ALASKA OCEAN OBSERVING SYSTEM
CONTRACT AGREEMENT
H3000-70

For valuable consideration received and acknowledged, the Alaska Ocean Observing System ("AOOS") by and through its fiscal agent the Seward Association for the Advancement of Marine Science dba the Alaska SeaLife Center ("ASLC") and Axiom Data Science, LLC ("Contractor") accept and agree to the following:

1. Contractor. Contractor shall perform the services set forth in Appendix 1, and Contractor accepts such engagement. Contractor acknowledges that he/she is not an employee of AOOS. As such, Contractor shall have no claim against AOOS for vacation pay, sick leave, retirement benefits, social security, worker's compensation, health or disability benefits, unemployment benefits or employee related benefits of any kind. Contractor acknowledges that AOOS shall have no obligation to pay any medical bills for injuries sustained by contractor in connection with the work performed for AOOS under this agreement. Contractor represents that he/she has his/her own health insurance or adequate financial arrangements to pay for such medical bills. Contractor shall not represent him/herself to any third party as being an AOOS employee.

2. Duties, Term and Compensation. This agreement shall commence on July 1, 2021 and shall terminate on June 30, 2022. For all services described in Appendix 1 compensation, reimbursement for expenses and payment shall not exceed <u>five hundred ten thousand dollars ($510,000)</u>.

Contractor shall provide quarterly invoices for services performed. Invoices shall be received for periods ending on September 30th, December 31st, March 31st and June 30th. Contractor shall provide an invoice for work performed through September 30th no later than October 30th.

Invoices shall be electronically sent to ASLC, grants-contracts@alaskasealife.org. Payments will be made by AOOS through ASLC within thirty days of invoicing by contracts. Payment shall be sent to: 1016 West 6th Avenue, Suite 105, Anchorage, Alaska 99501

Contractor is responsible for requesting and obtaining all required tax exemption numbers. Contractor shall be solely responsible to pay any and all taxes incurred by and through the performance or payments made pursuant to this Agreement.

3. Compliance with Laws, Rules and Regulations. Contractor will comply with all security, safety, and other applicable rules and regulations of AOOS and all applicable federal, state and local laws and regulations at all times that Contractor is working on behalf of AOOS.

4. Right to Terminate. AOOS or Contractor shall have the right to terminate this Agreement for any reason with or without cause upon 30 days written notice. In the event of such termination, AOOS shall pay contractor in accordance with this Agreement for work completed up to the

termination, less any damages or other expenses incurred by AOOS and arising from Contractor's performance.

5. Equal Opportunity. AOOS is an equal opportunity employer. All Federal Equal Employment Opportunity and Affirmative Action requirements in race, color, religion, sex, national origin, disabled, and veteran or disabled veteran status as found in 41 CFR 60-1.4(a), 60-300.5, and 60-741.5 are herein incorporated by reference.

6. Use of Data, Intellectual Property and Procedures. Contractor agrees that none of the processes, procedures, software, or other work products developed, data gathered, or analyses performed while engaged in the Statement of Work for AOOS are proprietary in nature. At no additional cost, Contractor shall make available for use by the public and AOOS all discoveries and work products developed in the course of performing this Statement of Work. Contractor grants to AOOS all rights and privileges to use data, documents and footage generated in the Statement of Work for purposes related to AOOS research, marketing and education programs.

Contractor represents and warrants to AOOS that the deliverables are original creations and do not infringe the property or intellectual property rights of any third parties, and that Contractor has obtained all consents, permits and approvals required to comply with all laws, rules and regulations applicable to Contractor's work under this agreement.

7. Indemnification and Confidentiality.
(a) *Indemnification by Contractor:* Contractor agrees to indemnify and hold harmless AOOS, Contractor's and AOOS's officers, agents, members, partners, employees, subsidiaries, affiliates, trustees, directors and/or consultants from and against any and all claims, costs, losses and damage (including, but not limited to, attorney's fees and litigation or arbitration costs), to the extent caused by the negligent acts or omissions of Contractor or Contractor's officers, directors, members, partners, employees and/or anyone Contractor is legally liable for in performing the services under this agreement.

