

1. Program Number: See, Reporting Policy at III (D) (1).

19120113

2. Program Title: See, Reporting Policy at III (D) (2).

Data Management Program

3. Program Lead Name(s): See, Reporting Policy at III (D) (3).

Dr. Carol Janzen

4. Time Period Covered by the Summary: See, Reporting Policy at III (D) (4).

February 1, 2019- January 31, 2020

5. Date of Summary: See, Reporting Policy at III (D) (5).

March 2020

6. Program Website (if applicable): See, Reporting Policy at III (D) (6).AOOS Gulf of Alaska Data Portal: <http://portal.aos.org/gulf-of-alaska.php>**7. Overview of Work Performed during the Reporting Period: See, Reporting Policy at III (D) (7).**

The goal of the Data Management (DM) program is to provide critical data management support to *Exxon Valdez* Oil Spill Trustee Council's Gulf Watch Alaska (GWA) and Herring Research and Monitoring (HRM) program investigators 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. To meet this goal, the data management program leveraged the extensive cyberinfrastructure and data management capacities of both the Alaska Ocean Observing System (AOOS) and its technical partner, Axiom Data Science, utilizing the existing, collaborative relationships with program PIs to ensure continuity in the data collected across efforts. The goals of the program are achieved with the following objectives:

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

Objective 2. Continue to standardize and provide access to datasets from the first five-year GWA and HRM efforts for continuity and integration.

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

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

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

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

Objective 7. Verify data and metadata completeness and final transfer at the term completion.

The FY19 Workplan focused on Objectives 1,3,4,5 and 6. Objective 2 is now complete for the existing projects serviced during FY17-19. The DM program prioritizes data preservation and accessibility to the scientific and resource management communities by supporting data submission and organization, metadata generation, and data transfer among study teams. The data curation process is designed to meet the requirements of the EVOSTC, including the transfer of GWA and HRM Program data to the EVOSTC storage resources at the completion of this funding term. To this end, Axiom data analysts and domain experts reviewed metadata and data structure formats produced from GWA and HRM data collection activities and advised study team members in best practices for short-term and long-term data formats. Axiom software engineers enhanced existing web-based tools to improve the discoverability of GWA and HRM project-level data. One such improvement is now the ability to search and filter EVOSTC-funded datasets by space, time, parameter and taxonomy, both privately within the project and externally after the data have been shared with the public.

The following activities sorted by Objective were accomplished during the FY19 period.

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

The DM team participated in the quarterly GWA Program PI conference calls to provide regular data management updates and data submission reminders on February 21, May 22, and July 23, 2019. The DM team maintained communications with PIs following the one-on-one data scoping meetings held with individual PIs from both the GWA and the HRM programs at the October 7-10, 2019 annual meeting in Homer, AK, and again at the GWA PI meeting on January 29, 2020 during the Alaska Marine Science Symposium Conference in Anchorage.

The DM lead (Janzen) sent quarterly updates of the data submission inventory table to GWA and HRM program leads to help remediate any potential data submission issues directly with the program and project PIs. The quarterly updates are simply to inform the program leads how PIs are performing with data submissions and they are not punitive. Data submission updates were provided to the program leads on March 31, July 8, October 7, 2019 (prior to the annual EVOSTC meeting on October 11), and January 13, 2020. A revised report-out was provided to the GWA PIs at the in-person meeting on January 29, 2020. Data management procedures continue to be available to all PIs through the Research Workspace.

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

Throughout the FY19 period, oversight of timely and organized data, metadata documentation, and other program documents to the Research Workspace occurred using a combination of data management personnel and technical infrastructure. Program-specific metadata templates for the PIs that include boilerplate information for fields that must contain program-wide metadata (e.g. access constraints, use constraints, and programmatic contact

information) have proven successful at making metadata creation less cumbersome for PIs while providing time saving steps and standardizing the metadata across programs. [Metadata templates](#) are in the Research Workspace.

A regularly updated data submission inventory tracks data and metadata submissions to the Workspace against data that were expected to be generated through the GWA and HRM program terms. The DM lead shares the most current data inventory status with the GWA and HRM program leads throughout the year (see Objective 1).

Following data submissions in FY19, Axiom audited the organization of the data by ensuring the types of data submitted were appropriate for long-term preservation and consistent conventions were used for naming files. Additionally, Axiom conducted quality control checks for accuracy and consistency of the metadata. These audits informed a list of issues in the data submissions and associated metadata, which required remedy before the dataset was considered final and ready for publication.

To facilitate timely data submission and corrections or updates to metadata, Axiom staff met with PIs at the October 2019 PI meeting to review and revise as needed the specific data management plan for their project and the current data and metadata progress. Based on previous experiences, one-on-one meetings are an effective way to address individual metadata authoring questions, create accountability for data submissions, and help to strengthen relationships between PIs and DM staff. During these meetings, any organizational, data format, or metadata documentation issues were discussed between Axiom staff and PIs, with clear direction on what changes were necessary to ensure the data are publication-ready.

An updated data submission inventory (as of March 15, 2020) of expected and submitted data to the Research Workspace and Gulf of Alaska (GOA) Data Portal can be found in Table 3 (Section 9.d). Table 4 contains summary statistics of data submissions as March 15, 2020 (Section 9.d). In most cases, projects are meeting or exceeding expectations for data sharing. Some projects are typically delayed annually due to late-in-year sampling schedules, longer sample processing times, and data processing delays, but are compliant and being updated when ready using the Research Workspace.

During this performance period the following new datasets were submitted to DataONE for long-term preservation and DOI citation (Table 1).

Table 1. A list of the GWA and HRM archived datasets that were submitted to the DataONE repository during the FY19 reporting period.

Stormy Haught, Steve Moffitt. Aerial survey observations of Pacific herring biomass in Prince William Sound, Alaska, 1973-2007. Research Workspace. 10.24431/rw1k442, version: 10.24431_rw1k442_202036231521.
Stormy Haught, Steve Moffitt. Aerial survey observations of Pacific herring spawn in Prince William Sound, Alaska, 1973-2019. Research Workspace. 10.24431/rw1k440, version: 10.24431_rw1k440_202036203132.
Stormy Haught, Steve Moffitt. Aerial survey observations of Pacific herring biomass, marine birds, and marine mammals in Prince William Sound, Alaska, 2008-2019. Research Workspace. 10.24431/rw1k43z, version: 10.24431_rw1k43z_202036203638.
Stormy Haught, Steve Moffitt. Age-Sex-Length-Weight data for Pacific Herring in Prince William Sound, Alaska, 2014-2018. Research Workspace. 10.24431/rw1k441, version: 10.24431_rw1k441_202036231323.

OBJECTIVE 4. *Provide, maintain, and modify technical infrastructure to ensure access to information produced*

or processed by the GWA and HRM Programs.

Scheduled and as-necessary maintenance was made to the data management system infrastructure, including the Research Workspace and the GOA Data Portal, to ensure continuous operation and reliability for the GWA and HRM Program PIs.

