

Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

Eco-spatial data layers of coral reef ecosystem drivers in American Samoa

1.2. Summary description of the data:

Understanding the spatial distribution, intensity, overlap, and cumulative impact of human activities and environmental stressors is essential for effective management and protection of ecosystem services generated by coral reefs. The data described here are that of the GIS layers of the eco-geospatial tool developed by staff of the Ecosystem Sciences Division (ESD) at the Pacific Island Fisheries Science Center (PIFSC) for American Samoa Coral Reef Drivers, hosted by Pacific Islands Ocean Observing System (PACIOOS) at <http://www.pacioos.hawaii.edu/projects/coral-drivers-amsam/>. Partners included the American Samoa Division of Marine and Wildlife Resources and the American Samoa Coral Reef Advisory Group.

This eco-geospatial tool gathers, organizes, analyzes, models and visualizes spatially-explicit information for American Samoa. Hereby, GIS layers are developed to provide the spatial patterns of anthropogenic and environmental drivers that influence the status of coral reefs in the region and the potential for degradation, including satellite-based oceanography (sea surface temperature [SST], chlorophyll-a, photosynthetically active radiation [PAR], Turbidity [Kd490]), wave power, coastal habitat modification, and sediment export to nearshore.

These geospatial products provide the basis to answer questions such as which places and habitat types are the most impacted; which stressors should be the greatest concern in different areas; and where to prioritize different management strategies. In addition, these datasets also inform watershed management and conservation action plans.

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

1985-01-01 to 2018-12-28, 1998-06-01 to 2018-06-26, 2013-01-01 to 2018-06-26, 1998-06-01 to 2018-06-26, 2002 to 2012

1.5. Actual or planned geographic coverage of the data:

W: -170.9367, E: -170.4925, N: -14.1535, S: -14.4562

The maximum extents for which there is data available underlying the GIS layers.

1.6. Type(s) of data:

(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)

1.7. Data collection method(s):

(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:**1.8.1. If data are from another observing system, please specify:****2. Point of Contact for this Data Management Plan (author or maintainer)****2.1. Name:**

Michael W Akridge

2.2. Title:

Metadata Contact

2.3. Affiliation or facility:**2.4. E-mail address:**

michael.akridge@noaa.gov

2.5. Phone number:

(808)725-5483

3. Responsible Party for Data Management

Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

Bernardo Vargas-Angel

3.2. Title:

Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

Unknown

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Lineage Statement:

To develop the LBSP GIS layers, there are three main components: satellite based oceanography, coastal habitat modification, and sediment export to nearshore. All data collected is publicly available, and utilized in an ArcGIS environment. The InVEST toolset was used to model sedimentation. The number of layers included in the tool which span the three components: 5 layers of chlorophyll, 5 layers of kd490, 5 layers of PAR, 5 layers of SST, 1 layer of wave power, 1 layer of sediment, and 1 layer of coastal modification.

Process Steps:

- Satellite-based Oceanography Component: Part I (with R and ERRDAP): Publically-available data was obtained for the multiple datastreams for satellite-based oceanography. Oceanographic variables: Sea surface temperature (SST), Chlorophyll-a (CHL), PAR/irradiance (PAR), Turbidity/kd490 (KD4), and Wave power* (WAV). For SST, Chl-a, PAR, Kd490: R was used to take data from ERRDAP to calculate Oceanographic metrics. Part II (in ArcGIS): After the climatology metrics are calculated, ocean color products (Chl-a, Kd490, PAR) will go through extra steps to remove unreliable nearshore values (due reflectation) and fill in those gaps by averaging the neighbor values. All products are extracted by a 10km buffer. These processes are done in the ArcGIS environment, and the detailed steps are described in the LBSP project - SOP for processing remote sensing data.docx. Data sources: SST (blended of multiple sensors): to achieve the longest time series (Operational Sea Surface Temperature and Sea Ice Analysis (OSTIA) Sea Surface Temperature Reanalysis (1985-2002), Geo-Polar Blended Night-only Sea Surface Temperature Reanalysis (2002-2016), Geo-Polar Blended Night-only Sea Surface Temperature Near Real-Time (2017 to present)); PAR data is from Aqua MODIS; Chl-a is from ESA Ocean Color CCI v.3.1 (blend of ESA's MERIS, Aqua MODIS, SeaWiFS LAC and GAC, and VIIRS); Turbidity/kd490 is derived from the same sensor as chl-a: ESA Ocean Color CCI v.3.1 (blend of ESA's MERIS, Aqua MODIS, SeaWiFS LAC and GAC, and VIIRS). Metrics calculated: Long term mean (MEAN) calculated by taking the average of all weekly data for each pixel, Standard deviation of long term mean (SDEV) calculated by taking the standard deviation over all weekly data for each

