewed.
- Through work with Defenders of Wildlife several new data layers added describing places of refuge and geographic response strategies.
- Marine Biodiversity Observation Network (MBON) biodiversity indices tool framework applied to BASIS datasets and exposed through Arctic Portal.
- Shell Sea Ice Characterization dataset updated with 2015 summer data.

2.6 Data Management & Products – Subaward to Axiom Data Science

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.*

- Biodiversity hex binning implemented for 4 index types for biological time series (BASIS, Arctic EIS, CSESP, and RUSALCA). Methodologies are being leveraged across SECOORA and CeNCOOS.
- Ocean Acidification and Alaska Climate Exchange Executive Roundtable special pages set up on AOOs.org.
- Continue to cultivate next generation 4 D capability to visualize gliders, CTD cruises and animal telemetry data sets (x,y,z,t).

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

- Ingested and exposed several PAME datasets (places of refuge, Geographic Emergency Response Strategies) for Bering Strait.
- Week long planning workshop held with Matt Biddle from NCEI to develop automated pathways of submission to NCEI for structured and unstructured data.

- Coastal Change Tool Developed for WALCC (data ingestion and application development).
 - Northwest Arctic Borough subsistence datasets fully ingested.
- 2.6.3 *Continue ADF&G (Alaska Department of Fish & Game) partnership*
- This project has been completed.
- 2.6.4 *Collaborate with other state, regional, national and international data management programs*
- Working with ERMA through DHS sponsored University of Alaska Arctic Information Fusion Capability. Focus is to make AOOS data feeds available to ERMA.
- 2.6.5 *Continue to develop IOOS SOS service and assist other RAs in deployment and begin work on IOOS Systems Integration Test.*
- Supported the national MBON network with data management support and XBON cross coordination. Launched MBON portal off the IOOS website.
 - Several new sensor networks added to Environmental Sensor Map including 1200 new sensors and Ocean Sites profiling mooring datasets.
 - Attended ODIP meeting in Colorado for 52 North SOS support.
 - Added additional data sources to IOOS scalability map (Missing NDBC, stations and RA providers).
 - Linked up RA 52 North SOS to Environmental Sensor Map.
 - Attended meeting (May 2016) in Silver Spring to demonstrate Scalability Map.
 - Working with ATN data providers (MARES and Josh London at NMML) to standardize tagging archive and develop submission pathway for ATN DAC.
 - HFR group prepared to transfer first radar archive dump to Axiom infrastructure.
- 2.6.6 *Develop new products and applications*
- Cook Inlet Beluga Whale Ecosystem Portal launched.
 - WALCC Coastal Change Tool released.
 - Defenders of Wildlife Bering Strait Response Tool launched.
 - IOOS MBON Portal launched.
- 2.6.7 *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; BOEM MARES; RUSALCA program; and Arctic Ecosystem Integrated Survey.*
- NPRB Integrated Arctic Program spinning up.
 - Gulf Watch Alaska and Herring Research and Monitoring programs being supported.
 - MARES year 1 data management activities completed.
 - AMBON field season 1 data sets acquired, fully curated and exposed through AMBON data portal.
 - Working with North Slope Borough to develop project plan for their data resources.
- 2.6.9 *Serve up oil & gas industry data on AOOS portal*
- This project has been completed.

2.7 Modeling & Analysis

2.7.1 Initiate statewide circulation model exchange & ensemble modeling

- Proposed Alaska Modeling Testbed in next 5-year proposal. Planning underway to initiate.

2.8 Communication, Education & Outreach

2.8.1 Support COSEE Alaska partnership

- Continue to support Community Based Monitoring page on AOOS website.
- COSEE project completed.

2.8.2 Support AOOS 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 quarterly e-newsletter to list-serve of over 500 recipients.
- Produced hard copy winter newsletter.

- Launched 2016 AOS film contest.

2.8.3 *Scope out potential Alaska Oceans & Coast Report*

- Seeking funding for report.

