***Exxon Valdez* Oil Spill Trustee Council**
Long-Term Research and Monitoring Program
Annual Program Status Summary

For Instructions for each section below, see Reporting Policy, II (C); the Reporting Policy can be found on the website, https://evostc.state.ak.us/policies-procedures/reporting-procedures/

Program Number: 22120113

Program Title: EVOSTC Data Management Program

Program Lead(s): Carol Janzen, Alaska Ocean Observing System
Rob Bochenek, Axiom Data Science

Reporting Period: Feb 1, 2022 – January 31, 2023

Submission Date (Due March 1 immediately following the reporting period): March 1, 2023

Program Website: AOOS Gulf of Alaska Data Portal https://gulf-of-alaska.portal.aoos.org/

Please check all the boxes that apply to the current reporting period.

☒ **Program progress is on schedule.**

The Data Management Program is proceeding as originally scheduled.

☐ **Program progress is delayed**

n/a

☐ **Budget reallocation request.**

n/a

☐ **Personnel changes.**

n/a

1. Summary of Work Performed:
The goal of the EVOSTC Data Management Program is to provide critical data management to support to the Gulf Watch of Alaska Long-term Research and Monitoring (GWA-LTRM) Program and the EVOSTC-funded Non-Program Projects (NPP) in order to assist study teams in efficiently meeting their objectives and ensuring data collected or consolidated through the effort are organized, documented, and available for their use and for future use by the larger scientific

community. We proposed in 2021 to be successful in meeting this goal with the budget provided by leveraging the extensive cyberinfrastructure and data management capacities of both the Alaska Ocean Observing System (AOOS) and Axiom Data Science (Axiom), and utilizing the existing, collaborative relationships with program PIs to ensure continuity in the data collected across efforts.

The workplan for Year 1 (2022) of the 5-year Data Management Program responds to the EVOSTC's continued need for cost-effective data management that also maintains continuity and builds upon the efforts of the prior contract years (FY2012-2016 and FY2017-2021). The FY22 Data Management workplan and budget includes data management support for both the GWA-LTRM and multiple funded Non-Program projects (NPPs) approved by the EVOSTC and added to the overall EVOSTC program in January 2022.

NPPs have their data management objectives embedded in the comprehensive Data Management Program starting in the FY22 workplan, and share the same goals and objectives as the GWA-LTRM Program projects. Three of the NPPs are continuing projects from the prior 5-year Data Management Program, and include project 22200127 Gulf Watch Ocean Acidification Monitoring (ending in 2023), project 21110853 Pigeon Guillemot Restoration Project (ending in 2024), and 21210128 Status and Trends of EVOS Injured Seabirds in the Kenai Peninsula Coast and Kachemak Bay (ending in 2025). Funding to complete data management support for these ongoing NPPs was approved by the EVOSTC in January of 2022 as part of the current five-year funding period (2022-2026)

Attachment 1 provides a list of GWA-LTRM Program and continuing and new NPPs that are supported by the 2022 Data Management Program. This list may be subject to change relative to future Council funding decisions.

Data management goal(s) will be achieved with the following objectives:

Objective 1. Initiate data management services and oversight for the GWA-LTRM Program and Non-Program projects.

Objective 2. Standardize and provide access to data sets from the prior EVOSTC-funded 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-LTRM Program and Non-Program projects.

Objective 5. Publish and promote data collected by the GWA-LTRM Program and Non-Program projects, making them available for research, management and general audiences.

Objective 6. Execute management, user feedback and internal and external communications related to the GWA-LTRM Program and Non-Program project data and data products.

Objective 7. Ensure long-term preservation and dissemination into publicly accessible repositories at the term completion.

The following activities were accomplished during the FY22 period.

OBJECTIVE 1. *Initiate data management services and oversight for the GWA-LTRM Program and Non-Program projects.*
In this initial year of the 2022-2026 program, data management kick-off meetings were hosted by Axiom with the GWA-LTRM Program and NPPs to orient project investigators (PIs) to the EVOSTC data sharing policy and discuss the program-level data management strategy.

On April 20, 2022, a data management webinar was held with new NPPs to orient them with the Data Management Program and data deliverables. The expectations for data sharing were discussed with the PIs at this time. Following this initial meeting, the Data Management Team updated data management procedures to more efficiently guide project PIs through data documentation and curation throughout the lifetime of their projects. These procedures are made available to all PIs through the Research Workspace, and will continue to be discussed in one-on-one meetings held with project PIs. The intent is to provide a data management framework with defined procedures for the collection, quality, storage, maintenance, and dissemination of project data that ultimately improves the accessibility and long-term usability of EVOSTC-funded data. Procedures may be followed by PIs at any time during the preparation of their data sets, but are most useful when considered at the onset of project planning and implemented during data collection.

On August 2, 2022, a kick-off meeting was held with GWA-LTRM program managers to verify the continuation of the existing program data management procedures, and to verify the list of funded research projects. Using information generated during the meeting, an inventory of data expected to be generated by GWA-LTRM sampling efforts was adapted from the 2017-2021 efforts. This inventory describes the data sets, indicates the investigator responsible for the data, and notes the status of metadata for each dataset (see Attachment 2). This inventory also provides a scaffold for which the data management team can track data and metadata progress throughout the life of the project.

The Data Management Team participated in the Mariculture Research and Restoration Consortium (Mar ReCon) virtual kick-off meeting on December 2, 2022 and the in-person meeting on January 13, 2023. Similar to other kick-off meetings, the EVOSTC data sharing procedures were reviewed, in addition to discussing expectations for the program data management strategy. During this meeting, a demonstration of the Research Workspace was

given and a discussion about the logical organization of data sets in the Research Workspace relative to the various program components occurred. Additionally, one-on-one meetings between the PIs and the Data Management Team are being scheduled to develop individual data management plans for each of the Mar ReCON components.