(b) *Indemnification by AOOS:* AOOS agrees to indemnify and hold harmless, Contractor, Contractor's officers, directors, members, partners, employees, to the fullest extent allowed by law, from and against any and all claims, costs, losses and damage (including, attorney's fees and litigation or arbitration costs), to the extent caused by the negligent acts, or omissions of AOOS, AOOS' officers, agents, members, partners, employees, subsidiaries, affiliates, trustees, and/or in performing the services under this agreement.

(c) *Percentage Share of Negligence:* A party's total liability to the other party and anyone claiming by, through or under the other party for any claim, cost, loss or damage caused in part by the negligence of the party and in part by the other party or any other negligent entity or individual, shall not exceed the percentage share that the party's negligence bears to the total of all other negligent entities and individuals.

(d) *Confidentiality:* Contractor agrees that any information of AOOS obtained by him/her while

performing services hereunder shall remain confidential and shall not be disclosed to third parties without the prior written consent of AOOS.

8. Insurance. During the term of this Agreement, the Contractor shall provide and keep in force such insurance as is required by the law of the jurisdiction in which the services will be performed, but in no event shall such insurance provide less than the following coverage:

(a) Statutory workers' compensation and occupational disease disability insurance for all employees of the Contractor. Such insurance shall cover claims filed under the workmen's compensation law of the jurisdiction in which the services are to be performed, or any law of any jurisdiction under which liability for any compensation claims shall arise.

(b) Commercial general liability insurance, including broad contractual liability with minimum bodily injury (including death) limits of $1,000,000 each occurrence, minimum property damage limits of $1,000,000 each occurrence, and $2,000,000 general aggregate.

(c) Professional liability insurance in the minimum amount of $1,000,000 per claim.

Contractor understands the inherent risk of working without commercial automobile insurance and agrees to exclude the use of automobiles while performing the Statement of Work unless commercial automobile insurance is obtained.

The amount of such insurance, the forms of the policies, the companies issuing the same, and all other matters with respect to the adequacy of insurance protection shall be subject to the prior and continuing approval of AOOS, and certificates of such insurance (ACORD form or equivalent) evidencing that the coverages are maintained in force shall be deposited with AOOS prior to commencement of the services. All such policies, except professional liability insurance, shall name AOOS as an additional insured, shall contain a waiver of subrogation in favor of AOOS and shall include a provision to the effect that AOOS shall be given not less than thirty (30) days prior written notice by certified mail of any cancellation or change that affects the coverage, and any certificates deposited with AOOS shall recite such provision.

9. Governing Law, Non-Waiver, Headings, Entire Agreement and Severability. The parties agree to negotiate diligently, in good faith, before resorting to court of law or equity for the resolution of any dispute arising from or pertaining to this Agreement. In the event of a conflict between the body of this Agreement and Appendix 1, this Agreement shall govern. No Amendment to any provision of this Agreement shall be effective unless in writing and signed by each party. This Agreement constitutes the entire understanding and Agreement between the parties and supersedes all prior written or oral agreements or understanding existing between the parties concerning the subject matter hereof.

This Agreement shall be governed by the laws of the State of Alaska except to the extent pre-empted by federal law. Jurisdiction for the resolution of any dispute between the parties shall be the state or federal trial courts of Anchorage, Alaska.

10. Debarment Certification. Contractor certifies, by signature on this Agreement, that Contractor and principals are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any U.S. Federal department or agency. Where Contractor is unable to certify to this statement, Contractor shall attach an explanation to this Agreement, and, at AOOS' option, this Agreement shall become null and void.

11. Subcontracting and Assignment. The parties agree that AOOS is purchasing from Contractor the unique services of individuals qualified to perform the Statement of Work as attached as Appendix 1. Contractor shall not assign or subcontract any portion of this Agreement without the prior written consent of AOOS.

12. Notices. All notices that in any way modify or alter this Agreement shall be sent to the following addresses:

Alaska Ocean Observing System:	Contractor:
Sheyna Wisdom, Executive Director	Rob Bochenek, Owner
Alaska Ocean Observing System	Axiom Data Science, LLC
1007 West 3rd Avenue, Suite 100	1016 West 6th Avenue, Suite 105
Anchorage, Alaska 99501	Anchorage, Alaska 99501
(907) 644-6703	(907) 230-0304
wisdom@aoos.org	rob@axiomdatascience.com

