

Progress Report

Implementation & Development of the Alaska Regional Coastal Ocean Observing System
(AOOS) FY 2021-2025

Award number: NA21NOS0120094

Period of Activity: January 1, 2022 – June 30, 2022

Principal Investigator: Sheyna Wisdom

PROJECT MILESTONES

An updated Project Milestone Table is provided as Attachment 1.

PROGRESS AND ACCOMPLISHMENTS

Section 1 (Core Funding)

High Frequency Radars (HFRs)

Amount	Funding Area	Task
		Sustained operational funding and service delivery.
\$156,000.00	Core	H3012 UAF (Danielson) Arctic HFR
\$115,000.00	Core	H3013 UAF (Danielson) Bering HFR
\$114,286.00	Core	H3060 UAF (Danielson) Cook Inlet HFR

Names of RA's existing and planned HFR stations	Status	Date of most recent antenna calibration	Date planned for next antenna calibration	Recapitalization needs
SIMP (Simpson)	Operational 7/21 for open water season. Station regularly telemetering data to CORDC. Reactivation completed in May 2022, currently offline due to communication equipment issues. Once ice leaves the region, a site visit will occur to reestablish communications.	4/2021	8/2022	HFR system (2013) coming to end of service life, replacement (\$150k)
PBRW (Point Barrow)	Operational 7/21 for open water season. Station has been regularly telemetering data to CORDC. Reactivation completed in May 2022.	4/2021	8/2022	HFR system (2003) end of service life (\$150k); 4 Wind Turbines for remote power module (\$20K); Replacement batteries end of service life (\$35K); CODAR spare parts/components (\$25K)
WAIN (Wainwright)	Operational 7/21 for open water season. Station regularly telemetering data to CORDC. Wainwright site experienced open water conditions and remained operational June 2021-May 2022.	6/2019	8/2022	HFR system (2009) end of service life, replacement (\$150K); 4 Wind Turbines for remote power module (\$20k)
SHSH (Shishmaref)	Not operational in 2021 due to COVID-19 travel restrictions. Reactivation planned in July - August 2022.	9/2019	8/2022	Transmit antenna - prone to breakage (\$15K); CODAR spare parts/components (\$25K)
WALE (Wales)	Not operational in 2021. Site not relocated in 2021 due to COVID-19 travel restrictions. Reactivation planned in August 2022. Installation of remote power module in July 2022, and associated HFR in August 2022.	9/2019	8/2022	Transmit antenna - prone to breakage (\$15); Receiver antenna (\$20k)
Cook Inlet	Installation plans for 2 HFRs in Cook Inlet during summer - fall 2022. Final site selection underway, and associated land use agreements and permits will be required.	NA	2022	NA

Names of RA's HFR IT Systems	Status	Recapitalization needs
UAF	Chukchi Sea (Arctic) HFR Data http://research.cfos.uaf.edu/hfradar/ Bering Strait HFR Data https://research.cfos.uaf.edu/hfradar/bstrait/ AOOS Data Portal https://portal.aaos.org/#module-metadata/de91c282-01e2-11e2-ad19-00219bfe5678	New Central Site Computer for UAF (\$3K)– Computer in Fairbanks that gathers data from all field sites and processes the surface currents that are sent to the IOOS data server and, subsequently, Axiom.

Gliders and Other Uncrewed Systems (UXS)

Summary of Activities

- Ecosystem Approach to Fisheries Management (EAFM) Glider**
 All tasks and milestones are Complete. A Seward Line transect in July 2021 was postponed to field test and ready the EAFM and Office of Marine and Aviation Operations (OMAO) International Year of the Salmon (IYS) gliders for the winter IYS Gulf of Alaska glider survey February - April 2022. Tests were completed in September and December 2021. The EAFM glider was deployed during the IYS Gulf of Alaska Surveys February - April 2022.
- Chukchi Glider**
 All tasks and milestones are Completed for University of Alaska Fairbanks (UAF), Oregon State University (OSU), and Woods Hole Oceanographic Institution (WHOI).
- International Year of the Salmon (IYS) Glider**
 All tasks and milestones are Completed for UAF, UW, and Axiom Data Science (Axiom).