The DM team continues to improve tools available on the [Gulf of Alaska Data Portal](#), which is a regional subset of AOOS's statewide Ocean Data Explorer portal. The updated GOA portal gives users access to new features as well as a revamped design to get more out of the AOOS data services. The portal offers sophisticated charting abilities, including comparisons between data sources, binning by time, and plotting climatologies and anomalies. During this performance period, additional GWA datasets were ingested and visualized in the GOA data portal to provide interactive data exploration. An example of the new data display for the Oceanographic Monitoring in Cook Inlet and Kachemak Bay and Zooplankton Data, 2012-2016 datasets can be seen in Figure 1.

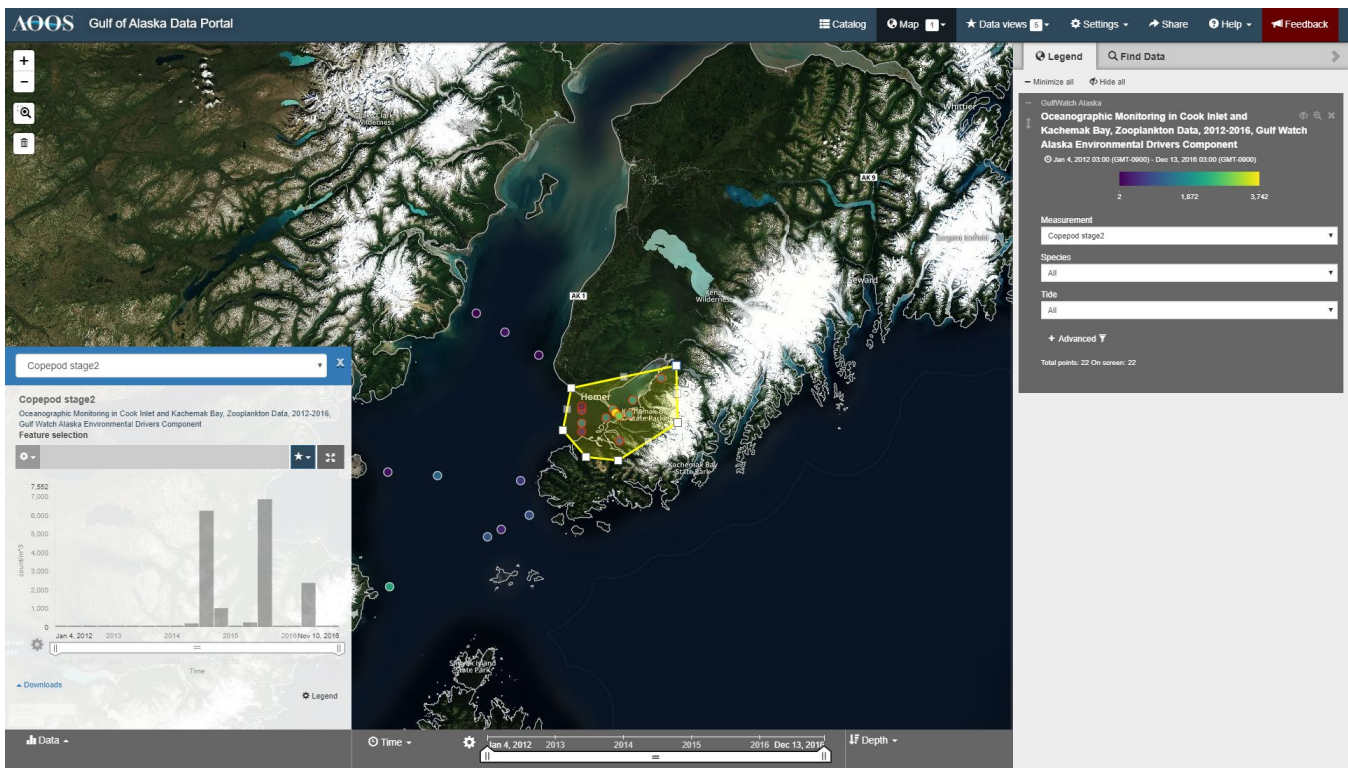


Figure 1. A screenshot of the 2012-2016 plankton timeseries data, along with interactive data charts available through the GOA Data Portal ([interactive link](#)).

A recently new feature, *Data Views*, allows users to save a collection of data layers and visualize them together for comparison and analysis. Data Views can be customized by individual users and shared among collaborators. This tool allows curated data trends or environmental events to be captured and easily shared among broader audiences, as well as instantly updated when refreshing the data view. An example data view 'The Blob,' a significant warm water event occurring in the Gulf of Alaska during 2013-15, can be interacted with at [this link](#), or viewed in the screenshot shown as Figure 2.

★ Cook Inlet and Kachemak Bay, Zooplankton and Sea-Surface Temperature Data, 2012-2016 datasets

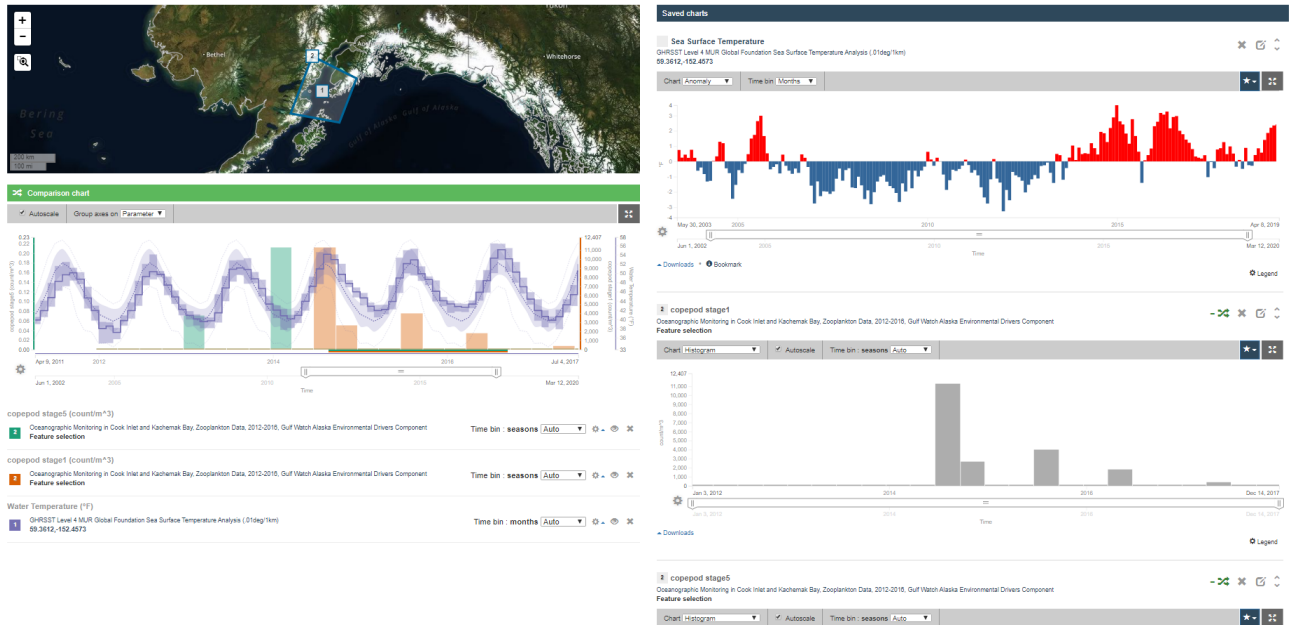


Figure 2. An example data view of ‘The Blob’, a significant warm water event occurring in the Gulf of Alaska during 2013-15, showing time series zooplankton data from Kachemak Bay oceanographic monitoring cruises ([interactive link](#)).