pixel, Maximum monthly climatological mean (MMCM) calculated by first taking the average of all 8-day periods for each month, then taking the maximum of those 12 values for each pixel. Also Maximum annual average anomaly (MAAA) calculated by taking the average of the annual maximum values in excess of the MMCM for each pixel, and Average annual frequency of anomalies (AAFA) calculated by the average # of weeks where an anomaly occurred divided by number of weeks in a year. Only long term mean was derived for wave power, which was developed by Jeanette Clark to use Wave Watch III global wave model data and coastline analysis of wave exposure

- Coastal habitat modification component: Coastal Habitat Modification, defined as Area of the alteration, or removal of geomorphic structure as a result of human use, was measured with Benthic Habitat Maps created by NOAA National Center for Coastal Ocean Science Biogeography Branch and the Environmental Sensitivity Index created by NOAA Office of Response and Restoration. Data were collected in 2004, extends to ~3 km offshore, identifies habitat areas such as sand, hardbottom reef, scattered rock, artificial/dredged. To develop a coastal habitat modification model, two input layers are mosaiced with a 250m raster file; In summary, this layer combines man-made shoreline modifications and in-water modifications to coastal habitat, and includes a buffer to indicate possible adjacent affected areas. Data for shoreline modification is from 2003, does not show recent development.

- Sediment export to nearshore component: The annual amount of sediment (tons/yr) reaching the coast was calculated using the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) Sediment Delivery Ratio model for Tutuila. Sediment load is a function of land use and vegetation type, geology, soil characteristics, rainfall, slope, and hydrology. Only land areas that drain to a stream which reaches the coast and have a sediment supply were considered. InVEST Sediment Delivery Ratio Available for download at: <https://naturalcapitalproject.stanford.edu/software/invest> Documentation: <http://data.naturalcapitalproject.org/nightly-build/invest-users-guide/html/sdr.html#> Rainfall, digital elevation models, soil, land cover, and watershed data was input into the InVEST SDR model to estimate annual soil loss and amount of sediment exported to the stream. Digital Elevation Model (DEM) data is from LiDAR, collected in 2012 and downloaded from NOS Data Access Viewer(<https://coast.noaa.gov/dataviewer/#/>)

Projection: UTM 2S Horizontal Datum: WGS84/ITRF Vertical Datum: NAVD88 Output Resolution: 1.0m Not all drainage networks are captured in DEM and need to be manually adjusted Watershed polygons were created with the DEM in ArcGIS taking into account flow direction, accumulated flow, watershed delineation, and stream network. Rainfall/ Erosivity map was taken from NRCS Field Office Technical Guide: https://efotg.sc.egov.usda.gov/references/public/HI/R_Factor_Map_Am_Samoa.doc then digitized. Erodibility values were extracted from NRCS Web Soil Survey Website and joined with the polygon shapefile

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other

plan:

5.2. Quality control procedures employed (describe or provide URL of description):

Data collected and produced by models was examined for each data layer as described on <http://www.pacioos.hawaii.edu/projects/coral-drivers-amsam/#data>

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:

- 1.6. Type(s) of data
- 1.7. Data collection method(s)

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

<https://www.fisheries.noaa.gov/inport/item/65145>

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

Yes

7.1.1. If the data are not to be made available to the public at all, or with

limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:

U.S. Integrated Ocean Observing System Program (IOOS)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

<https://www.pacioos.hawaii.edu/projects/coral-drivers-amsam/#data>

7.3. Data access methods or services offered:

Data can be accessed online via the Pacific Islands Ocean Observing System (PACIOOS) Projects page: <http://www.pacioos.hawaii.edu/projects/coral-drivers-amsam/#data>

7.4. Approximate delay between data collection and dissemination:

Unknown

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

OTHER

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):

Pacific Islands Fisheries Science Center - Honolulu, HI

8.3. Approximate delay between data collection and submission to an archive facility:

Unknown

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

No data will be archived.

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.