

# **Semi-annual Program Performance Report for NA11NOS0120020 FY 2011 Alaska Regional Coastal and Ocean Observing System For reporting period June 1, 2012 – November 30, 2012**

*Prepared by Molly McCammon, Project PI on December 28, 2012*

## **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 proposal 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 proposal 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*

- AOOS Board met in Anchorage October 30, focusing on strategic planning for next five years. As follow-up, Executive Director will assess organizing as non-profit corporation instead of consortium governed by MOA, and seek out broad spectrum of new board members, especially from private sectors.
- AOOS Data Management Advisory Committee met October 5 to review recent progress by the data management team.

#### *2.1.2 Participation in national IOOS activities*

- AOOS Executive Director McCammon and Board members Amy Holman and Cynthia Suchman attended national IOOS Summit in Herndon, VA Nov. 13-16. McCammon co-led stakeholder and advocacy breakout sessions, as well as moderated the plenary session on stakeholder needs.
- McCammon attended IOOS (Integrated Ocean Observation System) and NFRA (National Federation of Regional Associations) meetings in Washington, DC June 18-20; in Seattle July 16-17; in Washington, DC September 19-21, meeting with NOAA Administrator and the NFRA

Executive Committee; and at the NFRA annual meeting Nov 11, where the group voted to change its name to the “IOOS Association.”

- McCammon participated in regular meetings of the IOOS Summit Program Committee, ICOOS Act Reauthorization Committee, NFRA Certification Criteria review group and ERMA (Environmental Response Management Application) discussions.
- Rob Bochenek, AOS data team lead, participated in the IOOS Data Managers meeting in Washington, DC September 10-11, as well as IOOS-facilitated bi-weekly SOS reference specification calls and DMAC (Data Management and Communications) coordinator meetings.
- Darcy Dugan, AOS Program Manager, participated in monthly Education and Outreach calls.

### *2.1.3 Partnerships and external affairs - Alaska*

- McCammon participated in meetings of Alaska Center for Climate Assessment and Policy Steering Committee (National Oceanic and Atmospheric Association’s (NOAA) Alaska Regional Integrated Sciences and Assessments Program), member; NOAA’s regional collaboration team, member (including a 2-day retreat in September 2012); and Cook Inlet Regional Citizens’ Advisory Council and its Executive Committee.
- McCammon completed tasks as co-author of Alaska Regional Climate Assessment Technical Report and Alaska chapter of National Climate Assessment.
- McCammon met with Laura Furgione, acting National Weather Service director, in Anchorage, as well as with NOAA’s David Kennedy and Margaret Spring on August 22. On August 21, AOS helped host a meeting of the Alaska Data integration Working Group with the Department of Interior’s Assistant Secretary Anne Castle.
- AOS co-hosted with Alaska Sea Grant, sessions of Alaska Marine Policy Forum on June 6, July 25, September 26 and November 27.
- Dugan continued to participate in working group led by Kenai Watershed Fish Habitat Partnership to develop Conservation Action Plan for Cook Inlet.
- McCammon, Dugan, and Interagency Personnel Agreement detailee Rosa Meehan participated on the Alaska Marine Science Symposium organizing committee – reading abstracts, securing keynote speakers, coordinating workshops, and developing a participant survey.
- Dugan participated in 3-day Arctic Scenarios Planning class at UAF (University of Alaska Fairbanks) in June.
- AOS helped organize a briefing of Coast Guard program managers in Juneau interested in Arctic observing covering high frequency radar, AIS use for ship detection and overall AOS activities.
- McCammon participated in the Sept meeting in Alaska of the National Sea Grant Association and the annual meeting of the Alaska Sea Grant Advisory Committee in November.
- Bochenek demonstrated the AOS data portal on November 6 as part of the Alaska Center for Climate Assessment and Policy’s monthly webinar

introducing and showing the differences between the AOS data portal, GINA (Geographic Information Network of Alaska) catalog, and NOAA's Arctic ERMA.

