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:

2017 FEMA Lidar: California Region 9

1.2. Summary description of the data:

Eagle Mapping collected 2201 square miles for California FEMA R9 Lidar Project's five FEMA Region IX AOIs (Alpine, Cow Creek, Keefer, Russian, Upper Pit). The nominal pulse spacing for the FEMA Region IX AOIs was 1 point every 0.7 meters. Dewberry used proprietary procedures to classify the LAS according to project specifications: 1-Unclassified, 2-Ground, 7-Low Noise, 9-Water, 10-Ignored Ground due to breakline proximity, 17- Bridge Decks, 18-High Noise. Dewberry produced 3D breaklines and combined these with the final lidar data to produce seamless hydro flattened DEMs for the project area. The data was formatted according to the USNG tile naming convention with each tile covering an area of 5,000 feet by 5,000 ft.

Quantum Spatial collected 1228 square miles for California FEMA R9 Lidar Project's Mendocino QL1 AOI. The nominal pulse spacing for the Mendocino QL1 AOI was 1 point every 0.35 meters. Dewberry used proprietary procedures to classify the LAS according to project specifications: 1-Unclassified, 2-Ground, 3-Low Vegetation (<10 ft) , 4-Medium Vegetation (10 - 120 ft), 5-High Vegetation (> 120 ft), 6-Buildings, 7-Low Noise, 9-Water, 10-Ignored Ground due to breakline proximity, 17- Bridge Decks, 18-High Noise. Dewberry produced 3D breaklines and combined these with the final lidar data to produce seamless hydro flattened DEMs for the project area. The data was formatted according to the USNG tile naming convention with each tile covering an area of 5,000 feet by 5,000 feet.

The NOAA Office for Coastal Management (OCM) downloaded 6 data sets from this USGS site:

ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/

The data sets downloaded were:

USGS_LPC_CA_FEMA_R9_Alpine_2017_LAS_2018/ Number of files: 30

USGS_LPC_CA_FEMA_R9_Cow_Creek_2017_LAS_2018/ Number of files: 138

USGS_LPC_CA_FEMA_R9_Keefer_2017_LAS_2018/ Number of files: 126

USGS_LPC_CA_FEMA_R9_Menodcino_2017_LAS_2018/ Number of files: 1511

USGS_LPC_CA_FEMA_R9_Russian_2017_LAS_2018/ Number of files: 696

USGS_LPC_CA_FEMA_R9_Upper_Pit_2017_LAS_2019/ Number of files: 1790

These files were processed to the Data Access Viewer (DAV) and https. The total number of files downloaded and processed was 4291.

Hydro breaklines are also available. These data are available for download at the link provided in the URL section of this metadata record. Please note that these products have not been reviewed by the NOAA Office for Coastal Management (OCM) and any conclusions drawn from the analysis of this information are not the responsibility of NOAA or OCM.

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:
2017-03-03 to 2017-08-24

1.5. Actual or planned geographic coverage of the data:
W: -123.837496, E: -119.962208, N: 41.710152, S: 38.417921

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:
USGS

Process Steps:
- 2017-08-01 00:00:00 - Data for the California FEMA R9 Lidar Project's five FEMA AOIs (Upper Pit, Keefer-Slough, Cow Creek, Alpine, and Russian Mendocino) was acquired by Eagle Mapping. The five AOIs' area included approximately 2201 contiguous square miles for the California counties of Mendocino, Shasta, Alpine, Butte, Modoc, and Lassen. Lidar sensor data were collected with the Riegl Q1560 dual channel lidar system. Upper Pit and Cow Creek were delivered in the State Plane coordinate system, US survey feet, California Zone 1, horizontal datum NAD83, vertical datum NAVD88, Geoid 12B. Alpine, Russian Mendocino, and Keefer-Slough were delivered in the State Plane coordinate system, US survey feet, California Zone

2, horizontal datum NAD83, vertical datum NAVD88, Geoid 12B. Deliverables for the project included calibrated lidar point cloud, survey control, and a final acquisition/ calibration report. Data for the California FEMA R9 Lidar Project's Mendocino QL1 AOI was acquired by Quantum Spatial. Mendocino QL1's area included approximately 1228 contiguous square miles for the California county of Mendocino. Lidar sensor data were collected with the Leica ALS-80 HP lidar system. Mendocino QL1 AOI was delivered in the State Plane coordinate system, US survey feet, California Zone 2, horizontal datum NAD83, vertical datum NAVD88, Geoid 12B. Deliverables for the project included calibrated lidar point cloud, survey control, and a final acquisition/calibration report. The calibration process considered all errors inherent with the equipment including errors in GPS, IMU, and sensor specific parameters. Adjustments were made to achieve a flight line to flight line data match (relative calibration) and subsequently adjusted to control for absolute accuracy. Process steps to achieve this are as follows: Rigorous lidar calibration: all sources of error such as the sensor's ranging and torsion parameters, atmospheric variables, GPS conditions, and IMU offsets were analyzed and removed to the highest level possible. This method addresses all errors, both vertical and horizontal in nature. Ranging, atmospheric variables, and GPS conditions affect the vertical position of the surface, whereas IMU offsets and torsion parameters affect the data horizontally. The horizontal accuracy is proven through repeatability: when the position of features remains constant no matter what direction the plane was flying and no matter where the feature is positioned within the swath, relative horizontal accuracy is achieved. Absolute horizontal accuracy is achieved through the use of differential GPS with base lines shorter than 25 miles. The base station is set at a temporary monument that is 'tied-in' to the CORS network. The same position is used for every lift, ensuring that any errors in its position will affect all data equally and can therefore be removed equally. Vertical accuracy is achieved through the adjustment to ground control survey points within the finished product. Although the base station has absolute vertical accuracy, adjustments to sensor parameters introduces vertical error that must be normalized in the final (mean) adjustment. The withheld and overlap bits are set and all headers, appropriate point data records, and variable length records, including spatial reference information, are updated in GeoCue software and then verified using proprietary Dewberry tools.

