Optics Strategic Initiative

Project Charter

03/05/2025

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Background

The Optics Strategic Initiative (OSI) is leading an enterprise project to streamline the analysis of optical data (images and videos) in the assessment of oceanic ecosystems. Optics data is collected across a wide-variety of resource surveys conducted by the agency (e.g. fish and corals) and the derived data are used in a variety of ways, but primarily focuses on providing management advice for those resources (e.g. fisheries stock assessment). This project will be a collaboration across offices within the National Oceanic and Atmospheric Administration (NOAA) Fisheries and may also extend to other line offices within NOAA. There are some factors that currently limit the analysis of these datasets, including varying degrees of manual work, large volumes of data, and limited access to processing equipment. Currently, the six Financial Management Centers (FMCs), listed in Table 1, have their own process and platform for optical data analysis to assess the population health of vital ocean life species. The FMCs in conjunction with the Fisheries Office of the Chief Information Officer (OCIO) and Office of Science and Technology (OST), are pursuing an enterprise solution that will use the Google Cloud Platform (GCP) to leverage cloud technology and machine learning to synchronize existing optical data analysis and data storage and archiving.

Table 1 - Supported FMCs

FMC Acronym	FMC Name
AFSC	Alaska Fisheries Science Center
NEFSC	Northeast Fisheries Science Center
NWFSC	Northwest Fisheries Science Center
PIFSC	Pacific Islands Fisheries Science Center
SEFSC	Southeast Fisheries Science Center
SWFSC	Southwest Fisheries Science Center

Business Case

This project is an essential Strategic Initiative (SI) aimed at operationalizing new technologies to streamline processes and increase efficiencies. OSI is vital for

assessing oceanic population health and provides data to fisheries and mammals stock assessments, status and health of coral ecosystems, and information on complex food web dynamics. Much of these kinds of data are under utilized due to the slowness of post-processing and thus far more information can be gleaned. Automated processing will also allow us to integrate information with acoustics, genomics, and oceanographic data allowing for a more holistic understanding of ecosystems as we push to implement ecosystem-based management (EBM) further increasing the efficiency and accuracy of management's decision making processes.

Fisheries must build capacity to increase data ingestion into this system to streamline data processing, analysis, and storage. Having Optics data processing and analysis in the cloud will allow for each science center to follow similar workflows, effectively combining six different processes and systems into one. In this way we can leverage existing automated pipelines to expand the use of AI/ML processing to novel applications more easily, share technical expertise across Centers, and leverage knowledge across the agency. Implementing automated workflows will allow researchers to utilize their time focused on creating end-products (e.g. abundance estimation) rather than on time-consumptive manual processing. In cases where the technology can be ported to at-sea systems, and utilizing edge computing, data collection can be trimmed only to the observations of interest (e.g. remote, storage limited deployments of AUVs). The resulting process will decrease technical debt by requiring management and oversight of one system rather than six.

Project Scope

The project scope will be inclusive of the google cloud storage bucket, data ingest using existing API from on-prem and/or cloud storage, and adding data to a publicly accessible storage location. Additionally, Fisheries OCIO will support the development of tailored OSI Google Cloud Workstations, specifically the configuration of the base workstation to support the requirements of OSI software implementation. The project team will also support the development of a data workflow diagram; highlighting data ingest, storage, and archiving.

The following items, while related, are out of scope. Fisheries OCIO may provide guidance and infrastructure support for the OSI project team. If full scale support is required, these efforts will necessitate a new project.

