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:
2013 South Carolina DNR Lidar: Greenville County

1.2. Summary description of the data:
The Atlantic Group provided high accuracy, calibrated multiple return LiDAR for roughly 1,510 square miles covering both Greenville and Spartanburg counties, South Carolina. The nominal pulse spacing (NPS) for this project was 1.4m. Dewberry used proprietary procedures to classify the LAS according to project specifications: 1-Unclassified, 2-Ground, 7-Noise, 8-Model Key Points, 9-Water, 10-Ignored Ground, 11-Withheld Points, 13-Bridges and Box Culverts. Dewberry produced 3D breaklines and combined these with the final LiDAR data to produce seamless hydro-flattened DEMs for the 1,029 tiles (5000 ft x 5000 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:
2013-10-01 to 2013-12-31

1.5. Actual or planned geographic coverage of the data:
W: -82.770766, E: -82.139586, N: 34.475885, S: 32.815921

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:
- 2013-03-17 00:00:00 - Data for the South Carolina Dept of Natural Resources project

was acquired by The Atlantic Group. The Atlantic Group provided high accuracy, calibrated multiple return LiDAR for roughly 1,510 square miles around Greenville County, SC and Spartanburg County, SC. The data was delivered in the South Carolina State Plane (International Feet) coordinate system, horizontal datum NAD83 (NSRS 2007), vertical datum NAVD88, Geoid 09, Feet. Atlantic Group operated the collection aircraft; a Cessna T-210 (Tail # N732JE) outfitted with a LEICA ALS70-HP LiDAR system from Atlantic Group's facilities in Courtland. The LiDAR was completed over twenty lifts. LIDAR acquisition began on February 21, 2013 (julian day 052) and was completed on March 17, 2013 (julian day 076). Two hundred and twenty-six (226) passes were planned for Greenville and Spartanburg Counties in South Carolina as a series of parallel flight lines with cross flight lines for the purposes of quality control. The flight plan included a zigzag flight line collection as a result of the inherent IMU drift associated with all IMU systems. In order to reduce any margin for error in the flight plan, Atlantic Group followed FEMA's Appendix A "guidelines" for flight planning and, at a minimum, includes the following criteria: A digital flight line layout using LEICA MISSION PRO flight design software for direct integration into the aircraft flight navigation system; planned flight lines, flight line numbers, and coverage area; LiDAR coverage extended by a predetermined margin beyond all project borders to ensure necessary over-edge coverage appropriate for specific task order deliverables; and local restrictions related to air space and any controlled areas have been investigated so that required permissions can be obtained in a timely manner with respect to schedule. Additionally, Atlantic Group will file our flight plans as required by local Air Traffic Control (ATC) prior to each mission. Atlantic Group monitored weather and atmospheric conditions and conducted LiDAR missions only when no conditions exist below the sensor that will affect the collection of data. These conditions include leaf-off for hardwoods, no snow, rain, fog, smoke, mist and low clouds. LiDAR systems are active sensors, not requiring light, thus missions may be conducted during night hours when weather restrictions do not prevent collection. Atlantic Group accesses reliable weather sites and indicators (webcams) to establish the highest probability for successful collection in order to position our sensor to maximize successful data acquisition. - 2013-03-17 00:00:00 - Within 72-hours prior to the planned day(s) of acquisition, Atlantic Group closely monitored the weather, checking all sources for forecasts at least twice daily. As soon as weather conditions were conducive to acquisition, our aircraft mobilized to the project site to begin data collection. Once on site, the acquisition team took responsibility for weather analysis. Upon notification to proceed, the flight crew loaded the flight plans and validated the flight parameters. The Acquisition Manager contacted air traffic control and coordinated flight pattern requirements. LiDAR acquisition began immediately upon notification that control base stations were in place. During flight operations, the flight crew monitored weather and atmospheric conditions. LiDAR missions were flown only when no condition existed below the sensor that would affect the collection of data. The pilot constantly monitored the aircraft course, position, pitch, roll, and yaw of

the aircraft. The sensor operator monitored the sensor, the status of PDOPs, and performed the first Q/C review during acquisition. The flight crew constantly reviewed weather and cloud locations. Any flight lines impacted by unfavorable conditions were marked as invalid and re-flown immediately or at an optimal time. Data was checked after each mission and after all flown missions to verify complete coverage. Atlantic Group LiDAR sensors are calibrated at a designated site located at the Lawrence County Airport in Courtland, Alabama and are periodically checked and adjusted to minimize corrections at project sites. All surveys were performed to Federal Geodetic Control Subcommittee (FGCS) guidelines. Atlantic Group maximized existing NGS control and the ALDOT CORS stations to provide the control network, designed with proper redundancies, session occupation times, and time between sessions according to the applicable NOS technical standards. GPS observations were conducted using Federal Geodetic Control Committee (FGCC) approved dual frequency GPS receivers. A minimum of two fixed-height tripods were used as ground base stations running at a one (1.0) second epoch collection rate during every mission, typically at a minimum of four hours. The control locations are planned to ensure a 28km baseline distance from the furthest flight line distance. Also, the KP index is considered prior to mission collection and no collection occurred when the KP index was at or above 4. Atlantic Group utilized a combination of software tools to calibrate each flight line to each other as well as to control points. LEICA ALS post processing software was used to extract each individual flight line with initial settings for heading, roll, pitch, and scale. Once these lines are extracted they're then imported into Terra Scan to find the final heading, roll, pitch, and scale adjustments. Distance measurements are taken from flight line to flight line as well as known or established control points. These measurements are then applied to the flight lines through the terra scan software. The lines are then extracted with the calibration corrections and imported into the GeoCue software for classification. Utilizing GeoCue LiDAR ortho raster checklist, final calibration QC is performed to verify relative accuracy of less than or equal to 7cm RMSE(z) within individual swaths. Upon completion of QC the final LAS swaths are exported through Terra Scan based on client parameters and specifications.
- 2013-12-01 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. The swath data is tiled according to project specifications (5000 ft x 5000 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. Before the actual ground routine is run points with scan angles greater than plus or minus 20 degrees are classified to class 11, withheld. Due to these higher scan angles these points have the potential to introduce issues into the ground and are therefore not used in the final 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 that are within 1 foot of the hydrographic features are moved to class 10, an ignored ground due to breakline proximity. 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 Class 11 = Withheld Points Class 13 = Bridges and Culverts The LAS header information was verified to contain the following: Class (Integer) Adjusted GPS Time (0.000001 seconds) Easting (0.001 ft) Northing (0.001 ft) Elevation (0.001 ft) Echo Number (Integer 1 to 4) Echo (Integer 1 to 4) Intensity (8 bit integer) Flight Line (Integer) Scan Angle (Integer degree) - 2016-10-17 00:00:00 - The NOAA Office for Coastal Management (OCM) received the files in LAZ format from the South Carolina Department of Natural Resources (SCDNR) via a HDD. The files contained lidar elevation and intensity measurements. The data were in State Plane Zone 3900, NAVD88 (orthometric) heights in meters. OCM performed the following processing for data storage and Digital Coast provisioning purposes: 1. The data were converted from State Plane coordinates to geographic coordinates. 2. The data were converted from NAVD88 (orthometric) heights in meters to GRS80 (ellipsoid) heights in meters using Geoid 09. 3. The project files were reclassified to fit the OCM scheme: classes 11 and 13 were reclassified to 15 and 17 4. Erroneous elevations were removed.

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/49997

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=5108
https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/5108/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=5108

The data set is dynamically generated based on user-specified parameters.;

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.