Objective 2. *Standardize and provide access to data sets from the prior EVOSTC-funded efforts for continuity and integration.*

To build upon data management services from the prior five-year effort, the folder structure in the Research Workspace for all continuing GWA-LTRM projects was updated to assist PIs in maintaining an organized approach for storing data and metadata for the 2017-2021 funding period (Fig. 1). New data from the 2022-2026 program are to be stored in the Research Workplace alongside the data collected from the 2017-2021 and the 2012-2016 period for easy access by the study teams. This organization is intended to facilitate the archive of timeseries data that is a continuum across five-year funding increments.

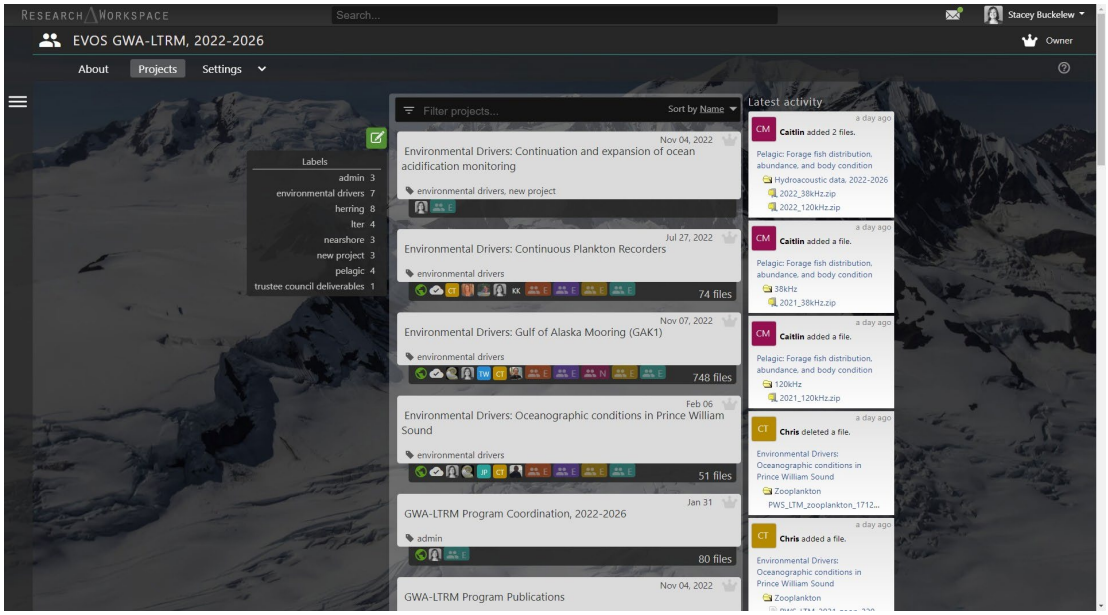

Figure 1. A screenshot of the Research Workspace, the web-based platform used to collaboratively manage GWA-LTRM and NPP data as separate campaigns shared among project PIs.

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

Using information generated during the data management planning meetings with PIs, a comprehensive inventory of data expected to be generated by all funded GWA-LTRM, Mar ReCON, and NPPs was created. This inventory describes the data sets, indicates the PI

responsible for the data, and notes the status of data and metadata submission to the Research Workspace for each dataset. The inventory serves as a tool to track the status of data and metadata submissions to the Research Workspace against data that are expected to be generated over the project term. A similar approach was used during the 2017-2021 Data Management Program, where the most current data submission inventory status was shared with the GWA and HRM Program leads throughout the year. Further, the data inventory status was included in EVOSTC Annual Program Status Summary to report on data sharing progress across all projects.

An updated data submission inventory (as of February 17, 2023) of expected and submitted data to the Research Workspace and Gulf of Alaska (GOA) Data Portal can be found in Attachment 2. With the exception of the three continuing NPPs from FY21, all projects are newly funded and FY22 data are not required to be published until January 31, 2024. However, in many cases with the ongoing GWA-LTRM projects, the data sharing expectation is being met or exceeded where 2022 data have already been submitted to the Research Workspace and/or made publicly-available. 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. Effective FY23, when the first data deliverables are due and/or continuing NPPs are completed, this data inventory will be updated with a submission status for each data set to report on progress.

OBJECTIVE 4. *Provide, maintain and modify technical infrastructure for user groups to access information produced or processed by the GWA-LTRM Program and Non-Program projects.*

In fall 2022, campaigns in the Research Workspace were established for each of the EVOSTC programs and projects, including; GWA-LTRM Program, Mar ReCON, and the NPPs. The campaigns are organized by funded projects within the program and shared with the respective PIs. The Research Workspace serves as a web-based platform for PIs to upload, share and discover data sets and supporting documents, and to rapidly author metadata. The Research Workspace includes an integrated metadata editor to capture detailed documentation on data sets and produce ISO 19110 and 19115-2 metadata outputs while implementing important labor-saving steps for PIs to reduce the tedium of metadata creation.

The Research Workspace is connected to the DataONE Network for long-term preservation of data in the most contextually relevant environment (Fig. 2). The intent of this capability is to ease the ingestion of data collections to national archives by simplifying the submission and upload of content and metadata. During this reporting period, maintenance to the Research Workspace submission pathway to DataONE was done to enable the archive of over 50 data sets at the completion of the 2017-2021 funding cycle. This maintenance included minor updates to the archive code that creates the ‘digital handshake’ between the Research Workspace and the DataONE Member Node. This maintenance did require close coordination with developers at DataONE to ensure an end-to-end solution was maintained and to ensure the long-term preservation of EVOSTC-funded project data.

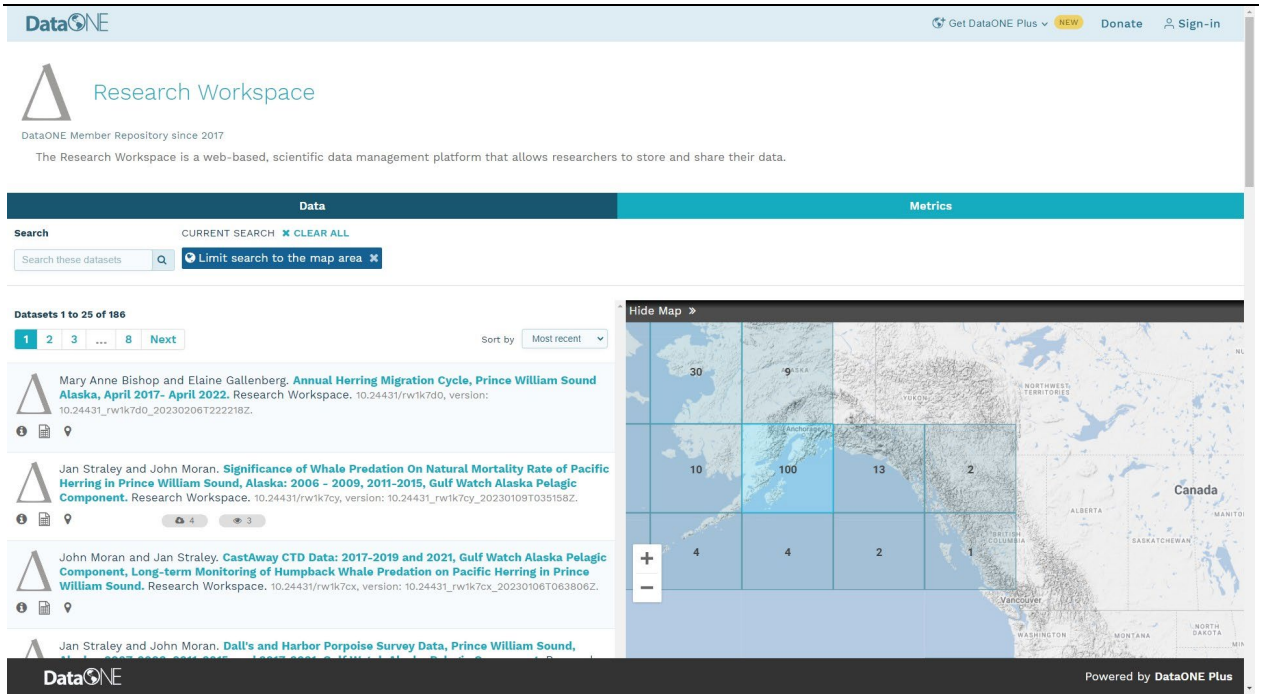

Figure 2. A screenshot of the Research Workspace Member Node in the DataONE Search catalog where EVOSTC-funded project data are archived for long-term preservation and made accessible by broader scientific audiences for re-use.

OBJECTIVE 5. *Publish and promote data collected by the GWA-LTRM Program and Non-Program projects, making them available for research, management and general audiences.*

To maximize data use for analysis, synthesis, review, and application, and to support the restoration and management of Spill injured resources, data from EVOSTC-funded projects will be made widely available through multiple pathways. During the research phase of this funding cycle, data will be securely available for internal use through the Research Workspace. When data are ready to be published, they will be made available through the existing, public-facing AOOS hosted GOA Data Portal (https://gulf-of-alaska.portal.aoos.org/) for exploration and discovery (Fig. 3). At the end of the fifth and 10th years (2026 and 2031), final data will be archived through DataONE for long-term preservation, noting that research or process studies data will likely be submitted at the 10-year project term submission.

During this reporting period, all project data and metadata from the prior GWA and HRM programs (i.e., 2017-2021) were finalized in the Research Workspace, made publicly available through the GOA Data Portal, and archived with DataONE for long-term preservation. Refer to the 2017-2021 final report for more information.

For the three continuing NPPs started in the 2017-2021 Data Management Program, final data are not expected until the end of the project term in December 2023 and 2024 (depending on the project). Final data will be published to the GOA Data Portal and archived with DataONE at the close of each NPP project.

All other NPPs were just being established in Year 1 of the 2022-2026 Data Management Program, and the first data publication will not occur until January 31, 2024.

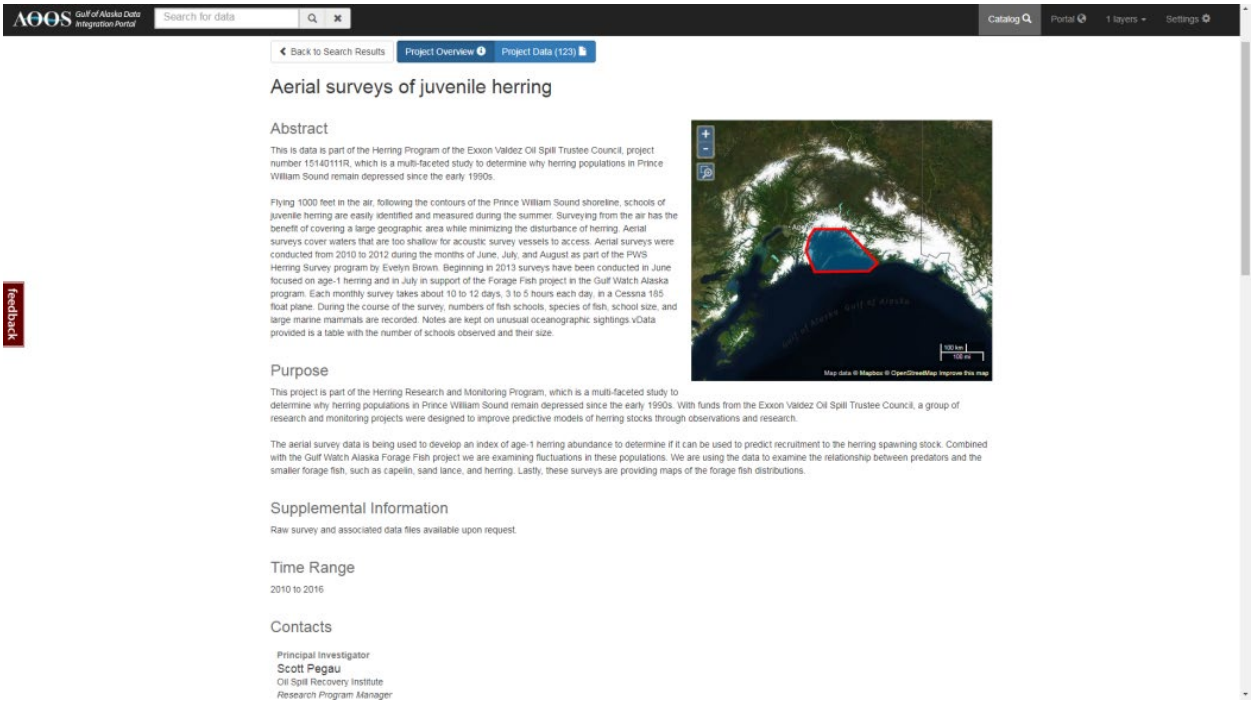

Figure 3. A screenshot of an HRM project available through the Gulf of Alaska Data Portal. A user can select the GWA or HRM label within the catalog and then navigate to the project of interest. A user can read an overview statement about the project and then navigate to the specific data of interest. A user can read an overview statement about the project, and then select the Project Data button to download data files and metadata of interest.

OBJECTIVE 6. *Execute management, user feedback and internal and external communications related to the GWA-LTRM Program and Non-Program project data and data products.*

The Data Management Team will participate in GWA-LTRM Program, Mar ReCON, and other project meetings, respond to user feedback, and maintain regular communication about project progress with the EVOSTC staff throughout the life of this program. In addition to the kick-off meetings mentioned in Objective 1, the Data Management Team participated in other meetings to give a status update on the program and meet with individual project PIs, including presenting final data submission reminders for the prior award (2017-2021) to GWA and HRM Program PIs at the November 2022 PI teleconference, and attending the January 23, 2023 in-person GWA-

LTRM Program PI meeting held during the Alaska Marine Science Symposium.

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). Given the maturity of how data are ingested and curated, the Data Management Team will continue to gather feedback through group discussion, one-on-one meetings and email correspondence. In addition to gathering feedback throughout the year, the Data Management Team maintained regular contact with PIs over email to provide notification of approaching deadlines for data or metadata submission, ask questions related to these submissions, and/or respond to PIs' questions about data management procedures and responsibilities.

Objective 7. *Ensure long-term preservation and dissemination into publicly accessible repositories at the term completion.*

There was no activity under this objective to report during this reporting period. Work for this objective will being in Year 4 (2025) to ensure the completeness of all project data and metadata records prior to archive in the last year of the funding cycle.

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2. Products:

Refer to Attachment 2 for a comprehensive list of data sets expected to be supported by the Data Management Program for submission to the Research Workspace, publication to the GOA Data Portal, and archived with DataONE at the end of the funding term.

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3. Coordination and Collaboration:

The Alaska SeaLife Center or Prince William Sound Science Center
The subaward from Prince William Sound Science Center (PWSSC) to AOOS (PI Janzen) for overall coordination of the Data Management Program and oversight of the GWA-LTRM Program data management is being administered through the AOOS fiscal agent, the Alaska SeaLife Center (ASLC). A separate PWSSC subcontract is being administered directly with Axiom Data Science (PI Bochenek) for their technical role in the overall Data Management Program, and for direct oversight of the NPPs data management.

EVOSTC Gulf Watch–Long-Term Research and Monitoring Program
Building upon previous experiences, the Data Management Program continued to strengthen the existing collaborative relationship with the GWA-LTRM Program to by effectively meet their data management needs. The Research Workspace provides the necessary open-access across program teams for file sharing and transparency of data progress. Backing this infrastructure is a

data management team that is well-coordinated with GWA-LTRM Program Managers and science teams to assist with timely data submissions and accuracy of metadata authoring, and to ensure data and products are available to general science and resource management communities.

The following coordination within the GWA-LTRM Program occurred during this reporting period:

- Coordination with GWA-LTRM Program: An initial coordination call occurred on August 2, 2022 between Axiom and the GWA-LTRM Program leads to discuss the data management procedures for this funding cycle and to establish organization of the Research Workspace. Further, coordination within the GWA-LTRM Program routinely occurred through email, phone communications, and regularly scheduled in-person meetings. The Data Management team attended the annual GWA-LTRM PI meeting in November 2022 and the quarterly PI meeting in January 2023 to provide Data Management Program updates and to be responsive to data management and decision-support needs.
- Coordination with individual GWA-LTRM projects: Regular communication was maintained with individual PIs through annual one-on-one meetings and regular email and/or phone conversations. One-on-one meetings and individual communications were held over this reporting period to also finalize data from the prior funding term and complete data submission to DataONE. Data management plans were developed for any newly-funded or modified GWA-LTRM projects to inform the data tracking inventory and to assist PIs in understanding and adherence to the EVOSTC data sharing policies.

EVOSTC-funded Non-Program Projects

In addition to maintaining regular communications with GWA-LTRM Program leads and project PIs, the Data Management team also maintained communications with NPP PIs through regular email correspondence and a kick-off webinar held in April 2022. At these meetings, The Data Management team communicated to all NPP PIs about data submission progress and procedures through presentations and group discussions. Further, the NPP PIs were notified of the program data inventory and the submission timelines to help encourage compliance. These communications are a continuation of effective working relationships developed with the GWA-LTRM science teams in the prior ten-year efforts.