Accomplishments/successes

(EAFM) Major hardware integration and software development for new fisheries acoustic instrumentation on the glider was achieved and tested during glider sea trials in September and December 2021. The EAFM and OMAO IYS Gliders were deployed as part of a paired glider mission (using two gliders) in support of the IYS Gulf of Alaska survey February 11 - April 11, 2022. Hydrographic data and the Ecometrics dashboard data from the glider were displayed in real time on the AOOS data portal at: [Ecometrics Dashboard](#). A second deployment was accomplished with deployment 6/6/2022 near Yakutat and recovery on 7/15/2022 near station GAK14. An in-house training program has been initiated in lieu of glider pilot training at Teledyne Webb Research.

(Chukchi Glider) The Chukchi Glider was deployed in the southern Chukchi Sea from the *R/V Norseman II* on July 11, 2021 during Rebecca Woodgate's (University of Washington Applied Physics Laboratory [UW-APL]) Bering Strait cruise. The glider was recovered about 5 km from the beach in front of Utqiagvik, AK, on September 12, 2021. All science and passive acoustics functioned flawlessly during the deployment. Hydrographic data from the glider were displayed in real time on the AOOS data portal at: [Ecometrics Dashboard](#), which is a new AOOS glider data reporting capability developed as part of the EAFM and IYS Glider projects.

Real-time data and platform diagnostics were presented on the WHOI Website: [Robots4Whales](#) for the July - September 2021 deployment. Scientific abstracts on the results of the Chukchi Glider program were presented at the 2022 Alaska Marine Science Symposium and the American Geophysical Union's Ocean Sciences Meeting in February-March 2022.

(OMAO IYS Glider) Additional glider field trials were completed in Seward-Resurrection Bay during December 2021, and the glider was deployed in February 2022 as part of the IYS Survey. Axiom developed an Ecometrics Dashboard prototype and implemented the real time reporting dashboard during the February - April 2022 IYS paired glider deployment. Data streams include glider trajectory, ocean parameter time series, and comparison of current conditions to World Ocean Atlas climatology across the profiles, and real time data and ecometrics were provided on the project website and the AOOS Data Portal. Hydrographic data and the Ecometrics dashboard data from the glider can be viewed on the AOOS data portal at: [Ecometrics Dashboard](#).

Problems/delays

None.

Other Core Observation Activities

Summary of Activities

- **Ecosystem Moorings:** AOOS funds the support of four ecosystem moorings in Alaska (Chukchi Sea Ecosystem Observatory [CEO], Gulf of Alaska Ecosystem Observatory [GEO], and M2 & M8 in the Bering Sea. We spent the spring getting ready for the 2022 GEO and CEO mooring turn-arounds. Recovery of the 2022 GEO moorings resulted in a mixture of positive and negative results. The GEO1 mooring was recovered but the ITP instrument was missing, and unfortunately this loss is not covered by UAF insurance. The ITP instrument has been problematic since its initial purchase. We did re-deploy the 2022 GEO1 ITP mooring and have plans to recover it in July 2022 in order to assess its performance on a short 3-month deployment. We may choose to replace the profiling ITP with fixed depth sensors on future year GEO deployments – this will lower our annual operating costs, though at the expense of the nice profile data that the ITP gets when it is correctly operating. The GEO2 mooring was recovered and all instruments were recovered except those mounted to the instrument frame just below the topmost float. Because we were able to pinpoint frame corrosion as the cause of the instrument loss, the lost equipment on this mooring will be covered by UAF insurance – that replacement process is now underway. All tasks on track.
- **Wave Buoys:** AOOS currently one wave buoy operating in lower Cook Inlet. The Nome wave buoy was not deployed in the summer of 2021 but will be deployed in summer 2022. We also have plans to deploy a wave buoy in Bristol Bay in summer 2022, but this deployment is delayed due to lack of vessel and logistical support for the Bristol Bay deployment and recovery operations in 2022. We are looking at possible deployment in fall but reconsidering this deployment location due to lack of logistical support in this remote region. We may choose alternative locations in Alaska for deployment. The equipment order is on standby until deployment plans for Bristol Bay are better understood. Expect to make purchases in fall of 2022 or winter 2023. All tasks on track.
- **Passive Acoustic Monitoring:** Turnaround of M2 was completed in May 2022, DBO 1-5 will hopefully be turned around this fall 2022; M2RW all delayed because it is currently unfunded. Preparation for fall 2022 cruise underway with NOAA's Pacific Marine Environmental Laboratory (PMEL).
- **Ship-based Surveys:** AOOS funds several ship-based surveys in Alaska including the Seward Line, Kenai Fjords Ocean Tracking Network (OTN), Lower Cook Inlet.
 - Seward Line: The 2022 survey was completed in May 2022. All tasks on track.
 - Kenai Fjords OTN: Acoustic receiver has been ordered, with plans to deploy and test it from a small boat by the end of summer 2022. Tasks on track.
 - Lower Cook Inlet Observing: Surveys are planned for 2022.
- **Shore-based Surveys:** AOOS funds the support of shore-based projects across Alaska:
 - Coastal Hazards/Alaska Water Level Watch (AWLW): The Alaska Coastal Mapping at GEOWEEK was canceled due to COVID-19. The 2022 Annual AWLW meeting was held May 11, 2022. The AWLW build out plan ArcGIS story map and website was updated. The Deering water level sensor did not need replacing. Water level sensors were installed at Kivalina and Kotzebue in June, 2022 and at Whittier in March 2022.
 - AIS Weather Stations: New weather stations were installed at St. George and St. Paul in March 2022; at Pelican in May 2022; and Point Pigot in June 2022. Planned installs in July 2022 at Rocky Island and Pt. Craven and optical sensor proof of concept at Homer Spit in Aug 2022.
 - Prince William Sound (PWS) Weather & Fish Monitoring: Service of Snotel stations were completed in fall 2021. Annual maintenance at the six OTN arrays were turned around in Apr 2022. The Cordova tide station was maintained in March and June 2022. We did encounter a problem with the Cordova conductivity sensor. In March it was found not to be reporting. After some diagnostics it was decided to swap out the cable and sensor to get the system operating quickly. The swap restored the operations of the system.
 - Valdez National Water Level Observation Network (NWLON) Conductivity, Temperature, and Depth instrument (CTD): Delayed but on track because of contract delays. The sensor data cable has been ordered, plan to deploy in Sep 2022.

