

*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 U.S. Geological Survey Topographic LiDAR: LiDAR for the North East

### **1.2. Summary description of the data:**

This data originated with USGS and partners and was modified by NOAA for distribution in the Digital Coast. Modifications primarily involve the projection, vertical datum, and point class coding.

This data was acquired through USGS Contract: G10PC00026

Task Order Numbers: G10PD01027 (ARRA) and G10PD02143 (non-ARRA).

The LiDAR for the North East Project, funded in large part by the American Recovery and Reinvestment Act (ARRA) of 2009, as well as, other funding sources was designed to help stimulate the U.S. economy and provide for more accurate floodplain mapping in the North East, representing the start of a regional LiDAR collection program that served as a test case for a national elevation program. Lead by the United States Geological Survey's (USGS) National Geospatial Program Office and the State of Maine's Office of GIS with active collaboration and participation by other federal, state and local agencies resulted in LiDAR acquisition and processing of over 8,000 sq. miles of (LiDAR) data of a coastal zone spanning six North Eastern states, including Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, and New York. USGS's National Geospatial Technical Operations Center (USGS NGTOC) in Rolla, MO provided project management and quality control oversight for the project which consisted of two Task Orders issued to USGS contractor, GMR Aerial Surveys inc. d/b/a Photo Science (contractor), for task order execution through the use of USGS's Geospatial Products and Services Contract (USGS Contract: G10PC00026). Task Order specifications included state/area specific vertical accuracy, nominal post spacing and tide coordinated acquisition requirements. To see state/area specific information please see the individual project metadata links in the Supplemental\_Information section below.

NOAA OCM received a redelivery for 32 tiles in Maine to fill small voids in data. These redelivered tiles were incorporated on 1/23/2014.

**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:**

2010-12-20 to 2011-12-11

**1.5. Actual or planned geographic coverage of the data:**

W: -74.236678, E: -66.938738, N: 45.193096, S: 40.574468

**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:

- 2012-01-01 00:00:00 - Control Process: James W. Sewall Company was contracted by Photo Science, Inc. to locate a total of 156 calibration control points (60 for MA, 31 for NY, 11 for CT18, 4 for CT19, 25 for NH and 25 for RI) used in the post processing of the LiDAR data as well as 20 quality assurance check points for each state. The points were located on relatively flat terrain on surfaces that generally consisted of grass, gravel or bare earth. See Final Survey Reports for additional collection parameters and methodologies. Raw Flight Line Process: Applanix software was used in the post processing of the airborne GPS and inertial data that is critical to the positioning and orientation of the sensor during all flights. POSPac MMS provides the smoothed best estimate of trajectory (SBET) that is necessary for Optech's post processor to develop the point cloud from the LiDAR missions. The point cloud is the mathematical three dimensional collection of all returns from all laser pulses as determined from the aerial mission. At this point this data is ready for analysis, classification, and filtering to generate a bare earth surface model in which the above ground features are removed from the data set. The point cloud was manipulated within the Optech or Leica software; GeoCue, TerraScan, and TerraModeler software was used for the automated data classification, manual cleanup, and bare earth generation from this data. Project specific macros were used to classify the ground and to remove the side overlap between parallel flight lines. All data was manually reviewed and any remaining artifacts removed using functionality provided by TerraScan and TerraModeler. Classified LAS Process: 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) were reclassified

to the correct classification after the automated classification was completed. A new class has been added to the dataset to represent the bare water of the ocean areas collected throughout the project area. ASPRS Class 14 is being used to represent the bare water ocean surface. While attempts were made to remove all extraneous features above the surface of the water, there may be above surface features classified to this class. Some islands below the required collection specifications have been classified to this class as well. This class was also used during the creation of the ERDAS Imagine Raster DEM files. The Ocean Shoreline and Ocean Island breaklines were used to complete the automated classification of these classes within the final LAS files.

- 2012-01-01 00:00:00 - 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 classified to Class 17 (USGS Overlap Default), Class 18 (USGS Overlap Ground), Class 25 (USGS Overlap Water), and Class 30 (USGS Overlap Bare Water). These classes were created through automated processes only and were not verified for classification accuracy. Due to software limitations within TerraScan, these classes were used to trip the Withheld bit within various software packages. These processes were reviewed and accepted by USGS through multiple conference calls and pilot study areas. Data was then run through additional macros to ensure deliverable classification levels matching the ASPRS LAS Version 1.2 Classification structure. GeoCue functionality was then used to ensure correct LAS Versioning. In-house software was used as a final QA/QC check to provide LAS Analysis of the delivered tiles. QA/QC checks were performed on a per tile level to verify final classification metrics and full LAS header information. Hydro Flattening Breakline Process: 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 8,000 sq. meters or greater surface area. Ocean Shoreline and Ocean Island features were collected at appropriate elevations on an overall review of the surface models to determine the land water breaklines. These features were used to determine the classification within the Classified LAS files. These features can be used to represent a flat water surface, but were not run through the same project quality control procedures as the inland water body features. Elevation differences between ocean shoreline and ocean islands will be found. This is due in large part to the coastal water elevation changes, found between missions, as well as flightline to flightline. Elevation values were assigned to all Inland Ponds and Lakes, Inland Pond and Lake Islands, Inland Stream and River Islands, Ocean Shoreline and Ocean Islands using TerraModeler functionality. Elevation values were assigned to all Inland streams and rivers using Photo Science 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 Shapefile format

using ESRI conversion tools. Raster DEM Process: Using automated scripting routines within ArcMap, the ground (ASPRS Class 2) and bare water (USGS Class 14) were combined with the Hydro Flattened Breaklines (excluding the Ocean Shoreline and Ocean Island line types) to create the 1 meter DEM. Final DEM tiles were clipped to the project tile boundary to provide a seamless dataset. ERDAS IMG files were then created as the project deliverable. A manual QA review of the tiles was completed in ArcMap and Global Mapper to ensure full coverage with no gaps or slivers within the project area.

- 2018-06-12 00:00:00 - The NOAA Office for Coastal Management (OCM) received the topographic files in .LAS format from USGS and the Maine Office of GIS. The classified .LAS files contained lidar elevation and intensity measurements. The data were received in UTM Zone 18N/19N, NAD83 coordinates and were vertically referenced to NAVD88 using the Geoid09 model. The vertical units of the data were meters. OCM performed the following processing for data storage and Digital Coast provisioning purposes: 1. The topographic .LAS files were compressed using LAsTools' laszip software. 2. The topographic .LAS files were converted from a Projected Coordinate System (UTM Zone 18N/19N) to a Geographic Coordinate system (NAD83). 3. The topographic .LAS files were converted from orthometric NAVD88 to NAD83 ellipsoidal heights using Geoid09.

**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/49844>

**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](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=2524>

<https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/2524/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=2524>;

**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.*