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:

Maine and Massachusetts 2015 QL1 and QL2 Lidar

1.2. Summary description of the data:

Geographic Extent:

Central Maine, covering approximately 2,882 total square miles at QL 2.

Western Massachusetts, covering approximately 815 total square miles at QL 1.

Western Massachusetts, covering approximately 2,770 total square miles at QL 2.

Dataset Description:

The Maine and Massachusetts 2015 QL1 and QL2 LiDAR 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 for the 5652 square miles of the QL2 Maine and Massachusetts AOIs, and an NPS of 0.35 meters for the 815 square miles of the QL1 Massachusetts AOI. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base LIDAR Specification, Version 1.2. The data was developed based on a horizontal projection/datum of NAD83 (2011) UTM Zones 18 and 19, meters and vertical datum of NAVD88 (GEOID12A), meters. The application of GEOID12A was subsequently reversed for storage in the Digital Coast Data Access Viewer resulting in ellipsoid heights instead of NAVD88. Lidar data was delivered in RAW flight line swath format, processed to create Classified LAS 1.4 Files formatted to individual 1,500 meter X 1,500 meter tiles for the QL2 data and 750 meter X 750 meter tiles for the QL1 data. Corresponding 1-meter Intensity Image and 1-meter Bare Earth DEM tiles were created with the same tile schema. Breaklines were produced in Esri shapefile format.

Ground Conditions:

Lidar was partially collected in spring of 2015 and completed in winter 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 a total of 286 Land Cover control points in Maine, 255 Land Cover control points in Massachusetts UTM zone 18 and 29 Land Cover control points in Massachusetts zone 19. These were used to calibrate the LIDAR to known ground locations established throughout the entire dataset as follows:

Maine: 136 calibration control points and 150 QC checkpoints.

Massachusetts zone 18: 122 calibration control points and 133 QC checkpoints

Massachusetts zone 19: 17 calibration control points and 22 QC checkpoints

Classification:

Lidar classes used are: 1) Undetermined/Unclassified; 2) Bare earth; 7) Low noise; 8) Model Key Point; 9) Water; 10) Ignored Ground; 17) Bridge Decks; and 18) High Noise.

Original contact information:

Contact Org: National Oceanic and Atmospheric Administration (NOAA)

Title: Coastal Services Center

Phone: (843) 740-1200

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:
2015-04-16 to 2015-12-05

1.5. Actual or planned geographic coverage of the data:
W: -73.51978508909, E: -68.26840969326, N: 45.3645115939, S: 41.99331854836

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Lidar point cloud

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:
- 2015-01-01 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. (Citation: Survey Report of LiDAR Ground Control and Quality Control Points: Maine)

- 2015-01-01 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. (Citation: Survey Report of LiDAR Ground Control and Quality Control Points: Maine)

- 2015-01-01 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 was 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. (Citation: Survey Report of LiDAR Ground Control and Quality Control Points: Maine)
- 2015-01-01 00:00:00 - Hydro-Flattened Breakline Creation: Class 2 LiDAR was used to create a bare earth surface model. The surface model was then used to heads-up digitize 2D breaklines of inland streams and rivers with a 30 meter nominal width and Inland Ponds and Lakes of 2 acres or greater surface area. Elevation values were assigned to all Inland Ponds and Lakes, Inland Pond and Lake Islands, Inland Stream and River Islands, using TerraModeler functionality.
Elevation values were assigned to all Inland streams and rivers using Quantum Spatial proprietary software. All ground (ASPRS Class 2) LiDAR data inside of the collected inland 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. These points were moved from ground (ASPRS Class 2) to Ignored Ground (ASPRS Class 10). The breakline files were then translated to Esri file-geodatabase format using Esri conversion tools. (Citation: Survey Report of LiDAR Ground Control and Quality Control Points: Maine)
- 2015-01-01 00:00:00 - Hydro Flattened Raster DEM Creation: Class 2 LiDAR in conjunction with the hydro breaklines were used to create a 1 meter Raster DEM. Using automated scripting routines within ArcMap, an ERDAS Imagine IMG file was created for each tile. Each surface is reviewed using Global Mapper to check for any surface anomalies or incorrect elevations found within the surface. (Citation: Survey Report of LiDAR Ground Control and Quality Control Points: Maine)
- 2015-01-01 00:00:00 - Intensity Image Creation: GeoCue software was used to create the deliverable Intensity Images with a 1 meter cell size. All overlap classes were ignored during this process. This helps to ensure a more aesthetically pleasing image. The GeoCue software was then used to verify full project coverage as well. TIF/TWF files were then provided as the deliverable for this dataset requirement. (Citation: Survey Report of LiDAR Ground Control and Quality Control Points: Maine)
- 2016-12-01 00:00:00 - The NOAA Coastal Services Center (coast) received the LAS files from Maine and Massachusetts via hard drive. The data was received in UTM zones 18 and 19 horizontal coordinates in meters with vertical coordinates referenced to NAVD88 (GEOID12a) in meters. The Digital Coast performed the following processing for data storage and Digital Coast provisioning purposes: 1. The vertical coordinates were converted to ellipsoidal heights using Geoid12a and horizontal coordinates were reprojected to geographic decimal degrees. 2. Points below -40 meters elevation on the ellipsoid were removed. 3. Data were compressed to LAZ format using laszip (www.laszip.org).

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/49614

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://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/5087/index.html
https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=5087

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=5087

;

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.