

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:**

2014 U.S. Geological Survey CMGP LiDAR: Post Sandy (Virginia)

1.2. Summary description of the data:

USGS Contract Number: G10PC00093, Task Order: G14PD00222

Digital Aerial Solutions LLC was tasked to collect and process 4607 sq. miles of Light Detection and Ranging (LiDAR) dataset in Virginia. The LiDAR Survey encompasses 4607 sq. miles of area in Eastern Virginia inclusive of the counties and cities of Spotsylvania, Caroline, Hanover, Henrico, Chesterfield, Dinwiddie, Sussex, Richmond City, Hopewell City, Colonial Heights City, Petersburg City, portions of Orange and Louisa, Amelia, Nottoway and Prince Edward. The LiDAR point cloud was flown at a nominal post spacing of 0.7 meters for un-obscured areas. The LiDAR data and derivative products produced are in compliance with the U.S. Geological Survey National Geospatial Program Guidelines and Base Specifications, Version 1.0. The final LAS point cloud classified as 1-Unclassified, 2-Ground, 7-Noise, 9-Water, 10-Ignored Ground due to breakline proximity, 17-overlap ground points and 18 - overlap unclassified points.

The GPS Survey was completed by ESP Associates for 3 block acquisition area, and 2 blocks acquisition area by Michale Baker Surveying totaling 4607 square miles through the project area.

Breaklines were delivered with the lidar dataset. These have not been reviewed by NOAA OCM, therefore are only available by request.

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:

2014-03-24 to 2014-04-21

1.5. Actual or planned geographic coverage of the data:

W: -78.692546, E: -76.953543, N: 38.39291, S: 36.70765

1.6. Type(s) of data:

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

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:

- 2014-04-02 00:00:00 - The primary collection of LiDAR data was done by two Cessna 421 aircrafts. There were three LiDAR sensors used to acquire this mission; ALS60, ALS70 and an Optech Pegasus system. 35 flight missions were required to collect the entire area of the project area. The ABGPS, inertial measurement unit (IMU), and raw scans are collected during the LiDAR aerial survey. The ABGPS monitors the xyz position of the sensor and the IMU monitors the orientation. During the aerial survey, laser pulses reflected from features on the ground surface are detected by the receiver optics and collected by the data logger. GPS locations are based on data collected by receivers on the aircraft and base stations on the ground. The ground base stations are placed no more than 40 km radius from the flight survey area.

- 2014-04-10 00:00:00 - The ABGPS, IMU, and raw scans are integrated using proprietary software developed by Leica and delivered with the Leica System. The resultant file is in a LAS binary file format. The LAS version 1.2 file format can be easily transferred from one file format to another. It is a binary file format that maintains information specific to the LiDAR data (return number, intensity value, xyz, etc.). The resultant points are produced in UTM18/ NAD83 coordinate system, with units in Meters and Vertical datum referenced to the NAVD88 datum. The LiDAR mass points were processed in American Society for Photogrammetry and Remote Sensing LAS 1.2 format. The header file for each dataset is complete as defined by the LAS 1.2 specification. The datasets were divided into 1500 Meters by 1500 Meters tiling scheme, based on United States National Grid Index. The tiles are contiguous, do not overlap, and are suitable for seamless topographic data mosaics that include no "no data" areas.

- 2014-04-25 00:00:00 - The unedited data are classified to facilitate the application of the appropriate feature extraction filters. Digital Aerial Solutions used Terrasolids Terrascan and Terramodel softwares to classify and edit the LAS data and a combination of proprietary filters are applied as appropriate for the production of bare earth digital elevation models (DEMs). Interactive editing methods are applied to those areas where it is inappropriate or impossible to use the feature extraction filters, based upon the design criteria and/or limitations of the relevant filters. These same feature extraction filters are used to produce elevation height surfaces. DAS classified the LAS data as follows: Class 1 = Unclassified. This class includes vegetation, buildings, noise etc. Class 2 = Ground Class 7 = Noise Class 9 = Water Class 10 = Ignored Ground Class 17 = overlap ground

Class 18 = overlap unclassified

- 2014-05-22 00:00:00 - Filtered and edited data are subjected to rigorous QA/QC, A series of quantitative and visual procedures are employed to validate the accuracy and consistency of the filtered and edited data. Ground control is established by DAS and GPS-derived ground control points (GCPs) in various areas of dominant and prescribed land cover. These points are coded according to land cover, surface material, and ground control suitability. A suitable number of points are selected for calculation of a statistically significant accuracy assessment, as per the requirements of the National Standard for Spatial Data Accuracy. A spatial proximity analysis is used to select edited LiDAR data points within a specified distance of the relevant GCPs. A search radius decision rule is applied with consideration of terrain complexity, cumulative error, and adequate sample size. Accuracy validation and evaluation is accomplished using proprietary software to apply relevant statistical routines for calculation of Root Mean Square Error (RMSE) and the National Standard for Spatial Data Accuracy (NSSDA), according to Federal Geographic Data Committee (FGDC) specifications.

- 2014-05-25 00:00:00 - The Bare Earth DEM was extracted from the raw LIDAR products and attributed with the bare earth elevation for each cell of the DEM. Bare Earth DEMs do not include buildings, vegetation, bridges or overpass structures in the bare earth model. Where abutments were clearly delineated, this transition occurred at the junction of the bridge and abutment. Where this junction was not clear, the extractor used their best estimate to delineate the separation of ground from elevated bridge surface. In the case of bridges over water bodies, if the abutment was not visible, the junction was biased to the prevailing stream bank so as not to impede the flow of water in a hydrographic model. Bare earth surface includes the top of water bodies not underwater terrain, if visible.

- 2016-05-01 00:00:00 - The NOAA Office for Coastal Management (OCM) received the topographic files in classified LAZ format from USGS' ftp site. The data were received in UTM Zone 18N NAD83 coordinates (meters) and vertically referenced to NAVD88 using the Geoid12a model in meters. OCM performed the following processing for data storage and Digital Coast provisioning purposes: 1. LAS files were compressed to LAZ format with LASTools. 2. LAS files were removed of any duplicated points and extraneous points were reclassified to noise. 3. The LAS files were transformed to geographic (decimal degrees), ellipsoidal coordinates (meters) referenced to the Geoid12a model.

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)
- 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/50135>

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=4970>

https://coast.noaa.gov/htdata/lidar1_z/geoid18/data/4970

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=4970>;

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.