

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:**

2018 USGS Lidar: Calumet, Clark, Fond du Lac, Green Lake, Price, and Waupaca, WI

1.2. Summary description of the data:

This is a multi-county lidar project in Wisconsin and may be referred to as the 2018 USGS Wisconsin Statewide collection. Coverages by county are: Calumet County = 336 square miles; Clark County = 1228 square miles; Fond Du Lac County = 780 square miles; Green Lake County = 386 square miles; Price County = 1288 square miles; and Waupaca County = 773 square miles.

The lidar data was acquired at a nominal point spacing (NPS) of 0.7 meters and a single swath nominal point density (NPD) of 2.0. Project specifications are based on county requirements and on the U.S. Geological Survey National Geospatial Program Lidar Base Specification, Version 1.2. The data were developed based on a county specific projections and vertical datum of NAVD88 - Geoid12B (Feet). Lidar data were acquired using the Leica ALS80 SN8227 Sensor. Acquisition occurred with leaves absent from deciduous trees, when no snow was present on the ground, and with rivers at or below normal levels.

The original data were transformed to Entwine Point Tile format in Web Mercator projection. The Digital Coast Data Access Viewer is referencing this data for custom processing and this metadata was created to support the Data Access Viewer.

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:

2018-05-13 to 2018-05-16, 2018-05-05 to 2018-05-12, 2018-05-05 to 2018-05-07, 2018-04-28 to 2018-04-30, 2018-05-11 to 2018-05-17, 2018-05-08 to 2018-05-13

1.5. Actual or planned geographic coverage of the data:

W: -88.889287, E: -88.406008, N: 44.245009, S: 43.890201

W: -90.926146, E: -90.310355, N: 45.035393, S: 44.420438

W: -88.889287, E: -88.156964, N: 43.939125, S: 43.541562

W: -89.24686, E: -88.882127, N: 43.984743, S: 43.630452

W: -90.682577, E: -90.03593, N: 45.983786, S: 45.375024

W: -89.22913, E: -88.603886, N: 44.683005, S: 44.240987

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:

- 2019-01-01 00:00:00 - The boresight for each lift was done individually as the solution may change slightly from lift to lift. The following steps describe the Raw Data Processing and Boresight process: 1) Technicians processed the raw data to LAS format flight lines using the final GPS/IMU solution. This LAS data set was used as source data for boresight. 2) Technicians first used Leica LMS software to calculate initial boresight adjustment angles based on sample areas selected in the lift. These areas cover calibration flight lines collected in the lift, cross tie and production flight lines. These areas are well distributed in the lift coverage and cover multiple terrain types that are necessary for boresight angle calculation. The technician then analyzed the results and made any necessary additional adjustment until it is acceptable for the selected areas. 3) Once the boresight angle calculation was completed for the selected areas, the adjusted settings were applied to all of the flight lines of the lift and checked for consistency. The technicians utilized commercial and proprietary software packages to analyze how well flight line overlaps match for the entire lift and adjusted as necessary until the results met the project specifications. 4) Once all lifts were completed with individual boresight adjustment, the technicians checked and corrected the vertical misalignment of all flight lines and also the matching between data and ground truth. The relative accuracy was less than or equal to 7 cm RMSEz within individual swaths and less than or equal to 10 cm RMSEz or within swath overlap (between adjacent swaths). 5) The technicians ran a final vertical accuracy check of the boresighted flight lines against the surveyed check points after the z correction to ensure the requirement of NVA = 19.6 cm 95% Confidence Level (Required Accuracy) was met. Point classification was performed according to USGS Lidar Base Specification 1.2, and breaklines were collected for water features. Bare earth DEMs were exported from the classified point cloud using collected breaklines for hydroflattening.
- 2019-01-01 00:00:00 - LAS Point Cloud Classification: LiDAR data processing for the point cloud deliverable consists of classifying the LiDAR using a combination of automated classification and manual edit/reclassification processes. On most

projects the automated classification routines will correctly classify 90-95 percent of the LiDAR points. The remaining 5-10 percent of the bare earth ground class must undergo manual edit and reclassification. Because the classified points serve as the foundation for the Terrain, DEM and breakline products, it is necessary for the QA/QC supervisor to review the completed point cloud deliverables prior to the production of any additional products. The following workflow steps are followed for automated LiDAR classification: 1. Lead technicians review the group of LiDAR tiles to determine which automated classification routines will achieve the best results. Factors such as vegetation density, cultural features, and terrain can affect the accuracy of the automated classification. The lead technicians have the ability to edit or tailor specific routines in order to accommodate the factors mentioned above, and achieve the best results and address errors. 2. Distributive processing is used to maximize the available hardware resources and speed up the automated processing as this is a resource-intensive process. 3. Once the results of the automated classification have been reviewed and passed consistent checks, the supervisor then approves the data tiles for manual classification. The following workflow steps are followed for manual edits of the LiDAR bare earth ground classification: 1. LiDAR technicians review each tile for errors made by the automated routines and correctly address errors any points that are in the wrong classification. By methodically panning through each tile, the technicians view the LiDAR points in profile, with a TIN surface, and as a point cloud. 2. Any ancillary data available, such as Google Earth, is used to identify any features that may not be identifiable as points so that the technician can make the determination to which classification the feature belongs. The QA/QC processes for the LiDAR processing phase consist of: 1. The lead technician reviews all automated classification results and adjust the macros as necessary to achieve the optimal efficiency. This is an iterative process, and the technician may need to make several adjustments to the macros, depending upon the complexity of the features in the area being processed. During the manual editing process, the LiDAR technicians use a system of QA, whereby they check each others edits. This results in several benefits to the process: - There is a greater chance of catching minor blunders - It increases communication between technicians on technique and appearance - Solutions to problems are communicated efficiently - To ensure consistency across the project area, the supervisor reviews the data once the manual editing is complete. For this phase of a project, the following specifications are checked against: • Point cloud - all points must be classified according to the USGS classification standard for LAS. The all-return point cloud must be delivered in fully-compliant LAS version 1.4. • LAS files will use the Spatial Reference Framework according to project specification and all files shall be projected and defined. • General Point classifications: - Class 1. Processed, but unclassified - Class 2. Bare Earth - Class 5. High Vegetation - Class 6. Building - Class 7. Noise - Class 9. Water - Class 17. Bridge Decks - Class 18. High Noise - Class 20. Ignored ground (Breakline proximity) • Outliers, noise, blunders, duplicates, geometrically unreliable points near the extreme edge of the swath, and other points deemed unusable are to be identified using the "Withheld" flag. This

applies primarily to points which are identified during pre-processing or through automated post-processing routines. Subsequently identified no
- 2023-12-15 00:00:00 - USGS created Entwine Point Tiles for the counties in Web Mercator projection. NOAA leveraged the data in that format for the Data Access Viewer custom processing. This metadata exists to support that custom processing. (Citation: Calumet EPT)

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/71685>

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=10001/details/10001>

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.