- **Data:**
 - The Sea Ice Atlas project is completed for this reporting period; National Snow and Ice Data Center (NSIDC) sea ice concentration data were updated in May 2022; the database is now complete through December 2021, with the next update planned for October 2022.
 - Work has not yet started on the Indigenous Sentinel Network (ISN) due to delays with prime award with the National Pacific Research Board (NPRB).

- **Harmful Algal Bloom (HAB) and Ocean Acidification (OA) Programs:**
 - Alaska Conservation Foundation (ACF) established a process by which partner communities will be onboarded into a payment system for collecting and analyzing HAB samples. Communities were set up with sampling supplies, trained and set up with database access to provide samples. HAB sampling is currently underway.
 - Axiom has been working with AOOS staff to stand up a dedicated Research Workspace campaign to ensure that data produced and consolidated through the Alaska Harmful Algal Bloom (AHAB) network efforts are organized and available. Axiom and AOOS continue to meet weekly to discuss project needs and to submit data sets to the NOAA National Centers for Environmental Information (NCEI) repository.
 - Axiom has been working on developing and maintaining a prototype sea surface temperature (SST) product in the AOOS data portal to determine the risk of *Alexandrium* blooms based on the sea surface temperature. Axiom, AOOS, and partners at NOAA have been in communication to develop a system to routinely harvest daily Naval Coastal Ocean Model (NCOM) SST images in the form of netCDF files.
 - Seward Burke-o-Lator: Outreach to two sites include Little Diomedea, Nome, Kotzebue, Utqiagvik, King Cove, and Seldovia. Samples received from King Cove. Staff participated in the Executive Committee for Alaska Ocean Acidification Network (AOAN) and in the 2022 Discussion Series.
 - Sitka Burke-o-Lator: Hired two new Burk-o-Lator operators; attending training at Hakai Institute; system was replumbed; began running continuous samples from communities; attended regional and state-wide meetings. Workshop was postponed until Sept 2022 due to limited space and Covid. Project is on track.
 - Kodiak Burke-o-Lator: Data were collected at sites in Kodiak. Project on track. At this point other sources of funding for keeping the Burk-o-Lator running have run out. We applied for funds from a number of sources in the last few years, but have been unsuccessful in obtaining funds. We have currently funded the contract position for the personnel to run the Burk-o-Lator until approximately the end of December 2022 We will be considering options for keeping it running after that point, but cannot guarantee its continued operation past that point. Project is on track.
 - OA Time Series: Samples from the NGA-LTER cruise have been analyzed and have been shared with project members. The GAKOA surface mooring was turned around in March 2022; preliminary data are being analyzed. The M2 surface mooring was deployed in May 2022. All final autonomous data have been archived. Project is on track.
 - OA ferry: No work will be completed on this project as the ferry is not operating and the subject matter expert is no longer with the lab.

