

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:

2011 Worcester County - VA FEMA LiDAR

1.2. Summary description of the data:

Dewberry collected LiDAR for ~3,341 square miles in various Virginia Counties, a part of Worcester County, and Hooper's Island. The acquisition was performed by Terrapoint. This metadata covers the LiDAR produced for Worcester County. The nominal pulse spacing for this project is 0.5 meters. This project was collected with a sensor which collects intensity values for each discrete pulse extracted from the waveform. GPS Week Time, Intensity, Flightline and echo number attributes were provided for each LiDAR point. Dewberry used proprietary procedures to classify the LAS according to contract specifications: 1-Unclassified, 2-Ground, 7-Noise, 9-Water, 10-Ignored Ground due to breakline proximity, and 11-Withheld. Dewberry produced 3D breaklines and combined these with the final LiDAR data to produce seamless hydro flattened DEMs for the 263 tiles (6000 ft x 4000 ft) that cover the project area.

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:

2011-03-05 to 2011-07-29

1.5. Actual or planned geographic coverage of the data:

W: -75.306562, E: -75.047219, N: 38.4528449, S: 38.024069
Coastal Worcester Maryland

1.6. Type(s) of data:

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

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:**

Kirk Waters

2.2. Title:

Metadata Contact

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

kirk.waters@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:

Kirk Waters

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:

Original acquisition and processing of lidar data was completed by Terrapoint and Dewberry. It was delivered to FEMA, USGS, and Maryland. NOAA OCM obtained the data from Maryland iMAP and modified for ingest into the Digital Coast system.

Process Steps:

- 2011-03-01 00:00:00 - Establishment of survey points to support the LiDAR data collection. Two existing published NGS stations (AI7609, HU2327) were observed in a GPS control network and used to establish four new points for the primary control for this site. 1110312 was observed and used to control all flight missions and static ground surveys. The following are the final coordinates of the control points used for this project: SurveyBlock, Station, Latitude(D M S Hem), Longitude(D M S Hem), H-Ell(m), H-MSL(m) Worcester, 1110312, N38 18 22.12367, W75 07 40.46389, -33.7921, 2.2581
- 2011-03-01 00:00:00 - Airborne GPS Kinematic processing Airborne GPS kinematic data was processed on-site using GrafNav kinematic On-The-Fly (OTF) software. Flights were flown with a minimum of 6 satellites in view (13o above the horizon) and with a PDOP of better than 4. Distances from base station to aircraft were kept to a maximum of 40 km, to ensure a strong OTF (On-The-Fly) solution. For all flights, the GPS data can be classified as excellent, with GPS residuals of 3cm average but no larger than 10 cm being recorded. The Geoid09 geoid model, published by the NGS, was used to transform all ellipsoidal heights to orthometric.
- 2011-04-01 00:00:00 - Mission to mission adjustments of Lidar data All missions are validated and adjusted against the adjoining missions for relative vertical biases and collected GPS static and kinematic ground truthing points for absolute vertical accuracy purposes
- 2011-11-01 00:00:00 - Dewberry utilizes a variety of software suites for inventory management, classification, and data processing. All LiDAR related processes begin by importing the data into the GeoCue task management software. GeoCue allows the data to retain its delivered tiling scheme (6000 ft by 4000 ft). The tiled data is then opened in Terrascan where Dewberry uses proprietary ground classification routines to remove any non-ground points and generate an accurate ground surface. The ground routine consists of three main parameters (building size, iteration angle, and iteration distance); by adjusting these parameters and running several iterations of this routine an initial ground surface is developed. The building size parameter sets a roaming window size. Each tile is loaded with neighboring points from adjacent tiles and the routine classifies the data section by section based on this roaming window size. The second most important parameter is the maximum terrain angle, which sets the highest allowed terrain angle within the model. Once the ground routine has been completed a manual quality control routine is done using hillshades, cross-sections, and profiles within the Terrasolid software suite. After this QC step, a peer review and supervisor manual inspection is completed on a percentage of the classified tiles based on the project size and

variability of the terrain. After the ground classification corrections were completed, the dataset was processed through a water classification routine that utilizes breaklines compiled by Dewberry to automatically classify hydrographic features. The water classification routine selects ground points within the breakline polygons and automatically classifies them as class 9, water. During this water classification routine, points which are in close proximity (1 m) to the hydrographic features are moved to class 10, an ignored ground. In addition to classes 1, 2, 8, 9, and 10, the project allows for a Class 7, noise points. This class was only used if needed when points could manually be identified as low/high points. Dewberry also used Class 11 - Withheld points. The fully classified dataset is then processed through Dewberry's comprehensive quality control program. The data was classified as follows: Class 1 = Unclassified. This class includes vegetation, buildings, noise etc. Class 2 = Ground Class 7= Noise Class 8= Model Key Points Class 9 = Water Class 10= Ignored Ground Class 11= Withheld The LAS header information was verified to contain the following: Class (Integer) GPS Week Time (0.0001 seconds) Easting (0.01 ft) Northing (0.01 ft) Elevation (0.01 ft) Echo Number (Integer 1 to 4) Echo (Integer 1 to 4) Intensity (8 bit integer) Flight Line (Integer) Scan Angle (Integer degree)

- Deliverable Product Generation Raw Lidar point were reprojected from UTM zone 18 to the delivery projection State Plane Maryland, US Survey Feet. *Raw Calibrated LIDAR Point Cloud Raw LiDAR point cloud, was provided in the following formats/parameters: - LAS V1.2, point record format 1, Adjusted GPS time, georeferencing information populated in header - The following fields are included in the LAS file: 1. Adjusted GPS time reported to the nearest microsecond 2. Flight line ID 3. Easting (reported to the nearest 0.01m) 4. Northing (reported to the nearest 0.01m) 5.

Elevation (reported to the nearest 0.01m) 6. intensity 7. Echo number 8. Classification 9. Scan angle 10. Edge of scan 11. Scan direction - Full swaths, all collected points delivered (except discarded flightline) - The Withheld bit flags the last 3 degrees of the swath - 1 file per swath, 1 swath per file (except when swath had to be divided in section for size or calibration).

- 2017-10-16 00:00:00 - NOAA OCM downloaded the data from Maryland iMAP as zip files by Block. (Citation: Lidar data from Maryland iMAP)

- 2018-02-26 00:00:00 - Lidar data were changed from NAVD88 (Geoid09) vertical coordinates to ellipsoid heights using the GEOID09 grids. Horizontal coordinates were changed to geographic NAD83(NSRS2007) Data were then ingested into the Digital Coast Data Access Viewer system for distribution.

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)
- 5.2. Quality control procedures employed
- 7.4. Approximate delay between data collection and dissemination
- 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/51657>

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:

Office for Coastal Management (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=8486>

7.3. Data access methods or services offered:

Access via online tool

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)

NCEI_CO

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.