

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 MN DNR Lidar: Arrowhead, MN

1.2. Summary description of the data:

The project vendor, Woolpert, Inc., acquired highly accurate Light Detection and Ranging (LiDAR) elevation data for the Arrowhead Region in Northeast Minnesota in Spring 2011. The data cover Carlton, Cook, Lake and St. Louis counties, part of Itasca County, and Voyageurs National Park in Koochiching County. LiDAR data are in the UTM Zone 15 coordinate system, NAD83 NAVD88 Geoid09 meters. The tiling scheme is 16th USGS 1:24,000 quadrangle tiles.

The vendor delivered the data to the Minnesota Department of Natural Resources (DNR) in several formats:

- 1) One-meter digital elevation model
- 2) Edge-of-water breaklines
- 3) Classified LAS formatted point cloud data

DNR staff created two additional products: two-foot contours and building outlines.

The original metadata record was created at the Minnesota Geospatial Information Office by combining information supplied by Woolpert and DNR.

This metadata supports the data entry in the NOAA Digital Coast Data Access Viewer (DAV). For this data set, the DAV is leveraging the Entwine Point Tiles (EPT) hosted by USGS on Amazon Web Services.

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:

2011-05-03 to 2011-06-02

1.5. Actual or planned geographic coverage of the data:

W: -93.23431, E: -89.562, N: 48.664343, S: 46.34806

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):

Lineage Statement:

The Arrowhead, MN lidar was ingested into the Data Access Viewer for custom product generation by leveraging USGS hosted Entwine Point Tiles.

Process Steps:

- Vendor Processing Steps: Woolpert Inc. was selected to provide LiDAR services for CFMS Contract Number B41672 T-Number 1029G Work Order #3 - Minnesota Arrowhead Region. Using Light Detection And Ranging (LiDAR) systems, 390 flight lines of high density data, at a nominal pulse spacing (NPS) of 1.0 meter for acquisition areas 1 and 2 while the remaining areas were collected and processed to meet a Nominal Post Spacing (NPS) of 1.5 meter, were collected over Minnesota counties of Carlton, Cook, Lake, St. Louis, and Itasca Counties and that portion of Koochiching County that comprises Voyageurs National Park (approximately 12,433 square miles). Multiple returns were recorded for each laser pulse along with an intensity value for each return. A total of 55 missions were flown over a 20 day period: May 03, 2011 through June 02, 2011. A minimum of two airborne global positioning system (GPS) base stations were used in support of the LiDAR data acquisition. 87 ground control points were surveyed through static methods. The geoid used to reduce satellite derived elevations to orthometric heights was Geoid09. All data for the task order is referenced to UTM 15N, NAD83, NAVD88, in meters. Airborne GPS data was differentially processed and integrated with the post processed IMU data to derive a smoothed best estimate of trajectory (SBET). The SBET was used to reduce the LiDAR slant range measurements to a raw reflective surface for each flight line. The coverage was classified to extract a bare earth digital elevation model (DEM) and separate last returns. In addition to the LAS deliverables, one layer of coverage were delivered in the ArcINFO ArcGrid binary format: bare-earth. LAS data were classified using the following standard ASPRS categories: 0 Unclassified, 1 Unknown, 2 Bare Earth, 3 Low Vegetation (less than 1.1 m), 4 Medium Vegetation (1.11 - 2.4 m), 5 High Vegetation (2.41 - 200 m), 6 Buildings, 7 Noise, 8 Model Keypoint, 9 Water, 14 Bridge Decks, 17 Overlap

System Parameters for 1.0 NPs: Post Spacing (Minimum): 3.28 ft / 1.0 m AGL (Above Ground Level) average flying height: 6,500 ft / 1,981.2 m MSL (Mean Sea Level) average flying height: 7,700 ft / 2,247 m Average Ground Speed: 130 knots / 149 mph Field of View (full): 40 degrees Pulse Rate: 115.6 kHz Scan Rate: 41.8 Hz

Side Lap (Minimum): 25% System Parameters for 1.5 NPs: Post Spacing (Minimum): 4.92 ft / 1.5 m AGL (Above Ground Level) average flying height: 7,800 ft / 2,377.4 m MSL (Mean Sea Level) average flying height: 8,900 ft / 2712.7 m Average Ground Speed: 150 knots / 172.6 mph Field of View (full): 40 degrees Pulse Rate: 99 kHz Scan Rate: 38 Hz Side Lap (Minimum): 25% Swath Width : variable due to multiple flying heights Distance Between Flight Lines: variable due to multiple flying heights Data is tiled by 1/16 1:24,000-scale quadrangle.

- Additional Products Generated by Minnesota DNR staff: These products are in the geodatabase for each of the tiles: 1. Two-foot contours were created by resampling the 1-meter DEM to 3 meters, then smoothing the 3-meter grid using a neighborhood average routine, and then creating contours from this surface using standard ArcGIS processing tools. 2. Building outlines were created by extracting from the LAS files those points with Classification 6 (buildings), then grouping those points within 3 meters of each other into a single cluster and then creating an outline around those points. This was done using standard ArcMap tools. 3. Hillshades were created from the one- and three-meter DEMs using standard ArcMap tools. Azimuth value = 215, Altitude = 45, Z-Factor = 1

- Original point clouds in LAS/LAZ format were restructured as Entwine Point Tiles and stored on Amazon Web Services. The data were reprojected horizontally to WGS84 web mercator (EPSG 3857) and no changes were made to the vertical (NAVD88 GEOID09 meters).

- 2022-12-02 00:00:00 - The NOAA Office for Coastal Management (OCM) created references to the Entwine Point Tiles (EPT) that were ingested into the NOAA Digital Coast Data Access Viewer (DAV). No changes were made to the data. The DAV will access the point cloud as it resides on Amazon Web Services (AWS) under the usgs-lidar-public container. These are the AWS URLs being accessed: https://s3-us-west-2.amazonaws.com/usgs-lidar-public/USGS_LPC_MN_Arrowhead_B1_2011_LAS_2016/ept.json https://s3-us-west-2.amazonaws.com/usgs-lidar-public/USGS_LPC_MN_Arrowhead_B2_2011_LAS_2016/ept.json https://s3-us-west-2.amazonaws.com/usgs-lidar-public/USGS_LPC_MN_Arrowhead_B3_2011_LAS_2016/ept.json https://s3-us-west-2.amazonaws.com/usgs-lidar-public/USGS_LPC_MN_Arrowhead_B4_2011_LAS_2016/ept.json https://s3-us-west-2.amazonaws.com/usgs-lidar-public/USGS_LPC_MN_Arrowhead_B5_2011_LAS_2016/ept.json

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/68645>

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=9675/details/9675>

https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/Eastern_MN_State_LiDA

7.3. Data access methods or services offered:

Data is available online for bulk and 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_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

Data is backed up to tape and 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.