- **Regional Ocean Data Sharing Initiative (RODSI):**
 - Under the RODSI program, AOOS and Axiom created three regional “Mariner’s Dashboards” for [Prince William Sound](#), [Cook Inlet](#), and [Kodiak](#). User feedback so far has been positive, and we continue to upgrade user features and add new weather assets.
 - In collaboration with UAF/International Arctic Research Center (IARC), we also released the most recent version of the [Bering Science outreach publication](#) in early June. A follow-up webinar has been scheduled with the Alaska Center for Climate Assessment and Policy (ACCAP).
 - Through RODSI, AOOS provided sea ice and surface current forecasts to the [Sea Ice for Walrus Outlook program](#) (SIWO). This program is a resource for Alaska Native subsistence hunters, coastal communities, and others interested in sea ice and walrus. The SIWO provides weekly reports during the spring sea ice season with information on weather and sea ice conditions relevant to walrus in the northern Bering Sea and southern Chukchi Sea regions of Alaska.
 - Work on a subaward for a data rescue project on trawl data from the Chukchi Sea is underway.
 - Work continues on the Bering Strait Transboundary Incident Response Tool (BSTIRT), partially funded by World Wildlife Fund (WWF) and the National Park Service, (NPS) with additional leveraging from RODSI.

Accomplishments/successes

- **Administrative:** We have been successful in receiving our funds for Year 2 for both core and non-core as of Jul 15, 2022, which is the first time that has happened. The new process of working with the core first and non-core second was initially confusing to our team members who were used to the “old way”, but once we were able to work with the IOOS program office on timing and requirements, it was a much simpler process. We appreciate the work done by Oriana Villar (whom we will miss dearly) and Debra Esty.
- **HAB and OA Programs:**
 - Four communities in Alaska were trained and equipped to sample for harmful algal bloom phytoplankton. Processes for paying community members for their time in collecting and analyzing samples were put in place and sampling has started and will continue through summer/fall 2022.
 - A new data layer was visualized in the AHAB data portal showing HAB sampling locations and frequency by project partners across the state. Additional enhancements to the AHAB data portal will be ongoing over the course of the project.
 - Axiom ingested and visualized a test SST product that predicts paralytic shellfish poisoning (PSP) risk assessment (based on *Alexandrium* growth and different temperature thresholds) from the NOAA-National Centers for Coastal Ocean Science (NCCOS) office into the AOOS data portal.
 - M2 and GAK mooring: The NOAA Alaska Fisheries Science Center (AFSC) is highlighted the EcoFOCI spring mooring cruise on its Science Blog in a 4-part series. [EcoFOCI Cruise - Post 1 | NOAA Fisheries](#). Natalie Monacci mentored the National Ocean Science Bowl (NOSB) team from Seward, AK in 2021 and 2022. During virtual meetings in 2021 and 2022, the NOSB team discussed global ocean acidification and OA research in Alaska. In November 2021, the team was able to visit the GAKOA mooring aboard the UAF R/V Nanuq (Photo 1). In January 2022, Monacci analyzed the samples the team collected and met to discuss their results. Natalie Monacci mentored the Future Farmers of America (FFA), Seward, AK chapter when they visited the UAF Seward Marine Center. During their meeting, the FFA team practiced their presentation for the statewide competition and discussed their choice to study ocean acidification and its impacts on Alaska’s food security.
- **RODSI:**
 - We released three regional “Mariner’s Dashboards” for [Prince William Sound](#), [Cook Inlet](#), and [Kodiak](#). User feedback so far has been positive, and we continue to upgrade user features and add new weather assets. We also released the most recent version of the [Bering Science outreach publication](#) in early June.