13. Authorizing Signatures

Sheyna Wisdom — Oct 7, 2021

Alaska Ocean Observing System — Date
Sheyna Wisdom, Executive Director

Rob Bochenek. (Oct 7, 2021 17:23 EDT) — Oct 7, 2021

Axiom Data Science, LLC — Date
Rob Bochenek, Owner

Appendix 1

AOOS ~~SUBAWARD~~ CONTRACT STATEMENT OF WORK (SOW)

FOR NOAA GRANT #NA21NOS0120094

PROJECT NAME: AOOS Data Management

PI NAME, INSTITUTION & CONTACT INFO:
Rob Bochenek, Axiom Data Science
rob@axiomdatascience.com 907-230-0304

PERIOD OF PERFORMANCE: July 1, 2021 – June 30, 2022

PROJECT SHORT TITLE: AOOS CORE DMAC

GOAL/PURPOSE:
The goal of AOOS DMAC is to serve as a regional Data Assembly Center to facilitate access to regional federal, state, local, tribal & private data, and to develop regional data products in response to stakeholder needs. In support of these goals, this DMAC effort will focus on maintaining and further cultivating the AOOS cyberinfrastructure, managing and ingesting new AOOS data assets, extending the capabilities of existing data management tools, developing new functionality for the AOOS web-based data portals, supporting existing and new data products, and serving as a modeling testbed.

BACKGROUND:
The Alaska Ocean Observing System (AOOS) requires a data management system that allows a complex array of oceanographic data types to be well organized, accessible, and understandable. Axiom Data Science provides comprehensive technical solutions to data management needs, underpinned by a scalable, open source system that uses existing and emerging software resources, high performance compute clusters, and interoperability services. The framework will directly leverage systems, capabilities and lessons learned from ongoing data management and communications (DMAC) activities that support the Southeast Coastal Ocean Observing System (SECOORA), Central and Northern California Ocean Observing System (CeNCOOS) and the Integrated Ocean Observing System (IOOS). The resulting data management system will provide an environment that increases the access and use of data by all user groups and will allow AOOS data management staff to rapidly develop new capabilities and tools to meet a variety of user needs.

PROJECT OBJECTIVES:
The objectives of this project are to:

1. Provide core data management support services that allow AOOS to fulfill its mission and contribute to the development of IOOS.
2. Maintain and enhance existing data portals and products.
3. Develop and maintain new, specialized data products and tools.
4. Serve as a coastal and ocean model test bed.

PROJECT ACTIVITIES

Objective 1: Provide Core Data Management Support

Task 1: Provide technical support for AOOS Cyber Infrastructure –
As the existing DMAC provider, Axiom has developed the AOOS data system infrastructure for managing and visualizing high-volume, heterogeneous, observation data from hundreds of sources. This system automates the ingestion of real-time observations from in situ devices, model and remote-sensed outputs, and mobile platform data, and caches millions of observations each week in fast, high-availability memory. The backbone of the AOOS data system is physical hardware (i.e., data center) & software systems that support data ingestion, search, aggregation, access/transport, & storage/archive systems. The data collected by AOOS and member entities are distributed on the AOOS web-based data portal and managed according to best practices identified by NOAA/US IOOS under the AOOS RA Certification. This approach ensures that AOOS is implementing recommended and standard practices as defined by the U.S. IOOS DMAC committee, with specific consideration to meet the core capacity requirements outlined in Contributing Data to IOOS. Under this task the following activities will be completed:

- Data Storage and Archive - Axiom will provide storage for data streams on Axiom hardware/infrastructure. Axiom will coordinate with DataONE and NOAA NODC/NDBC/NCEI as appropriate to provide long-term archive.

- Metadata - The AOOS data sets served by Axiom will conform to the Federal Geographic Data Committee (FGDC) and/or ISO standards. Additional IOOS standards will apply when these become fully developed which include Darwin Core and Biological Data Services. A web catalog service will be maintained by Axiom to provide access to the metadata. Axiom will maintain an AOOS-specific instance(s) of the Research Workspace for metadata documentation and dataset creation, storage, and internal file sharing.

- Data Discovery - Axiom will ensure AOOS data and metadata are included in the AOOS web-based data portals, as well as the IOOS catalogs, registries and inventories. Search utilities will be employed via a web browser to browse the data archives. Metadata and web service endpoints will be made available to the IOOS catalog on demand.

- Data Display/Browse - Axiom will maintain several web-based data browsing and display tools, including the integrated portal catalog, as well as catalogs for individual services. These services include the Environmental Research Division's Data Access Program (ERDDAP) which is used for a variety of services, including display and browse. A Web Map Server (WMS) based on GeoServer is used to serve maps and geospatial data. The THREDDS data server also provides tools for data browse such as Godiva 2, which, in that respect, can be viewed as an additional resource for data display/browse.

- Data Transport - Direct data access will be provided through a variety of services including OPeNDAP, WCS, WFS, WMS, THREDDS, 52N and GeoServer. As stated above, Axiom will also maintain an ERDDAP server that follows the latest version of IOOS metadata.

- System Redundancy - Axiom operates a high redundancy data cluster in Portland, OR, which implements several levels of redundancy and backup. The system ensures that multiple redundant copies of data exist in addition to web application servers. Several layers of physical hardware (enterprise level firewalls) and system monitoring software

(NAGIOS) are also in place to provide hardened cyber security.

- Interoperability - To facilitate interoperability, Axiom will ensure the open dissemination of AOOS datasets over standardized services, including, but not limited to, SOS, ERDDAP and THREDDS.

DELIVERABLE: Continuous performance of AOOS data system following IOOS DMAC guidelines.

Task 2: AOOS data portal maintenance & development – The AOOS Ocean Data Explorer framework will continue to be cultivated to integrate new technologies and functionalities. Improved mechanisms of interactivity could greatly augment the usefulness of the various AOOS data assets for the broader user base. The following list provides a summary of AOOS data system updates and enhancements that will be considered and implemented throughout the life of this contract, subject to AOOS approval. Further, Axiom will deliver and expand upon a data quality subsystem within the AOOS data system that automates data quality tests according to IOOS QARTOD specifications. These tests can be applied to real-time and non-real-time data, and can incorporate quality flags from data providers. After QC, data will be made available via interoperability services for near real-time data distribution and will be accompanied by time-series visualizations illustrating QC results alongside the observation values in the AOOS data portals. These tasks will be prioritized and releases scheduled in collaboration with AOOS staff as identified through regular meetings.

- Implement new, modern methods for creating and serving gridded data products with an emphasis on performance, flexibility, and stability. This task also includes improving performance of map-based visualizations and time series extractions (virtual sensor).
- Implement user log-in authentication, user permissions, and multiple browser state saving preferences, units, dataset compilations, etc.
- Enhance data view capability to allow for extended layout, data layer handling, download options, and improved sharing. Custom data view management enabled following user log-in.
- Implement custom map tools, including draw shapes, measure distances, & annotations.
- Introduction of user-defined export or printing of annotated maps, charts, or images.
- Develop inset map in portal map view to provide location context.
- Migrate charting libraries to open-source for access by the broader community.
- Enable animations of vector and platform assets.
- Introduce data packages to revamp how catalog data assets are organized and associated with each other, and to add flexibility to group across asset types (e.g., present related model and sensor data as a single package). This task includes enhanced versions of metadata exposed through the AOOS data catalog.
- Maintain the automated pipeline for applying basic QARTOD checks and visualizations to real-time data feeds streaming into the AOOS data portal, following v1.0 version QARTOD GitHub library. Continue to make test results via QARTOD quality codes available for download within the data and metadata, and visually within the portal for roll up and individual flagged results, and visualizing test results in the portal.
- Expand upon prototype version of a test configuration management application for users to store and manage test configurations across parameters and geographies will be developed. Enhancements to the prototype version will be isolated for future

development of this tool, based on feedback from AOOS, researchers, and the DMAC community.

- Other functionality may be included, including: adding libraries for calculating additional "advanced" QARTOD tests; being able to define test parameters per source, station, or region; or early prototype tool for providing alerts for failed QARTOD test results to Axiom, data providers, and/or external groups. Review of appropriate tests and ranges of qualifiers (e.g., out of range specs) will be reviewed with AOOS staff as needed.
- Additional new features and improvements to be implemented as requested by AOOS staff and as informed by end user feedback.
- Helping make sure that data accessibility is current on the AOOS portal systems.

DELIVERABLE: Improved performance of AOOS data portals implemented in scheduled software releases documented at: https://axiomdatascience.com/portal-updates/

DELIVERABLE: The basic/required quality tests are run on real-time and historical observation data for AOOS assets. The flags from quality tests are viewable and available for download in the data portal and/or ERDDAP data servers. The test code and test thresholds are documented and publicly available. Test thresholds will be reviewed periodically with AOOS staff.

Task 3: Ingest new data streams

The data assets for AOOS and its partners contain scientific information including real-time sensor feeds, operational oceanographic and atmospheric models, satellite observations and GIS data sets that describe the biological, chemical and physical characteristics of the Alaska coastal and ocean region. Under this task, new data streams will be ingested into the AOOS data portal in support of achieving a statewide portal for public access. Data rescue projects will also be supported under this task, where AOOS seeks to bring in hard-to-access data sets from previous efforts into the AOOS portals (including metadata) and making them publicly available. Further, existing data streams will be maintained to ensure access to highly-available data and metadata. Under this task the following activities will be completed:

- Prioritize new data sets for ingestion and display through the AOOS Data Portal, including new stations, gliders, HFR, water level and other prioritized new data.
- Work with AOOS data rescue projects to ensure proper metadata development and working with data rescue partners supplying the data on any visualization and data considerations.
- Collect, manage, quality control, and make available high impact and/or highly requested data (including historical data not archived elsewhere) in the AOOS region.
- Work with data providers to load recovered observational data (via Research Workspace), as available, from within the region. In addition, work with data providers to curate metadata through the Research Workspace, as needed, for post-processed datasets lacking standards-compliant documentation.
- When appropriate, work with AOOS with ingesting data products for display or description and linkage for the Ocean Data Explorer data catalogue.
- Maintain data access services, as required by IOOS, through a variety of services including OPeNDAP, WCS, WFS, WMS and in a variety of common formats including CSV, MATLAB, and JSON. These services will be provided by a combination of THREDDS, ERDDAP, and GeoServer.

- Include data and metadata in the AOOS portal as well as the IOOS catalogs, registries and inventories. Further, employ search utilities via a web browser to browse the data archives, and metadata and web service endpoints to the IOOS catalog on demand.
- Serve datasets through the portal with metadata conforming to the Federal Geographic Data Committee (FGDC) and/or ISO standards. Apply additional IOOS standards as they become fully developed, such as Darwin Core and Biological Data Services.
- Maintain a web catalog service to provide access to the metadata, as well as an AOOS-specific instance(s) of the Research Workspace for metadata documentation and dataset creation, storage, and internal file sharing.

DELIVERABLE: New and historical data streams ingested, quality-checked, standardized to IOOS requirements, and accessible through interoperability services via AOOS data portals.

Task 4: Participate in regional, state, national and international DMAC activities –
As the DMAC provider, Axiom will work closely with AOOS data managers to provide overcall DMAC project management and technical oversight, in addition to participating in regular AOOS and IOOS DMAC web-based and in-person meetings. Further, Axiom will seek opportunities to engage in and broaden connectivity to national and international ocean and data management networks, including but not limited to the AK Data Integration Working Group, the IARPC Arctic Data team, as well as national IOOS and IOOS Association data management committees and working groups. Axiom will participate in statewide, national, and international conferences (notably in the Arctic region) to promote AOOS data services and products. To support the AOOS user community, Axiom will conduct end user engagement by responding to feedback and data requests submitted through the AOOS data portal, and by expanding on existing portal documentation. Last, Axiom may deliver or assist in the delivery of in-person or remote training targeting regional stakeholders to inform them of AOOS data portal and/or products. Activities under this task include:

- User engagement - respond to 100% of feedback button requests from the portal and to 100% of data requests.
- Participate in regularly scheduled AOOS DMAC meetings, and AOOS Board meetings, as requested.
- Attend IOOS DMAC annual meetings, Code Sprints, and monthly IOOS DMAC webinars.
- Participate in 'tri-RA' DMAC meeting with AOOS, CeNCOOS, and SECOORA to discuss cross-regional data management objectives and products.
- Prepare for and engage in the yearly DMAC review from IOOS, as needed.
- Participate in annual Polar Data Forums.
- Continue developing and maintaining the portal documentation at https://portal.aoos.org/help/ with common workflows, animated tutorials, and tasks.
- Expand documentation to include submission guidelines for various data types to the AOOS data system.
- Provide in-person training, workshop, or webinars in AOOS region to the end user community.

DELIVERABLE: Participation in regional, state, national and international DMAC activities, including IOOS related workgroups and meetings.