A. AI/ML solutions
B. Additional software implementations

Project Goals

The goals of this project are to modernize OSI solutions by:

1. Create a GCP project for OSI and determine best practices for processing, storing, and archiving data (including metadata)
2. Establish a data ingest for OSI data using existing API
3. Create a GPU enabled workstation capable of running TagLab and other automation software
4. Develop process to offload data to a publicly accessible archive

Project Deliverables

Table 1 - Key Deliverables

#	Key Deliverables/Milestones	Deliverable Description	Requirement Met
1	GCP Resources and Service Diagram	Create GCP project folder and develop a service diagram outlining the services and data flow.	
2	Data Workflow Diagram	Development of a data workflow diagram.	
3	Data Ingest Pipeline	Data Ingest Pipeline with API for quickly finding files amongst multiple data sources.	
4	Data Egress Pipeline	Data egress pipeline to archival data storage	
5	GPU Enabled Workstation	A Google Workstation with GPU to provide a testing space for Optics Data Analysis.	

Timeline

The project completion goal is the end of FY26. Initial goals are to:

1. Stand up GCP dev project environment and provide permissions to project stakeholders (Q2 FY25) [Fisheries OCIO]
2. Establish data ingest using existing API from science centers and across line offices (Q3 FY25) [Fisheries OCIO Dev Team]
3. Supply chain review for TagLab (Q3 FY25) [Fisheries OCIO]
4. Authorization To Use for TagLab (Q4 FY25) [Fisheries OCIO]
5. Establish OSI Workstation with GPU (Q4 FY25) [Fisheries OCIO Cloud Program Office and OSI Project Team]
6. Develop data egress to archival data storage (Q1 FY26) [Fisheries OCIO Dev Team]

Risk Considerations

This will be the third project to follow the incubator path. There are some funding risks associated with this project. Most of the funds for the project work have been obligated to mitigate any risks. There is a risk of over analysis for project decisions as well as risks surrounding data permissions and management as this is a cross-FMC project. The project team will lean on the expertise of the technical team to help guide technical decisions.

Stakeholders

Key Stakeholders	Stakeholder Description
Nancy Majower	NMFS Chief Information Officer
Samir Mehta	NMFS Deputy Chief Information Officer
Leo Fukuda	Program Coordinator
Matthew Campbell	SI Lead, Project Sponsor, SEFSC
Dr. Derek Bolser	Project Co-Lead; OST
Kresimir Williams	AFSC - FMC User and POC
Erin Moreland	AFSC - FMC User and POC
Pete Chase	NEFSC - FMC User and POC
Jennifer Fisher	NWFSC - FMC User and POC
Liz Clarke	NWFSC - FMC User and POC
Ben Richards	PIFSC - FMC User and POC
Tom Oliver	PIFSC - FMC User and POC
Christian Reece	SWFSC - FMC User and POC

Stakeholder Engagement Plan

FMC stakeholders will be engaged at bi-weekly meetings and will be able to provide feedback on progress as well as provide guidance. OCIO stakeholders will be updated through OCIO PMO Smartsheet reporting mechanisms. OCIO leadership will be engaged through PMO escalation as required.

Project Team

Name	Role	Contact	Responsibilities
Matthew Campbell	Project Lead/ Sponsor; SEFSC	matthew.d.campbell @noaa.gov	Product Ownership, Project Oversight, FMC POC
Dr. Derek Bolser	Project Co-Lead; OST	derek.bolser@noaa .gov	Product Ownership, Project Oversight, FMC POC
Patrick Crawford	Project Manager; NMFS OCIO	patrick.crawford@n oaa.gov	Project Management, OCIO Coordination, OCIO POC
Ed Rodgers	Cloud Architect; NMFS OCIO	ed.rodgers@noaa.g ov	Cloud Architecture, Provisioning, and Network Support
Optics Working Group			Optics SI Software Cloud Integration/ Coordination

Appendix A: Sponsor & OCIO Acceptance

Sponsor Acceptance
Optics SI Primary Lead: Matt Campbell
Date: 3/5/25
Signature: CAMPBELL.MATTHEW.DENIS.1404115657 Digitally signed by CAMPBELL.MATTHEW.DENIS.1404115657 Date: 2025.03.05 11:11:03 -06'00'
Optics SI Secondary Lead: Derek Bolser
Date:
Signature:

OCIO Acceptance
OCIO Approver: Samir Mehta
Date:
Signature: