

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 NOAA Topobathy Lidar DEM: Morro Bay, CA

1.2. Summary description of the data:

Morro Bay 2022 topobathymetric Lidar area data were collected by NV5 Geospatial (NV5) using a Riegl VQ880GII system. Morro Bay 2022 data acquisition occurred on 20220614 in two missions. The Morro Bay 2022 dataset includes topobathymetric data in a LAS format 1.4, point data record format 6, with the following classifications in accordance with project specifications and the American Society for Photogrammetry and Remote Sensing (ASPRS) classification standards:

1 - unclassified

10 - edge clip

2 - ground

7W - low noise

9 - NIR water surface

18W - high noise

40 - bathymetric bottom or submerged topography

41 - Green water surface

43 - Submerged object, not otherwise specified (For Morro Bay, oyster reefs have this classification, even though exposed at

low tide)

45 - water column

This data set also includes lidar intensity values, number of returns, return number, time, and scan angle. The 100 meter buffered project area covers approximately 4,215 acres along the south central Pacific Coast of California near the town of Los Osos. LAS files were compiled in 500 m x 500 m tiles clipped to the project boundary. The final

classified Lidar data were used to create topobathymetric DEMs in GeoTIFF format with 1m pixel resolution. This delivery of the Morro Bay 2022 dataset represents an area covering 96 - 500 m x 500 m DEM tiles clipped to the project boundary. One tile (MRR22_088) did not have any valid bathymetric bottom or ground points and so it did not produce a valid dem. This Project was completed in partnership between NOAA OCM and the NEP.

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. These data are available for custom download at the link provided in the URL section of this metadata record.

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:

2022-06-14

1.5. Actual or planned geographic coverage of the data:

W: -120.875211, E: -120.821145, N: 35.373531, S: 35.304796

1.6. Type(s) of data:

(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Elevation Data

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):

Lineage Statement:

NV5 Geospatial collected topobathy elevation data for the NOAA Office for Coastal Management (OCM) and the Morro Bay NEP (National Estuary Program). The data were processed to be available for custom download from the NOAA Digital Coast Data Access Viewer (DAV) and for bulk download from https.

Process Steps:

- 2022-08-30 00:00:00 - Data for the Morro Bay 2022 Topobathymetric Lidar project area was acquired by NV5 Geospatial (NV5) using Riegl VQ-880-GII topobathymetric Lidar systems. All derived DEM data is referenced to: Horizontal Datum-NAD83(2011) epoch: 2010.00 Projection-UTM Zone 10N Horizontal Units-meters Vertical Datum-NAVD88 (Geoid12b) Vertical Units-meters The collected Lidar data were immediately processed by NV5 to a level that allowed QA/QC measures to determine if the sensor functioned properly and to assess the coverage of submerged topography. The initial files were inspected for sensor malfunctions and then passed through automated raster generation to develop an initial assessment of bathymetric coverage. NV5 reviewed all acquired flight lines to ensure complete

coverage and positional accuracy of the laser points. NV5 resolved kinematic corrections for aircraft position data in PosPac MMS 8.5 using aircraft GNSS and Applanix's proprietary PP-RTX solution. This was used to correct the continuous onboard measurements of the aircraft position recorded throughout the flight. A final smoothed best estimate trajectory (SBET) was developed, blending post-processed aircraft position with attitude data. Using the SBETs, sensor head position and attitude were then calculated throughout the survey. Following final SBET creation, NV5 used RiUnite 1.0.1 to calculate laser point positioning by associating SBET positions to each laser point return time. The speed of light and its direction of travel is changed or refracted when entering the water column from air. A refraction correction was applied to account for this difference by adjusting the depth (distance traveled) and horizontal positioning (change of angle/direction) of all submerged points in the Lidar data. TerraSolid v19 and NV5's proprietary software LasMonkey were used to classify water surface points and derive water surface models. Separate models were created for each scanner of each collected swath to ensure temporal differences and wave or water surface height variations between flight lines were accurately accounted for when applying the refraction correction to the submerged data. These models, along with the Lidar points and the SBETs, were processed in LasMonkey's refraction tool to accurately adjust the positioning of bathymetric points. Using raster-based QC methods, the output data were verified to ensure the refraction tool functioned properly. Once all submerged points were refracted by flight line, data were exported to LAS 1.4 format and combined into 500 m x 500 m tiles. NV5 used custom algorithms in Terrascan v19 to classify the initial ground/submerged topography surface points. Data were then further calibrated using StripAlign 2.1 based on classified hard surface areas of swath overlap. Relative accuracy was compared and verified through the use Delta-Z (DZ) orthos created using NV5's Las Product Creator. Absolute vertical accuracy of the calibrated data were assessed using ground survey data and complete coverage was again verified. After a final automated classification, NV5 then performed manual editing to review all classification and improve the final topobathymetric surface. NV5's LasMonkey software was used to update LAS header information, including all projection and coordinate reference system information. The final Lidar data are in LAS format 1.4 and point data record format 6. The final classification scheme is as follows: 1 - unclassified 10 - edge clip 2 - ground 7W - low noise 9 - NIR water surface 18W - high noise 40 - bathymetric bottom or submerged topography 41 - Green water surface 45 - water column

- 2022-08-30 00:00:00 - The topobathymetric bare earth DEMs were output at 1 meter resolution in GeoTIFF format into 96 500 m x 500 m tiles. The Morro Bay 2022 rasters are clipped to the extent of the project boundary and named according to project specifications. A bathymetric void shapefile was created to indicate areas where there was a lack of bathymetric returns. This shape was created by triangulating bathymetric bottom points with an edge length maximum of 4.56m to identify all areas greater than 9 square meters without bathymetric returns. This

shapefile was used to clip and exclude interpolated elevation data from these areas in the bathymetric void clipped topobathymetric bare earth model.

- 2022-10-06 00:00:00 - The NOAA Office for Coastal Management (OCM) received 96 digital elevation model (DEM) files in GeoTiff format from NV5 Geospatial. The bare earth raster files were at a 1 m grid spacing. The data were in UTM Zone 10N NAD83 (2011), meters coordinates and NAVD88 (Geoid12B) elevations in meters. OCM assigned the appropriate EPSG codes (Horiz - 6339, Vert - 5703) and copied the raster files to https for NOAA Digital Coast storage and provisioning purposes.
- 2023-02-13 00:00:00 - In February of 2023, NV5 Geospatial sent three replacement files for existing files. These files were: 1. MRR22_038 2. MRR22_046 3. MRR22_055 The point files that correspond to these DEM files were reclassified to include points that were changed from 1 - Unclassified to Class 43 - Submerged Object, not otherwise specified (For Morro Bay, oyster reefs have this classification, even though exposed at low tide). The new DEMs reflect that change. These files were processed to replace the existing files of the same name. The NOAA Office for Coastal Management (OCM) received 3 digital elevation model (DEM) files in GeoTiff format from NV5 Geospatial. The bare earth raster files were at a 1 m grid spacing. The data were in UTM Zone 10N NAD83 (2011), meters coordinates and NAVD88 (Geoid12B) elevations in meters. OCM assigned the appropriate EPSG codes (Horiz - 6339, Vert - 5703) and copied the raster files to https for NOAA 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
- 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/67998>

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=9630/details/9630>

https://noaa-nos-coastal-lidar-pds.s3.us-east-1.amazonaws.com/dem/CA_Morro_Bay_DEM_2022_9630

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)

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.