EVOSTC Mariculture Projects

The Data Management team participated in the Mar ReCon virtual kick-off meeting on December 2, 2022 and the in-person meeting on January 13, 2023. Similar to other kick-off meetings, the EVOSTC data sharing procedures were reviewed, in addition to discussing expectations for the program data management strategy. During this meeting, a demonstration of

the Research Workspace was given and a discussion about the logical organization of data sets in the Research Workspace relative to the various program components occurred. Additionally, one-on-one meetings between the PIs and the Data Management team are being scheduled to develop individual data management plans for each of the Mar ReCON components to help inform the data submission inventory.

EVOSTC Education and Outreach Program

During the January 2023 GWA-LTRM PI meeting, the CORaL Network PIs attended to introduce this new education and outreach program and to discuss possible collaborations with other projects. During this meeting, CORaL indicated they would develop an 'a la carte' menu of opportunities for project PIs to participate in and share information from their projects. The Data Management team will look to these opportunities as a possible pathway for increasing outreach regarding the GOA Data Portal and DataONE as the central access point for up-to-date data produced from EVOSTC-funded programs and projects.

Trustee or Management Agencies

AOOS brings a significant level of leveraged resources, infrastructure, regional data management projects and partnerships to the EVOSTC Data Management Program. For one, AOOS is a certified Regional Coastal Observing System (RCOS) 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 EVOSTC 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 Data Management Program benefits trustee or management agencies on many levels. For one, all data and final data products produced by the GWA-LTRM Program and NPPs 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 data sets are also accessible via the AOOS data system of portals, and can be accessed by the same end-user accessing the historical GWA and HRM data sets and new GWA-LTRM data sets. DataONE provides access to data across multiple member repositories, supporting enhanced search and discovery of earth and environmental data. Other associated programs affiliated with EVOSTC and affiliated management agencies are given below (Table 1).

Table 1. *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
Regional Coastal Ocean Observing System: Alaska Ocean Observing System (AOOS) Integrated Ocean Observing System (IOOS), National Ocean and Atmospheric Administration (NOAA)	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 Through the IOOS grant, AOOS provides partial support on a few GWA-LTRM supported projects --Seward Line environmental drivers ship time support, Kachemak Bay environmental drivers project support, and the Ocean Tracking Network Herring acoustic tracking arrays in PWS. AOOS has invested a significant portion of their IOOS support to host the regions most sophisticated data acquisition system, which hosts the AOOS Ocean Data Explorer data visualization portal, the GWA Website, and the GOA Data Portal 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.	Carl Gouldman, Director, IOOS Dave Easter, Regions, Budget, and Policy Division Chief, IOOS
Integrated Ocean Observing System (IOOS), National Ocean and Atmospheric Administration (NOAA)	Develop community standards for sensor observations; make regional data nationally accessible. This supports all the data management activities for the prior GWA and HRM Programs and will for the LRTM-GWA Program, as well as other projects listed here, and provides data in the correct formats to meet national and	Derrick Snowden, Data Management and Coordination (DMAC) System Architect, IOOS

Group Agency	Level and Type of Coordination and How the Project Assisted EVOSTC Trust or Agency Work	Representative
	international data preservation and archival requirements and standards.	
Alaska Ocean Observing System (AOOS) Data Management, (AOOS grants support funded through NOAA's IOOS Program)	Provide data management; cyberinfrastructure support. Works directly with member and non-member organizations to ingest and document new data sets as well as historical data assets that might not be available elsewhere or in a consistent useful format; data visualizations and product development Support data collection, data sharing and acquisition for the entire region of Alaska, including the GOA. 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.	Sheyna Wisdom, Executive Director, AOOS
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 data sets; 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 data sets; 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
Southern California Coastal Ocean Observing System (SCCOOS) Data Management, NOAA	Provide data management; cyberinfrastructure. Works directly with member and non-member organizations to ingest and document new data sets; visualizations Tools developed for SCCOOS can be leveraged for other projects listed on this table. as well as ingestion capability of new data types. Activities undertaken for SCCOOS can	Clarissa Anderson, Executive Director, SCCOOS

Group Agency	Level and Type of Coordination and How the Project Assisted EVOSTC Trust or Agency Work	Representative
	be leveraged across the national IOOS Data System and other regions using the AOOS Data System platform.	
Building coupled storm surge and wave operational forecasting capacity for Western Alaska, NOAA-IOOS Program - OTT (Ocean Technology Transition)	Provide data management and outreach support for transitional project that is developing a multi-scale, 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 is 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.	Joannes Westerink, Civil and Environmental 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
Central Beaufort Sea Wave and Hydrodynamic Modeling Study (BOEM)	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	Jeremy Kasper, Lead Principal Investigator, University of Alaska, Institute of Northern Engineering

Group Agency	Level and Type of Coordination and How the Project Assisted EVOSTC Trust or Agency Work	Representative
	management contractor Axiom Data Science provided 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.	
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 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.	Josh Bradley, Data Manager, Arctic Landscape Conservation Cooperative (LLC), US Fish and Wildlife Service

4. Response to EVOSTC Review, Recommendations and Comments:

n/a

5. Budget:

The Budget Report for FY22 uses the most recent Data Management Program Budget, approved in November 2022, and summarizes comprehensive AOOS/Axiom Data Science actual expenditures. Note, the 45% indirect is not charged on the AOOS subaward amounts in this budget, which included personnel and contractual costs during this reporting period. The Data Management Program is on track for FY22 spending. Amounts reported below are expenses invoiced through December 2022.

Attachment 1. A list of actively funded projects by program that will be supported by the Data Management Program in meeting the EVOSTC data sharing deliverables.