- 2017-08-01 00:00:00 - For the California FEMA R9 Lidar Project's five FEMA AOIs (Upper Pit, Keefer-Slough, Cow Creek, Alpine, and Russian Mendocino): Dewberry utilizes a variety of software suites for inventory management, classification, and data processing. All lidar related processes begin by importing data into GeoCue task management software. Swath data is tiled according to project specifications (5,000 ft x 5,000 ft). Tiled data is then opened in Terrascan where Dewberry identifies edge of flight line points that may be geometrically unusable with the withheld bit. These points are separated from main point cloud so that they are not used in the ground algorithms. Overage points are then identified with overlap bit. Dewberry uses proprietary ground classification routines to remove any non-

ground points and generate an accurate ground surface. The ground routine consists of three main parameters (building size, iteration angle, and iteration distance); by adjusting these parameters and running several iterations of this routine an initial ground surface is developed. Building size parameter sets a roaming window size. Each tile is loaded with neighboring points from adjacent tiles and the routine classifies the data section by section based on this roaming window size. Second most important parameter is the maximum terrain angle, which sets the highest allowed terrain angle within the model. As part of the ground routine, low noise points are classified to class 7 and high noise points are classified to class 18. Once the ground routine has been completed, bridge decks are classified to class 17 using bridge breaklines compiled by Dewberry. A manual quality control routine is then performed using hillshades, cross-sections, and profiles within Terrasolid software suite. After this QC step, peer review is performed on all tiles and a supervisor manual inspection completed on percentage of classified tiles based on project size and variability of terrain. After ground classification and bridge deck corrections are completed, dataset is processed through a water classification routine that utilizes breaklines compiled by Dewberry to automatically classify hydrographic features. The water classification routine selects ground points within breakline polygons and automatically classifies them as class 9, water. During this water classification routine, points that are within 1x NPS or less of hydrographic features are moved to class 10, an ignored ground due to breakline proximity. A final QC is performed on data. All headers, appropriate point data records, and variable length records, including spatial reference information, are updated in GeoCue software and then verified using proprietary Dewberry tools. Data classified as follows: Class 1 = Unclassified. Includes vegetation, buildings, noise etc. Class 2 = Ground Class 7 = Low Noise Class 9 = Water Class 10 = Ignored Ground due to breakline proximity Class 17 = Bridge Decks Class 18 = High Noise For the Mendocino QL1 data: As part of the ground routine, buildings are classified to class 6, low noise points are classified to class 7 and high noise points are classified to class 18. An automated process took place after classification to assign Class 3 (<10 ft), class 4 (10 - 120 ft), and class 5 (>120 ft) based on height ranges. A manual quality control routine is then performed using hillshades, cross-sections, and profiles within the Terrasolid software suite. Data classified as follows: Class 1 = Unclassified. Includes vegetation, buildings, noise etc. Class 2 = Ground Class 3 = Low Vegetation Class 4 = Medium Vegetation Class 5 = High Vegetation Class 6 = Buildings Class 7 = Low Noise Class 9 = Water Class 10 = Ignored Ground due to breakline proximity Class 17 = Bridge Decks Class 18 = High Noise

- 2019-12-31 00:00:00 - The NOAA Office for Coastal Management (OCM) downloaded 6 data sets from this USGS site: ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/ The data sets downloaded were:
USGS_LPC_CA_FEMA_R9_Alpine_2017_LAS_2018/ Number of files: 30
USGS_LPC_CA_FEMA_R9_Cow_Creek_2017_LAS_2018/ Number of files: 138
USGS_LPC_CA_FEMA_R9_Keefer_2017_LAS_2018/ Number of files: 126

USGS_LPC_CA_FEMA_R9_Menodcino_2017_LAS_2018/ Number of files: 1511 USGS_LPC_CA_FEMA_R9_Russian_2017_LAS_2018/ Number of files: 696 USGS_LPC_CA_FEMA_R9_Upper_Pit_2017_LAS_2019/ Number of files: 1790 These files were processed to the Data Access Viewer (DAV) and https. The total number of files downloaded and processed was 4291. The data were in CA State Plane Zone 401 and 402 (NAD83 2011), US Survey feet, coordinates and NAVD88 (Geoid12B) elevations in US Survey feet. The data were classified as: 1 - Unclassified, 2 - Ground, 3 - Low Veg, 4 - Medium Veg, 5 - High Veg, 6 - Buildings, 7 - Low Noise, 9 - Water, 10 - Ignored Ground, 17 - Bridge Decks, 18 - High Noise. OCM processed all classifications of points to the Digital Coast Data Access Viewer (DAV). Classes available on the DAV are: 1, 2, 3, 4, 5, 6, 7, 9, 10, 17, 18. Classes 3, 4, 5, 6 are only available in the Mendocino QL1 area. 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 and by flight ID and the gps and intensity ranges. 2. Internal OCM scripts were run on the laz files to convert from orthometric (NAVD88) elevations to ellipsoid elevations using the Geoid 12B model, to convert from elevations in feet to meters, to convert from CA State Plane Zones 401 and 402 (NAD83 2011) coordinates in survey feet to geographic coordinates, to assign the geokeys, to sort the data by gps time and zip the data to database and to http.

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/58428

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=8979
https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/8979/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.