2.8.4 *Interact with stakeholders and partners*

- AOS launched the 2016 Short Film Contest.
- Kent gave a presentation on the Alaska Ocean Acidification Network to the board of the Alaska Marine Conservation Council on April 15.
- AOS co-sponsored the Alaska Marine Science Symposium in January and organized a media communications workshop.
- AOS hosted a 2-day workshop on ocean acidification (OA) January 29-30 with over 30 OA technical experts and Alaska-based organizations working on OA issues in attendance.
- Kent and Janzen met with the Cook Inlet Beluga Ecosystem Portal Steering Committee on February 2 to coordinate final activities for this project, funded by the National Fish and Wildlife Foundation.
- AOS sent a press release out for the Cook Inlet Beluga Ecosystem Portal launch and received earned media stories in both print and radio.
- AOS staff Darcy Dugan held the first planning session for an Alaska Ocean Acidification Network (AOAN) on February 23. The steering committee met on April 12 to set activities for the coming year and the first email of the new AOAN listserv was delivered on May 12.
- AOS is supporting Alaska Sea Grant's efforts to host a workshop next winter on how to better coordinate, integrate and increase existing HAB research and monitoring efforts.

3.0 Scope of Work (Priorities for next 6 months, June 1 2016 – November 30, 2016, and anticipated changes to SOW)

3.1 AOS Regional Management

3.1.1 AOS Board and Committees

- Full board meeting planned for fall 2016.
- Full Data Management Advisory Committee meeting planned for fall 2016.

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.
- Submit IOOS certification in August 2016.

3.2 Marine Operations

3.2.1 Maintain Snotel stations in PWS and CI

- Contract for routine maintenance of Snotel stations

3.2.2 Pilot AIS dissemination of weather data

- This project was completed within the original project period.

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

- With additional funding from Shell Oil, we will install and maintain long-range CODAR HFR field sites on the northwest Alaska coast at Icy Cape, Wainwright, Point Barrow, and Cape Simpson from June through November 2016.

3.2.4 Maintain WRF wind model for PWS and CI

- This project is completed.

3.2.5 Maintain operational ROMS model for GOA

- Determine use of the real-time PWS ROMS modeling system and assess its continuance.

3.2.6 *Validate hydrological model for PWS*

- Model evaluations are ongoing although funding is complete

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*

- Finish configuration and testing of the ultrasonic water level sensor.
- Deploy moored Seabird Seacat in Beaufort Sea to collect water level information for a ~1 year.

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*

- Project completed.

3.3.2 *Maintain CDIP wave buoy in Cook Inlet*

- Monitor.

3.3.3 *Produce electronic sea ice atlas*

- Update to include Alaska sea ice data through June 2016 should be completed in fall 2016.

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

- Work with community-based observation group in Barrow to acquire data and establish collection protocols for Interactive Coastal Profile Tool.
- Expand the Color-indexed Elevation Map Series for Coastal Communities to more communities and into the National Weather Service format.
- Deploy 2 real-time water level sensors at Dillingham, Emmonak or Kaktovik.

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*

- Complete September 2015 samples and move onto May 2016 samples.
- Work on manuscripts describing the first 18 years of Seward Line Zooplankton Data and the 2014/15 anomaly.
- Next Seward line cruise is scheduled for early September – this will be the 20th consecutive late summer/fall cruise.

3.4.3 *Use A00S glider for high-latitude observation node in Chukchi & continue testing use of gliders for other uses*

- Conduct Chukchi Sea glider survey with NPRB support starting in early July 2016.

3.4.4 *Support Distributed Biological Observatory: Chukchi Ecosystem mooring*

- Finalize 2016 mooring construction.
- Recover 2015 deployment from USCGC Healy in August 2016 and deploy 2016 mooring.

3.4.5 *Maintain OA sampling along Seward Line & OA mooring sensors*

- OARC will coordinate with the Hakai Institute to install a second BoL system at OceansAlaska in Ketchikan. These data will be available online in July 2016.

3.4.6 *Test use of conductivity sensors at Cordova tide station*

- Maintain conductivity sensor.

3.4.7 *Support mooring array for biological monitoring in PWS*

- Ongoing.

3.4.8 *Conduct CTD surveys in Kachemak Bay and lower Cook Inlet*

- Conduct monthly CTD surveys at mid-Kachemak Bay transect, two seasonal CTD surveys at the outer Kachemak Bay transect and at least one along-bay CTD survey in Kachemak Bay.

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.

3.6 Data Management & Products

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

- Deploy Next Generation Ocean Portal Framework. Includes advanced charting with data compare, integration of 4D datasets with visualization (gliders, animal telemetry and cruise datasets) and enhanced user interface.
- Continue to develop biodiversity index tools for biological time series.
- Assist AOOs with developing a plan for new AOOs website.

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

- Expose Western Alaska tidal forcing models from Rob Grumbine through AOOs portals.
- Expose Barrow Sea Ice Radar, UAF MODIS Imagery and HIOMAS Arctic model through AIFC coordination.
- Continue to work with Shell to acquire and curate legacy of Arctic data collection.

3.6.3 Continue ADF&G partnership

- This project has been completed.

3.6.4 Collaborate with other state, regional, national & international data management programs

- Continue collaborations.

3.6.5 Continue to develop/support IOOS SOS service and assist other RAs in deployment and conduct System Integration Test.

- Work with IOOS Office to define details of next years IOOS Special project workplan.
- Ingest HF Radar Network radial files and establish RSYNC.
- Add ARGOS and all OceanSites data feeds to Environmental Sensor Map.
- Complete development on 52 north SOS 2.0 specification.
- Complete integration Scalability map into IOOS catalog.
- Upgrade IOOS Environmental Sensor Map to Next Generation Ocean Portal User Interface technology.
- Continue to support national MBON effort with research workspace and data coordination activities.

3.6.5 Develop new products and applications

- Develop Coastal Change Tool through the Alaska Department of Natural Resources.
- Complete development on multidimensional data model (Ocean in 4D) and integrate into next generation ocean portal framework.
- Develop seasonal averages (climatology tool) for long term sensor time series and graphics.

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

- Release ocean in 4D ocean portal integration as part of Next Generation Ocean Portal rollout.

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

- Attend Arctic IERP for NPRB and initiate data management efforts.
- Cultivate and expand capabilities of AOOs Research Workspace.
- Attend all PI meetings.
- Deploy annual report tool for NPRB annual program research workspace project.
- Curate Arctic EIS data sets.

3.6.9 Serve up oil & gas industry data on AOOs portal

- Manage access to industry data and facilitate updates to the resource.
- Make data publicly available with simple search tool.
- Acquire legacy Shell data that hasn't been acquired through CSESP program.
- Continue to Work with NODC to streamline archive process.

3.7 Modeling & Analysis

3.7.1 Initiate statewide circulation model exchange & ensemble modeling

- Continue discussion on future AOS modeling efforts.

3.8 Communication, Education & Outreach

3.8.1 Support AOS 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 AOS on their website.
- Work with AOS staff and Axiom to plan new website.

3.8.2 Scope out potential Alaska Oceans & Coast Report

- Begin scoping phase for this report.

3.8.3 Interact with stakeholders and partners

- Continue providing demos of AOS tools to interested organizations and agencies.
- Reach out to local media contacts to improve frequency of earned media.
- Finalize the third annual AOS Ocean Film Contest.

4.0 Personnel and Organizational Structure

No changes.

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

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

- Continue to update the interactive web-based data integration and visualization tool for the Alaskan Arctic based on AOS data infrastructure, which now includes over 300 data sets from a wide variety of sources.
- Made progress on an "AOS lite" version of the AOS Arctic Portal that can run efficiently on low-bandwidth computers.

8.0 Special Report: Efforts to Leverage IOOS Funding

AOS 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.

AOS Proposals:

- AOS was successful in the following proposals: AOS to develop an ocean acidification network from NOAA; and AOS, Axiom, and Agnew Beck Consulting to provide communication tools and training for coastal resilience and adaptation in Alaska.

- Three proposals submitted are pending: AOOs and Axiom to provide data management services for the Exxon Valdez Oil Spill Trustees Council, AOOs with the Kenai Fjords National Park to run an ocean acidification workshop for NPS employees for the National Park Service's Ocean Alaska Science Learning Center, and AOOs to the Bureau of Safety and Environmental Enforcement (BSEE) to provide community web access to modeling efforts and atmospheric and meteorological data collected by the Bureau of Ocean Energy Management (BOEM) in the Beaufort and Chukchi Sea regions.
- Two proposals submitted during this period were unsuccessful: a proposal on coastal resiliency for NOAA; and AOOs with National Marine Fisheries Service's (NMFS) Auke Bay Lab in Juneau to NOAA's Big Earth Data Initiative (BEDI) to increase the usefulness of and access to NMFS fisheries oceanography data collected in Alaska.

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

- Chris Zimmerman acted as the interim USGS representative until Aimee DeVaris replaced him.
- Brad Moran replaced Dan White as University of Alaska representative.
- Michael Macrander will be replacing Robert Raye as Shell representative.
- We are finalizing a statewide tribal representative for the fall meeting. The IOOS governance template was not available to update at the time of this report.