Budget Category:	Proposed FY 22	Proposed FY 23	Proposed FY 24	Proposed FY 25	Proposed FY 26	5- YR TOTAL PROPOSED	ACTUAL CUMULATIVE
Personnel	$237,237	$245,619	$255,956	$249,977	$234,556	$1,223,345	$168,802
Travel	$0	$600	$0	$600	$0	$1,200	$0
Contractual	$1,247	$1,345	$1,323	$1,423	$1,404	$6,742	$258
Commodities	$0	$0	$0	$0	$0	$0	$0
Equipment	$0	$0	$0	$0	$0	$0	$0
Indirect Costs Rate = 45%	$101,144	$104,748	$109,226	$106,357	$99,233	$520,708	$74,803
SUBTOTAL	$339,628	$352,311	$366,505	$358,357	$335,193	$1,751,994	$243,863
General Administration (9% of certain projects)	$30,567	$31,708	$32,985	$32,252	$30,167	$157,679	N/A
PWSSC Fiscal Administration (10% of certain projects)	$9,522	$10,188	$12,328	$10,915	$8,116	$51,068	
PROJECT TOTAL	$379,716	$394,207	$411,819	$401,524	$373,476	$1,960,742	$1,960,742
Other Resources (In-Kind Funds)						$0	

COMMENTS:
The Data Management Program budget represents Axiom Data Science, the Alaska Ocean Observing System, and the Alaska Sea Life Center and Prince William Sound Science Center as fiscal agents. Indirect rates and exemptions from indirect rates vary. The Data Management Program is on track. The contracts were finalized July 26, 2022 for FY22, and these expenditures report AOOS and Axiom Data Science expenses through January 2023 as reported by Prince William Sound Science Center. The 45% indirect is not charged on the AOOS subaward amounts in this budget, which included personnel and contractual costs during this reporting period.

Program: Gulf Watch Alaska Long-Term Research and Monitoring Program (GWA-LTRM)

Project Number	Principal Investigator	Project Title	Years approved for funding
2222LTRM	Lindeberg & Hoffman	Gulf Watch Alaska Long-Term Research and Monitoring Program (GWA-LTRM)	FY22-31
22120111-C	Branch	Modeling and stock assessment of PWS herring	FY22-31
22120111-E	Hershberger	Herring disease program	FY22-31
22160111-F	Morella	Herring surveys and age, sex, and size collection and processing	FY22-31
22220111-I	Rand et al.	Ecological interactions between Pacific herring and Pacific salmon in Prince William Sound	FY22-28
22120114-C	Arimitsu & Piatt	Forage Fish Distribution, Abundance, and Body Condition	FY22-31
22120114-D	Ostle & Batten	Continuous Plankton Recorders	FY22-31
22120114-G	Campbell	Oceanographic Conditions in PWS	FY22-31

22120114-H	Coletti	Nearshore ecosystems the Gulf of AK	FY22-31
22120114-I	Danielson	GAK1 Monitoring	FY22-31
22120114-L	Hopcroft	Seward Line Monitoring	FY22-31
22120114-M	Kuletz & Kaler	PWS Marine Bird Surveys	FY22-31
22120114-N	Matkin	Long-term Killer Whale Monitoring	FY22-23
22120114-O	Moran & Straley	Humpback Whale Predation on Herring	FY22-31
22200114-P	Esler & Lindeberg	Lingering Oil Component Project	FY25, FY30
22220202	Hauri	Continuation and expansion of ocean acidification monitoring*	FY22-31
22220203	Rhea-Fournier et al.	Walleye pollock-Pacific herring interactions*	FY22-31

Program: Continuing EVOSTC-funded Non-Program Projects

Project Number	Principal Investigator	Project Title	Years approved for funding
22200127	Hetrick, Campbell, Baird, Evans	Ocean acidification sampling	FY22 (original FY20-21)
22110853	Kuletz, Kaler, Irons	Pigeon guillemot restoration	FY22-23 (original FY20-23)
22210128	Hollmen, Labunski et al.	Status and trends of EVOS injured seabirds	FY22-25 (original FY21-25)

Program: New EVOSTC-funded Non-Program Projects

Project Number	Principal Investigator	Project Title	Years approved for funding
22220201	Branson & Hetrick-Price	Chugach Regional Ocean Monitoring Program	FY22-31

22220300	Hetrick-Price	PWS kelp mariculture development for habitat restoration and local economy	FY22-26
22220301	Poe et al.	Social, cultural and economic assessment of kelp mariculture opportunities for coastal villages within the EVOS spill zone	FY22-26
22220302	Hoffman et al.	Sustainable mariculture development for restoration and economic benefit in the EVOS spill area	FY22-31
22220502	Lomax	Clean Water Act assessment of beaches with lingering oil	FY23-26
22220507	Moonin	Port Graham Corporation general restoration and habitat protection	FY22-26
22220508	Thielke	Geospatial wetlands and hydrography data across the EVOS region	FY22-25

Attachment 2. An inventory of data sets than are expected to be generated by EVOSTC-funded projects across the GWA-LTRM Program, Mar ReCON, and Non-Program Projects (NPPs)s. Ultimately these datasets will be accompanied with metadata, published to the GOA Data Portal, and archived to DataONE at the end of the funding term.

Program	EVOS Project #	Years approved for funding	Project	Dataset
GWA-LTRM	22220202	FY22-FY26	Continuation and expansion of ocean acidification monitoring	discrete water sample data
GWA-LTRM	22220202	FY22-FY26	Continuation and expansion of ocean acidification monitoring	inorganic carbon sampling
GWA-LTRM	22220202	FY22-FY26	Continuation and expansion of ocean acidification monitoring	CO32-, CO2, Ωarag and other inorganic carbon concentrations
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	intermediary acoustic-trawl survey data from six cruises across the 10 project years
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	spawning-stock biomass estimates generated from acoustic-trawl survey data
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	annual bottom trawl survey data for all project years and associated pollock abundance estimates
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	Ichthyophonus transmission and prevalence study data from six cruises
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	stomach content analysis from summer surveys and DNA probes (beginning 2024)
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	outputs from bioenergetics modeling to determine herring consumption
GWA-LTRM	22220203	FY22-FY26	Walleye pollock-Pacific herring interactions	age-structure predation study data using otolith reading data (beginning 2024)
GWA-LTRM	22120111-C	FY22-FY26	Modeling and stock assessment of PWS herring	age composition
GWA-LTRM	22120111-C	FY22-FY26	Modeling and stock assessment of PWS herring	model codebase
GWA-LTRM	22120111-C	FY22-FY26	Modeling and stock assessment of PWS herring	output data
GWA-LTRM	22120111-E	FY22-FY26	Herring disease program	prevalence summary
GWA-LTRM	22160111-F	FY22-FY26	Herring surveys and age, sex, and size collection and processing	aerial biomass observation & routes data
GWA-LTRM	22160111-F	FY22-FY26	Herring surveys and age, sex, and size collection and processing	aerial survey marine bird & mammal observations data
GWA-LTRM	22160111-F	FY22-FY26	Herring surveys and age, sex, and size collection and processing	ASL data
GWA-LTRM	22220111-I	FY22-FY26	Ecological interactions between Pacific herring and Pacific salmon in Prince William Sound, Alaska	