Problems/delays

- **HAB and OA Programs:**
 - Supplies for sampling and analyzing HAB samples by community members were delayed due to covid supply chain issues. Therefore, sampling for HABs did not start until the end of June 2022. This sampling will continue through October 2022.
 - Data sets and metadata to be included in the AHAB data portal are still being collected and aggregated, therefore the submission of these data to the NOAA NCEI repository for long-term preservation is scheduled to happen in the coming years.
 - Establishing the SFTP site for routine harvest of daily NCOM SST images in netCDF files took slightly longer than expected but has been accomplished. Visualization of final data products is currently under development.
 - M2 and GAK mooring: There were delays due to a variety of reasons (COVID, supply chain, vessel inspections, concrete union in Seattle going on strike) which meant that the maintenance and turnaround of the moorings happened later than expected.
- **RODSI:**
 - While in-person meetings are important for communication and feedback with remote Alaskan communities, travel to communities remains uncertain due to the covid pandemic.
 - Work on the BSTIRT was paused and then slowed in the spring due to the Russian invasion of Ukraine and the resulting pause in communications with Russian scientists. We resumed work on the tool and will continue developing to ensure its usefulness to US stakeholders.

Section 2 (Non-Core Funding)

Funding amount spent	Funding Area /Recipient	Task
Provided \$30,000	Axiom	<p><i>HFR - Products & Data Management - Operationalize HFR Range Series file archiving through Research Workspace (in accordance with direction of IOOS Surface Currents Program Manager)</i></p> <p>Status: All tasks complete.</p> <p>Accomplishments: Axiom increased storage capacity of the data center to 60 TB; RSSH accounts setup; HFR website available and updated; data continues to be updated and maintained.</p> <p>Issue: No issues.</p>
Provided \$270,000	HABs	<p><i>To further HABS understanding and prediction via a pilot project to "Continue the support of a full-time AHAB coordinator ..."</i></p> <p>Status: All tasks complete.</p> <p>Accomplishment: Grew the AHAB network, continued monthly update meetings, coordinated sampling and research efforts, developed pilot community sampling program for HABs, performed outreach and engagement activities, began process of updating AHAB data portal, unveiled a new AHAB Network website (ahab.aos.org).</p> <p>Issue: No travel yet due to covid, travel planned for fall/winter 2022</p>
Provided \$29,033	Axiom	<p><i>Marine Biodiversity Observation Network (MBON) - \$25,000 to support the MBON portal and \$4,033 to support unifying MBON-Animal Telemetry Network</i></p> <p>Status: All tasks complete.</p> <p>Accomplishment: Five datasets ingested; four AMBON datasets formatted based on feedback; updates made by IOOS Matt Biddle; prototype for overlaying animals movement developed; and enhancements to metadata displayed.</p> <p>Issue: No issues.</p>
Provided \$80,000	Axiom	<p><i>Maintain and enhance Data Access Service Software - ERDDAP</i></p> <p>Status: All tasks complete.</p> <p>Accomplishments: RoadMap created in FY19; project brief prepared for IOOS Director in August 2021; Version 1.2 of metadata profile updated; Best Practices and Examples prepared; data ingesting monitoring dashboard created; improved user documentation (Metadata Profile, QARTOD guidelines, configuration); and created a staging version of the IOOS sensor map to test data ingestion process.</p> <p>Issue: No issues.</p>
Provided \$50,000	Axiom	<p><i>Environmental Sensor Map and Global Data Integration</i></p> <p>Status: All tasks complete.</p> <p>Accomplishment: Road map created for portal release schedule and plan for QC of sensor data, bi-monthly meetings with IOOS program office; enhancements to ESM; continued ingestion of real-time stations (48,000+ stations).</p> <p>Issue: No issues.</p>