- AOS and NOAA's Office of Response and Restoration have signed a formal Letter of Understanding to coordinate AOS and Arctic ERMA data initiatives.
- Rob Bochenek demonstrated the recently developed "Cook Inlet Response Tool" data and mapping application during the ShoreZone annual meeting in November. AOS hosted two meetings of the Cook Inlet modeling working group, focusing on field research in the lower inlet in 2012, and options for data sharing in the future.

#### *2.1.4 Partnerships and external affairs – national & international*

- McCammon participated in the Polar Research Board meeting in Portland OR in July and ORAP in Washington, DC in August.
- Meehan attended "Marine Mammals of the Holarctic" meeting in Suzdal, Russia and presented proposal to develop Arctic Animal Tagging Network focused on marine mammals.
- McCammon represented AOS at the National Research Council Marine Board's October 15-16 workshop in Seattle, which focused on issues, needs and recommendations relating to increased shipping and vessel traffic through the Bering Strait.
- Dugan presented on AOS data activities during a November 27 webinar to the Canadian Beaufort Sea Partnership meeting held in Winnipeg.

#### *2.1.5 Program management, administration, fundraising and financial oversight*

- AOS annual audit underway by Alaska SeaLife Center.
- New position of program coordinator advertised; candidates were interviewed and offer made to finalist.
- Several unsuccessful proposals were submitted during this period: pre-proposal as part of Department of Defense Legacy Program to support Animal Tagging workshop and implementation plan; letter of intent to NOAA's SARP Program to develop an extreme weather/climate event threshold early warning application.
- Several proposals submitted are still pending: proposal with UAA to NSF Biology Cyberinfrastructure program to support cyberinfrastructure development for biological resources including invasive species; and proposal with the National Snow and Ice Data Center to NSF Arctic Observing Network to incorporate the AOS Research Workspace into the Advanced Cooperative Arctic Data and Information Service, which provides data management services for the Arctic Observing Network and other NSF projects in the Arctic.
- AOS collaborated with partners to submit a series of research ideas in response to the Bureau of Ocean Energy Management's call for science recommendations prior to lease sales in the Beaufort and Chukchi Seas and Cook Inlet. AOS' profile topics included new data integration tools, expanding data management infrastructure, compiling and analyzing

oceanographic model hindcasts and forecasts, and contributing to an animal tagging network.

- A00S received one small grant from the Bering Sea/Aleutian Islands Landscape Conservation Cooperative to develop a “platform of opportunity” portal showing planned research cruises in Alaska waters to assist with coordination and cost efficiency.

## **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 (NRCS). McNeil River Snotel installed in Cook Inlet.

### *2.2.2 Pilot AIS dissemination of weather data*

- Subaward to Marine Exchange of Alaska (MXAK). Three AIS/WX stations constructed and deployed on Portland and Marmion Islands in Southeast Alaska and at Homer Alaska. All three providing valid weather data.
- One AIS/WX transmitting unit installed in Homer. 50’ tower for AIS/WX transmitting unit planned for Juneau constructed.
- Meetings with NOAA held to obtain required permits to commence transmitting weather data over AIS.

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

- Subaward with University of Alaska Fairbanks. Deployed, calibrated, maintained, and demobilized long-range High Frequency Radar (HFR) equipment for 2012 field season in Barrow, Wainwright, and Point Lay.
- Upgraded existing laptops and field equipment to be compatible with latest Codar Ocean Sensors software and firmware releases.

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

- Subaward with University of Alaska Anchorage AEFF.
- Routine 48-hour forecasts for PWS and CI region produced twice daily with 3 model variants. Models continue to be verified. Preliminary results show that WRF consistently over-predicts winds and precipitation. New version of WRF model may help.
- Transitioning to new version of model WRF v.3.4.1.
- Development of direct circuit to NWS has been stalled. Elevated to executive director for further discussion.
- Collaborated with UAA group on study of winds at Valdez Marine Terminal and impacts on tanker loading safety.

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

- Subaward with YI Chao for maintenance with daily update schedule.

### *2.2.6 Validate hydrological model for PWS*

- Subaward to Prince William Sound Science Center. Established contracts with Oregon State University and University of Alaska.

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

- Yi Chao subaward. Installed OpenDAP server and populated it with 15-year retrospective analysis.

