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:

2011-2013 Indiana Statewide Imagery and LiDAR Program: Lake Michigan Watershed Counties

1.2. Summary description of the data:

Indiana's Statewide LiDAR data is produced at 1.5-meter average post spacing for all 92 Indiana Counties covering more than 36,420 square miles. New LiDAR data was captured except where previously captured LiDAR data exists, or the participating County bought-up to a higher resolution of 1.0-meter average post spacing LiDAR data. Existing LiDAR data exists for: Porter, Steuben, Noble, De Kalb, Allen, Madison, Delaware, Hendricks, Marion, Hancock, Morgan, Johnson, Shelby, Monroe, and portions of Vermillion, Parke, Vigo, Clay, Sullivan, Knox, Gibson, and Posey. These existing LiDAR datasets were seamlessly integrated into this new statewide dataset. From this seamless LiDAR product a statewide 5-foot post spacing hydro-flattened DEM product was created and is also available. See the FGDC Metadata provided for more details. This statewide project is divided into three geographic areas captured over a 3-year period (2011-2013). Area 1: St. Joseph, Elkhart Area 2 (2012): LaGrange, Area 3 (2013): Lake, Porter, LaPorte

Original contact information:

Contact Org: Indiana Office of Information Technology

Title: State of Indiana GIS Officer

Phone: (317) 234-5889

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:

2011-03-13 to 2012-04-30

1.5. Actual or planned geographic coverage of the data:

W: -87.53026, E: -85.18312, N: 41.78118, S: 41.15913

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)

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:

- 2012-04-30 00:00:00 - Block 7(partial) and 8 - Using an Optech Gemini LiDAR system, 152 flight lines of high density data, at a nominal pulse spacing (NPS) of 1.5 meter (1.0 meters for Floyd and Dearborn Counties)and Blocks 5, 6, and 7(partial) - Using Leica ALS LiDAR systems, 219 flight lines of high density data were collected, at a nominal pulse spacing (NPS) of 1.5 meter. Multiple returns were recorded for each laser pulse along with an intensity value for each return. A total of thirty (30) missions were flown January 31, 2012 December 13, 2012. Eleven (11) airborne global positioning system (GPS) base stations were used in support of the LiDAR data acquisition. 248 ground control points were surveyed through static methods. The geoid used to reduce satellite derived elevations to orthometric heights was Geoid09. The horizontal datum used for this survey is North American Datum 1983 (NSRS2007), Indiana State Plane Coordinate System, East Zone, and expressed in US Survey Feet. The vertical datum used for this survey is North American Vertical Datum 1988 (NAVD88), and expressed in US Survey Feet. 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. System Parameters: - Type of Scanner = Optech Gemini - Data Acquisition Height = 7, 380-feet AGL - Scanner Field of View = 20 degrees - Scan Frequency = 32 Hertz - Pulse Repetition Rate - 100.0 Kilohertz - Aircraft Speed = 150 Knots - Swath Width = 5374 feet - Number of Returns Per Pulse = Maximum of 4 - Distance Between Flight Lines = Varies. System Parameters: - Type of Scanner = Leica ALS50-II / ALS60 / ALS70 - Data Acquisition Height = 7800 feet AGL - Scanner Field of View = 40 degrees - Scan Frequency = Varies - Pulse Repetition Rate - 99 Kilohertz - Aircraft Speed = Varies - Swath Width = 5678 feet - Number of Returns Per Pulse = Maximum of 4 - Distance Between Flight Lines = Varies.
- 2011-01-01 00:00:00 - The Optech Gemini and Leica systems' LiDAR system calibration and performance is verified on a periodic basis using Woolpert's calibration range. The calibration range consists of a large building and runway. The edges of the building and control points along the runway have been located using conventional survey methods. Inertial measurement unit (IMU) misalignment angles and horizontal accuracy are calculated by comparing the position of the building edges between opposing flight lines. The scanner scale factor and vertical accuracy is calculated through comparison of LiDAR data against control points