***Exxon Valdez* Oil Spill Trustee Council**

Long-Term Research and Monitoring Program

Annual Program Status Summary

Program	EVOS Project #	Years approved for funding	Project	Dataset
GWA-LTRM	22120114-C	FY22-FY26	Forage Fish Distribution, Abundance, and Body Condition	Forage fish count data
GWA-LTRM	22120114-C	FY22-FY26	Forage Fish Distribution, Abundance, and Body Condition	Forage fish morph data
GWA-LTRM	22120114-C	FY22-FY26	Forage Fish Distribution, Abundance, and Body Condition	Seabird diet data
GWA-LTRM	22120114-C	FY22-FY26	Forage Fish Distribution, Abundance, and Body Condition	Hydroacoustic data
GWA-LTRM	22120114-C	FY22-FY26	Forage Fish Distribution, Abundance, and Body Condition	Water chemistry (CTD & nutrients) data
GWA-LTRM	22120114-C	FY22-FY26	Forage Fish Distribution, Abundance, and Body Condition	Zooplankton data
GWA-LTRM	22120114-D	FY22-FY26	Continuous Plankton Recorders	Plankton data
GWA-LTRM	22120114-D	FY22-FY26	Continuous Plankton Recorders	Temperature data
GWA-LTRM	22120114-G	FY22-FY26	Oceanographic Conditions in PWS	Chlorophyll data
GWA-LTRM	22120114-G	FY22-FY26	Oceanographic Conditions in PWS	CTD data
GWA-LTRM	22120114-G	FY22-FY26	Oceanographic Conditions in PWS	Zooplankton data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Rocky intertidal community data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Mussel data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Rocky intertidal data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Substrate data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Seagrass data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Oystercatcher diet & nest density data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Invertebrate and algae data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Marine birds and mammals data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Water quality data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Sea otter survey data
GWA-LTRM	22120114-H	FY22-FY26	Nearshore ecosystems the Gulf of AK	Sea otter scat data
GWA-LTRM	22120114-I	FY22-FY26	GAK1 Monitoring	CTD data
GWA-LTRM	22120114-I	FY22-FY26	GAK1 Monitoring	Mooring data
GWA-LTRM	22120114-L	FY22-FY26	Seward Line Monitoring	Chlorophyll data
GWA-LTRM	22120114-L	FY22-FY26	Seward Line Monitoring	CTD data
GWA-LTRM	22120114-L	FY22-FY26	Seward Line Monitoring	Nutrient data
GWA-LTRM	22120114-L	FY22-FY26	Seward Line Monitoring	Seabird data (Kuletz)
GWA-LTRM	22120114-L	FY22-FY26	Seward Line Monitoring	Zooplankton data
GWA-LTRM	22120114-M	FY22-FY26	PWS Marine Bird Surveys	Summer bird survey data
GWA-LTRM	22120114-N	FY22-FY23	Long-term Killer Whale Monitoring	Acoustic catalog
GWA-LTRM	22120114-N	FY22-FY23	Long-term Killer Whale Monitoring	Photo catalog
GWA-LTRM	22120114-N	FY22-FY23	Long-term Killer Whale Monitoring	Biopsy data- genetic
GWA-LTRM	22120114-N	FY22-FY23	Long-term Killer Whale Monitoring	Biopsy data- contaminants
GWA-LTRM	22120114-N	FY22-FY23	Long-term Killer Whale Monitoring	Prey genetic sampling
GWA-LTRM	22120114-N	FY22-FY23	Humpback Whale Predation on Herring	Fluke id catalog
GWA-LTRM	22120114-N	FY22-FY23	Humpback Whale Predation on Herring	Energetic/stable isotope data
GWA-LTRM	22120114-N	FY22-FY23	Humpback Whale Predation on Herring	Whale survey data

