

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:**

2020 USFS Lidar DEM: Middle Fork, North and South Clackamas (OR, WA)

1.2. Summary description of the data:

The United States Forest Service, Region 6, (USFS) required leaf-on airborne LiDAR surveys to be collected over approximately 4,141 square miles of national forestry in Oregon and Washington State. The following areas were requested to be covered: Fremont-Winema National Forest (FRE-WINNF) in Lakeview, Oregon; Malheur National Forest (MALNF) in John Day, Oregon; Willamette National Forest (WILNF) in Bend, Oregon; Okanogan-Wenatchee National Forest (OKA-WENNF) in Wenatchee, Washington; and Rogue River-Siskiyou National Forest (RR-SNF) in Medford, Oregon. Table 1 below details the Areas of Interest (AOIs) requested for 2020 reflight.

Aerial LiDAR data for this task order was planned, acquired, processed and produced at an aggregate nominal pulse spacing (ANPS) of 0.35 meters and in compliance with USGS National Geospatial Program LiDAR Base Specification version 1.3.

Area No.	Forest AOI	Square Miles
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AOI-1	WILBRE Breitenbush	16
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AOI-2	MBSMFS Middle Fork	124
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AOI-3	MTHNCZ North Clackamas/Zig Zag	223
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AOI-4	WILNFM NFMF	22
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AOI-5	MTHSCL South Clackamas	430
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AOI-6	WILCMP Willamette	942
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This dataset is a subset of the total flown, covering only the Middle Fork and Clackamas areas (North and South).

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:

2020-07-29 to 2020-08-20

1.5. Actual or planned geographic coverage of the data:

W: -121.68091, E: -121.22512, N: 47.581444, S: 47.41808505

Middle Fork Site

W: -122.09427, E: -121.98112, N: 45.648061, S: 45.608655

North Clackamas

W: -122.68988, E: -121.7768388, N: 44.8495, S: 43.556866

Detroit Middle Fork

W: -122.25318499, E: -121.7283273, N: 45.17222218, S: 44.76329079

South Clackamas

1.6. Type(s) of data:

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

Raster

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:

- 2020-09-20 00:00:00 - Aircraft and Sensor Information and Flight Plan Execution
Atlantic operated a PACDV (N750DV) outfitted with an Optech Galaxy Prime LiDAR system during the collection of the project area. Atlantic acquired 1588 passes of the AOI as a series of perpendicular and/or adjacent flight-lines executed in 44 flight missions conducted between June 29, 2018 and January 24, 2019. Onboard differential Global Navigation Satellite System (GNSS) unit(s) recorded sample aircraft positions at 2 hertz (Hz) or more frequency. LiDAR data was only acquired when a minimum of six (6) satellites were in view.
- 2018-09-19 00:00:00 - Ground Control Survey A total of 198 ground survey points were collected in support of this project. Point cloud data accuracy was tested against a Triangulated Irregular Network (TIN) constructed from LiDAR points in clear and open areas. A clear and open area can be characterized with respect to topographic and ground cover variation such that a minimum of five (5) times than 1/3 of the RMSEZ deviation from a low-slope plane. Slopes that exceed ten (10) percent were avoided. Each land cover type representing ten (10) percent or more of the total project area were tested and reported with a GCP. In land cover categories other than dense urban areas, the tested points did not have obstructions forty-five (45) degrees above the horizon to ensure a satisfactory TIN surface. The GCP value is provided as a target. It is understood that in areas of dense vegetation, swamps, or extremely difficult terrain, this value may be exceeded. The GCP value

is a requirement that must be met, regardless of any allowed 'busts' in the VVA(s) for individual land cover types within the project. Checkpoints for the assessment are required to be well-distributed throughout the land cover type, for the entire project area

- 2021-04-12 00:00:00 - LiDAR Point Cloud Generation Atlantic used Leica software products to download the IPAS ABGNSS/IMU data and raw laser scan files from the airborne system. Waypoint Inertial Explorer is used to extract the raw IPAS ABGNSS/IMU data, which is further processed in combination with controlled base stations to provide the final Smoothed Best Estimate Trajectory (SBET) for each mission. The SBETs are combined with the raw laser scan files to export the LiDAR ASCII Standard (*.las) formatted swath point clouds.

- 2021-04-12 00:00:00 - LiDAR Calibration Using a combination of GeoCue, TerraScan and TerraMatch; overlapping swath point clouds are corrected for any orientation or linear deviations to obtain the best fit swath-to-swath calibration. Relative calibration was evaluated using advanced plane-matching analysis and parameter corrections derived. This process was repeated interactively until residual errors between overlapping swaths, across all project missions, was reduced to no more than 2cm. A final analysis of the calibrated lidar is preformed using a TerraMatch tie line report for an overall statistical model of the project area.

Upon completion of the data calibration, a complete set of elevation difference intensity rasters (dZ Orthos) are produced. A user-defined color ramp is applied depicting the offsets between overlapping swaths based on project specifications. The dZ orthos provide an opportunity to review the data calibration in a qualitative manner. Atlantic assigns green to all offset values that fall below the required RMSDz requirement of the project. A yellow color is assigned for offsets that fall between the RMSDz value and 1.5x of that value. Finally, red values are assigned to all values that fall beyond 1.5x of the RMSDz requirements of the project

- 2021-04-12 00:00:00 - LiDAR Classification Multiple automated filtering routines are applied to the calibrated LiDAR point cloud identifying and extracting bare-earth and above ground features. GeoCue, TerraScan, and TerraModeler software was used for the initial batch processing, visual inspection and any manual editing of the LiDAR point clouds. Classified point clouds were cut to match the tile index and its corresponding tile names and delivered in .laz format.

- 2021-04-12 00:00:00 - LiDAR Intensity Imagery LiDAR intensity imagery was created from the final calibrated and classified lidar point cloud. Intensity images were produced from all classified points and posted to a 0.5-meter cell size. Intensity images were cut to match the tile index and its corresponding tile names and delivered in .img format.

- 2021-04-12 00:00:00 - Bare-Earth Surface - Digital Elevation Model (DEM) Bare earth Digital Elevation Models (DEMs) were derived using the bare earth (ground) LiDAR points. All DEMs were created with a grid spacing of 1 meter. DEMs were cut to match the tile index and its corresponding tile names and delivered in .img format.

- 2023-04-20 00:00:00 - Data were received from US Forest Service region 6 in

Imagine (*.img) format, USFS region 6 Albers projection (meters) and NAVD88 Geoid12b meters vertically. Data were converted to cloud optimized geotiffs for distribution in the Digital Coast Data Access Viewer. The time of collection listed in process step 1 is noted to be incorrect, but was left as the original metadata record from Atlantic, Inc. Based upon the time stamps in the lidar records, the collection appears to be from July 29, 2020 to August 20, 2020. This suggests that some of the process steps were copied from a different metadata records and may not reliably describe the collection and processing of this dataset. (Citation: Digital Elevation Models)

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/69622>

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=9817/details/9817>

https://noaa-nos-coastal-lidar-pds.s3.us-east-1.amazonaws.com/dem/USFS_Oregon_Forests_2020_9817

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)

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.