### **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. Assessment underway.
- PS9800, 50 PSIa pressure/temperature sensor (4-20mA) equipped with submersible 5-conductor PU cable with submersible connector assembly were installed October 10, 2012 on Seward station and remain operational. Seward webcam housing flooded and camera failed.

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

- Buoy lost again in August. Redeployed in September with help of multiple partners, especially US Fish and Wildlife Service and Kachemak NERR.

#### *2.3.3 Produce electronic sea ice atlas*

- Developed algorithms for incorporating sea ice information from Dehn charts, whaling logs and ship reports into database.
- Created prototype digital database by merging the Dehn data (1953-1979) with satellite (passive microwave) digital data for 1979-2012.
- Preliminary work to incorporate NWS/Anchorage Ice Desk charts underway.

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

- Develop collaborative strategy as follow-up to Western AK coastal Hazards workshop held in May 2012.

### **2.4 Ecosystems/Fisheries and Climate Trends**

#### *2.4.1 Maintain Arctic Research Assets Map*

- Intern updated map for 2012 field season, with expansion to western Alaska.
- Data team overhauled map as component of AOOS Ocean Portal with improved interface and access to project data.

#### *2.4.2 Support sampling along Seward Line*

- Subaward to University of Alaska Fairbanks (UAF). Line occupied September 12-18, along with expanded sampling in PWS. Spring 2011 analysis of samples/data underway. New CTD received for 2013 field season.

#### *2.4.3 Use AOOS glider for high-latitude observation node in Chukchi*

- Batteries replaced and new sensors added.
- Glider was not used this season due to sea ice and logistical issues.

#### *2.4.4 Support Distributed Biological Observatory*

- Funded 1 day of ship time for Chukchi Sea line.

#### *2.4.5 Maintain ocean acidification (OA) sampling along Seward Line & support OA sensors on moorings in Chukchi, Gulf of Alaska and Bering Sea*

- Subaward to UAF. A total of 450 OA measurements were taken during fall Seward Line cruise and new ancillary measurements (dissolved oxygen, particle organic carbon, oxygen isotopes).
- All data from 2012 analyzed and being used in two peer-reviewed manuscripts
- Bering Sea and Arctic moorings turned around.

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

- Subaward to PWSSC. Signed MOA with NOAA COOPS. Sensor sent out for modifications and calibration.

#### *2.4.7 Support mooring turnovers for biological monitoring*

- Subaward to PWSSC. Funds now being used to help with installation of acoustic tracking network. Received anchors. Rest of equipment soon.

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

- Funds withheld from AOOs agreement for NOAA Kasitsna Bay Lab.
- Extra surveys conducted June-September. No surveys in November-December due to severe ice and wind/wave conditions.

### **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"*

- Conducted scoping process for new tools, including 20+ in-person interviews and an online survey.
- Completed final reports summarizing scoping findings and assessing decision support tools developed elsewhere and their applicability to Alaska.
- Held project advisory group meeting in September to discuss progress and next steps
- Initial platform created for STAMP portal, including around 200 data sets to date.
- Gave presentations on STAMP to multiple audiences including the North Pacific Fisheries Management Council, Beaufort Sea Partnership, Northwest Arctic Borough Subsistence Mapping Workshop, and Barrow community.

### **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.*

- Initiated discussion with PACIOOS and NANOOS. Worked with NANOOS staff on developing ideas for NSF submissions.
- Prototype model explorer developed in HTML 5 and presented to AOOs.
- Reviewing role of Portland site given power outage/shutdown of Anchorage site during fall storm.