10. Special Report: Governance Activities and Accomplishments

- AOOs has been working on certification documentation and will submit its application for certification this summer.
- AOOs Data Management Advisory Committee met November 4, 2015 in Anchorage to review current activities and Axiom workplan and discuss implications of Shell's withdrawal from the Arctic. They met again on March 11 in Anchorage to review current activities, the Axiom 2016 workplan and new data capabilities.
- AOOs Board met in Anchorage June 29, 2015 to approve changes to the budget and the conceptual draft of the FY 16-20 IOOS proposal. The regular fall board meeting November 3, 2015 included approval of grant awards, a discussion on certification and some strategic planning. The regular spring board meeting on March 16, 2016 in Fairbanks was concurrent with Arctic Science Summit Week and consisted of review and approval of the FY 17 work plan and the draft Strategic Operations Plan.

11. Special Report: Education and Outreach Activities

11.1 Education

- Co-hosted Communicating Ocean Sciences Workshop at Alaska Marine Science Symposium in January.
- Hosted an intern from Stanford in summer 2015 to work on ocean acidification outreach.
- Partnered with Cook Inlet Regional Citizens Advisory Council and Axiom to present a workshop for resource managers on the Cook Inlet Response Tool application of the AOOOS data portal.
- Developed and continues to maintain the Alaska Blob Tracker, a blog that provides information about the realized and potential effects to Alaska from the current Pacific Ocean Anomaly.
- Hosted a 2-day ocean acidification technical workshop in Anchorage attended by top researchers in the field of ocean acidification research.
- Partnered with 4 other IOOS regional associations to sponsor the second Pacific Anomalies workshop in Seattle, January 2016.
- Launched the new Alaska Ocean Acidification Network focusing on expanding the understanding of OA processes and impacts in Alaska, as well as potential adaptation and mitigation actions, April 2016.
- Co-hosted a workshop on coastal resiliency in rural Alaska communities in Nome, May 2016.

11.2 Outreach

- Hosted Ambassador Brzezinski, Executive Director of the Arctic Executive Steering Committee at the White House, with the AOOOS board of directors for an update on AOOOS activities in the arctic in January 2016.
- Gave AOOOS overview and data portal presentations to the following audiences:
 - Dr. Russell Callender, NOAA's National Ocean Service Assistant Administrator, and Vice Admiral Michael Devany, NOAA's Deputy Under Secretary for Operations in Anchorage, June 2015.
 - The Arctic Zephyr International Search and Rescue Tabletop Exercise in Anchorage, October 2015.
 - The Alaska Association of Harbormasters and Port Administrators conference in Anchorage, October 2016.
- Presented awards to two young filmmakers and three adults for the second annual AOOOS Film Contest and opened entries for the third annual AOOOS Film Contest.
- Partnered with Alaska Marine Conservation Council to hold an Anchorage Coastal Cleanup in June 2015.
- Presented a poster on the AOOOS Arctic Portal at the 6th Symposium on the Impacts of an Ice-diminishing Arctic on Naval and Maritime Operations in July 2016 in Washington DC.
- Partnered with World Wildlife Fund to present a Climate Science Expo in Anchorage connecting arctic research scientists to national and international media representatives in August 2015 during President Obama's GLACIER conference.
- Presented an overview of AOOOS and an Arctic Data Portal demonstration at the Arctic Energy Summit in Fairbanks in September 2015.
- Presented AOOOS' support of Alaska's Blue Economy at the Marine Technology Society (MTS) and IEEE Oceans '15 conference, October 2015.
- Presented AOOOS' mission, arctic activities and Arctic Data Portal at the Arctic Observing Open Science Meeting in November 2015.
- Presented a talk on "Expanding Alaska's Remote Ocean Observing Capabilities Using Robotic Gliders and Remote Sensing Technologies" and a poster on the Chukchi Ecosystem Mooring at the AGU Ocean Sciences Meeting in New Orleans, February 2016.
- Briefed Thomas Cuff, the National Weather Service's new Director of the Ocean Prediction Center, on the AOOOS program and our collaborations with NWS during Tom's Alaska visit February 23.
- Presented a poster detailing the AOOOS Arctic Data Portal at the Arctic Observing Summit & Arctic Summit Science Week, March 2016.

- Developed and now hosting and maintaining a new webpage for the Alaska Climate Change Executive Roundtable nested within the AOOS website, April 2016.
- Continued to add content to AOOS 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 AOOS-funded projects.
- Expanded the reach of AOOS Facebook page, continued posting several times per week.
- Regularly check Google Analytics to assess website and data portal viewership.
- Highlighted short films from entrees submitted to the 2015 Film contest on the website.