along the runway. Field calibration is performed on all flight lines to refine the IMU misalignment angles. IMU misalignment angles are calculated from the relative displacement of features within the overlap region of adjacent (and opposing) flight lines. The raw LiDAR data is reduced using the refined misalignment angles.
- 2012-03-02 00:00:00 - Once the data acquisition and GPS processing phases are complete, the LiDAR data was processed immediately to verify the coverage had no voids. The GPS and IMU data was post processed using differential and Kalman filter algorithms to derive a best estimate of trajectory. The quality of the solution was verified to be consistent with the accuracy requirements of the project.
- 2012-04-03 00:00:00 - The individual flight lines were inspected to ensure the systematic and residual errors have been identified and removed. Then, the flight lines were compared to adjacent flight lines for any mismatches to obtain a homogeneous coverage throughout the project area. The point cloud underwent a classification process to determine bare-earth points and non-ground points utilizing "first and only" as well as "last of many" LiDAR returns. This process determined bare-earth points (Class 2), noise (Class 7), water (Class 9) ignored ground (Class 10), unclassified data (Class 1), overlap points (Class 12), and bridges (Class 13). The bare-earth (Class 2 - Ground) LiDAR points underwent a manual QA/ QC step to verify that artifacts have been removed from the bare-earth surface. The surveyed ground control points are used to perform the accuracy checks and statistical analysis of the LiDAR dataset.
- 2012-04-30 00:00:00 - Breaklines defining lakes, greater than two acres, and double-line streams, wider than 100 feet (30.5 meters), were compiled using digital photogrammetric techniques as part of the hydrographic flattening process and provided as ESRI Polyline Z and Polygon Z shape files. Breaklines defining water bodies and streams were compiled for this task order. The breaklines were used to perform the hydrologic flattening of water bodies, and gradient hydrologic flattening of double line streams. Lakes, reservoirs and ponds, at a nominal minimum size of two (2) acres or greater, were compiled as closed polygons. The closed water bodies were collected at a constant elevation. Rivers and streams, at a nominal minimum width of 100 feet (30.5 meters), were compiled in the direction of flow with both sides of the stream maintaining an equal gradient elevation. The hydrologic flattening of the LiDAR data was performed for inclusion in the National Elevation Dataset (NED).
- 2013-09-04 00:00:00 - The NOAA Office for Coastal Management (OCM) received the files in laz format. The files contained Lidar elevation and intensity measurements. The Indiana East State Plane counties of Elkhart, St. Joseph and LaGrange were received in Indiana State Plane projection east (1301) in feet and NAVD88 Geoid 09 vertical datum. The Indiana West State Plane counties of LaPorte, Porter and Lake were said to be in Indiana State Plane west (1302) akin to the eastern counties however at closer inspection these tiles did not align with the eastern counties after transformation to geographic coordinates and ellipsoidal heights. It was then discovered that the tiles were in fact already in geographic WGS84. Therefore a transformation of horizontal coordinates was completed on the eastern counties

and all counties received an ellipsoidal transformation. The resulting tiles align to each other and to existing OCM Lake Michigan bathymetry/topographical collections and Ohio topographical data. OCM performed the following processing to the data to make it available within the Digital Coast: 1. The eastern Indiana county data were converted from State Plane coordinates to geographic coordinates. 2. The data were converted from NAVD88 (orthometric) heights to GRS80 (ellipsoid) heights using Geoid 09. 3. The high and low error outlier elevations were removed and variable length records (vlr) were removed. 4. The LAS data were sorted by latitude and the headers were updated. 5. Originally classed points as bridges (classification 13) were moved to ASPRS class 17 (bridge deck)

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:
- 1.6. Type(s) of data
- 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/49763

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?

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=3649
https://coast.noaa.gov/htdata/lidar1_z/geoid18/data/3649

7.3. Data access methods or services offered:
https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=3649

This data set is dynamically generated based on user-specified parameter

;

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.