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

- Ingested approximately 200 data layers for STAMP tool/Arctic Portal and several new observational gridded data feeds.
- Archived sensor data now available.
- AOOs Data Search and Catalogue deployed to multiple portal instances with Html 5 interface (runs on iPad/iPhone) developed

- 2.6.3 *Continue ADF&G (Alaska Department of Fish & Game) partnership*
- Yukon run timing project heralded as a success.
  - Phase I completed with ADF&G; work plan developed for next phase of work with focus on exposing AYK salmon database through AOOS portal.
- 2.6.4 *Use NOAA Bering Sea models as demonstration for High Performance Compute – separate funding received in June 2011 and included in this grant.*
- NOAA models not provided in time; used the AEFF (Alaska Experimental Forecast Facility) WRF (Weather Research and Forecasting) model developed for AOOS and the JPL (Jet Propulsion Laboratory) Circumpolar 1km sea surface model instead as two separate test datasets to generate performance benchmarking for cluster.
  - Final report under development and results being prepared for journal article.
- 2.6.5 *Collaborate with other state, regional, national and international data management programs*
- Attended IOOS DMAC Meeting and Data Summit in September.
  - Attended ADIWG (Alaska Data Integration Working Group) meetings to assist in data integration across Alaska entities.
  - Letter of Agreement developed with Arctic ERMA to coordinate data acquisition and sharing.
- 2.6.6 *Continue to develop IOOS SOS service and assist other RAs in deployment*
- IOOS SOS version 1.0 deployed and tested; templates developed.
  - SOS data injectors developed for 15 national data sources.
- 2.6.7 *Develop new products and applications*
- Cook Inlet Response Tool further cultivated and augmented with search catalogue interface.
  - Tools for STAMP in progress.
  - AOOS Ocean Workspace expanded to support file level metadata and several improvements made to user interface to increase usability.
  - AOOS Ocean Portal developed into production level system.
  - Contracted by BSAI Landscape Conservation Cooperative (separate funding) to develop web-based “platform of opportunity” portal showing planned research vessel routes.
- 2.6.8 *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; RUSALCA program; and Arctic EIS program – all with separate funding*
- Currently supporting program with Ocean Workspace application.
  - Participated in EVOS (Exxon Valdez Oil Spill) PI meetings in Nov and Dec.
  - Participating in monthly and other PI meetings as needed.
- 2.6.9 *Serve up oil & gas industry data on AOOS portal*
- Annex 2 for industry joint environmental studies in process of being signed.
  - Historical met ocean data from Annex 1 received from industry.

## **2.7 Modeling & Analysis**

### *2.7.1 Initiate statewide circulation model exchange & ensemble modeling*

- Discussions underway.

## **2.8 Communication, Education & Outreach**

### *2.8.1 Support COSEE Alaska partnership*

- Participated in 2012 National Marine Educators Association conference in June in Anchorage attended by more than 350 marine educators.
- Worked with COSEE staff to assess AOS communication and outreach activities and make recommendations for modifications.
- Online teacher's guide with lesson plans finalized for AOS co-sponsored publication of *Pete Puffin's Wild Ride*, which features Alaska's currents.

### *2.8.2 Support AOS website and publications*

- Continued to add content to website, including animations and new pages.
- Produced monthly updates.
- Initiated e-newsletter and Facebook page and postings.

### *2.8.3 Scope out potential Alaska Oceans & Coast Report*

- Refining draft white paper with Alaska Sea Grant Program.

### *2.8.4 Interact with stakeholders and partners*

- Dugan participated in Ocean Festival in Cordova in September.
- Will Koeppen (Axiom Consulting and Design) presented an overview of AOS Arctic Portal on November 13 at Northern Oil and Gas Forum in Anchorage.
- Dugan visited Kotzebue Oct 24-26 to participate in workshop of the Northwest Arctic Borough subsistence mapping project and give update on STAMP project.
- Dugan met with North Slope Borough's wildlife, search and rescue, and planning departments to share latest on AOS activities and resources November 1-2 in Barrow. Gave community presentation at Barrow library, now available on YouTube courtesy of the Barrow Arctic Science Consortium.

## **3.0 Scope of Work (Priorities for next 6 months, December 1, 2012 - May 30, 2013, and anticipated changes to SOW)**

### **3.1 AOS Regional Management**

#### *3.1.1 AOS Board and Committees*

- Full board meeting planned for February/March 2013. Data Management Committee meeting planned for March 1.
- Increase Board membership.
- Provide Board members with outreach and communication materials to better spread awareness of AOS resources.

