

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:

2015 NOAA NGS Topobathy Lidar: Puerto Rico

1.2. Summary description of the data:

These data were collected by the National Oceanic Atmospheric Administration National Geodetic Survey Remote Sensing Division using a Riegl VQ-820G system. The data were acquired from 201410- 201505 in fifty three missions along the coastline of Puerto Rico. The project consists of 525 square miles along the shores of Puerto Rico. This dataset contains 5721 - 500 m x 500 m lidar tiles. The data classifications for the data are: 1 - unclassified, 2 - ground, 7 - topo noise, 25 - water column, 26 - bathymetric bottom or submerged topography, 27 - water surface, and 30 - International Hydrographic Organization (IHO) S-57 objects.

Original contact information:

Contact Org: National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), National Geodetic Survey (NGS), Remote Sensing Division

Title: Chief, Remote Sensing Division

Phone: 301-713-2663

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:

2014-11-02 to 2015-05-20

1.5. Actual or planned geographic coverage of the data:

W: -67.296377, E: -65.539127, N: 18.528369, S: 17.850323

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:

NOAA Office for Coastal Management (NOAA/OCM)

2.2. Title:

Metadata Contact

2.3. Affiliation or facility:

NOAA Office for Coastal Management (NOAA/OCM)

2.4. E-mail address:

coastal.info@noaa.gov

2.5. Phone number:

(843) 740-1202

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:

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:

- 2016-05-01 00:00:00 - Data for the Puerto Rico Topobathy LiDAR project was acquired by NOAA using a Riegl VQ-820G Topobathy LiDAR systems. All delivered LiDAR data is referenced to: Horizontal Datum-NAD83 (2011) epoch: 2010 Projection-UTM Zone 19 Horizontal Units-meters Vertical Datum-NAD83 (2011) epoch: 2010 (ellipsoid heights) Vertical Units-meters This dataset encompasses 5, 721 500m x 500m tiles in Puerto Rico. Both green LiDAR data and NIR LiDAR data (used for water surface model creation that is incorporated during refraction of the green bathymetric data) was acquired. NOAA acquired and calibrated the LiDAR data. Dewberry received the calibrated green and NIR data and verified complete coverage. Relative accuracy of the green swaths compared to overlapping and adjacent green swaths as well as the relative accuracy of green swaths compared to overlapping and adjacent NIR swaths was verified through the use Delta-Z (DZ) orthos created in GeoCue software. Dewberry used E-Cognition to create 2D breaklines representing land/water interfaces. These 2D breaklines were manually reviewed and adjusted where necessary to ensure all well-defined hydrographic features (at 1:1200-scale) were represented with breaklines. Using TerraScan, all green LiDAR data within breaklines are classified as water column and a sub-set of these points meeting specific criteria are classified as green water surface points. Using TerraScan, all NIR LiDAR data within breaklines are classified as water column and a sub-set of these points meeting specific criteria are classified as NIR water surface points. Dewberry used the green water surface points and NIR water surface points to create water surface models. These models are used in the refraction tool to determine the depth of bathymetric points and are created for single swaths to ensure temporal differences and wave or water surface height variations between flight lines do not impact the refraction of the bathymetric data.

Using the SBET data and the water surface models, all green LiDAR data classified as water column (data within the breaklines) is refracted using Dewberry's LiDAR Processor (DLP). Light travels at different speeds in air versus water and its direction of travel or angle is changed or refracted when entering the water column.

The refraction tool corrects for this difference by adjusting the depth (distance traveled) and horizontal position (change of angle/direction) of the green LiDAR data. Using statistics and limited manual review, the output data is verified to ensure the refraction tool functioned properly.

- 2016-05-01 00:00:00 - Once all green data has been refracted by flight lines, all flight lines covering each tile are combined into a single 500 m x 500 m tile. As the various flight lines may include data collected at Mean Lower Low Water (MLLW) and higher water (HW), which includes everything that is outside the range of MLLW, any HW refracted data points landward of the MLLW land/water interface were classified to class 18 to ensure these HW bathymetric points were not used

when MLLW exposed ground points exist in those locations. Dewberry used algorithms in TerraScan to create the initial ground/submerged topography surface. Dewberry then performed manual editing to review and improve the final topobathy surface. Locations of temporal differences were resolved using the Temporal Difference Decision Tree approved by NOAA. Polygons marking the locations of large temporal differences are provided as part of the deliverables. All LiDAR data was peer-reviewed. Dewberry's internal QC also included creating void polygons for use during review. All necessary edits were applied to the dataset. GeoCue software was used to update LAS header information, including all projection and coordinate reference system information. The final LiDAR data are in LAS format 1.2 and point data record format 3. The final classification scheme is as follows: 1-Unclassified 2-Ground 7-Topo Noise 25-Water Column 26-Bathymetric Bottom or Submerged Topography 27-Water Surface 29-Submerged Object 30-International Hydrographic Organization (IHO) S-57 objects Dewberry then produced the final void layer and final set of DZ orthos using the final ground (2) and submerged topography (26) classes. All data is then verified by an Independent QC department within Dewberry. The independent QC is performed by separate analysts who do not perform manual classification or editing. The independent QC involves quantitative and qualitative reviews.

- 2016-12-05 00:00:00 - The NOAA Office for Coastal Management (OCM) received files in las format. The files contained lidar elevation and intensity measurements along the coast of Puerto Rico. The data were in UTM Zone 19 coordinates and ellipsoid elevations in meters. The data classifications for the data are: 1 - unclassified, 2 - ground, 7 - topo noise, 25 - water column, 26 - bathymetric bottom or submerged topography, 27 - water surface, and 30 - International Hydrographic Organization (IHO) S-57 objects. OCM performed the following processing on the data for Digital Coast storage and provisioning purposes:

1. Eliminated elevation outliers below -100 meters ellipsoid height
2. Converted from UTM Zone 19 to geographic coordinates
3. Sorted by gps time
4. Compressed the data using laszip

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:

- 1.6. Type(s) of data
- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 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
- 7.4. 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/48213>

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?

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:

NOAA Office for Coastal Management (NOAA/OCM)

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

7.2.2. URL of data access service, if known:

<https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=5193>

<https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/5193/index.html>

7.3. Data access methods or services offered:

This data can be obtained on-line at the following URL: <https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=5193>;

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):

Office for Coastal Management - Charleston, SC

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.