Objective 2: Develop and maintain special data products

Task 1: Develop new data products

The AOOS Ocean Data Explorer and its regional portals have been designed to support the creation of data-driven products to solve user needs within the region. To improve the access to emerging data types, or to fill targeted information gaps, this task will support development of new products as determined by AOOS, with input from its stakeholder community. Using an agile approach to product development, Axiom engineers will identify and prototype feasible data-powered discovery and decision support tools. This effort will involve working with the AOOS staff lead and other project participants to isolate the desired functionality and technical requirements to ensure data products align with user needs and are implemented within scope of the allocated resources. Activities under this task may include, but are not limited to:

- Development of custom data applications, such as include mobile phone apps; specialized data portals, products or tools for subregions of Alaska's Large Marine Ecosystems; specialized data portals, products or tools for unique Alaska stakeholder groups such as recreational fishers, mariculture fisheries, and emergency planners; and specialized data portals, products or tools for topical issues such as Arctic shipping, ocean acidification, and community-based monitoring.
- Work closely with AOOS, other data management awardees and appropriate advisory committees to implement identified user products, tools and their web interfaces, which includes developing product requirements; beta testing and refining products in order to increase their utility; developing detailed work plans with measurable timelines, deliverables, and performance metrics; and assisting with the development of funding proposals.

DELIVERABLE: Develop new custom data products and/or capabilities for presenting, visualizing and processing data holdings.

Objective 3: Maintain and enhance existing data portals and products

Task 1: Support existing data products - Based on input from AOOS and its partners, this task will support existing AOOS data products to ensure their continuous operation and availability. Support tasks may vary by product, but generally include: refreshing data and metadata to the latest version; debugging or issue diagnoses for data availability; introducing new features to improve user experience; upgrading software to latest version; and technical support to end users. While AOOS hosts a suite of data products developed over the past decade, maintenance and support will be prioritized for the following products:

- Sea Ice Atlas
- Alaska Water Level Watch Data Portal
- COASST seabird database
- AIS database
- Mariculture Map
- Alaska HAB data portal
- Cook Inlet Response Tool
- Cook Inlet Beluga portal

DELIVERABLE: Continuous operation of existing AOOS data products following ongoing technical support and maintenance.

Objective 4: Support coastal and ocean model test bed

Task 1: Support model testbed capability to improve the transition of model data to operational status

Coastal and ocean modeling in the AOOS region offers information that can help save lives, protect property, and sustain marine resources. The intent of a model testbed under this effort is to conduct targeted research and development aimed at speeding up the process by which scientific and technical advances from the coastal and ocean modeling research community are transitioned into improved operational ocean products and services. To date, this effort on model testbed tasks has been and will continue to be focused on: assessing the performance of existing coastal and ocean models in the AOOS region (e.g., developing approaches for comparing model outputs to available observations); creating new model code and tools to improve performance or user confidence; informing and training users; and making a repository of evaluation data sets available through the AOOS data system to expand and improve the modeling capabilities of operational partners and the broader coastal and ocean modeling community. The activities completed under this task include:

- Optimizing and enhancing a modeling framework within the AOOS data system using existing infrastructure and cloud system
- Standing up a dedicated, operational instance of the model testbed capability
- Developing and executing testbed analyses relative to stakeholder needs
- Publishing software modules as open source
- Operationalizing and persisting a hosted instance of the testbed within the AOOS data system

DELIVERABLE: Testbed capability stood-up within the AOOS data system for execution of testbed analyses and new model outputs.

Objective 5: Support AOOS website and other programmatic websites.

Task 1: Support existing AOOS and program websites- Axiom will host and maintain the AOOS web portal at www.aoos.org, in addition to working with AOOS staff to make periodic updates to improve content, use, and the overall "look and feel". Axiom will also provide web-presence support for user interface and visualization tools, data products, decision-support tools, IOOS Registry tools, and other research or project-specific products, such as the Gulf of Alaska data portal, Alaska Water Level Watch Data Portal, Automated Information Systems (AIS) for Prioritizing in the Arctic (AIS PAC updates), Western Alaska Storm Models (providing data comparisons to model outputs), and more.

