

*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:**

2018-2019 NOAA NGS Topobathy Lidar Post Hurricane Harvey: Galveston to Corpus Christi, TX

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

These data were collected by Leading Edge Geomatics using a Leica Chiroptera II Bathymetric & Topographic Sensor. The data were acquired from October 22, 2018 through May 31, 2019. The data include topobathy data in LAS 1.4 format classified as created, unclassified (1); ground (2); noise (low or high) (7); bathymetric bottom (40); water surface (41); derived water surface (42); submerged object (43); IHO S-57 object (44); no bathymetric bottom found (45); and bathymetric bottom temporal changes (46) in accordance with project specifications. The project consists of approximately 942 square miles of data along the Gulf shore of Texas from Galveston to Corpus Christi. This full project delivery consists of 3813 1000 m x 1000 m lidar tiles in five blocks:

Block 01 delivery consists of 322 1000 m x 1000 m lidar tiles.

Block 02 delivery consists of 871 1000 m x 1000 m lidar tiles.

Block 03 delivery consists of 789 1000 m x 1000 m lidar tiles.

Block 04 delivery consists of 557 1000 m x 1000 m lidar tiles.

Block 05 delivery consists of 1274 1000 m x 1000 m lidar tiles.

### **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:**

2018-10-22 to 2019-05-31, 2018-10-22 to 2019-05-31, 2018-10-22 to 2019-05-31, 2018-10-22 to 2019-05-31, 2018-10-22 to 2019-05-31, 2018-10-22 to 2019-05-31

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

W: -96, E: -95.33, N: 28.92, S: 28.571

W: -94.78, E: -94.42, N: 29.57, S: 29.32

W: -95.39, E: -94.68, N: 29.41, S: 28.89

W: -97.244, E: -96.89, N: 28.179, S: 27.65

W: -96.89, E: -95.98, N: 28.68, S: 27.99

**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):*

Process Steps:

- 2019-12-01 00:00:00 - Data for the coastline for the TX1803 topobathy project was acquired by Leading Edge Geomatics using a Leica Chiroptera II Bathymetric and Topographic lidar sensor. All delivered lidar data is referenced to: Horizontal Datum-NAD83 (2011) epoch: 2010 Projection-UTM Zone 14 North Projection-UTM Zone 15 North Horizontal Units-meters Vertical Datum-NAD83 (2011) Vertical Units-meters This dataset encompasses 3813 1000 m x 1000 m tiles. Both green lidar data and NIR lidar data were acquired. Leading Edge Geomatics acquired, calibrated and performed the refraction correction to the lidar data.
- 2019-12-01 00:00:00 - Dewberry received the calibrated green and NIR data and verified complete coverage. Relative accuracy of the green swaths compared to overlapping and adjacent green swaths as well as the relative accuracy of green swaths compared to overlapping and adjacent NIR swaths were verified through the use of Delta-Z (DZ) orthos created in GeoCue software. Visual inspections using z-range rasters were used to verify intraswath or within a swath relative accuracy. Profiles of elevated planar features, such as roofs, were used to verify horizontal alignment between overlapping swaths. Dewberry then verified absolute vertical accuracy of the swath data prior to full-scale production. Dewberry used algorithms in TerraScan to create the initial ground/submerged topography surface. Dewberry used rasterized aggregate extents of refracted points to create automated, smoothed 2-D refraction extent vectors with LAStools and ArcGIS. Light travels at different speeds in air versus water and its speed and direction of travel change when it enters the water column. The refraction correction process accounts for this difference by adjusting the depth (distance traveled) and horizontal position (change of angle/direction) of the lidar points acquired within water. These refraction extents delineate areas where the refraction correction was applied to the lidar data by Leica's automated refraction correction software based on the software's detection of water.
- 2019-12-01 00:00:00 - All lidar data was peer-reviewed. Dewberry's QAQC also included creating void polygons for use during review. All necessary edits were applied to the dataset. GeoCue 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: 0-Created, never classified 1-Unclassified 2-Ground 7-Noise 40-Bathymetric bottom 41-Water surface 42-Derived water surface 43-Submerged object, not otherwise specified 44-International Hydrographic Organization (IHO) S-57 object 45-No bottom found 46-Temporal change All data was then verified by an independent QC department within Dewberry. The independent QC was performed by analysts who do not perform manual classification or editing. The independent QC involved quantitative and qualitative reviews.

- The NOAA Office for Coastal Management (OCM) received files in laz format. The files contained lidar elevation and intensity measurements. The data were in UTM Zone 14 and UTM Zone 15 coordinates and ellipsoid elevations in meters. OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. Converted from UTM Zone 14 and 15 to geographic coordinates 2. Sorted by gps time. 3. Moved data from class 46 to class 22 The final classification scheme is as follows: 1 - Unclassified 2 - Ground 7 - Noise 22 - Temporal Exclusion 40 - Bathymetric Bottom or Submerged Topography 41 - Water Surface 42-Derived water surface 43 - Submerged feature 45 - Water Column

**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):**

Because swath data is tested prior to any classification, only non-vegetated (open terrain, bare earth and urban) checkpoints are used in this testing. All checkpoints located in non-vegetated terrain were used to compute the NVA of the unclassified swath data. Project specifications require a NVA of 19.6 cm at the 95% confidence level based on  $RMSEz (10 \text{ cm}) \times 1.9600$ . The unclassified swath lidar dataset was tested to meet ASPRS Positional Accuracy Standards for Digital Geospatial Data (2014) for a 10 cm RMSEz Vertical Accuracy Class.

## 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
- 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/63297>

**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=9215>

<https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/9215/>

**7.3. Data access methods or services offered:**

Data is available online for bulk or 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.*