Additionally, visualization of the ADFG annual herring biomass and spawn aerial survey visualizations were refreshed with data through 2019. Those five datasets can be accessed through the GOA data portal using this [link](#). Those same datasets were archived through DataONE during this performance period (Table 1) and the dataset DOIs were added to the GOA data catalog for citation.

A number of DataONE bugs affecting the Research Workspace Member Node were identified, researched, and steps towards resolution were completed to facilitate archive of GWA and HRM project data. An improved DataONE citation preview feature for PIs was created to help more easily structure metadata for optimal citations.

The Research Workspace continues to serve as an efficient internal file sharing and storage tool, where all data files (including the contextual information, raw data, data not currently public, etc.) are housed, and from which these data files can be made public. The Workspace contains individual PI user and group profiles in which data are submitted and shared among project collaborators. Software engineers at Axiom continue to provide support for the Research Workspace, which includes resolving bugs and implementing new functionality in response to user feedback. A Java framework update was implemented that affects most of the underlying code in the Research Workspace, which will improve Axiom’s ability to maintain the system and be responsive in delivering future updates.

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

Once PIs have written metadata and that metadata have been reviewed and approved by DM team members from Axiom, the Research Workspace is used as a gateway to publish data and associated metadata to the GOA Data

Portal. Through this portal, the data are publicly-available for discovery by researchers, managers, and general audiences. As data providers, PIs have ultimate control for managing which data and supplemental documents are made publicly available. Within each project in the Research Workspace, PIs elect to publish data folders to the portal using a simple, clearly marked checkbox. In FY19, all 2018 data finalized in the FY18 period were published by the PIs and made publicly available through the GOA Data Portal. Using the catalog within the GOA Data Portal, users can browse or search for datasets of interest to learn more about the project or download datasets and metadata of interest.

Throughout the performance period, the AOOS web catalog service was maintained to provide continuous public data and metadata access. A re-architecture of the GOA portal data catalog search occurred to provide data result groupings by data types and cascading project tags, as requested in user feedback. Refactoring also occurred to improve search term results, indicate applied filters, and provide a framework for better catalog asset integration and maintenance in the future. The GWA and HRM project pages were improved to prominently display and link to the dataset archives (via the DataONE DOI) and to make the download of data and metadata more intuitive.

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

In FY19, DM team members attended and presented at the GWA and HRM PI meeting October 2019 in Homer, AK. A data management program progress update was given, and presentation on improvements to the Research Workspace and corresponding changes in program procedures were provided. Future directions for the Research Workspace and the GOA Data Portal were also discussed. DM lead (Janzen) attended the EVOSTC annual meeting on October 11, 2019 and provided the EVOSTC Science Director a presentation on the 2017-19 Data Management program for GWA and HRM as well as provided a data submission inventory update through October 2019 to the EVOSTC. Quarterly data submission updates were provided to the GWA and HRM program leads to inform how PIs are meeting data submission requirements. These reports are not punitive. Data submission updates were provided to the program leads on February 27, 2019, April 1, 2019 and July 8, 2019, October 7, 2019 (prior to the annual EVOSTC meeting on October 11) and January 13, 2020. A revised report-out was provided to the GWA PI's at the in-person meeting on January 29, 2020. The Data Submission Inventory Table for the period is provided in **Section 9.d**.

Finally, providing and maintaining a system to serve the GWA and HRM data management needs is a core component of the DM program. To ensure the efficacy of such a system, regular and structured feedback is required from data management system users, i.e., the program leads and PIs. The DM team gathered feedback from PIs through group discussions and one-on-one meetings and will continue to do so throughout the course of this program. This feedback is tracked and synthesized to identify what data management methods are working well and what procedural modifications or new technologies could be implemented to improve the performance of the data management system. In addition to gathering feedback throughout the year, the DM team maintained regular contact with PIs over email to provide notification of approaching deadlines for data or metadata submission, asked questions related to these submissions, and/or responded to PIs' questions about data management procedures and responsibilities.

8. Coordination/Collaboration: See, Reporting Policy at III (D) (8).

a) Projects Within a Trustee Council-funded program

(1) Within the Program

As the DM program, we provide all levels of data management support for all the projects under the GWA and HRM programs funded by the EVOSTC.

The DM program uses the AOOS data management technical infrastructure, which is collaborative by design, using the Research Workspace to give open access across the GWA and HRM program teams for file sharing and transparency of data progress. Backing this infrastructure is a DM team that is well-coordinated with GWA and HRM program leads and science teams for timely data submissions and accurate metadata authoring. Successful coordination and collaboration ensures data and products are available to general science and resource management communities. Through this collaborative work structure, the DM team is positioned to respond to the needs of the GWA and HRM programs by providing the required technical support and implementing requested modifications to the Research Workspace, improving accessibility and utility to scientists.

The data managers maintain regular communications with project PIs, program management, and EVOSTC staff through participation at the annual PI meetings in November and January, programmatic conference calls (April and July), and through regular program-wide email correspondence. At the meetings, AOOS and the DM team communicate to all PIs about data submission progress and procedures through presentations and group discussions. Using emails, project PIs are notified of program data inventories and the submission timelines to help encourage compliance.

(2) Across Programs

(a) Gulf Watch Alaska

Overall coordination of the data management effort is provided by Dr. Janzen, the DM program lead (AOOS), who is responsible for ensuring coordination between this program and the GWA Program. AOOS time dedicated to the EVOSTC programs is focused on data management project oversight. Coordination across the program projects occurs through email, phone communications, and regularly scheduled in-person meetings. Axiom representatives from the DM team attended the annual PI meeting in October 2019, and Dr. Janzen (AOOS) and Stacey Buckelew (Axiom) join the regularly scheduled Program Management team phone calls to help ensure a seamless response to data management and decision-support needs.

