

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:

Benthic Habitats of Puerto Rico and the U.S. Virgin Islands; Photomosaic of Puerto Rico (Cabo Rojo), 1999

### 1.2. Summary description of the data:

Habitat maps of Puerto Rico and the U.S. Virgin Islands were created by visual interpretation of aerial photographs using the Habitat Digitizer Extension. Aerial photographs are valuable tools for natural resource managers and researchers since they provide an excellent record of the location and extent of habitats. However, spatial distortions in aerial photographs due to such factors as camera angle, lens characteristics, and relief displacement must be accounted for during analysis to prevent incorrect measurements of area, distance, and other spatial parameters. These distortions of scale within an image can be removed through orthorectification. During orthorectification, digital scans of aerial photos are subjected to algorithms that eliminate each source of spatial distortion. The result is a georeferenced digital mosaic of several photographs with uniform scale throughout the mosaic. Features near land are generally georeferenced with greater accuracy while the accuracy of features away from land is generally not as good. Where no land is in the original photographic frame only kinematic GPS locations and image tie points were used to georeference the images.

After the orthorectified mosaics were created, photointerpreters were able to accurately and reliably delineate boundaries of features in the imagery as they appear on the computer monitor.

### 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:

1999-02, 1999-03, 1999-12

### 1.5. Actual or planned geographic coverage of the data:

W: -67.21, E: -67.06, N: 18.08, S: 17.5

### 1.6. Type(s) of data:

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

raster digital data

**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:**

NCCOS Scientific Data Coordinator

**2.2. Title:**

Metadata Contact

**2.3. Affiliation or facility:**

**2.4. E-mail address:**

NCCOS.data@noaa.gov

**2.5. Phone number:**

**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:**

NCCOS Scientific Data Coordinator

**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?**

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

Process Steps:

- 2000-01-01 00:00:00 - Aerial photographs were acquired for Puerto Rico and the U. S. Virgin Islands Benthic Mapping Project in 1999 by NOAA Aircraft Operation Centers aircraft and National Geodetic Survey cameras and personnel. Approximately 600, color, 9 by 9 inch photos were taken of the coastal waters of Puerto Rico and the U.S. Virgin Islands at 1:48000 scale. Specific sun angle and maximum percent cloud cover restrictions were adhered to when possible during the photography mission to ensure collection of high quality imagery for the purpose of benthic mapping. Print and diapositives were created from the original negatives. Diapositives were then scanned at a resolution of 500 dots per inch(DPI) using a metric scanner, yielding 2.4 by 2.4 meter pixels for the 1:48000 scale photography. All scans were saved in TIFF format for the purposes of orthorectification and photointerpretation. Georeferencing/mosaicing of the TIFF's was performed using Socet Set Version 4.2.1. Lens correction parameters were applied to each frame to eliminate image distortion. Airborne kinematic GPS was then used when available to provide a first order geolocation. When this information was not available, measurements were made between lightline strips for input into Socet Set to provide preliminary co-registration. Image to image tie-points were then used to further co-register the imagery, especially for photos taken over open water where ground control points were not available. Fixed ground features visible in the scanned photos were selected for ground control points (GCP's) which were then used to georeference the imagery. GCP's were measured using real-time DGPS (differential Global Positioning System). Points were obtained with a wide distribution throughout the imagery, especially on peninsulas and outer islands whenever possible since this results in the most accurate registration throughout each image. Only ground control points for terrestrial features were collected due to difficulty of obtaining precise positions for submerged features. A custom digital terrain model (DTM) was then created using the Socet Set software to correct for feature displacement due to terrain effects. To accomplish this, water features and the shoreline were set to an elevation of zero. Preliminary experimentation revealed that the effects of refraction on the position of submerged features in the imagery were not significant enough to make a correction for underwater displacement according to Snell's law. Selected land elevation points were then inserted from USGS 1:24000 Digital Elevation Models or other elevation data sets where clouds or other sources of interference prevented the Socet Set software from automatically making an accurate DTM. Once the terrain models were complete and a draft orthorectified mosaic was produced, a set

of independent ground control points was used to measure the quality of each mosaic's rectification and ensure that it met acceptable limits of horizontal spatial accuracy. If spatial accuracy was not acceptable based on this comparison, additional modifications were made, until a satisfactory mosaic was created for each island. In general, mosaics were georeferenced such that pixels are positioned within one pixel width of their correct location.

**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):**

## **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:

- 1.7. Data collection method(s)
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.2. Name of organization of facility providing data access
- 7.2.1. If data hosting service is needed, please indicate
- 7.3. Data access methods or services offered
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

**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/39431>

**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](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?**

**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:**

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

**7.2.2. URL of data access service, if known:**

<http://coastalscience.noaa.gov/datasets/ccma/biogeobenthic/mosaic/zip/caborojo.zip>

**7.3. Data access methods or services offered:****7.4. Approximate delay between data collection and dissemination:**

**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)*

#### 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):

National Centers for Coastal Ocean Science - Silver Spring, MD

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

### 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*

## 9. Additional Line Office or Staff Office Questions

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