#### *3.1.2 Participate in national IOOS*

- Participate in IOOS regional meetings in March in Washington DC.
- Review certification criteria implementation as it develops.

#### *3.1.3 Partnerships and external affairs - in Alaska*

- Host Alaska animal tagging workshop in spring.

- Pursue funding for water level sensors for western Alaska.

#### *3.1.4 Partnerships and external affairs – national & international*

- Attend Arctic Observing Summit in Vancouver, BC in May.
- Present on Yukon River run timing project at AMS in Austin in January.

#### *3.1.5 Program management, administration, fundraising and financial oversight*

- Develop long-term agreement with Alaska SeaLife Center for fiscal management.
- Work on additional funding proposals, including funding for oil and gas industry data visualization.
- Develop analysis of pros/cons of MOA structure vs. 501(c)(3).

### **3.2 Marine Operations**

#### *3.2.1 Maintain Snotel stations in PWS and CI and wave buoy in CI*

#### *3.2.2 Pilot AIS dissemination of weather data*

- Complete installation of radio at Juneau site.
- Work with NOAA to obtain required permits for transmitting data.

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

- Work with UAF to interpret HFR data.

#### *3.2.4 Maintain WRF wind model for PWS and CI*

- Continue routine forecasts and verification project. Follow up on Valdez Terminal wind and NWS conduit issues.

#### *3.2.5 Maintain operational ROMS model for GOA*

- Ingest 5-year PWS ROMS retrospective simulation and analysis to AOOS DMAC for further analysis and distribution.
- Move PWS forecast system from JPL's old computer system to new RSS cluster computer in coming year.

#### *3.2.6 Validate hydrological model for PWS*

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

- Ingest 15-year Bering Sea ROMS retrospective simulation and analysis to AOOS DMAC for further analysis and distribution.

### **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*

#### *3.3.2 Maintain CDIP wave buoy in Cook Inlet*

#### *3.3.3 Produce electronic sea ice atlas*

- Incorporate data from NWS Alaska Region Headquarters (ARH, Sea Ice Desk).
- Complete prototype product for 1953-2011, including Dehn, ARH and passive microwave datasets.
- Finalize procedure for incorporating whaling log and ship report information.
- Extend prototype product to span period 1875-2012 by merging products from Danish Meteorological Institute (via NSIDC) and post-1953 grids.
- Develop algorithms for spatial/temporal interpolation of missing data and for derived variables (opening/closing dates, open water season length).

- Collaborate with A00S portal coordinators/visualization team to initiate work on user interface for the sea ice product.

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

- Deploy wave buoy in Norton Sound (with separate funding).
- Seek funding to implement western AK water level collaborative.

### **3.4 Ecosystems/Fisheries and Climate Trends**

#### *3.4.1 Maintain Arctic assets map*

- Expand to statewide.
- Organize feedback group to recommend future product development.

#### *3.4.2 Support sampling along Seward Line*

- Next cruise April 26-May 10, 2013. Analyze fall 2012 samples/data.

#### *3.4.3 Use A00S glider for high-latitude observation node in Chukchi*

#### *3.4.4 Support Distributed Biological Observatory*

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

- Collect 450 OA measurements on spring Seward Line cruise.
- Turn around (redeploy) OA sensors on GAK 1 mooring.

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

- NOAA COOPS to provide personnel support for installation in spring.
- COOPS to send design for mounting system.

#### *3.4.7 Support mooring array for biological monitoring*

- Install POST array in March before herring spawn.

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

- Conduct monthly and seasonal CTD surveys.

### **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*

- Continue adding relevant data layers to the STAMP/Arctic portal, including social and economic data, and downscaled climate change projections.
- Hold a spring stakeholder workshop demonstrating new tool and discussion of future steps.

### **3.6 Data Management & Products**

#### *3.6.1 Support A00S website, data portal & applications. Maintain & provide access to products developed in this project. Explore developing multi-regional products with other RAs.*

- Work with NANOOS staff to draft NSF proposal for collaborative work.
- Continue transition to HTML5 and iPad/iPhone friendly system.

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

- Continue to ingest data sets to support STAMP tool and Arctic Portal with focus on fisheries, marine mammals, subsistence use and habitat.

- Ingest new data products being developed by ISER (Institute of Social and Economic Research) and SNAP (Scenarios Network for Alaska & Arctic Planning).
- Extend real time sensor portal to expose sensor archive and SOS backend.
- 3.6.3 *Continue ADF&G partnership*
  - Complete Phase II work with ADF&G data feeds being served through data layers exposed through AOOS portals.
- 3.6.4 *Complete NOAA's High Performance Compute project*
  - Publish project results.
- 3.6.5 *Collaborate with other state, regional, national & international data management programs*
  - Collaborate with ACADIS for Arctic Observing Summit.
  - Develop proposals with UAF GINA and ACADIS (Advanced Cooperative Arctic Data and Information Service).
- 3.6.6 *Continue to develop/support IOOS SOS service and assist other RAs in deployment*
  - Upgrade SOS core and templates to SOS 2.0
  - Develop 52 North to netCDF archive module.
  - Implement ncSOS and 52 North broker wrapper.
- 3.6.7 *Develop new products and applications*
  - Redevelop Ocean Portal Framework in HTML 5 to enable AOOS applications to run on iPad/iPhone.
  - Convene several targeted focus groups to help direct future development of Ocean Portal and Arctic Assets portal.
  - Explore data visualizations for Seward Line, ocean moorings and ocean acidification data.
- 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; RUSALCA program; and Arctic EIS program – all with separate funding*
  - Cultivate and expand capabilities of AOOS Research Workspace.
  - Attend all PI meetings.
  - Initiate Arctic EIS and Brenda Norcross Beaufort BOEM workspace groups.
- 3.6.9 *Serve up oil & gas industry data on AOOS portal*
  - Finalize signing of annex #2.
  - Manage access to industry data and facilitate updates to the resource.
  - Make data publicly available with simple search tool.

### **3.7 Modeling & Analysis**

- 3.7.1 *Initiate statewide circulation model exchange & ensemble modeling*
  - Continue discussions. Pursue participation in IOOS modeling testbed proposal.

### **3.8 Communication, Education & Outreach**

#### *3.8.1 Support COSEE Alaska partnership*

- Co-host Communicating Ocean Sciences workshop in January.

#### *3.8.2 Support AOOS website and publications*

- Produce winter newsletter, quarterly e-news, monthly ED updates and Facebook postings.
- Update observing project pages on website.

#### *3.8.3 Scope out potential Alaska Oceans & Coast Report*

- Circulate white paper to potential partners.

#### *3.8.4 Interact with stakeholders and partners*

- Organize animal tagging planning meeting in March.
- Host Arctic Observing planning and Gulf of Alaska science planning workshops at Alaska Marine Science Symposium in January 2013.
- Implement new outreach strategy to better inform agencies and stakeholder groups of AOOS resources and products.
- Hold focus group/feedback session in January seeking input on the AOOS Ocean Portal framework.
- Convene a steering committee in January to discuss and guide future of Arctic Research Assets map.

### **4.0 Personnel and Organizational Structure**

- IPA detailee set to retire at end of December. Intern still working 10 hrs/week.
- Program manager Darcy Dugan to go on family leave January 24 – April 15 2013, then will work half-time.
- New Program Coordinator Ellen Tyler starts January 4.
- ADF&G Board member Cora Campbell delegated her position to Chris Siddons. Paul Gill replaced Shane Montoya as the US Coast Guard board member.
- AOOS Board will advertise for new members in January 2013.

### **5.0 Budget Analysis**

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

### **6.0 Issues**

#### *6.1 AIS/WX stations*

- Obtaining FCC permits to broadcast weather information over AIS continues to be issue.

#### *6.2 Cordova conductivity sensor on tide gauge*

- Issues raised by CO-OPS leadership appear to be addressed, but not finalized.

#### *6.3 WRF conduit to NWS*

- Process is stalled; need to reassess.

## **7.0 Special Report: Products and Services**

### *7.1 New or improved regional products or services*

- Cook Inlet Response Tool (CIRT) – Instance of the AOOs Ocean Portal framework which packages real time sensor observations, operational models and GIS data layers into a single mapped based interface for use by the spill response community in Cook Inlet.
- AOOs Arctic Portal – Instance of the AOOs Ocean Portal framework which showcases Arctic models, remotely sensed datasets and GIS data packaged in a way to assist in facilitating discovery and planning in the Arctic.
- Developed search/catalogue interface for AOOs assets.
- Extended number of real time sensors being exposed through the AOOs Real Time Sensor Map.
- AOOs Arctic Assets platform has been extended with several thousand additional sampling effort descriptions.
- 46 new operational model/remotely sensed data sets have been established as additional real time import to the backend AOOs data system.
- Deployed and cultivated a platform (Research Workspace) to support integrated research program. The tool provides a secure collaborative environment for scientists in geographically distributed agencies to share and document datasets.
- Deployed new Snotel weather station at McNeil River.
- Redeployed Cook Inlet CDIP wave buoy at new location.
- Deployed three new AIS/weather stations.
- Took over Operations & Maintenance of 3 HFR sites in Arctic.

### *7.2 New or improved national products or services*

- Developed the 52 north SOS version 1.0 compliant with IOOS requirements and published code base for use by all RAs and the national IOOS office.

## **8.0 Special Report: Data Management**

### *8.1 Progress towards standards-based foundation for DMAC capabilities*

- AOOs has contributed heavily towards development of SOS 1.0 suite of specifications in addition to manifesting those specifications into the 52 North SOS Core.
- AOOs has improved its gridded metadata documents exposed through its THREDDS (Thematic Realtime Environmental Distributed Data Services) server.

### *8.2 Demonstrated progress towards:*

#### *8.2.1 Open data sharing*

- Developing and implementing the SOS 1.0 spec has greatly improved the ability of AOOs and other RAs to openly share sensor data sets. AOOs data management staff played a key role in authoring the IOOS SOS templates.
- AOOs data archive has increased its data and metadata holdings considerably and improved its user access tools. Larger amounts of data are much more accessible by the general public. AOOs website metrics show increased numbers of users who stay longer on the AOOs web portals.

### 8.2.2 *Provision of data to WMO GTS*

- Much of AOS data is exposed through interoperability protocols and is also available to WMO GTS systems from the source that AOS acquires it from.

### 8.2.3 *Implementation of a service-oriented architecture*

- Interoperability enhancements including load balancing for performance and increased quality of metadata for higher levels of discoverability.

### 8.2.4 *Use of common vocabularies and identifiers*

- Cf Conventions have been applied across gridded and sensor metadata. ITIS has been integrated into the Research Workspace to assist with taxonomic association of project metadata.

### 8.2.5 *Improved use of metadata conventions*

- Improved ncML and SensorML to be compliant with IOOS best practices.

### 8.2.6 *Data storage and archiving*

- AOS HPC cluster is fully functioning with ~50 TBs of high performance disk capacity.
- Initiated talks with NODC to develop semi-automated data and metadata transfer.

## 8.3 *On-going program-level participation in:*

### 8.3.1 *Data management planning and coordination*

- Participated in bi-monthly calls when they occur.
- Participate in several ad hoc working groups to strategize on key IOOS efforts such as metadata, SOS and vocabularies.
- Work directly with Derrick Snowden via ad hoc teleconferences assisting in developing IOOS core technical strategies.

### 8.3.2 *IOOS maturity levels and certification standards*

- Review and comment on current evolution of these requirements.

## **9.0 Special Report: Observing Assets**

### 9.1 *'Platforms of opportunity' used to support monitoring of ocean acidification*

- AOS funds OA sampling of an existing, ongoing oceanographic time series transect (Seward Line) in the northern Gulf of Alaska two times per year to quantify the physical and biogeochemical controls on OA.
- AOS contributes funds to a consortium to support maintenance of OA sensors on existing moorings (funded by other programs in Bering Sea, Chukchi Sea, and Resurrection Bay in Gulf of Alaska).

### 9.2 *Current inventory of all regional observing assets*

- This has been requested by the IOOS Program Office separately with a due date of January 14, 2013 and will be submitted at that time.