Regular communications are maintained between the Axiom data managers and the GWA program lead as well as the individual project PIs within the GWA program. These communications are a continuation of effective working relationships developed with the science teams in the first five-year effort. Regular communications with individual project PIs are through annual one-on-one meetings, and regular email and/or phone conversations. One-on-one meetings were made available to each project and program PI in October 2019 to track project and data submittal progress and provide hands-on support for data organization, formatting, and metadata authoring. The data managers also use email to inform individual PIs of their data submission progress using the data inventory table. The DM team can then 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) Herring Research and Monitoring

Overall coordination of the data management effort is provided by Dr. Janzen, the DM program lead (AOOS), who is responsible for ensuring coordination between this program and the HRM Program. AOOS time dedicated to the EVOSTC programs is focused on data management project oversight. Coordination across the program projects occurs through email, phone communications, and regularly scheduled in-person meetings. Axiom representatives from the DM team attended the annual PI meetings in October 2019, and Dr. Janzen (AOOS) and Stacey Buckelew (Axiom) join the regularly scheduled Program Management team phone calls to help ensure a seamless response to data management and decision-support needs.

Regular communications are maintained between the Axiom data managers and the HRM program lead as well as the individual project PIs within the HRM program. These communications are a continuation of effective working relationships developed with the science teams in the first five-year effort. Regular communications with individual project PIs are through annual one-on-one meetings, and regular email and/or phone conversations. One-on-one meetings were made available for each project and program PI in October 2019 to track project and data submittal progress and provide hands-on support for data organization, formatting, and metadata authoring.

The data managers also use email to inform individual PIs of their data submission progress using the data inventory table. The DM team can then 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).

(c) Data Management

This report covers the FY19 Data Management program for EVOSTC funded GWA, HRM, as well as partial support for Pigeon Guillemot (PIGU) and Lingering Oil projects.

(d) Lingering Oil

The DM team is interacting with other EVOSTC-funded projects, including the PIGU Restoration and Lingering Oil projects, by providing them access to the Research Workspace to store data and final project reports. Though the DM team is not officially offering or funded to provide full data management services to these projects in the same way we are with GWA and HRM, the team works with the EVOSTC Science Director and maintains a Research Workspace group for information exchange between these EVOSTC funded projects and EVOS Trustees. This allows the Trustees to access final reports and other project documents loaded by the PIGU and Lingering Oil project PIs, and has streamlined access to up-to-date reports while alleviating sending large documents by email. Beginning in FY20, the Lingering Oil project will continue to be supported through the Research Workspace for data sharing among GWA PIs and metadata documentation.

b) Projects not Within a Trustee Council-funded program (but funded by the Trustee Council)

The FY19 DM program provided data management support for the Trustee Council-funded GWA and HRM programs, which is fully described in this report, and also supported the Trustee Council-funded PIGU Restoration and Lingering Oil program described in section 8.a.2.(d).

c) With Trustee or Management Agencies

AOOS brings a significant level of leveraged resources, infrastructure, regional data management projects and partnerships to this EVOSTC-funded DM program. For one, AOOS is a certified Regional Association (RA) under the authority of the Integrated Coastal and Ocean Observation System Act of 2009 (ICOOS Act). The ICOOS Act directs NOAA to certify and integrate RAs into the U.S. Integrated Ocean Observing System (IOOS). Such integration formally establishes the role of the RA within the U.S. IOOS and ensures that the data collected and distributed by the RA are managed according to the best practices, as identified by NOAA. To become certified, applicants must demonstrate they meet the requirements established by the U.S. IOOS's Regulations to Certify and Integrate Regional Information Coordination Entities.

As the AOOS data team, Axiom works to provide data management, visualization and preservation services, including providing access to and facilitating the use of the Research Workspace. The team offers similar services to a number of other programs that receive funding from or are administered or overseen by representatives from the Trustee Council and associated agencies. EVOSTC agencies include: 1) *National Oceanographic and Atmospheric Administration (NOAA)*; 2) *US Department of Agriculture/US Forest Service*; and 3) *the US Department of the Interior (Bureau of Ocean Energy Management, US Fish and Wildlife Service, National Park Service and the US Geological Survey)*. Three state agencies are also represented by the EVOSTC including: 1) *Alaska Department of Fish and Game (ADF&G)*; 2) *Alaska Department of Environmental Conservation*; and 3) *Alaska Department of Law*.

The EVOSTC-funded DM program benefits Trustee or management agencies on many levels. For one, all data and final data products produced by the GWA and HRM programs are (or will be) made accessible and publicly available through the AOOS hosted GOA Data Portal and the DataONE Member Node, both of which are no-cost services that can be accessed by any member of the public. Other programmatic and statewide datasets are also accessible via the AOOS data system, and can be accessed by the same end user accessing the GWA and HRM datasets. DataONE provides access to data across multiple member repositories, supporting enhanced search and discovery of earth and environmental data. The DM program also supports the Lingering Oil and PIGU

Restoration projects as described in Section 8.a.2.(d). Other associated programs affiliated with EVOSTC and affiliated management agencies are given below (Table 2).

Table 2. Associated EVOS Trustee Council programs and agencies for which AOOS and Axiom coordinate data management as well as other services.

Group Agency	Level and Type of Coordination and How the Project Assisted EVOSTC Trust or Agency Work	Representative
<p>Regional Coastal Ocean Observing System: Alaska Ocean Observing System (AOOS).</p> <p>Integrated Ocean Observing System (IOOS), National Ocean and Atmospheric Administration (NOAA)</p>	<p>Develop the integration of ocean and coastal observing capabilities, in collaboration with Federal and non-Federal partners, to maximize access to data and generation of information products, inform decision making, and promote economic, environmental, and social benefits</p> <p>Through the IOOS grant, AOOS provides partial support on a few GWA supported projects (e.g, Seward Line environmental drivers shiptime support). AOOS has invested a significant portion of their IOOS support to host the regions most sophisticated data acquisition system, which hosts the GWA Website and the Gulf of Alaska Data Portal as subsystem. This data system is highly leveraged by other large research and ecosystem based programs (listed here). AOOS supports all the related EVOSTC and management agency projects by providing the backbone and base support to keep this data system operational, and also by providing data management services to all these groups and their projects.</p>	<p>Carl Gouldman, Director, IOOS</p> <p>Dave Easter, Division Chief, IOOS</p>
<p>Integrated Ocean Observing System (IOOS), National Ocean and Atmospheric Administration (NOAA)</p>	<p>Develop community standards for sensor observations; make regional data nationally accessible.</p> <p>This supports all the data management activities for GWA and HRM as well as other projects listed here, and provides data in the correct formats to meet national and international data archival requirements and standards.</p>	<p>Derrick Snowden, Data Management and Coordination (DMAC) System Architect, IOOS</p>
<p>Alaska Ocean Observing System (AOOS) Data Management, (AOOS grants support funded through NOAA's IOOS Program)</p>	<p>Provide data management; cyberinfrastructure support. Works directly with member and non-member organizations to ingest and document new datasets as well as historical data assets that might not be available elsewhere or in a consistent useful format; data visualizations and product development</p> <p>Support data collection, data sharing and acquisition for the entire region of Alaska, including the Gulf of</p>	<p>Molly McCammon, Executive Director, AOOS</p>