Funding amount spent	Funding Area /Recipient	Task
Provided \$3,000	Axiom	<p>Trello Subscription Status: Complete. Accomplishment: Operation of Trello Board for IOOS Program Office collaboration. Issue: No issues.</p>
Provided \$50,000	Axiom	<p>Support for MBON data portal, FY21 SOW (unifying MBON-ATN) Status: All tasks complete. Accomplishment: Five datasets ingested; four AMBON datasets formatted based on feedback; updates made by IOOS Matt Biddle; prototype for overlaying animals movement developed; and enhancements to metadata displayed. Issue: No issues.</p>
Provided \$95,000	Axiom	<p>NOAA National Weather Service to support the Freezing Spray project - engage with the marine community while collecting data of appropriate quality to provide meaningful input into modifying or developing a new Freezing Spray Algorithm Status: project extended. Accomplishment: None Issue: Due to the pandemic and the inability to convene mariners, this start of this project has been delayed until active, in-person engagements can resume.</p>
Provided \$10,000	Axiom	<p>NOAA Alaska Regional Collaboration Team to support the Cook Inlet Operational Forecast System model validation and application development Status: Complete. Accomplishment: Receipt and ingestion of 27 TB of data from BOEM for 10-year hindcast model; files standardized to netCDF; codebase developed to extract processed files for model visualization; developed a prototype to run trajectory scenarios for visualization and downloading. Issue: No issues.</p>
Provided \$75,000	Axiom	<p>OR&R support for Axiom developer to improve GOODS and help with EDS THREDDS testing Status: All tasks complete. Accomplishment: Monthly meetings with ORR to scope requirements; operational Python package in development; feasibility of using THREDDS was evaluated and outputs will be delivered as designated by NOAA. Issue: No issues.</p>
Provided \$20,000	AOOS	<p>NOAA National Centers for Coastal Ocean Science (NCCOS) funds to AOOS for HAB tools support Status: Complete. Accomplishment: Axiom ingested and visualized a test SST product that predicts PSP risk assessment (based on Alexandrium growth and different temperature thresholds) from the NOAA-NCCOS office into the AOOS data portal. A sftp site was enabled for routine harvest of daily NCOM SST images in the form of netCDF files, which will be updated daily in the AOOS data portals. Visualization of final data products is currently under development. Issue: None.</p>

Funding amount spent	Funding Area /Recipient	Task
Provided \$192,041	AOOS	<p><i>"Office of Marine and Aviation Operations (OMAO) support for glider operations/UxS Project"</i> Status: All tasks are complete. Accomplishment: We have shown that even in a global pandemic that forced many businesses to close, we can safely carry out science missions with autonomous sampling devices. Issue: None.</p>
Provided \$244,444	Regional Ocean Partnership	<p><i>Regional Ocean Data Sharing Initiative</i> Status: All tasks complete. Accomplishment: "Mariner's Dashboards" for Prince William Sound, Cook Inlet, and Kodiak; Bering Science outreach publication in early June; AOOS provided sea ice and surface current forecasts to the Sea Ice for Walrus Outlook program (SIWO). Issue: None</p>
Provided \$85,000	Ocean Acidification	<p><i>OAP allotment of FY21 project resources in support of the NOAA Ocean Acidification Observing Network (NOA-ON) GAKAO (PI Monacci, University of Alaska at Fairbanks)</i> Status: Completed Accomplishment: The GAKOA surface mooring was successfully turned around at the end of March 2022. The M2 surface mooring was successfully deployed in the southeastern Bering Sea mooring site M2. Issue: Delayed recovery meant that the sea ice reached the M2 site prior to the recovery. There were some minor loss of instruments and data due to sea ice striking the buoy, but the recovery was still a success because nearly all instrumentation and data records were recovered.</p>
Provided \$30,000	Ocean Acidification	<p><i>OAP allotment of FY21 project resources in support of the Alaska Ocean Acidification Network (PI Dugan, AOOS)</i> Status: complete Accomplishment: held committee and researcher meetings, produced and published the Spring OA Discussion Series, and unveiled a new Alaska OA Network website (aoan.aos.org). Issue: none</p>
Provided \$3,858	Ocean Acidification	<p><i>OAP allotment of FY21 project resources in support of Thresholds in a changing ocean environment: bioeconomic implications to inform decisions for Alaska's salmon fisheries (PI Dugan, AOOS)</i> Status: project extended Accomplishment: working with project team on outreach, travel to Juneau to present at the Alaska Mariculture Symposium and meet with legislators Issue: reduced travel due to covid</p>

PROJECT CHALLENGES/MODIFICATIONS

We have been successful in receiving our funds for Year 2 for both core and non-core as of Jul 15, 2022, which is the first time that has happened. The new process of working with the core first and non-core second was initially confusing to our team members who were used to the "old way", but once we were able to work with the IOOS program office on timing and requirements, it was a much simpler process. We appreciate the work done by Oriana Villar (whom we will miss

dearly) and Debra Esty. However, it was challenging to not have the ASAP codes and drawlines sooner for the non-core funding, as this determines the applied fiscal fee.

