

*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:**

2021 USGS Lidar: Salton Sea, CA

### **1.2. Summary description of the data:**

Product: These lidar data are processed Classified LAS 1.4 files, formatted to individual 1,000 m x 1,000 m tiles; used to create intensity images, 3D breaklines and hydro-flattened DEMs as necessary.

Geographic Extent: This project covers portions of Imperial, Riverside and San Diego counties in southern California. The four USGS work unit areas for the project are:

CA\_SaltonSea\_EarthMRI\_1 (Work Unit 223484) covering approximately 1418 square miles in Imperial and Riverside counties

CA\_SaltonSea\_EarthMRI\_2 (Work Unit 300191) covering approximately 1431 square miles in Imperial County

CA\_SaltonSea\_EarthMRI\_3 (Work Unit 300216) covering approximately 2,969 square miles in Imperial, Riverside, and San Diego counties

CA\_SaltonSea\_EarthMRI\_4 (Work Unit 300258) covering approximately 6.24 square miles in Imperial County

Dataset Description of the Original Data: The CA\_SaltonSea\_EarthMRI 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 meter. Project specifications were based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification, Version 2021 Rev A. The data was developed based on a horizontal datum/projection of NAD83 (2011) UTM Zone 11, Universal Transverse Mercator, meters and vertical datum of NAVD88 (GEOID18), meters. Lidar data was delivered as processed Classified LAS 1.4 files, formatted to individual 1,000 m x 1,000 m tiles, as tiled Intensity Imagery, and as tiled bare earth DEMs; all tiled to the same 1,000 m x 1,000 m schema.

Ground Conditions: Lidar was collected in early November 2021 to late November 2021 (with the data in CA\_SaltonSea\_EarthMRI\_4 also being collected in 2023) 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, Dewberry established ground control points that were used to calibrate the lidar to known ground locations established throughout the project area. Additional independent accuracy checkpoints, in Bare Earth, Urban, Tall Grass and Brushland/Low Trees categories 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:**

2021-11-02 to 2021-11-30, 2021-11-02 to 2021-11-27, 2021-11-04 to 2021-11-30, 2021-11-12 to 2023-08-04

**1.5. Actual or planned geographic coverage of the data:**

W: -116.68579, E: -115.24566, N: 34.02227, S: 32.60959

CA\_SaltonSea\_EarthMRI\_3 (Work Unit 300216) covering approximately 2,969 square miles in Imperial, Riverside, and San Diego counties

W: -115.85, E: -115.12, N: 33.74, S: 33.04

A\_SaltonSea\_EarthMRI\_1 (Work Unit 223484) covering approximately 1418 square miles in Imperial and Riverside counties

W: -115.28, E: -114.49, N: 33.24, S: 32.68

CA\_SaltonSea\_EarthMRI\_2 (Work Unit 300191) covering approximately 1431 square miles in Imperial County

W: -114.76, E: -114.65, N: 33.13, S: 32.96

CA\_SaltonSea\_EarthMRI\_4 (Work Unit 300258) covering approximately 6.24 square miles in Imperial County

**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 Tiles (EPT) 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:

- 2022-11-30 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 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 22 Rev A, and breaklines were collected for water features. Bare earth DEMs were exported from the classified point cloud using collected breaklines for hydroflattening.

- 2023-04-26 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 ground (ASPRS Class 2) lidar data inside of the Lake Pond and Double Line Drain hydro flattening breaklines were then classified to water (ASPRS Class 9) using TerraScan macro functionality. A buffer of 0.35 meters was also used around each hydro-flattened feature to classify these ground (ASPRS Class 2) points to Ignored ground (ASPRS Class 20). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the ground (ASPRS Class 2) 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 TerraScan and TerraModeler. Global Mapper was used as a final check of the bare earth dataset. The withheld bit was set on the

withheld points previously identified in TerraScan before the ground classification routine was performed. The withheld bit was set on class 7 and class 18 in TerraScan after all classification was complete. Dewberry proprietary software was then used to create the deliverable industry-standard LAS files for both the Point Cloud Data and the Bare Earth. Dewberry 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.

- 2022-12-15 00:00:00 - Data was tested at 0.23 meter nominal pulse spacing and 18.9 points per square meter (ppsm). The average density was tested on the LAS data using geometrically reliable (withheld and noise points excluded) first-return points. (A)NPD was tested using rasters which produce the average number of points within each cell.

- 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 (NAVD88 GEOID18 meters).

- 2024-03-22 00:00:00 - The NOAA Office for Coastal Management (OCM) created references to the Entwine Point Tiles (EPT) 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 AWS URLs being accessed: [https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA\\_SaltonSea\\_EarthMRI\\_1\\_2021/ept.json](https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA_SaltonSea_EarthMRI_1_2021/ept.json) [https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA\\_SaltonSea\\_EarthMRI\\_2\\_2021/ept.json](https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA_SaltonSea_EarthMRI_2_2021/ept.json) [https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA\\_SaltonSea\\_EarthMRI\\_3\\_D21/ept.json](https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA_SaltonSea_EarthMRI_3_D21/ept.json) [https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA\\_SaltonSea\\_EarthMRI\\_4\\_2021/ept.json](https://s3-us-west-2.amazonaws.com/usgs-lidar-public/CA_SaltonSea_EarthMRI_4_2021/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/72350>

**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](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=10102/details/10102>

[https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/CA\\_SaltonSea\\_EarthMRI](https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/CA_SaltonSea_EarthMRI)

**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\_NC

**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 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.*