

**EVOSTC FY17-FY21 INVITATION FOR PROPOSALS
FY18 DATA PROGRAM PROPOSAL SUMMARY PAGE**

Proposals requesting FY18 funding are due to shiwai.wang@alaska.gov and elise.hsieh@alaska.gov by August 23, 2017. Please note that the information in your proposal and budget form will be used for funding review. Late proposals, revisions or corrections may not be accepted.

Team Lead(s) and Affiliation(s)

Carol Janzen, Alaska Ocean Observing System

Date Proposal Submitted

August 23, 2017

Program Abstract

The *Exxon Valdez* Oil Spill Trustee Council (EVOSTC) requires a data management program composed of tools covering the entire data lifecycle, from immediately after data collection, to long-term preservation, to discovery and reuse. During the last EVOSTC five-year funding cycle, the Alaska Ocean Observing System (AOOS) provided data management services for both the “Long-Term Monitoring of Marine Conditions and Injured Resources and Services” Program, referred to as Gulf Watch Alaska (GWA), and the “Herring Research and Monitoring” (HRM) Program. These two programs leveraged the existing data management capacity of AOOS, but also helped inform and improve AOOS’ overall data and metadata management, access, and visualization tools. Because of these past investments, the AOOS team and infrastructure are best situated to provide data services to the EVOSTC for the next five years and thus maintain continuity and build upon the ongoing efforts and data management system development. Through these efforts, AOOS will continue to provide access to these tools and services for which the principal investigators (PIs) of the GWA and HRM Programs depend. Among these, the Research Workspace (an enhanced version of the former web-based data management platform, the Ocean Workspace) will be maintained and supported to upload, organize, and document data, as well as to facilitate program administration. This platform is familiar to GWA and HRM PIs from the prior funded effort, and allows data to be made promptly and securely available to team members and program administrators. During the spring of 2016, the existing Ocean Workspace will be updated with an enhanced metadata editor designed to help researchers more easily generate flexible yet robust, standards-compliant metadata. As in previous years, GWA and HRM Program data will be shared publicly (or ‘published’) through the AOOS Gulf of Alaska Data Portal, where it can be accompanied by any supplemental files or project documentation. Publishing through AOOS makes the data available to a wide-ranging and established network of resource managers, scientists, and the general public to support decision-making. In addition, the GWA and HRM Program datasets will be ingested into DataONE for long-term preservation, where each dataset will be assigned a digital object identifier (DOI) and made discoverable through other DataONE nodes. Through the AOOS data management system, the significant expertise of the data management staff at its technical partner organization, Axiom Data Science, is leveraged. The Axiom staff have extensive experience with the GWA and HRM Programs and their associated data through the prior five-year effort. Building upon these established relationships and infrastructure, AOOS is well-poised to deliver continued success in its data management services to facilitate the access and curation of data to support decision-making related to Spill affected ecosystems.

**The abstract should provide a brief overview of the overall goals and hypotheses of the Program and provide sufficient information for a summary review as this is the text that will be used in the public work plan and may be relied upon by the PAC and other parties.*

EVOSTC Funding Requested* (must include 9% GA)					
FY17	FY18	FY19	FY20	FY21	TOTAL
\$218,000	\$218,000	\$218,000	\$218,000	\$218,000	\$1,090,000

Non-EVOSTC Funds to be used, please include source and amount per source:					
FY17	FY18	FY19	FY20	FY21	TOTAL
\$2,705	\$2,786	\$2,869	\$2,955	\$3,044	\$14,359

**If the amount requested here does not match the amount on the budget form, the request on the budget form will be considered to be correct.*

1. EXECUTIVE SUMMARY

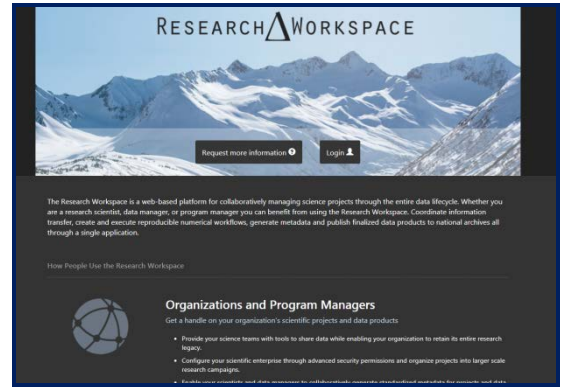
Please provide a summary of the Program’s overall goals as submitted in your original proposal. If there are highlights that you would like to include from the Program’s FY17 work, please include them here.

As originally proposed, this program responds to the EVOSTC’s continued need for cost-effective data management that maintains continuity and builds upon the efforts of the prior contract. AOOS and its technical partner, Axiom Data Science, are best situated to provide that continuity by leveraging the data management system that was instituted for the GWA and HRM Programs in the previous five-year effort. The goal of this program is to provide critical data management support to GWA and HRM investigators and program leads in order to assist study teams in efficiently meeting their objectives and ensuring data collected or consolidated through the effort is organized, documented, and available for their use and for future use by the larger scientific community.

This program prioritizes data preservation and accessibility to scientific and resource management communities. This will be achieved through support for data submission and organization, metadata generation, and data transfer among study teams. Axiom data analysts and domain experts will continue to review metadata and data structure formats produced from GWA and HRM data collection activities and advise study team members in best practices for short-term and long-term data formats, as well as metadata authoring. Axiom software engineers will also enhance existing web-based tools to improve the discoverability of GWA and HRM project-level data, which will include the ability to search and filter EVOS-funded datasets by space, time, parameter and taxonomy, both privately within the project and externally after the data have been shared with the public. This data curation process has been designed to meet the requirements of the EVOSTC as specified in the Data Management Program Invitation, which also includes the transfer of GWA and HRM Program data to the EVOSTC storage resources at the completion of this funding term.

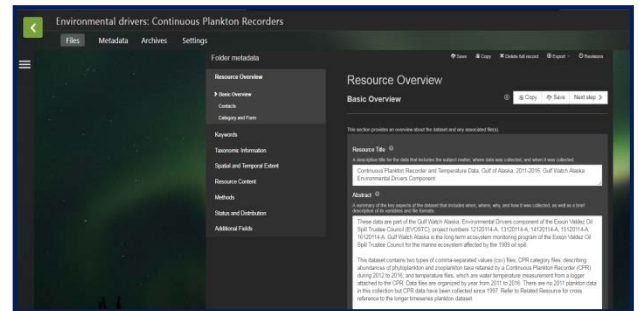
Key highlights from the program's FY17 work included:

- Launched the [Research Workspace](https://researchworkspace.com/intro/)¹ to the GWA and HRM programs, in addition to 600 others members associated with other research and monitoring programs. The Research Workspace is a redesign of the Ocean Workspace, with new features to improve data management and collaboration throughout all stages of scientific programs. *Photo right*

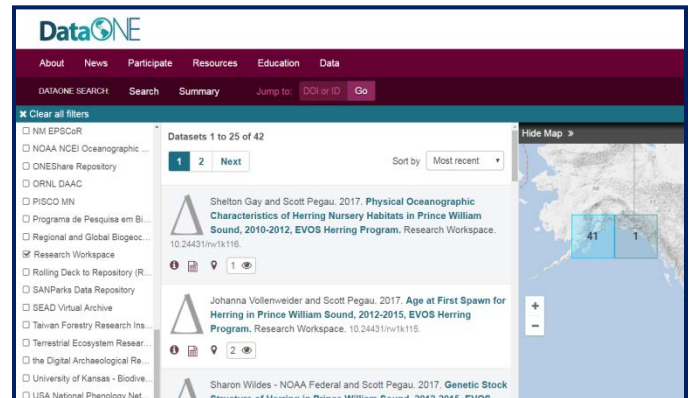


- Created a new Workspace group to store and share data files among collaborators for the GWA program 2017-2021 effort.

- Released a new, robust version of the Research Workspace's metadata editor to capture detailed documentation on datasets and produce ISO 19110 and 19115-2 metadata outputs. *Photo right*



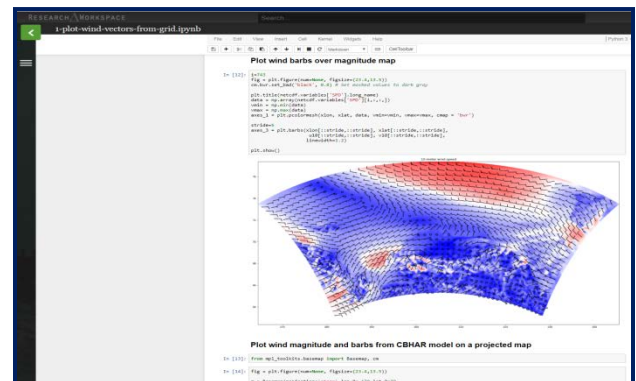
- The Research Workspace became a [DataONE](https://www.dataone.org/)² Member Node (news release [here](http://portal.aos.org/gulf-of-alaska.php)), which allows PIs to automatically transfer data and metadata from the Workspace to DataONE for long-term preservation, a citable digital object identifier (DOI), and discovery by broader scientific audiences.



- The entire data holdings from the 2012-2016 GWA and HRM programs were archived with DataONE and are now publicly discoverable and citable through the [AOOS Gulf of Alaska data portal](http://portal.aos.org/gulf-of-alaska.php)³ and the [DataONE Search](https://search.dataone.org/#data)⁴ catalog. *Photo right*

- Developed updated data management procedures to more efficiently guide project PIs through data documentation and curation throughout the lifetime of their projects.

- Provided training to GWA team members in [Jupyter Notebooks](https://workspace.aos.org/help/JupyterNotebooks.html#jupyter-notebooks)⁵, which is a cloud-based feature integrated into the Research Workspace that allows PIs to write numerical workflows and scripts in Python and R to leverage uploaded datasets as well as a library



¹ <https://researchworkspace.com/intro/>

² <https://www.dataone.org/>

³ <http://portal.aos.org/gulf-of-alaska.php>

⁴ <https://search.dataone.org/#data>

⁵ <https://workspace.aos.org/help/JupyterNotebooks.html#jupyter-notebooks>

of public datasets. This allows computationally-intense scripts to be developed, shared, and run iteratively through the life of the project. *Photo right, above.*

2. COORDINATION AND COLLABORATION

A. With the Herring and Long-Term Monitoring Program

Provide a list and clearly describe the functional and operational relationships with the Programs. This includes any coordination that has taken or will take place and what form the coordination will take. Describe how the proposed program will communicate and collaborate with the Programs to ensure compliance with data and reporting policies.

B. With Trustee or Management Agencies

Please discuss if there are any areas which may support EVOSTC trust or other agency work or which have received EVOSTC trust or other agency feedback or direction, including the contact name of the agency staff. Please include specific information as to how the subject area may assist EVOSTC trust or other agency work. If the Program requires or includes collaboration with other agencies, organizations or scientists to accomplish the work, such arrangements should be fully explained and the names of agency or organization representatives involved in the project should be provided. If your proposal is in conflict with another project, note this and explain why.

A. Within a EVOSTC-Funded Program

By its very nature, AOOS's data management technical infrastructure is collaborative in the sense that the Workspace is designed to give open access across the GWA and HRM program teams for file sharing and transparency of data progress. Backing this infrastructure is a data management team that is well-coordinated with GWA and HRM program leads and science teams for timely data submissions and accuracy of metadata authoring, and to ensure data and products are available to general science and resource management communities. Through this collaborative work structure, the data management team is positioned to respond to the needs of the GWA and HRM programs by providing both the required technical support and requested modifications to the Workspace to enhance its accessibility and utility to scientists.

Coordination among these programs occurs through these activities:

- Across program coordination: Overall coordination of the data management effort is provided by Dr. Janzen, the AOOS Program Lead, who is responsible for ensuring coordination within this project and across the GWA and HRM Programs. AOOS's time dedicated to the EVOSTC programs is focused on data management project oversight to ensure integration across GWA and HRM Programs and the data management services. Coordination across the programs occurs through email, phone communications, and regularly scheduled in-person meetings. Dr. Janzen and representatives from the Axiom data management team will attend the annual PI meeting in November and January, and the regularly scheduled Program Management Team phone calls to ensure a seamless response to data management and decision-support needs.
- Within program and individual coordination: Regular communication are maintained between the Axiom data management team and the GWA and HRM PIs both within the program (e.g. all GWA or HRM PIs) and at the individual PI level. These communications are a continuation of effective working relationships developed with the science teams in the first five-year effort.
 - Within program: The data managers will maintain regular communications with PIs, program management, and EVOSTC staff through participation at the annual PI meetings in November and January, and through regular program-wide emails correspondence. At meetings AOOS and the data management team will communicate to all PIs about data submission progress and procedures through presentations and group discussions. Using

emails, PIs are notified of program data inventories and the submission timelines to help encourage compliance.

- **Individual:** Regular communications also occur with individual PIs through annual one-on-one meetings, and regular email and/or phone conversations. A one-on-one meetings will be held with each PI in November 2018 to track project progress and provide hands-on support for data organization, formatting, and metadata authoring. The data managers also use email to inform individuals PIs of their data submission progress using the data inventory tool, and to respond to PIs inquiries and/or requests for additional assistance. Depending on the location of individual PIs, this assistance is provided through the most practical communication method (e.g., email, phone correspondence, or scheduled meetings).

B. With Trustee or Management Agencies

AOOS brings a significant level of leveraged resources, infrastructure, regional data management projects and partnerships to the proposed effort. The project team provides data management visualization, and preservation services (including providing access to and facilitating the use of the Research Workspace) to a number of other programs that receive funding from or are administered or overseen by representatives from the Trustee Council agencies. Additionally, this work will benefit trustee or management agencies as all data and final data products produced by the GWA and HRM programs will be made available through the Gulf of Alaska data portal and DataONE Member Node, both of which are no-cost services that can be accessed by any member of the public. None of the programs or projects listed above conflict with this proposal. Some of these programs and their associated Trustee agencies are given below (Table 1).

Table 1. Other groups and agencies for which AOOS and Axiom coordinate data management services.

Group, Agency	Level and Type of Coordination	Representative
Arctic Marine Biological Observation Network (AMBON), Bureau of Ocean Management (BOEM)	Coordinate all data management activities for AMBON using the Workspace	Katrin Iken, Lead Principal Investigator
Core Program, North Pacific Research Board (NPRB)	Guidance given on data and metadata best practices; access to and facilitation of the Workspace; organization and archiving of historical projects	Matthew Baker, Science Director; Jo-Ann Mellish, Program Manager
Arctic Ecosystem Integrated Synthesis (Arctic EIS), BOEM	Provide guidance to program management on data and metadata best practices; access to and facilitation of the Workspace; organization and archiving of completed projects	Franz Mueter, Lead Principal Investigator
Marine Arctic Ecosystem Study (MARES), BOEM	Develop data management plans for each sampling effort; access to and facilitation of the Workspace; acquire and ingest into AOOS Arctic Data Portal environmental datasets identified by program PIs as important context for MARES program; facilitate conversion of data into long-term preservation-ready formats; submission of datasets to long-term archives	Francis Wiese, Lead Project Manager
Integrated Ocean Observing System (IOOS), National Ocean and	Develop community standards for sensor observations; make regional data nationally	Derrick Snowden, Data Management And

Atmospheric Administration (NOAA)	accessible	Coordination (DMAC) System Architect
Beluga Sightings Database Visualization, NOAA-National Marine Fisheries Service (NMFS)	Visualizations, guidance on building community standards for submitting marine mammal stranding observations	Mandy Migura, Marine Mammal Specialist
Alaska Ocean Observing System (AOOS) Data Management, NOAA	Data management; cyberinfrastructure; working directly with member and non-member organizations to ingest and document new datasets; visualizations	Molly McCammon, Director; Phil Mundy, Data Management Committee Chair
Central and Northern California Ocean Observing System (CeNCOOS) Data Management, NOAA	Data management; cyberinfrastructure; working directly with member and non-member organizations to ingest and document new datasets; visualizations	Francisco Chavez, Acting Director;
Southeast Coastal Ocean Observing System (SECOORA) Data Management, NOAA	Data management; cyberinfrastructure; working directly with member and non-member organizations to ingest and document new datasets; visualizations	Francisco Chavez, Acting Director;
Gulf of Alaska Integrated Ecological Research Program (GOAIERP), NPRB	Fully facilitated data and metadata management working directly with PIs, from initial sharing within the group to long-term archiving at NPRB	Danielle Dickson, Program Manager
Russian-American Long-term Census of the Arctic (RUSALCA), NOAA	Access to Workspace; guidance on data and metadata management; archiving; visualizations in support of mission	Kathy Crane, U.S. Mission Coordinator
Alaska Data Integration working group (ADIwg), U.S. Geological Survey (USGS)	Generate community standards for project data; advise on translation from ADIwg metadata content profile into suite of ISO geospatial metadata of standards	Josh Bradley, Data Manager

3. PROGRAM TECHNICAL DESIGN – PLAN FOR FY18

A. Objectives for FY18

Identify the primary Program objectives for FY18 as submitted in your original proposal.

B. Changes to Project Design

If the Program design has changed from your original proposal, please identify any substantive changes and the reason for the changes. Include any information on problems encountered, if any. This may include logistic or technical challenges, budget problems, personnel issues, etc. Please also include information as to how any problem has been or will be resolved. This may also include new insights that develop and prompt adjustment to the overall Program.

A. Objectives for FY18

- 1) **Objective 1.** Initiate data management services and oversight for EVOSTC GWA and HRM Program data-related activities.
- 2) **Objective 3.** Facilitate, monitor, and evaluate regular data submissions and metadata generation in the Ocean Workspace.
- 3) **Objective 4.** Provide, maintain, and modify technical infrastructure for user groups to access information produced or processed by the GWA and HRM Programs.

- 4) **Objective 5.** Publish and promote data collected by the GWA and HRM Programs, making it available for research, management, and general audiences.
- 5) **Objective 6.** Execute management, user feedback, and internal and external communications related to GWA and HRM data and data products.

B. Changes to Project Design

There are no changes to the project design for FY18.

4. SCHEDULE

A. Program Milestones for FY18

Specify when critical program tasks will be completed. Reviewers will use this information in conjunction with annual program reports to assess whether the program is meeting its objectives and is suitable for continued funding.

B. Measurable Project Tasks for FY18

Specify, by each quarter of each fiscal year (February 1 – January 31), when critical program tasks will be completed.

A. Project Milestones for FY 18

Objective 1. Initiate data management services and oversight for EVOSTC GWA and HRM Program data-related activities.

Convene data scoping meeting with individual PIs- November 2018

Maintain up-to-date inventory of expected and submitted data- ongoing

Objective 3. Facilitate, monitor, and evaluate regular data submissions and metadata generation in the Workspace.

Track regular data and metadata submissions- ongoing

Hold annual data progress checks with individual PIs- January 2019

Provide supplemental data and metadata quality control- May 2018

Objective 4. Provide, maintain, and modify technical infrastructure to ensure access to information produced or processed by the GWA and HRM Programs

Provide scheduled and unscheduled maintenance to the system infrastructure- ongoing

Objective 5. Publish and promote data collected by the HRM and GWA Programs, making it available for research, management, and general audiences.

Publish data and relevant program documents through the Gulf of Alaska Portal- February 2018

Objective 6. Execute management, user feedback, and internal and external communications related to GWA and HRM data and data products.

Interface with program PIs on data management progress and procedures- ongoing

Continually evaluate progress and new technologies to keep pace with program needs- ongoing

B. Measurable Project Tasks for FY 18

FY 18, 1st quarter (February 1, 2018 - April 31, 2018)

Schedule & complete data management meetings with individual PIs
Modify Workspace metadata to connect time series data sets
Publish data and data products through the AOOS Gulf of Alaska data
Final data collections (from outstanding 2016 datasets) submitted to DataONE
Present data management procedures & progress at annual meeting
Provide ongoing data and metadata support to PIs
Submit annual report to EVOSTC

FY 15, 2nd quarter (May 1, 2018-July 30, 2018)

Hold one-on-one meetings with PIs on data progress
Revise data management plans to respond to project-level changes
Conduct semi-annual review of data submissions
Notification to PIs re: metadata & data submission deadline
Provide maintenance on data management system
Provide ongoing data and metadata support to project PIs, as needed

FY 15, 3rd quarter (August 1, 2018 – October 31, 2018)

Non-compliance notification to the program managers if data management deliverables are delinquent for certain projects (if applicable)
Provide maintenance on data management system
Verify the conversion of file formats as preservation-ready
Review data to be published with PIs for consent
Audit the readiness of datasets for archive
Submit FY19 workplan

FY 15, 4th quarter (November 1, 2018- January 31, 2019)

Conduct semi-annual review of data submissions
Notification to PIs re: metadata & data submission deadline
Complete QC of data formats and completed metadata
Verify the conversion of file formats as preservation-ready
Review data to be published with PIs for consent
Audit the readiness of datasets for archive
Publish data and data products through the GOA portal
Final data collections submitted to DataONE

5. PROJECT PERSONNEL – CHANGES AND UPDATES

If there are any staffing changes to the Team Leads or any other senior personnel please provide CV's for any new personnel and describe their role in the Program.

There are no changes to project personnel for this program.

6. Budget

A. Budget Forms (Attached)

Provide completed budget forms.

B. Changes from Original Proposal

If your FY18 funding request differs from your original proposal, provide a detailed list of the changes and discuss the reason for each change.

C. Sources of Additional Funding

Identify non-EVOSTC funds or in-kind contributions used as cost-share for the work in this Program. List the amount of funds, the source of funds, and the purpose for which the funds will be used. Do not include funds that are not directly and specifically related to the work being proposed in this proposal.

A. Budget Forms (Attached)

See attached

B. Changes from Original Proposal

There are no changes from the original proposal.

C. Sources of Additional Funding

AOOS will also make available one additional week of in-kind salary for Dr. Janzen (Operations Director, AOOS) bringing her commitment to the Data Management Program to 4 weeks in order to fulfill Program Lead duties under this award and to oversee program data integration activities into the AOOS data system. The value of Dr. Janzen's in-kind support (includes salary, benefits, fiscal sponsor fees) will be \$2785.62 in FY18.