Program	EVOS Project #	Years approved for funding	Project	Dataset
GWA-LTRM	22120114-N	FY22-FY23	Humpback Whale Predation on Herring	Porpoise survey data
GWA-LTRM	22120114-N	FY22-FY23	Humpback Whale Predation on Herring	CTD data
GWA-LTRM	22200114-P	FY25, FY30	Lingering Oil Component Project	hydrocarbon database
Mar ReCON	22220302	FY22-FY26	1	Carbonate chemistry measurements: hourly measures of pH, temperature, salinity, oxygen concentration and PAR, inside and outside of mariculture operation at 3 farms in three separate bioregions
Mar ReCON	22220302	FY22-FY26	1	Physical measurements inside and outside of mariculture operations in Kachemak Bay, Kodiak Island, and Prince William Sound (three sites per region): temperature, salinity, dissolved oxygen, chlorophyll-a fluorescence, turbidity, PAR, nutrients.
Mar ReCON	22220302	FY22-FY26	2A	Zooplankton composition, abundance, and biomass
Mar ReCON	22220302	FY22-FY26	2A	eDNA data
Mar ReCON	22220302	FY22-FY26	2A	Size and growth rates of targeted epibenthic invertebrates and seaweeds
Mar ReCON	22220302	FY22-FY26	2B	Benthic fish, epibenthic invertebrate, macroinfauna, and seaweed composition, abundance, and biomass at oyster and seaweed farms
Mar ReCON	22220302	FY22-FY26	2B	Fouling community structure associated with mariculture farm structures
Mar ReCON	22220302	FY22-FY26	2B	Static physical attributes associated with mariculture farms (substrate, depth, exposure, distance to freshwater)
Mar ReCON	22220302	FY22-FY26	2C	Pelagic fish abundance, species diversity, and behavior associated with mariculture farms.
Mar ReCON	22220302	FY22-FY26	2C	Trophic flow estimates between species (a proxy for ecosystem dynamics) in PWS bays.
Mar ReCON	22220302	FY22-FY26	2C	Farm carrying capacity estimates for PWS bays.
Mar ReCON	22220302	FY22-FY26	2D	Seabird community response to mariculture sites in PWS
Mar ReCON	22220302	FY22-FY26	2E	Marine mammal interactions with farm gear, including species, location, gear type, photographs
Mar ReCON	22220302	FY22-FY26	2E	Marine mammal mitigation measures and success rates
Mar ReCON	22220302	FY22-FY26	3A	Morphometrics, carbon and nitrogen content, estimated yields, and photosynthetic parameters of sugar kelp and winged kelp as a function of density
Mar ReCON	22220302	FY22-FY26	3A	Growth rate models of individual oyster lineages
Mar ReCON	22220302	FY22-FY26	3B	Morphometric and compositional measurements of kelp and oysters grown in production arrays

Program	EVOS Project #	Years approved for funding	Project	Dataset
Mar ReCON	22220302	FY22-FY26	3B	Multiple distinct oyster lineages, one lineage specifically optimized for Alaska's unique marine conditions (pedigrees)
Mar ReCON	22220302	FY22-FY26	3B	Survival and growth rates across sites and generations of individual oyster lineages
Mar ReCON	22220302	FY22-FY26	3B	Gene expression profiles-bioindicators of growth performance (SCPb, ATP synthase, peptidylprolyl isomerase) of individual oyster lineages
Mar ReCON	22220302	FY22-FY26	3B	Shell composition of individual oyster lineages
Mar ReCON	22220302	FY22-FY26	3C	Morphometric and compositional measurements of kelp and oysters grown in commercial polyculture and monoculture
Mar ReCON	22220302	FY22-FY26	3C	Morphometrics, carbon and nitrogen content, estimated yields, and photosynthetic parameters of sugar kelp and winged kelp as a function of trimming.
NPP	22200127	FY20-FY22	Ocean acidification sampling	GWA OA yearly sampling
NPP	22110853	FY20-FY23	Pigeon guillemot restoration	PIGU Bird Survey
NPP	22110853	FY20-FY23	Pigeon guillemot restoration	BLKI productivity Survey
NPP	22110853	FY20-FY23	Pigeon guillemot restoration	Transect Information start/stop from research vessel
NPP	22210128	FY21-FY25	Status and trends of EVOS injured seabirds in the Kenai Peninsula Coast and Kachemak Bay	Kenai Peninsula Component- Annual Bird Surveys
NPP	22210128	FY21-FY25	Status and trends of EVOS injured seabirds in the Kenai Peninsula Coast and Kachemak Bay	Kachemak Bay Component- Annual Bird Surveys
NPP	22220201	FY22-FY31	Chugach Regional Ocean Monitoring Program	Time series environmental data
NPP	22220201	FY22-FY31	Chugach Regional Ocean Monitoring Program	Time series chemical seawater analyses
NPP	22220201	FY22-FY31	Chugach Regional Ocean Monitoring Program	Phytoplankton ID and species prevalence
NPP	22220201	FY22-FY31	Chugach Regional Ocean Monitoring Program	Biotoxin levels
NPP	22220300	FY22-FY26	PWS kelp mariculture development for habitat restoration and local economy	water sample data from test sites
NPP	22220300	FY22-FY26	PWS kelp mariculture development for habitat restoration and local economy	Kelp bed marine life surveys
NPP	22220301	FY22-FY26	Social, cultural and economic assessment of kelp mariculture opportunities for coastal villages within the EVOS spill zone	geospatial database and/or mapped layers containing of local knowledge, uses, and values of kelp

Program	EVOS Project #	Years approved for funding	Project	Dataset
NPP	22220301	FY22-FY26	Social, cultural and economic assessment of kelp mariculture opportunities for coastal villages within the EVOS spill zone	synthesized results from surveys and assessment of mariculture activity and interests
NPP	22220301	FY22-FY26	Social, cultural and economic assessment of kelp mariculture opportunities for coastal villages within the EVOS spill zone	outputs from economic experiment and analyses of mariculture activities
NPP	22220502	FY23-FY25	Clean Water Act assessment of beaches with lingering oil	beach characterization data
NPP	22220502	FY23-FY25	Clean Water Act assessment of beaches with lingering oil	hydrocarbon data
NPP	22220502	FY23-FY25	Clean Water Act assessment of beaches with lingering oil	Water chemistry (CTD & nutrients) data
NPP	22220502	FY23-FY25	Clean Water Act assessment of beaches with lingering oil	biotic sampling data
NPP	22220507	FY22-FY26	Port Graham Corporation general restoration and habitat protection	land information and geospatial database
NPP	22220508	FY22-FY25	Geospatial wetlands and hydrography data across the EVOS region	High-resolution National Wetland Inventory (NWI) database for the entire EVOS region north of Shelikof Strait and Kodiak Watersheds
NPP	22220508	FY22-FY25	Geospatial wetlands and hydrography data across the EVOS region	National Hydrography Data (NHD) for the unmapped portion of the Bering Glacier Watershed
NPP	22220508	FY22-FY25	Geospatial wetlands and hydrography data across the EVOS region	QL 1 LiDAR data for Copper River Delta