	Alaska. These data are provided to the public and all interested users free of charge via the AOOS data system. The AOOS Data System leverages their own data portal system to support other programs listed in this table.	
Central and Northern California Ocean Observing System (CeNCOOS) Data Management, NOAA	Provide data management; cyberinfrastructure. Works directly with member and non-member organizations to ingest and document new datasets; visualizations Tools developed for CenCOOS can be leveraged for other projects listed on this table, as well as ingestion capability of new data types. Activities undertaken for CenCOOS can be leveraged across the national IOOS data system and other regions using the AOOS data system platform.	Henry Ruhl, Executive Director, CenCOOS
Southeast Coastal Ocean Observing Regional Association (SeCOORA) Data Management, NOAA	Provide data management; cyberinfrastructure. Works directly with member and non-member organizations to ingest and document new datasets; visualizations Tools developed for SeCOORA can be leveraged for other projects listed on this table. as well as ingestion capability of new data types. Activities undertaken for SeCOORA can be leveraged across the national IOOS data system and other regions using the AOOS data system platform.	Debra Hernandez, Executive Director, SeCOORA
Beluga Sightings Database Visualization, NOAA-National Marine Fisheries Service (NMFS)	Produces visualizations, guidance on building community standards for submitting marine mammal stranding observations. AOOS hosts The Cook Inlet Beluga Whale Ecosystem Portal.	Mandy Migura, Marine Mammal Specialist, NOAA (2018) (Current position, Broad Conservation LLC)
Russian-American Long-term Census of the Arctic (RUSALCA), NOAA	Provides access to Workspace; guidance on data and metadata management; archiving; visualizations in support of mission. RUSALCA was an international consortium effort to coordinate biological, geological, chemical and physical oceanographic sampling strategies to be pursued in the Bering Strait and the Chukchi Sea. The cruise objectives for the United States partner were to support the U.S. interagency Study of Environmental Arctic Change (SEARCH) Program, the NOAA Ocean Exploration Program and the Arctic Ocean Census of Marine Life (ArcOcCoML).	Kathy Crane, Program Manager Arctic Research Program, U.S. Mission Coordinator for RUSALCA, NOAA (2015) (Current position, ArcticLynx LLC, and Univ. of Hawaii SOEST)
Building coupled storm surge and wave operational	Provide data management and outreach support for transitional project that is developing a multi-scale,	Joannes Westerink, Civil and Environmental

forecasting capacity for Western Alaska, NOAA-IOOS Program - OTT (Ocean Technology Transition)	multi-process integrally coupled wave-surge forecast modeling system, refined and validated with a focus on transition to operations while resolving key issues that presently limit forecast reliability in western Alaska. The system will be designed to fit into the NOAA ESTOFS Pacific Storm Surge Guidance System framework. The specific goal is to enable significant advancement of NOAA's high-fidelity operational surge and wave models, ADCIRC and WAVEWATCH III, within the northern Pacific Ocean, Bering, Chukchi and Arctic Seas.	Engineering and Earth Sciences, University of Notre Dame, IN
Core Program, North Pacific Research Board (NPRB)	Provide guidance given on data and metadata best practices; access to and facilitation of the Workspace; organization and archiving of historical projects; Now the data management team for NPRB. NPRB funds are administered through the EVOSTC. Data management from the NPRB programs is being managed by Axiom Data Science, and is leveraging the Research Workspace and the data system developed by AOOS to make data public and available for sharing, and standardized for long-term, national archival.	Matthew Baker, Science Director, NPRB Jo-Ann Mellish, Program Manager, NPRB
Arctic Integrated Ecological Research Program (AIERP), NPRB	Fully facilitate data and metadata management working directly with PIs, from initial sharing within the group to long-term archiving at NPRB	Danielle Dickson, Program Manager, NPRB
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, Professor, College of Fisheries and Ocean Sciences, University of Alaska, Fairbanks
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, Associate Professor, College of Fisheries and Ocean Sciences, University of Alaska, Fairbanks
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, Stantec

<p>Central Beaufort Sea Wave and Hydrodynamic Modeling Study (BOEM)</p>	<p>Provide data management and outreach support for a joint data synthesis and modeling effort between the University of Alaska, Fairbanks (UAF), the University of Alaska Anchorage (UAA), and the U.S. Geological Survey (USGS) Coastal & Marine Geology Program-Pacific Coastal & Marine Science Center (PCMSC). The Alaska Ocean Observing System (AOOS) and the AOOS data management contractor Axiom Data Science are providing data management services and outreach for this project. Through field observations, historical and new, the goal is to adequately document wave and sediment transport conditions within Stefansson Sound/Foggy Island observationally and provide input data assimilation and validation support for project modeling activities.</p>	<p>Jeremy Kasper, Lead Principal Investigator, University of Alaska, Institute of Northern Engineering</p>
<p>Alaska Data Integration working group (ADIwg), U.S. Geological Survey (USGS)</p>	<p>Generate community standards for project data; advise on translation from ADIwg metadata content profile into suite of ISO geospatial metadata of standards</p> <p>The mission of the Arctic LCC is to identify and provide information needed to conserve natural and cultural resources in the face of landscape scale stressors, focusing on climate change, through a multidisciplinary program that supports coordinated actions among management agencies, conservation organizations, communities, and other stakeholders. The conservation goals of the Arctic LCC are: to provide information on, and predict the effects of climate- driven changes and other landscape stressors; determine how climate driven changes affect subsistence users; and provide improved data and information access to managers and policy makers.</p>	<p>Josh Bradley, Data Manager, Arctic Landscape Conservation Cooperative (LLC), US Fish and Wildlife Service</p>

9. Information and Data Transfer: See, Reporting Policy at III (D) (9).

a) Publications Produced During the Reporting Period

Not applicable

b) Dates and Locations of any Conference or Workshop Presentations where EVOSTC-funded Work was Presented

Specific presentations given by DM program team members during FY19 are listed below.

Data Management Presentations and Workshops

- Buckelew, S., Turner, C., and Janzen, C. 2019. Data management update for the Gulf Watch Alaska Program. Oral presentation. 2019 Gulf Watch Alaska Program PI Meeting, Anchorage, AK. October 8-10, 2019.
- Buckelew, S., Turner, C., and Janzen, C. 2019. Data management update for the Gulf Watch Alaska Program. Oral presentation. 2019 Herring Program PI Meeting, Anchorage, AK. October 8-10, 2019
- Janzen, C., Buckelew, S. 2019. EVOSTC 2018-19 Data Management Program for GWA and HRM. Oral presentation. EVOSTC Meeting, Anchorage, AK. October 11, 2019.
- Buckelew, S., Turner, C., and Janzen, C. 2020. Data management update for the Gulf Watch Alaska Program. Oral presentation. 2020. Gulf Watch Alaska Program PI Meeting at the Alaska Marine Science Symposium, Anchorage, AK. January 29, 2020.
- Lopez, J., Singh, A. 2020. OrcaCNN: Detecting Killer Whales in Northern Gulf of Alaska from Passive Acoustic Data. American Geophysical Union (AGU), the Association for the Sciences of Limnology and Oceanography (ASLO), and The Oceanography Society (TOS) sponsored Ocean Sciences Meeting 2020, San Diego, CA. February 16-20, 2020 (<https://agu.confex.com/agu/osm20/meetingapp.cgi/Paper/646602>)

c) Data and/or Information Products Developed During the Reporting Period, if Applicable