In April 2022, our accounting department notified the NOAA Grants Management Division (GMD) office of several significant changes to several of our accounts on the FY16-FY20 cooperative agreement, including closure of some drawlines and decrease/increase in other drawlines. After over three months of trying to work with the Finance Office, it was finally determined that these drawlines were erroneously closed by an outgoing/retiring employee. During this three-month period, we were unable to pay subaward invoices and were unable to get any assistance from the NOAA helpline. We had to raise this issue to IOOS Program Office leadership to finally receive assistance. Once the cause of the problem had been identified, it took another month of AOOS staff time to reclassify and correct these drawlines. This resulted in significant work on the AOOS accounting staff time, delays in payment to our subawards, delays in administration of other facets of AOOS, and frustration from everyone.

PUBLICATIONS

Danielson, S., Grebmeier, J., Iken, K., Berchok, C., Britt, L., Dunton, K., Eisner, L., Farley, E., Fujiwara, A., Hauser, D. and Itoh, M., 2022. Monitoring Alaskan Arctic Shelf Ecosystems Through Collaborative Observation Networks. *Oceanography*.

González, S., Horne, J.K., Danielson, S.L., Lieber, L. and López, G., 2022. Representative range of acoustic point source measurements in the Chukchi Sea. *Elementa: Science of the Anthropocene*, 10(1)

Sandy, S.J., 2022. Acoustic Detection and Characterization of Sea Ice and Surface Waves in the Northeast Chukchi Sea (MS Thesis, University of Alaska Fairbanks)

Stafford KM, Statscewich H, Baumgartner MF, Danielson SL. 2022. Eavesdropping on the northward range expansion of subarctic marine mammals into the Arctic with underwater gliders. Presentation at the International Conference on Underwater Acoustics 2022, 20-23 June 2022, Southampton UK.

Statscewich H, Stafford K, Baumgartner M, Danielson S. Marine mammal distribution and habitat in the eastern Chukchi Sea during 2015-2020 observed from a Slocum ocean glider. Alaska Marine Science Symposium Anchorage AK 2022.

EDUCATION, MEDIA ENGAGEMENT, AND OUTREACH

AOOS has been busy with outreach and education in this reporting period. Below is a list of events in which we participated:

- AHAB monthly meetings
- Alaska Marine Policy Form bi-monthly meetings
- Alaska Marine Science Symposium - Jan 2022
- Marine Mammal Response Working Group - Jan 2022
- Cook Inlet Beluga Whale Task Force - Jan 2022
- US Russia Science Corner - Jan 2022
- Alaska Eskimo Whaling Commission - Feb & Jul 2022
- Alaska Forum on the Environment - Feb 2022
- Skipper Science Workshop - Feb 2022
- IARPC Marine Ecosystems Collaboration Team Meeting - Feb 2022
- KANA Water Quality Workshop - Feb 2022
- Alaska ComFish - Mar 2022
- OA Network Discussion Series - Mar 2022
- Shipping Coalition - Apr 2022
- BIA Providers Conference - Apr 2022
- Arctic Encounter Symposium - Apr 2022
- Alaska Mariculture Symposium - Apr 2022
- APIA Food Security and Climate Change Conference - Apr 2022
- Western Alaska Interdisciplinary Science Conference - Apr 2022
- Alaskan Command Arctic Symposium - May 2022

- KBNERR Water Quality Monitoring Training - May 2022
- ArcticX Summit - May 2022
- WWF/MXAK Arctic Watch meeting - Jun 2022

PRODUCT DELIVERY

- Three regional “Mariner’s Dashboards” for [Prince William Sound](#), [Cook Inlet](#), and [Kodiak](#) were released to provide mariners a user-friendly interface to find weather observations relevant to making boating decisions. User feedback so far has been positive, and we continue to upgrade user features and add new weather assets.
- In collaboration with UAF/IARC, we also released the most recent version of the [Bering Science outreach publication](#) in early June. These publications share observations and research that is happening in and around the region. This year’s report focuses on six topics identified by our Community Advisory Panel: climate, salmon, seabirds, walrus, halibut and crab.
- Through RODSI, AOOS provided sea ice and surface current forecasts to the [Sea Ice for Walrus Outlook program](#) (SIWO).
- The BSITRT is underway. While the prototype is not live yet, work continues on the user interface and will be available for the next reporting period.

