

*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:**

2016 - 2017 USGS Lidar: Mississippi NRCS

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

Product: These lidar data are processed Classified LAS 1.4 files, formatted to 5903 individual 1500 m x 1500 m tiles in NAD83(2011) UTM Zone 15N; used to create intensity images, 3D breaklines and hydro-flattened DEMs as necessary.

Geographic Extent: AOI is located in Mississippi over Warren, Hinds, Claiborne, Jefferson, Adams, Franklin, Wilkinson, and Amite Counties. The area of interest covers approximately 4,780 square miles. Dataset Description: Mississippi NRCS FY16 Lidar project called for the Planning, Acquisition, processing and derivative products of lidar data to be collected at a nominal pulse spacing (NPS) of 0.70 meter. Project specifications are based on the U.S. Geological Survey National Geospatial Program Base Lidar Specification, Version 1.2. The data was developed based on a horizontal projection/ datum of NAD83, Universal Transverse Mercator, meters and vertical datum of NAVD88 (GEOID12B), meters. Lidar data was delivered as flightline-extent unclassified LAS swaths, as processed Classified LAS 1.4 files, formatted to 5303 individual 1,500m x 1,500m tiles in NAD83(2011) UTM Zone 15N, as tiled Intensity Imagery, and as tiled bare earth DEMs; all tiled to the same 1,500m x 1,500m schema. Please note that tiles 15RXQ330320 and 15RXQ405950 do not contain lidar points. The data boundary intersects these tiles and a hydro breakline was digitized based on this boundary. For this reason a hydro-flattened DEM IMG and Intensity Image was generated. There will be no LAS 1.4 for tiles 15RXQ330320 and 15RXQ405950. The DEM IMG/Intensity tiff file count is 5903. The LAS 1.4 count is 5901.

Ground Conditions: Initial collection of lidar data took place January and February of 2016. During this time some significant precipitation events occurred in the region and led to increased water levels in the Mississippi River and surrounding low-lying areas. Due to these high water levels it was determined that data acquisition be postponed until water levels lowered. Approximately 80% of the AOI had been acquired at this point. The remaining 20% was collected in January of 2017. Some water level differences will be observed in the point cloud and DEM data due to the differing

collection dates, specifically in the low-lying areas near the Mississippi River. Woolpert has taken great care to limit the amount of temporal differences between the two collection dates. In order to post process the lidar data to meet task order specifications and meet ASPRS vertical accuracy guidelines, Woolpert established a total of 103 ground control points that were used to calibrate the lidar to known ground locations established throughout the project area. Additional independent accuracy checkpoints were collected (120 NVA points and 90 VVA points) and used to assess the vertical accuracy of the data. These checkpoints were not used to calibrate or post process the data. Due to temporal variability, visible artifacts in the project DEM are evident within a historical floodplain along a portion of the Mississippi River. Lidar acquisition occurred when river levels were below action stage per NOAA flood gauge readings, however, some areas within the floodplain exhibited higher water levels during the January 2016 flights than what is observed in the January 2017 flights. This is specifically evident within oxbow streams and lakes found within the floodplain. Visible elevation variability in the DEM is located approximately within a bounding box of -91.36 degrees East Longitude, 31.85 degrees North Latitude; -91.24 West Longitude; 31.74 South Latitude.

The NOAA Office for Coastal Management (OCM) downloaded 5901 MS\_NatchezTrace\_2016 laz files from this USGS site: [ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/USGS\\_LPC\\_MS\\_NatchezTrace\\_2016\\_LAS\\_2017/](ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/USGS_LPC_MS_NatchezTrace_2016_LAS_2017/) and processed the data to the Data Access Viewer (DAV) and https.

In addition to these lidar point data, the bare earth Digital Elevation Models (DEM) created from the lidar point data are also available. These data are available for custom download at the link provided in the URL section of this metadata record.

