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:
2022 NOAA OCM Topobathy Lidar: Washington Island, WI

1.2. Summary description of the data:
These data were collected by Dewberry using a CZMIL Super Nova system. The data were acquired from 20220719 through 20220816. The data include topobathy data in LAS 1.4 format classified as unclassified (1); ground (2); low noise (7); high noise (18); bathymetric bottom (40); water surface (41); derived water surface (42); submerged object, not otherwise specified (e.g., wreck, rock, submerged piling) (43); and no bottom found (bathymetric lidar point for which no detectable bottom return was received) (45).
  This dataset consists of approximately 219 square miles of data along the shores of Green Bay and contains 2,630 500 m x 500 m LAS tiles.

In addition to the lidar point data, topobathy bare earth Digital Elevation Models (DEMs) at a 1 meter grid spacing, created from the lidar point data are available from the NOAA Digital Coast. A link to this data is provided in the URL section of this metadata record.

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:
2022-07-19 to 2022-08-16

1.5. Actual or planned geographic coverage of the data:
W: -87.041476, E: -86.664068, N: 45.445808, S: 45.131468

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:

This data was collected by Dewberry for the NOAA Office for Coastal Management (OCM) . The data was provided to NOAA OCM where it was processed to the NOAA Digital Coast Data Access Viewer (DAV) to make the data available for custom and bulk download.

Process Steps:

- 2023-01-17 00:00:00 - Data were processed to an initial LAS format using Teledyne CARIS software. CARIS was also utilized for GPS and inertial processing, and Terrasolid and LAStools were used for data visualization, 3D editing, and export to final LAS/LAZ. Data were processed using NAD83(2011) horizontal and vertical datums. The data are in UTM Zone 16 coordinates and NAVD88 elevations in meters. The data classifications are: unclassified (1); ground (2); noise (7); water surface (topographic sensor) (18); bathymetric bottom (40); water surface (41); derived water surface (42); submerged object, not otherwise specified (e.g., wreck, rock, submerged piling) (43); and no bottom found (bathymetric lidar point for which no detectable bottom return was received) (45).

- 2023-01-17 00:00:00 - The boresight for each lift was done individually as the solution may change slightly from lift to lift. The initial points for each mission calibration were inspected for flight line errors, flight line overlap, slivers or gaps in the data, point data minimums, or issues with the lidar unit or GPS. Roll, pitch and scanner scale were optimized during the calibration process until the relative accuracy was met. Dewberry utilized Bayesmap StripAlign for this alignment procedure. This alignment procedure corrected systematic issues globally, per aircraft lift, per flightline, and finally based on local errors along the flight trajectory. Error adjustments included internal sensor parameters. Due to the complex geometric relationship of the elliptical scan pattern the forward and reverse directions must be aligned independently. Additionally, since the green and NIR scanner map different surfaces, they were also aligned independently, then corrected to match each other. Difference rasters (DZ orthos) were generated, adjustment parameters were reviewed, and registration/match regions were reviewed to ensure data quality. A final vertical accuracy check of the boresighted flight lines was completed against the surveyed check points after the z correction to ensure the requirement of NVA = 19.6 cm 95% Confidence Level was met. Point classification was performed according to USGS Lidar Base Specification 2.1. Bare earth DEMs were exported from the classified point cloud. Synthetic points generated by CZMIL refraciton correction algorithms are present in this dataset. Please see the final project report for more details on the synthetic points

- 2023-01-17 00:00:00 - Dewberry used algoritms in TerraScan to create the intial ground/submerged topography surface. Dewberry used rasterized aggregate extents of refracted points to create automated 2-D breaklines with LAStools and ArcGIS. Light travels at different speeds in air versus water and its speed and direction of travel change when it enters the water column. The refraction correction process accounts for this difference by adjusting the depth (distance traveled) and horizontal position (change of angle/direction) of the lidar points

acquired within water. These breaklines delineate areas where the refraction correction was applied to the lidar data by CZMIL's automated refraction correction software based on the software's detection of water. The class 42 synthetic surface is generated by the software as a reference surface from which to perform the correction. Dewberry used the 2-D refraction extents and additional bathy features to classify the bathymetric bottom and ground points properly in TerraScan. Geometrically unused points at the edges of flight lines were flagged using the withheld bit. This includes synthetically generated class 42 (synthetic water surface) points at the edges of flight lines. All class 42 points were flagged using the synthetic bit. The withheld bit was set on class 7 and class 18 in TerraScan after all classification was complete. All lidar data was peer-reviewed. Dewberry's QAQC also included creating void polygons for use during review. All necessary edits were applied to the dataset. LASTools software was used to update LAS header information, including all projection and coordinate reference system information. The final lidar data are in LAS format 1.4 and point data record format 6. All data was then verified by an Independent QC department within Dewberry. The independent QC was performed by separate analysts who did not perform manual classification or editing. The independent QC involved quantitative and qualitative reviews.
- 2023-10-20 00:00:00 - The NOAA Office for Coastal Management (OCM) received 2630 topobathy las files from Dewberry for northern Green Bay, Wisconsin. The lidar data had elevation and intensity measurements. The data were in UTM Zone 16N (NAD83 2011), meters coordinates and NAVD88 (Geoid18) elevations in meters. The data were classified as: 1 - Unclassified, 2 - Ground, 7 - Low Noise, 18 - High Noise, 40 - Bathymetric Point, 41 - Water Surface , 42 - Derived Water Surface , 43 - Submerged Object, 45 - No bathymetric bottom found. OCM processed all classifications of points to the Digital Coast Data Access Viewer (DAV). Classes available on the DAV are: 1, 2, 7, 18, 40, 41, 42, 43, 45.   OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. An internal OCM script was run to check the number of points by classification, by flight ID, the gps times, and intensity ranges.   2. Internal OCM scripts were run on the las files to, convert from UTM Zone 16N (NAD83 (2011) meters coordinates to geographic coordinates, to convert from NAVD88 meters elevations to ellipsoid elevations using the NOAA NGS Geoid18 model, to assign the geokeys, to sort the data by gps time and zip the data to database and to AWS S3.

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/71179

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=9949/details/9949
https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/9949/index.html

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.