In FY 2019, Axiom staff worked with the Pelagic Component: Killer Whales team members on a *Google Summer of Code Project* to develop a model using machine-learning techniques to detect killer whales in the Northern GOA using passive acoustic data generated through the EVOSTC GWA program. Passive acoustic data has the potential to greatly increase our knowledge of the presence, habitat, and routines of elusive killer whales by providing time-series of vocalizations from individuals and pods on hourly to seasonal time-scales. However, extracting useful data and information about killer whales from these time series is difficult due to the sheer size of the data. Specifically, it is difficult to quickly and accurately identify killer whale vocalizations in acoustic data sets because manually detecting calls by a trained human listener is intractable and legacy software detection methods are inaccurate and still require substantial human time for verification. In this project, an automated detection and classification pipeline capable of quickly detecting the presence of killer whales in acoustic data was developed, which subsequently identified the source pod of the detected vocalization trained on data gathered in the Northeast Pacific off the coast of Southeast Alaska, USA (via the GWA program). The pipeline consisted of two convolutional neural networks developed with Keras using TensorFlow as the backend and trained on GoogleCloud. The first model detected the presence of killer whale calls in the audio samples with 95% accuracy. The second model identifies the pod source of the vocalization with 60% accuracy. This project also presented the architecture of the models, provided comparisons to legacy results, and demonstrated the deployment of the model pipeline as a web-based application. More information and project code can be accessed: <https://github.com/axiom-data-science/OrcaCNN/wiki/ESIP-Reporting-for-GSoC-2019>

d) Data Sets and Associated Metadata that have been Uploaded to the Program's Data Portal

The status (as of March 15, 2020) of the 2017 and 2018 data and provisional 2019 data submissions from GWA and HRM programs currently available through the Research Workspace and the GOA Data Portal is shown in Table 3. Annual summary statistics for data submissions for 2017-2019 (as of March 15, 2020) are provided in Table 4.

Table 3. Data Submission Inventory of the 2017-2018 data and the provisional 2019 data from GWA and HRMs programs available through the Research Workspace and the Gulf of Alaska Data Portal as of March 15, 2020. The numeric codes "2" : Obligation to publish data has been met; "1" : Obligation to share data to Workspace has been met; "0.5" : Obligation to share data has been partially met; "0" : No data from this season was shared for the project; "n/a" : The project was not funded during this season; "P": process study with data not expected until end of project.

Program	Project	Dataset	2017	2018	2019	Comments
GWA	Environmental drivers: Continuous Plankton Recorders	Plankton data	2	2	0	
		Temperature data	2	2	0	
GWA	Environmental drivers: Gulf of Alaska Mooring (GAK1)	CTD data	2	1	0	2018 data are in the Workspace, but in the LTER campaign, which is in flux. This will be shared with the GWA campaign once the structure is settled.
		Mooring data	2	2	2	
GWA	Environmental Drivers: Oceanographic Conditions in Prince William Sound	Chlorophyll data	2	2	0	
		CTD data	2	2	2	
		Zooplankton data	2	2	0	
GWA	Environmental Drivers: Oceanographic monitoring in Cook Inlet and Kachemak Bay	CTD data	2	2	1	
		KBNER meteorological data	2	2	0	
		KBNER nutrient data	2	2	0	
		KBNER water quality data	2	2	0	
		Zooplankton data	2	2	0	
GWA	Environmental Drivers: Seward Line	Chlorophyll data	2	1	1	2018 data are in the Workspace, but in the LTER campaign, which is in flux. This will be shared with the GWA campaign once the structure is settled.
		CTD data	2	1	1	2018 data are in the Workspace, but in the LTER campaign, which is in flux. This will be shared with the GWA campaign once the structure is settled.
		Nutrient data	2	1	1	2018 data are in the Workspace, but in the LTER campaign, which is in flux. This will be shared with the GWA campaign once the structure is settled.

		<i>Seabird data (Kuletz)</i>	2	1	0	<i>2018 data are in the Workspace, but in the LTER campaign, which is in flux. This will be shared with the GWA campaign once the structure is settled.</i>
		<i>Zooplankton data</i>	2	1	0	<i>2018 zooplankton data still being processed</i>
GWA	<i>Nearshore: Ecological trends in Kachemak Bay</i>	<i>Rocky intertidal community data</i>	2	2	2	
		<i>Mussel data</i>	2	2	2	
		<i>Rocky intertidal data</i>	2	2	2	
		<i>Substrate data</i>	2	2	2	
		<i>Seagrass data</i>	2	2	2	
GWA	<i>Nearshore: Intertidal Systems in Gulf of Alaska</i>	<i>Oystercatcher diet & nest density data</i>	2	2	0	
		<i>Eelgrass data</i>	2	n/a	n/a	<i>This dataset was not collected after 2017.</i>
		<i>Invertebrate and algae data</i>	2	2	2	
		<i>Marine birds and mammals data</i>	2	2	1	
		<i>Water quality data</i>	2	2	2	
		<i>Sea otter survey data</i>	2	2	1	
		<i>Sea otter scat data</i>	2	2	1	
GWA	<i>Pelagic: Fall and Winter seabird abundance</i>	<i>Seabird survey data</i>	2	2	1	
GWA	<i>Pelagic: Forage fish distribution, abundance, and body condition</i>	<i>Forage fish count data</i>	2	2	0	
		<i>Forage fish morph data</i>	2	2	0	
		<i>Seabird diet data</i>	2	2	0	<i>Actively working with Yumi to update flat file structure from SQL db.</i>
		<i>Hydroacoustic data</i>	2	2	0	
		<i>Water chemistry (CTD & nutrients) data</i>	2	2	0	

		Zooplankton data	2	2	0	
GWA	Pelagic: Humpback whale predation on herring	Fluke id catalog	2	2	0	
		Energetic/stable isotope data	2	2	0	
		Whale survey data	2	2	2	
		Porpoise survey data	2	2	2	
		CTD data	2	2	2	
GWA	Pelagic: Long-term killer whale monitoring	Acoustic catalog	2	2	1	
		Photo catalog	2	2	0	
		Biopsy data- genetic	n/a	n/a	n/a	A single biopsy was performed in 2017. Craig sent that sample away to NWFSC for analysis, but hasn't received the results. Craig will contact lab and ask about the results. No biopsy data were collected in 2018-19.
		Biopsy data- contaminants	n/a	n/a	n/a	This is based on biopsy data
		Prey genetic sampling	1	1	0	Data in the Workspace but are not ready for publication.
GWA	Pelagic: Prince William Sound Marine Birds	Summer bird survey data	n/a	2	0	no surveys conducted in 2017
HRM	ADFG Surveys: surveys and age, sex, and size collection	aerial biomass observation & routes data	2	2	2	
		aerial survey marine bird & mammal observations data	2	2	2	
		ASL data	2	2	2	
HRM	Adult acoustic biomass surveys	processed acoustic data	2	1	1	Due to large volume of acoustic files, they are stored in RW and made available to researchers upon request (they are too large for download via web browser)
		biomass summary	2	2	0	
HRM	Aerial surveys of juvenile herring	raw survey data	2	2	2	
		age 1 index	2	2	2	
HRM	Herring disease program	prevalence summary	1	1	0	