CERTIFICATION UPDATES

- Employee updates:
 - Molly McCammon, former AOOS Executive Director, has transitioned to Senior Advisor as an hourly employee.
 - Darcy Dugan, AOOS Director of the Ocean Acidification Network, has transitioned to hourly employee for a period of one-year to work remotely with family.
 - AOOS advertised for two positions of Engagement and Outreach and have selected two applicants to start in the next reporting period.
- Revised bylaws:
 - No revisions at this time.
- Certification website updates:
 - AOOS is in the process of updating documents for recertification in 2022. There have been no updates to the AOOS website NOAA Certification page at this time. When the Recertification Application is submitted, AOOS will provide updated documents to the AOOS website NOAA Certification page found here: <https://aoos.org/about/resources/>

BUDGET SUMMARY

- The oldest ASAP TAS BETC accounting lines are always drawn first unless otherwise directed.
- Payments are never delayed when invoices are received accurately. Anything received and processed and are submitted to our AP are mailed by Friday. Invoicing delays are results timing delays from primary funding and will result in a delay in projects fully billing. There are no noteworthy delays in subcontracts and subrecipient invoicing, although organizations may occasionally fall behind the quarterly billing requirement.
- Equipment purchases charged to the award are detailed in the table below.

Equipment	Serial Number	Use Description	Cost
Hull section	N/A	Extended length hull for increased buoyancy and large batteries	\$6,889.00
Sound Trap	6996	Monitoring underwater sound	\$5,100
Hydrobios Sed Trap Electronics	N/A	Sediment trap computer and power pack to refurbish an existing sediment trap.	\$12,825
Sea-Bird CTD Sensor	37-23136	Salinity Sensor	\$7,742.50

- Travel during this period included;
 - Thomas Farrugia to Homer for a HAB sampling training and community outreach.
 - Thomas Farrugia to Kodiak to attend and present at the Alaska ComFish 2022 Conference.
 - Thomas Farrugia to Seward for HABscope training and meeting with Alutiiq Pride Marine Institute.
 - Darcy Dugan to Juneau to meet w/ legislators & attend the Alaska Mariculture workshop.
 - AOOS Principal Investigator Seth Danielson from Fairbanks to Anchorage to present at the AOOS Spring Board meeting.
 - AOOS Board Chair Katrina Hoffman from Cordova to Anchorage to attend the AOOS Spring Board meeting.
- As identified in the previous section, we experienced significant challenges with early and erroneous closures of accounts on the previous agreement. This caused delays in administration of the current agreement and payment of subawards because of the amount of time the staff had to put into fixing the error. Although we were able to fix this error, it is an example of how challenging and time-consuming it is for AOOS/ASLC to manage the high numbers of different drawlines. We would welcome any simplification of the non-core funding drawlines.
- Under the HABs and RODSI drawlines, we are transitioning Axiom to time-and-materials contracts instead of subawards to improve the project management of individual tasks. Axiom will continue to receive subawards for IOOS/NOAA pass-throughs.
- Under the HABs drawline, we have added a contract with Ocean and Earth (O&E) Environmental Services for management of the HABs database. This will be a new vendor.
- There are no subaward/contracts invoice rates and invoicing details for the reporting period that are linked to NOAA interagency agreements, contracts, or holdover funding.

BUDGET SUMMARY				
Cost Categories	Funding Provided	Funds Spent	Unspent funds remaining	Remaining %
Personnel	513,858	236,175	277,683	54%
Fringe	143,880	49,152	94,728	66%
Travel	41,321	5,204	36,117	87%
Equipment	49,500	35,903	13,597	27%
Supplies	47,493	28,364	19,129	40%
Contractual	713,111	700,916	12,195	2%
Other	2,581,849	867,503	1,714,346	66%
Total Direct Charges	4,091,012	1,923,217	2,167,795	53%

SUCCESS STORIES

Success Story Brief Description	Contact
Our sensor upgrades to the EAFM Glider place us squarely in the realm of being able to capture fisheries-management-relevant data that extends beyond the near-real-time environmental conditions.	Seth Danielson