PLAN FOR DATA DELIVERY: N/A

DELIVERABLES WILL INCLUDE THE FOLLOWING:

- Continuous performance of AOOS data system following IOOS DMAC guidelines.
- Improved performance of AOOS data portals implemented in scheduled software releases documented at: https://axiomdatascience.com/portal-updates/
- New data streams (including data rescue projects) ingested, quality-checked, standardized to IOOS requirements, and accessible through interoperability services via AOOS data portals.

- Participation in regional, state, national and international DMAC activities, including IOOS related workgroups and meetings.
- Develop new custom data products and/or capabilities for presenting, visualizing and processing data holdings.
- Work with external application and product developers as needed for processing and integrating AOOS portal data.
- Continuous operation of existing AOOS data products following ongoing technical support and maintenance.
- Testbed capability stood-up within the AOOS data system for execution of testbed analyses and new model outputs.
- Support and maintenance of AOOS website and other program websites.
- AOOS and IOOS will be acknowledged in all publications and presentations using your project's data.
- Pictures from field sites and activities will be provided to AOOS and/or IOOS for websites, publications, and outreach presentations upon request.
- Semi-annual reports following the standard AOOS template will be submitted to AOOS in December and June.
- If available, PI will participate in an AOOS-sponsored stakeholder or scientist workshop, which may include the Alaska Marine Science Symposium.
- Presentations will be made to the AOOS board upon request.
- Stories for the AOOS newsletter, annual report,website news and Facebook page will be provided upon request.
- DMAC updates will be provided for Executive Director monthly updates.

AOOS ~~SUBAWARD~~ CONTRACT BUDGET JUSTIFICATION FOR NOAA GRANT #NA21NOS0120094

PROJECT NAME:
AOOS Core Data Management
PI NAME, INSTITUTION & CONTACT INFO:
Rob Bochenek
Axiom Data Science LLC
rob@axiomdatascience.com
907-230-0304
PERIOD OF PERFORMANCE:
July 1, 2021 – June 30, 2026
PROJECT TOTAL GRANT REQUEST: Year 1 $510,000
a. Personnel
Rob Bochenek, Information Architect, is budgeted at 18%FTE ($21600; 374.4 hours).
Brian Stone, Software Engineer, is budgeted at 21%FTE ($24570; 436.8 hours).
Chris Turner, Data Librarian, is budgeted at 17%FTE ($14518; 353.6 hours).
Elizabeth Dobbins, Environmental Data Scientist, is budgeted at ~~20~~%FTE ($16405; 416 hours). 17% - typo
Will Koeppen, Physical Scientist, is budgeted at 20%FTE ($19112; 416 hours).
Josh Rhoades, Software Engineer, is budgeted at 17%FTE ($17850; 353.6 hours).
Trevor Golden, Environmental Data Scientist, is budgeted at 14%FTE ($9800; 291.2 hours).
Patrick Kalita, Software Engineer, is budgeted at 17%FTE ($16150; 353.6 hours).
Dave Foster, Software Engineer, is budgeted at 10%FTE ($11200; 208 hours).
Kristen Thyng, MetOcean Data Scientist, is budgeted at 11%FTE ($15070; 228.8 hours).
Stacey Buckelew, Project Manager, is budgeted at 19%FTE ($19950; 395.2 hours).
Ian Gill, Data Coordinator, is budgeted at 12%FTE ($7978; 249.6 hours).
Kyle Wilcox, Senior Software Engineer, is budgeted at 12%FTE ($13920; 249.6 hours).
Jesse Lopez, Physical Scientist, is budgeted at 15.82%FTE ($18824; 329.06 hours).
Shane StSavage, Senior Software Engineer, is budgeted at 15.7%FTE ($16754; 326.56 hours).
Vacant Project Manager, Project Manager, is budgeted at 5.48%FTE ($5096; 113.98 hours).
Karl Hiner, Senior Software Engineer, is budgeted at 14.7%FTE ($18522; 305.76 hours).
Luke Campbell, Software Engineer, is budgeted at 11.46%FTE ($12835; 238.37 hours).
Adrienne Canino, Data Coordinator, is budgeted at 14.31%FTE (~~$10446~~ $10,443 - typo; 297.65 hours).
b. Fringe Benefits
Fringe benefits are calculated at 30% to cover 401K, health insurance, and paid leave for staff salaries.
c. Travel
d. Equipment/Software > $5,000
e. Supplies/Commodities
f. Contracts/Services
g. Other
Axiom charges a 35% facilities rate to cover AOOS' continuous use of our HPC data center.
h. Indirect