		raw lab data	1	1	0	P
HRM	Modeling and stock assessment of herring population dynamics in Prince William Sound	age composition	2	2	0	
		model codebase	2	2	0	
		output data	2	2	0	
HRM	Studies of reproductive maturity	lab analysis (weight, length, gonad) database	1	1	0	P
		collection database	1	1	0	P
		scales database	1	1	0	P
		histology database	1	1	0	P
HRM	Annual herring migration cycle	collected fish data	1	1	0	P
HRM	Lingering Oil: Immunological compromise of fish	genetic & lab-based experiments	0	0	0	P

Table 4. Summary statistics of data submissions by March 15, 2020 (17 projects composing 55 datasets). PIs have until December 1, 2019 to submit 2018 data to the Research Workspace, and December 1, 2020 to submit 2019 data. Some datasets are routinely delayed due to longer sample processing times, data processing times, and late-in-the-year or delayed sampling schedules. Datasets that were not collected in a given year are not included in the metrics below. ‘Process’ datasets (those with a ‘P’ in the ‘Comments’ column), do not have an obligation to publish annually to the Gulf of Alaska Data Portal and are also excluded from the percentages.

Data Submission Metrics	2017	2018	2019
Obligation to shared datasets in the RW, % complete	100%	100%	48%
Obligation to published through the GOA portal, % complete	96%	84%	27%

10. Response to EVOSTC Review, Recommendations and Comments: See, Reporting Policy at III (D) (10).

Response to Science Panel Comments in 2018 on the FY19 Data Management Program Workplan

The Science Panel applauds the Data Management (DM) team for the progress they have made with the program. The process for uploading and sharing data, making data publicly available appears to be seamless. The Data Management team provides detailed instructions and good support to PIs and programs, EVOSTC staff and reviewing committees. We recognize that the PI compliance is high, which is a reflection of how well the program is functioning and supporting the long-term monitoring programs. We note that Table A could be effectively summarized to highlight the high compliance rates and data availability.

We now include a table summarizing the statistics of data submissions in all reports and workplans, to highlight the high compliance rates and data availability (See Table 4, Section 9 in this report).

These are the questions and responses from the DM Team as requested by the Science Panel from our September 12, 2018 Question and Answer call:

1. Send Shiway the metadata template that is used by us for the data management program.

We responded by sending Shiway an attachment showing the metadata templates that can be viewed with an xml editor. It is not included here in this report for brevity. Instead, for this report, the metadata editor can be found in the Research Workspace here for [GWA](#) and [HRM](#) Programs. (click on the links for GWA and HRM). We include some of the standard verbiage for use constraints and metadata maintenance contact that has been applied to all records. If you have any questions, please contact us.

2. The panel was not 100% clear what the differences were between Obligation codes 0.5 and 1...and then 2.

Thank you for this question. We will clarify such coding in future reports and updates.

The codes refer to:

2 = The PI has final data and metadata that are stored in the RW and published to the GOA portal.

1 = The PI has intermediary data and metadata that are stored in the RW. The data are not yet published to the GOA portal. We differentiate between 1 and 2 for clarification based on feedback from Project Leads on our draft report. They thought showing data that are available internally is important to differentiate between data that are available publicly.

0.5 = The PI has stored some of the data in the RW, but the entire expected dataset is not complete. Example, for the killer whale prey sampling dataset the field data (e.g. time/location of prey sample) are available in the RW but the final processed lab results (e.g. stable isotope ratios) are not yet available. This basically shows that the dataset is underdevelopment and the PI is not negligent of the data sharing clause, rather is waiting for lagged components of the expected dataset to be completed before uploading to the RW.

0 = Data are expected from the PI for a monitoring project, but they have not yet been submitted.

The other codes used in the table are:

n/a = The project was not funded during this FY.

P = The process study data are not expected until the end of the 5-year project period.

3. Table A is helpful, but the Science Panel would like us also to synthesize in some way, the percentage of data that are in compliance for the project year, so something like either an additional column on that table, or a new table saying that XX% of the PIs are meeting compliance.

Thank you for this feedback. We have provided some crude metrics in the past for a less detailed version of the dataset inventory. Please see attached (Table 5 shown below) for an example of how we might provide this information going forward. This table provides summary statistics on data submission compliance on the bottom row. After feedback to this response, we now provide an updated data submission inventory and a separate summary statistics table for data compliance percentages in each report and annual workplan. We also provide this table in our EVOSTC presentations and send the data submission inventory table quarterly to the GWA and HRM Program Leads. The updated inventory and data compliance statistics table for this reporting period (FY19) can be found in Section 9, Table 3 and 4.

Table 5. Sample data submission inventory and compliance table provided to the Science Panel as an example for reporting progress of data submissions throughout the previous 5-year program.

Project	2012	2013	2014	2015	2016**	Comments
Environmental Drivers: Continuous Plankton Recorders	1	1	1	0.5	0	2015 zooplankton processing in progress
Environmental Drivers: Gulf of Alaska Mooring (GAK1)	1	1	1	1	0	
Environmental Drivers: Oceanographic Conditions in Prince William Sound	1	1	1	1	0	
Environmental Drivers: Oceanographic monitoring in Cook Inlet and Kachemak Bay	1	1	1	0.5	0	2015 zooplankton processing in progress
Environmental Drivers: Seward Line	1	1	1	0.5	0	2015 zooplankton processing in progress
Lingering Oil: Harlequin Ducks and Sea Otters	-	1	1	-	0	
Lingering Oil: Tracking of Oil Levels and Weathering	1	1	1	1	0.5	remainder of 2016 data available as draft in the Workspace
Nearshore: Ecological Trends in Kachemak Bay	1	1	1	1	0.5	
Nearshore: Intertidal Systems in Gulf of Alaska	1	1	1	1	0	
Pelagic: Fall and Winter seabird abundance	1	1	1	1	0.5	remainder of 2016 data available as draft in the Workspace
Pelagic: Forage Fish Distribution, Abundance, and Body Condition	1	1	1	1	0	
Pelagic: Humpback Whale Predation on Herring	1	1	1	1	0	
Pelagic: Long-term Killer Whale Monitoring	1	1	1	1	0	
Pelagic: Prince William Sound Marine Birds	1	-	1	-	0	
% of projects with their data published through GWA portal	100.0%	100.0%	100.0%	87.5%		

Response to the Science Coordinator Comments in 2018 on the FY19 Data Management Program Workplan

I [Science Coordinator] use the Workspace to provide documents to the Science Panel and other reviewing committees. I greatly appreciate how much easier it is to share information. Program is on track except for one task due to technical difficulties and scheduled for the next quarter.

