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:

2020 USGS Lidar: Hicks Dome Fluorspar District, IL

1.2. Summary description of the data:

Product: These lidar data are processed Classified LAS 1.4 files, formatted to individual 2000 US survey feet x 2000 US survey feet tiles; used to create intensity images, 3D breaklines and hydro-flattened DEMs as necessary.

Geographic Extent:

IL_HicksDome_FluorsparDistrict_B1_2019 (Work Unit 183399; Block 1)

Block 1 HicksDome_FloursparDistrict Illinois, covering approximately 2616 square miles. Counties include in this block: Franklin, Hamilton, Johnson, Saline, Wayne (portion), Williamson

IL_HicksDome_FluorsparDist_2_2019 (Work Unit 222506; Block 2 East)

Block 2 East HicksDome_FloursparDistrict Illinois, covering approximately 2399 square miles. Counties include in this block: Edwards, Gallatin, Hardin, Massac, Pope, Wabash, Wayne (portion), White

IL_HicksDome_FluorsparDist_3_2019 (Work Unit 222509; Block 3 West)

Block 2 West HicksDome_FloursparDistrict Illinois, covering approximately 2685 square miles. Counties include in this block: Alexander, Monroe, Pulaski, Randolph, St. Clair, Union

Dataset Description:

IL_HicksDome_FluorsparDistrict_B1_2019 (Work Unit 183399; Block 1)

Block 1 HicksDome_FloursparDistrict, Illinois 2019 Lidar project called for the planning, acquisition, processing and derivative products of lidar data to be collected at a nominal pulse spacing of 0.5 meter. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification, Version 1.3. The data was developed based on a horizontal projection/datum of NAD83(2011), State Plane Illinois

East, US survey feet, and a vertical datum of NAVD88 (GEOID12B), US survey feet. Lidar data was delivered as processed Classified LAS 1.4 files, formatted to 18,609 individual 2000 US survey feet x 2000 US survey feet tiles, as was tiled Intensity Imagery, and 18, 609 tiled bare earth DEMs; all tiled to the same 2000 US survey feet x 2000 US survey feet schema. DEMs were created with a 2 foot cell size and for that reason one DEM could not be produced for Tile 7430_4150 due to the tile containing less that 2 feet of data within the AOI.

IL_HicksDome_FluorsparDist_2_2019 (Work Unit 222506; Block 2 East)

Block 2 East HicksDome_FloursparDistrict Illinois 2019 Lidar project called for the planning, acquisition, processing and derivative products of lidar data to be collected at a nominal pulse spacing (NPS) of 0.5 meters. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification, Version 1.3. The data was developed based on a horizontal projection/datum of NAD83(2011), State Plane Illinois East, US survey feet, and a vertical datum of NAVD88 (GEOID12B), US survey feet. Lidar data was delivered as processed Classified LAS 1.4 files, formatted to 17,232 individual 2000 US survey feet x 2000 US survey feet tiles, 17,201 LAS files,as was tiled Intensity Imagery, and 17,232 tiled bare earth DEMs; all tiled to the same 2000 US survey feet x 2000 US survey feet schema. Lidar point cloud LAS files are created for each tile in the tiling schema in which there is reflected photonic energy. No LAS files are created for tiles in which there is total absorption of photons, such as tiles consisting of all water and in which photonic energy is absorbed. LAS files affected by photonic energy absorption are; 1011_2830, 1021_2870, 1037_3590, 1037_3610, 1041_2910, 1043_2910, 1045_2910, 1063_3110, 8090_2030, 8130_1990, 8150_1990, 8230_1970, 8310_1930, 8410_1870, 8430_1870, 8450_1870, 8470_1830, 8470_1850, 8470_1870, 8490_1830, 8510_1830, 8790_1670, 8790_1690, 8810_1670, 8850_1670, 8910_1630, 8950_1630, 9270_1430, 9530_1590, 9530_1890, 9530_1930, 9550_1850. Intensity Images are created for each tile in the tiling schema in which there is reflected photonic energy. No intensity tiles are created for tiles in which there is total absorption of photons, such as tiles consisting of all water and in which photonic energy is absorbed.

IL_HicksDome_FluorsparDist_3_2019 (Work Unit 222509; Block 2 West)

Block 2 West HicksDome_FloursparDistrict Illinois 2019 Lidar project called for the planning, acquisition, processing and derivative products of lidar data to be collected at a nominal pulse spacing (NPS) of 0.5 meters. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification, Version 1.3. The data was developed based on a horizontal projection/datum of NAD83(2011), State Plane Illinois West, US survey feet, and a vertical datum of NAVD88 (GEOID12B), US survey feet. Lidar data was delivered as processed Classified LAS 1.4 files, formatted to 19,255 individual 2000 US survey feet x 2000 US survey feet tiles, 19,250 LAS files,as was tiled Intensity Imagery, and 19,255 tiled bare earth DEMs; all tiled to the same 2000 US survey feet x 2000 US survey feet schema. Lidar point cloud LAS files are created for each tile in the tiling schema in which there is reflected photonic energy. No LAS files are created for tiles in which there is total absorption of photons, such as tiles consisting

of all water and in which photonic energy is absorbed. LAS files affected by photonic energy absorption are; 2483_2210, 2655_2050, 2657_2050, 2643_2030, 2295_5090. Intensity Images are created for each tile in the tiling schema in which there is reflected photonic energy. No intensity tiles are created for tiles in which there is total absorption of photons, such as tiles consisting of all water and in which photonic energy is absorbed.

Ground Conditions:

IL_HicksDome_FluorsparDistrict_B1_2019 (Work Unit 183399; Block 1)

Lidar was collected in early 2020, while no snow was on the ground and rivers were at or below normal levels. In order to post process the lidar data to meet task order specifications and meet ASPRS vertical accuracy guidelines, Subcontractor, Surveying and Mapping, LLC (SAM) established a total of 39 ground control points that were used to calibrate the lidar to known ground locations established throughout the Block 1 HicksDome_FloursparDistrict, Illinois project area. An additional 98 independent accuracy checkpoints, 57 in Bare Earth and Urban landcovers (57 NVA points), 41 in tall Grass/tall weeds/crops, Brush lands/short trees, Forested categories (41 VVA points), were used to assess the vertical accuracy of the data. These checkpoints were not used to calibrate or post process the data.

IL_HicksDome_FluorsparDist_2_2019(Work Unit 222506; Block 2 East)

Lidar was collected in early 2020, while no snow was on the ground and rivers were at or below normal levels. In order to post process the lidar data to meet task order specifications and meet ASPRS vertical accuracy guidelines, Subcontractor, Surveying and Mapping, LLC (SAM) established a total of 35 ground control points that were used to calibrate the lidar to known ground locations established throughout the Block 2 East HicksDome_FloursparDistrict, Illinois project area. An additional 92 independent accuracy checkpoints, 53 in Bare Earth and Urban landcovers (53 NVA points), 39 in tall Grass/tall weeds/crops, Brush lands/short trees, Forested categories (39 VVA points), were used to assess the vertical accuracy of the data. These checkpoints were not used to calibrate or post process the data.

IL_HicksDome_FluorsparDist_3_2019 (Work Unit 222509; Block 2 West)

Lidar was collected in spring and late fall 2020, while no snow was on the ground and rivers were at or below normal levels. In order to post process the lidar data to meet task order specifications and meet ASPRS vertical accuracy guidelines, Subcontractor, Surveying and Mapping, LLC (SAM) established a total of 61 ground control points that were used to calibrate the lidar to known ground locations established throughout the Block 2 West HicksDome_FloursparDistrict, Illinois project area. An additional 171 independent accuracy checkpoints, 97 in Bare Earth and Urban landcovers (97 NVA points), 74 in tall Grass/tall weeds/crops, Brush lands/short trees, Forested categories (74 VVA points), were used to assess the vertical accuracy of the data. These checkpoints were not used to calibrate or post process the data.

This metadata record 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:
2020-02-29 to 2020-03-01, 2020-03-05 to 2020-03-08, 2020-02-29 to 2020-03-08, 2020-12-06 to 2020-12-11, 2020-03-05 to 2020-12-10

1.5. Actual or planned geographic coverage of the data:
W: -89.18, E: -88.28, N: 38.63, S: 37.3
IL_HicksDome_FluorsparDistrict_B1

W: -88.94, E: -87.63, N: 38.63, S: 37.07
IL_HicksDome_FluorsparDist_2

W: -90.4, E: -88.92, N: 38.69, S: 36.98
IL_HicksDome_FluorsparDist_3

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 NOAA Office for Coastal Management (OCM) ingested references to the USGS Entwine Point Tile (EPT) files hosted on Amazon Web Services (AWS) into the Digital Coast Data Access Viewer (DAV). The DAV accesses the point cloud as it resides on AWS under the usgs-lidar-public-container.

Process Steps:
- 2021-02-11 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 Aerial Services Inc. proprietary and commercial 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 6 cm RMSEz within individual swaths and less than or equal to 8 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 1.4, and breaklines were collected for water features. Bare earth DEMs were exported from the classified point cloud using collected breaklines for hydroflattening.

- 2021-08-25 00:00:00 - LAS Point Classification: The point classification was performed as described below. Classification Filters were applied to aid in the definition of; terrain characteristics, and vegetation attribution to low, medium, or high. Filtering processes address aspects of the data such as ground points, noise points, air points, low points, manmade features, and setting withheld and overlap bitset. The automated filtration defined: Low Vegetation at 0.5-5 feet, Medium Vegetation at 5-20 feet, and High Vegetation at >20 feet by distance from the ground. Classifying low vegetation to class code 3, medium vegetation to class code 4, and high vegetation to class code 5 respectively. These vegetation classes represent all non-noise points that fall into the distances above the ground surface, and will likely include buildings, utility poles, powerlines, and other infrastructure. The Classified point cloud data was manually reviewed to ensure correct classification of; ground (ASPRS class 2). After the bare earth surface was finalized, it was then used to generate all hydro-breaklines through heads-up digitization. All ground (ASPRS class 2) lidar data inside of the Inland Ponds and Lakes, and Inland Streams and Rivers are classified to water (ASPRS class 9). A buffer of 2.5 feet was used around each hydro-flattened feature to classify ground (ASPRS class 2) to ignored ground (ASPRS class 20). Island features were checked to ensure that Ground point (ASPRS class 2) remained classified as Ground. Ground points (ASPRS class 2) within 2.5 feet of bridge breaklines, used to reduce triangulation between bridge decks were also classified to Ignored ground (ASPRS class 20). All bridge decks were classified to Bridge deck (ASPRS class 17). All remaining points were filtered, or manually classified to their respective point classification; processed (ASPRS class 1), low vegetation (ASPRS class 3), medium vegetation (ASPRS class 4), high vegetation (ASPRS class 5), low noise (ASPRS class 7), high noise (ASPRS class 18). TerraScan version 021.005 was used to identify the withheld and overlap flag and bit set flags

to LAS v1.4 specifications. LP360 64bit was used to deduce the Well Known Text (WKT) and an ASI proprietary software was used to format the LAS to the final LAS v1.4 Format 6 version. LAStools by rapidlasso GmbH, open source, lasvalidate (open source LGPL) and an ASI proprietary software was used to perform final analysis to checks on LAS header information, LAS point classes, and LAS timestamps.
- 2021-02-11 00:00:00 - Data was tested at 0.5 meter nominal pulse spacing and a 4 pulses per meter. The nominal pulse spacing was tested on classified tiled LAS using geometrically reliable first-return points. NPS was tested using Delaunay Triangulation that produced average point spacing between all nearest neighbors.
- Original point clouds in LAS/LAZ format were restructured as Entwine Point Tiles and stored on Amazon Web Services. The data were re-projected horizontally to WGS84 web mercator (EPSG 3857) and no changes were made to the vertical elevations in NAVD88 (GEOID12B).
- 2023-08-28 00:00:00 - The NOAA Office for Coastal Management (OCM) created references to the Entwine Point Tile (EPT) files 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 URLs being accessed: https://s3-us-west-2.amazonaws.com/usgs-lidar-public/IL_HicksDome_FluorsparDistrict_B1_2019/ept.json https://s3-us-west-2.amazonaws.com/usgs-lidar-public/IL_HicksDome_FluorsparDist_2_2019/ept.json https://s3-us-west-2.amazonaws.com/usgs-lidar-public/IL_HicksDome_FluorsparDist_3_2019/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/70658

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=9888/details/9888
https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/IL_HicksDome_Fluorspa

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.