Contract

AOOS ~~Subaward~~ Budget
for NOAA Grant #NA21NOS0120094
PROJECT NAME: AOOS Core Data Management: Tier I
PI NAME & CONTACT INFO: Rob Bochenek 907-230-0304 rob@axiomdatascience.com
PERIOD OF PERFORMANCE: July 1, 2021 - June 30, 2022

			510,000		
			Total Budget		
			Budget	MTDC	
a. Personnel	Sal/yr	% FTE			
Rob Bochenek	120,000	18.00%	21,600	21,600	
Brian Stone	117,000	21.00%	24,570	24,570	
Chris Turner	85,402	17.00%	14,518	14,518	
Elizabeth Dobbins	96,500	17.00%	16,405	16,405	
Will Koeppen	95,562	20.00%	19,112	19,112	
Josh Rhoades	105,000	17.00%	17,850	17,850	
Trevor Golden	70,000	14.00%	9,800	9,800	
Patrick Kalita	95,000	17.00%	16,150	16,150	
Dave Foster	112,000	10.00%	11,200	11,200	
Kristen Thyng	137,000	11.00%	15,070	15,070	
Stacey Buckelew	105,000	19.00%	19,950	19,950	
Ian Gill	66,482	12.00%	7,978	7,978	
Kyle Wilcox	116,000	12.00%	13,920	13,920	
Jesse Lopez	119,000	15.82%	18,824	18,824	
Shane StSavage	106,716	15.70%	16,754	16,754	
Vacant Project Manager	93,000	5.48%	5,096	5,096	
Karl Hiner	126,000	14.70%	18,522	18,522	
Luke Campbell	112,000	11.46%	12,835	12,835	
Adrienne Canino	73,000	14.31%	10,443	10,443	
Total Personnel			290,598	290,598	
b. Fringe Benefits	Rate				
Rob Bochenek	30%	[redacted]	6,480	6,480	
Brian Stone	30%	[redacted]	7,371	7,371	
Chris Turner	30%	[redacted]	4,356	4,356	
Elizabeth Dobbins	30%	[redacted]	4,922	4,922	
Will Koeppen	30%	[redacted]	5,734	5,734	
Josh Rhoades	30%	[redacted]	5,355	5,355	
Trevor Golden	30%	[redacted]	2,940	2,940	
Patrick Kalita	30%	[redacted]	4,845	4,845	
Dave Foster	30%	[redacted]	3,360	3,360	
Kristen Thyng	30%	[redacted]	4,521	4,521	
Stacey Buckelew	30%	[redacted]	5,985	5,985	
Ian Gill	30%	[redacted]	2,393	2,393	
Kyle Wilcox	30%	[redacted]	4,176	4,176	
Jesse Lopez	30%	[redacted]	5,647	5,647	
Shane StSavage	30%	[redacted]	5,026	5,026	
Vacant Project Manager	30%	[redacted]	1,529	1,529	
Karl Hiner	30%	[redacted]	5,557	5,557	
Luke Campbell	30%	[redacted]	3,851	3,851	
Adrienne Canino	30%	[redacted]	3,133	3,133	
Total Fringe Benefits			87,179	87,179	87,180
c. Travel and Per Diem					
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
Total Travel and Per Diem			0	0	
d. Equipment/software >$5,000	Rate	Qty			
			0	N/A	
			0	N/A	
			0	N/A	
			0	N/A	
			0	N/A	
			0	N/A	
			0	N/A	
Total Equipment>5000			0		
e. Supplies/commodities/equipment <$5,000	Rate	Qty			
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
Total Supplies/commodities< 5000			0	0	
f. Contracts/Services:	Rate	Qty			
Services					
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
			0	0	
Total Services			0	0	
g. Other	Rate	Qty			
Facilities Rate @ 35%	377,778	0.35	132,222	132,222	
			0	0	
			0	0	
			0	0	
			0	0	
Total Other			132,222	132,222	
TOTAL Categories			510,000	510,000	
			0		
Total Per Funding Source			510,000		

Indirect rate:

ASLC Note: On SF424A and FRF, fringe amount will be increased by $1 to correct for rounding and balance budget.

H3000-70 Axiom Contract for signature

Final Audit Report 2021-10-07

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