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:
 2015-2016 USGS/FEMA Lidar: Connecticut River Watershed, NH

 1.2. Summary description of the data:
 Geographic Extent: Connecticut River Watershed (4,437 sq mi), Winnipesaukee River Watershed (796 sq mi), and portions of the White Mountain National Forest (WMNF) in New Hampshire (181 sq mi), covering approximately 5,233 total square miles.

 Dataset Description: The Connecticut River Watershed 2015 project called for the planning, acquisition, processing and derivative products of LIDAR data to be collected at an aggregate nominal pulse spacing (NPS) of 0.7 meters the Connecticut and Winnipesaukee River Watershed areas of interest, and 0.58 meters NPS for the White Mountain National Forest project area. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification, Version 1.2 as well as the National Enhanced Elevation Assessment (NEEA) for QL2/QL2+ data for the WMNF area. The data was developed based on a horizontal projection/datum of NAD83 (2011) State Plane New Hampshire, US survey feet and vertical datum of NAVD88 (Geoid 12B), US survey feet. Lidar data for all three areas of interest was delivered in RAW LAS 1.4 flightline swath format, and processed to create Classified LAS 1.4 Files formatted to 6,464 individual 5,000-foot x 5,000-foot tiles.

 After approval of the initial dataset was received from the USGS, the additional deliverables was produced for the White Mountain National Forest project area. This dataset includes tiled classified LAS data (first and last return) in LAS 1.4 and comma-delimited ASCII formats and 2.5-foot bare-earth raster DEMs in Esri grid format. Tiles names follow the naming schema implemented in previous WMNF task orders.

 Data were subsequently reprocessed to Entwine Point Tile (EPT) format in web mercator projection with vertical meters. The EPT form of the data is used by the NOAA Digital Coast Data Access Viewer, which this metadata record is supporting. Additional processing steps may have been done by the Data Access Viewer and will be recorded in the lineage section.

 Ground Conditions: LiDAR collection began in Fall 2015, while no snow was on the

ground and rivers were at or below normal levels. In order to post process the LiDAR data to meet task order specifications, Quantum Spatial established 155 calibration control points in order to calibrate the LIDAR to known ground locations established throughout the project area. The accuracy of the data was checked with 135 NVA points and 117 VVA points (252 total QC checkpoints).

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:
2015-10-24 to 2016-04-29

1.5. Actual or planned geographic coverage of the data:
W: -72.57793839123, E: -70.9282606398, N: 45.3113522389, S: 42.70426337249

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Model (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:
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?
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):
Process Steps:

- 2016-01-01 00:00:00 - Lidar Pre-Processing: Airborne GPS and IMU data were merged to develop a Single Best Estimate (SBET) of the lidar system trajectory for each lift. Lidar ranging data were initially calibrated using previous best parameters for this instrument and aircraft. Relative calibration was evaluated using advanced plane-matching analysis and parameter corrections derived. This was repeated iteratively until residual errors between overlapping swaths, across all project lifts, was reduced to acceptable levels. Data were then block adjusted to match surveyed calibration control. Raw data NVA were checked using independently surveyed checkpoints. Swath overage points were identified and tagged within each swath file. The results of the final calibration, NVA and horizontal accuracy assessments, and the "raw" swaths were forwarded to the client to obtain a Notice To Proceed on classification and derivative product generation.

- 2016-01-01 00:00:00 - Lidar Post-Processing: The calibrated and controlled lidar swaths were processed using automatic point classification routines in proprietary software. These routines operate against the entire collection (all swaths, all lifts), eliminating character differences between files. Data were then distributed as virtual tiles to experienced lidar analysts for localized automatic classification, manual editing, and peer-based QC checks. Supervisory QC monitoring of work in progress and completed editing ensured consistency of classification character and adherence to project requirements across the entire

project area.   All classification tags are stored in the original swath files. After completion of classification and final QC approval, the NVA and VVA for the project are calculated. Sample areas for each land cover type present in the project area were extracted and forwarded to the client, along with the results of the accuracy tests. Upon acceptance, the complete classified lidar swath files were delivered to the client.

- 2016-01-01 00:00:00 - Classified LAS Processing: The bare earth surface is then manually reviewed to ensure correct classification on the Class 2 (Ground) points. After the bare-earth surface is finalized, it is then used to generate all hydro-breaklines through heads-up digitization.   All ground (ASPRS Class 2) LiDAR data inside of the Lake Pond and Double Line Drain hydro flattening breaklines were then classified to water (ASPRS Class 9) using TerraScan macro functionality. A buffer of 1 meter was also used around each hydro-flattened feature to classify these ground (ASPRS Class 2) points to Ignored ground (ASPRS Class 10). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the ground (ASPRS Class 2) points were reclassified to the correct classification after the automated classification was completed. All bridge decks were classified to Class 17.

    All overlap data was processed through automated functionality provided by TerraScan to classify the overlapping flight line data to approved classes by USGS. The overlap data was identified using the Overlap Flag, per LAS 1.4 specifications.

   All data was manually reviewed and any remaining artifacts removed using functionality provided by TerraScan and TerraModeler. Global Mapper us used as a final check of the bare earth dataset. GeoCue was then used to create the deliverable industry-standard LAS files for both the All Point Cloud Data and the Bare Earth. Quantum Spatial proprietary software was used to perform final statistical analysis of the classes in the LAS files, on a per tile level to verify final classification metrics and full LAS header information.

- Data were converted to Entwine Point Tiles (EPT) in Web Mercator projection and units of meters by USGS. NOAA is leveraging the EPT files for use in the Digital Coast Data Access Viewer and created this metadata to support that usage. (Citation: Entwine Point Tiles)

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
- 5.2. Quality control procedures employed
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.4. Approximate delay between data collection and dissemination
- 8.3. Approximate delay between data collection and submission to an archive facility

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/71770

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:

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=10025/details/10025

7.3. Data access methods or services offered:
Data is available online for bulk or custom downloads

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_NC

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
Data is backed up to cloud storage.

9. Additional Line Office or Staff Office Questions
Line and Staff Offices may extend this template by inserting additional questions in this section.