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 IN DNR Lidar DEM: Indiana Coastline

1.2. Summary description of the data:

Product: These are Digital Elevation Model (DEM) data as part of the required deliverables for the lidar project. Class 2 (Ground) lidar points in conjunction with the hydro breaklines were used to create a 1 ft hydro-flattened Raster DEM.

Geographic Extent: LaPorte, Lake, and Porter counties in Indiana (and small portions of Cook County, Illinois and Berrien County, Michigan), covering approximately 112 square miles.

Dataset Description: The lidar project called for the planning, acquisition, processing, and derivative products of lidar data to be collected at a nominal pulse spacing (NPS) of 0.35 meters. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification 2021, Revision A. The data was developed based on a horizontal projection/datum of NAD83(HARN), Indiana West Feet, and vertical datum of NAVD88 (GEOID18) Feet. Lidar data was delivered as processed Classified LAS 1.4 files, formatted to 1995 individual 1250 ft x 1250 ft tiles clipped to the DPA, as tiled Intensity Images and tiled bare-earth DEMs; all tiled to the same 1250 ft x 1250 ft schema.

Ground Conditions: Lidar was collected in April 2022, while no snow was on the ground and rivers were at or below normal levels.

Sanborn Map Company, Inc. established a total of 25 accuracy check points, 20 in Bare Earth and Urban landcovers (20 NVA points), 5 in Tall Grass and Brushland/Low Trees categories (5 VVA points), that were used to assess the vertical accuracy of the data.

These data were received by the NOAA Office for Coastal Management (OCM) from the Indiana Dept. of Natural Resources (IN DNR). NOAA OCM processed the data to be available for custom and bulk downloads from the NOAA Digital Coast Data Access Viewer (DAV). In addition to these bare earth Digital Elevation Model (DEM) data, the lidar point data that these DEM data were created from are also available from the NOAA Digital Coast. The link to these data and the hydro breaklines are provided in the

URL section of this metadata record. Reports and hillshade rasters are available by request at coastal.info@noaa.gov.

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:
2022-04-23

1.5. Actual or planned geographic coverage of the data:
W: -87.561124, E: -86.722008, N: 41.813054, S: 41.592519

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 Sanborn Map Company, Inc., collected lidar data for the Indiana (and small portions of the Illinois and Michigan) coastline for the Indiana Department of Natural Resources (IN DNR). The IN DNR provided the data to NOAA OCM for data distribution via the NOAA Digital Coast.

Process Steps:

- 2022-01-01 00:00:00 - The boresight was completed prior to project execution. The following steps describe the Raw Data Processing process: 1) Technicians processed the raw data to LAS format flight lines using the final GNSS/IMU solution. This LAS data set was used as source data for lidar matching. 2) 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. 3) Once all lifts were completed with lidar matching, 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 6 cm RMSEz within individual swaths and less than or equal to 8 cm RMSEz or within swath overlap (between adjacent swaths). 4) The technicians ran a final vertical accuracy check of the 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 2021, Revision A, and breaklines were collected for water features. Bare-earth DEMs were exported from the classified point cloud using collected breaklines for hydroflattening.
- 2022-01-01 00:00:00 - LAS Point Classification: The point classification is performed

as described below. 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 Class 2 (Ground) lidar data inside of the Lake Pond and Double Line Drain hydro-flattened breaklines were then classified to Class 9 (Water) using LP360 functionality. A buffer of 1 ft was also used around each hydro-flattened feature to classify these Class 2 (Ground) points to Class 20 (Ignored Ground). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the Class 2 (Ground) points were reclassified to the correct classification after the automated classification was completed. All data was manually reviewed and any remaining artifacts removed using functionality provided by LP360, 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. Sanborn Map Company, Inc. 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.
- 2022-01-01 00:00:00 - Data was tested at 0.29 meter aggregate nominal pulse spacing and at 12.0 aggregate points per meter. The aggregate nominal pulse spacing was tested on classified tiled LAS using geometrically reliable first-return points. ANPS was tested using Delaunay Triangulation that produced average point spacing between all nearest neighbors.
- Hydro-flattened Bare-earth DEM Process: Class 2 (Ground) lidar points in conjunction with the hydro breaklines were used to create a 1 ft hydro-flattened Raster DEM. Using automated scripting routines within LP360, a GeoTIFF 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.
- 2023-02-22 00:00:00 - The NOAA Office for Coastal Management (OCM) received 1995 files in tif format from the Indiana DNR for the Indiana Lake Michigan coastline. The bare earth raster files were at a 1 ft grid spacing. The data were in Indiana State Plane West NAD83(HARN), US survey feet coordinates and NAVD88 (Geoid18) elevations in feet. OCM assigned the appropriate EPSG codes (Horiz - 2968 and Vert - 6360) and copied the raster files to https for Digital Coast storage and provisioning purposes.

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/69334

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=9761/details/9761
https://noaa-nos-coastal-lidar-pds.s3.us-east-1.amazonaws.com/dem/IN_Coastline_DEM_2022_9761/in

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.