There is one question from the Science Panel in 2017 (from the FY18 Work Plan) that needs a follow up: Are the ADFG herring data sets available on the DataOne portal? If not, they should be made accessible.

PI Response (10/13/2017): The ADFG Prince William Sound datasets have been submitted to the Research Workspace for sharing among collaborators. Some of these datasets have been made available to the public through both the GOA data portal and DataONE. An inventory of these datasets and their publication status are shown in the below table (not included here for brevity).

The data management team is awaiting a final decision from ADFG Commercial Fisheries division about whether to make the remainder of the data available publicly. We will update the EVOSTC and the EVOS Science Panel with this information as soon as we have a response.

(2018 Science Coordinator question on FY19 Workplan): Has this been done?

PI Response (9/6/18) The ADFG Prince William Sound datasets through 2017 (with the exception of the acoustic and scale measurement data) have been submitted to the Research Workspace for sharing among collaborators.

- *Some of these datasets have been made available to the public through both the GOA (Gulf of 115 Alaska) data portal and DataONE.*
- *In March 2018, the data management team received the final decision from ADFG Commercial Fisheries division to allow the remainder of the data to be made available publicly with appropriate permissions.*

A copy of this communication is attached below this response, as an email from Sherri Dressel. Since that time, the following actions have been taken by the Data Management team to prepare these data for archive.

- 1. The visualization of the Herring ASL data (including biomass, survey, ASL, spawn, marine mammal, and marine bird datasets) has been updated through 2017 in the GOA data portal.*
- 2. For all datasets, the ADFG Use Constraints disclaimer described in the Dressel email below has been added to the portal overview page for each dataset and to the corresponding metadata.*
- 3. The FGDC version of the historical metadata records (created by Steve Moffitt) has been migrated into the contemporary ISO metadata standard within the Research Workspace. This is a necessary precursor towards data archive and helps to ensure that metadata can be more readily updated by the PI in the coming years.*

4. As the ADFG database structure evolved over many decades, there were inconsistencies in the presentation of some of the aerial survey data. In consultation with ADFG, updates were made to correct errors within the data files. It should be noted that many of these data are long-term historical datasets that, while a considerable resource to the Herring Research and Monitoring Program, extend beyond the life of the 2012-2016 Data Management Program. It is our intention to help ensure the long-term preservation of these data by submitting them to DataONE within this funding cycle, assuming confirmation from ADFG about the readiness of those data.

Final decision email from ADFG Commercial Fisheries Division:

To: Stacey Buckelew, Axiom Data Science

Subject: FW: ADF&G PWS data to be made public

I'm writing to follow up on the question of whether ADFG data can be made available publicly. Thank you with your patience with the long delay in my reply. Yes, it is acceptable with ADFG to make datasets public on the AOOS Gulf of Alaska portal and archived with DataONE, once you have received confirmation from ADFG that the data and metadata are as final as can be and given the following:

ADFG requests the following statements be required to be read prior to downloading ADFG data:

“ADF&G retains intellectual property rights to data collected by or for ADF&G. Any dissemination of the data must acknowledge ADF&G as the source, with a disclaimer that exonerates the department for errors or deficiencies in reproduction, subsequent analysis, or interpretation.”

“Any user of this data should contact ADFG to discuss potential caveats and sampling design details pertinent to their research questions prior to using.”

I've attached two documents on Department of Fish and Game and Division of Commercial Fisheries policy that are the source for the disclaimer in the first bullet. Stormy has agreed to be the ADFG contact to confirm whether individual datasets are ready (from an ADFG perspective) to be made public on the AOOS Gulf of Alaska portal and archived with DataONE and to work with you on publication agreements.

We will provide the results for surveys funded by EVOSTC as soon as we feasibly can. Other historic and related data will be submitted based on usefulness, necessity, and as resources allow.

Please feel free to contact me with any questions.

Thanks,

Sherri

Sherri Dressel
Statewide Herring Fisheries Scientist
Alaska Department of Fish and Game
Division of Commercial Fisheries
P.O. Box 115526
1255 W 8th Street
Juneau, Alaska 99811-5526

11. Budget: See, Reporting Policy at III (D) (11).

The Data Management program does not require any funding adjustments to the authorized level of funding for FY19. All budget items are either on target or are reporting as underspent as of January 31, 2020.

Cumulative totals for Years 1 through 3 represent only the posted expenditures as of the end of Year 3, January 31, 2020. However, not all year-end expenditures for a given year are posted by the program year-end date (January 31), due to program activities that occur during the last months of the program year, and subsequent invoicing to the project that occurs after the years' end.

- Personnel actual cumulative budget is on track. This line covers program lead Janzen's salary (and fringe and indirect) on the project.

- Travel expenses are on track.
- Contractual actual cumulative budget is also on track. As of January 31, 2020, this is reported underspent due to the fact the contracted program services Axiom provides that occur during the last quarter of the program year (including the last month of the program year - January) are subsequently invoiced after the program year ends on January 31.

**EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
PROGRAM BUDGET PROPOSAL AND REPORTING FORM**

Budget Category:	Proposed FY 17	Proposed FY 18	Proposed FY 19	Proposed FY 20	Proposed FY 21	TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	\$8.1	\$8.4	\$8.6	\$8.9	\$9.2	\$43.2	\$25.1
Travel	\$0.0	\$0.6	\$0.6	\$0.0	\$0.6	\$1.8	\$1.2
Contractual	\$191.9	\$191.0	\$190.8	\$191.1	\$190.2	\$955.0	\$513.9
Commodities	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Equipment	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Indirect Costs (<i>will vary by proposer</i>)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
SUBTOTAL	\$200.0	\$200.0	\$200.0	\$200.0	\$200.0	\$1,000.0	\$540.2
General Administration (9% of subtotal)	\$18.0	\$18.0	\$18.0	\$18.0	\$18.0	\$90.0	N/A
PROJECT TOTAL	\$218.0	\$218.0	\$218.0	\$218.0	\$218.0	\$1,090.0	\$594.2
Other Resources (Cost Share Funds)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0

COMMENTS: The Data Management Program does not require any funding adjustments to the authorized level of funding for FY19. All budget items are either on target or are reporting as underspent as of January 31, 2020. The Contractual line on this summary reporting form is underspent as these expenditures do not reflect/include the last quarter billing cycle, which occurs after the year end of January 31, 2020. Project Totals assume all the GA 9% fees for each year have been invoiced. Note: the FY20 and FY21 budgets DO NOT INCLUDE newly added projects. This budget is from the original proposal which remained unchanged through FY19.

This summary page provides an five-year overview of proposed project funding and actual cumulative spending. The column titled 'Actual Cumulative' must be updated each fiscal year as part of the annual reporting requirements. Provide information on the total amount actually spent for all completed years of the project. On the Project Annual Report Form, if any line item exceeds a 10% deviation from the originally-proposed amount;