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:**

2016-01-16 to 2017-01-15

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

W: -91.654205, E: -90.049536, N: 32.597549, S: 30.962011

**1.6. Type(s) of data:**

*(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)*  
Lidar point cloud

**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):

Process Steps:

- The data were collected using: 1. Two Leica ALS80 HP 1000 kHz Multiple Pulses in Air (MPiA) lidar systems on board WoolpertQSI aircraft. The ALS80 sensor collects up to four returns per pulse, as well as intensity data, for the first three returns. If a fourth return was captured, the system does not record an associated intensity value. 2. One Leica ALS70 500 kHz Multiple Pulses in Air (MPiA) lidar sensors owned and operated by Quantum Spatial. The sensor was mounted in Quantum Spatial aircraft.
- The Lidar data was collected in Twenty-five (25) missions, flown as close together as the weather permitted, to ensure consistent ground conditions across the project area. An initial quality control process was performed immediately on the Lidar data to review the data coverage, airborne GPS data, and trajectory solution. Initial collection of lidar data took place January and February of 2016. During this time some significant precipitation events occurred in the region and led to significantly increased water levels in the Mississippi River and surrounding low-lying areas. Due to these high water levels it was determined that data acquisition be postponed until water levels lowered. Approximately 80% of the AOI had been acquired at this point. The remaining 20% was collected in January of 2017. Some water level differences will be observed in the point cloud and DEM data due to the differing collection dates, specifically in the low-lying areas near the Mississippi River. Woolpert has taken great care to limit the amount of temporal differences between the two collection dates.
- 2016-01-16 00:00:00 - LAS Point Classification: The point classification is performed as described below. The point cloud underwent a classification process to determine bare-earth points and non-ground points utilizing "first and only" as well as "last of many" lidar returns. This process determined Default (Class 1), Ground (Class 2), Low Noise (Class 7), Water (Class 9), Ignored ground (Class 10), Bridge Decks (Class 17), High Noise (Class 18) classifications. The bare-earth (Class 2 - Ground) lidar points underwent a manual QA/QC step to verify the quality of the DEM as well as a peer-based QC review. This included a review of the DEM surface to remove artifacts and ensure topographic quality. After the bare-earth surface is finalized, it is then used to generate all hydro-breaklines through a semi-automated process. All ground (Class 2) lidar data inside of the Lake Pond and Double Line Drain hydro flattening breaklines were then classified to water (Class 9) using TerraScan/LP360 macro functionality. A buffer of 1.14 feet was also used around each hydro-flattened feature to classify these ground (Class 2) points to Ignored ground (Class 10). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the ground (Class 2) points were reclassified to the correct classification after the automated classification was completed. All overlap data was processed through automated functionality provided by TerraScan to classify the

overlapping flight line data to approved classes by USGS. The overlap data was classified using standard LAS overlap bit. These classes were created through automated processes only and were not verified for classification accuracy. Due to software limitations within TerraScan, these classes were used to trip the withheld bit within various software packages. These processes were reviewed and accepted by USGS through numerous conference calls and pilot study areas. 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. GeoCue was then used to create the deliverable industry-standard LAS files for both the All Point Cloud Data and the Bare Earth. Woolpert Inc. proprietary software and LP360 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.

- 2018-09-24 00:00:00 - The NOAA Office for Coastal Management (OCM) downloaded 5901 MS\_NatchezTrace\_2017\_LAS\_2017 laz files from this USGS site: [ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/USGS\\_LPC\\_MS\\_NatchezTrace\\_2016\\_LAS\\_2017/](ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/LPC/Projects/USGS_LPC_MS_NatchezTrace_2016_LAS_2017/). The data were in UTM Zone 15 North coordinates and NAVD88 (Geoid12B) elevations in meters. The data were classified as: 1 - Unclassified, 2 - Ground, 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, 7, 9, 10, 17, 18. OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. The LAStools software scripts lasinfo and lasvalidate were run on the laz files to check for errors. 2. An internal OCM script was run to check the number of points by classification and by flight ID and the gps and intensity ranges. 3. 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 NAD83 2011 UTM Zone 15 North coordinates in meters 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
- 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/53850>

**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?**

**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=8599>

<https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/8599/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)*

**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.*