

*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 USGS Lidar DEM: West Washington

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

In March 2016, Quantum Spatial (QSI) was contracted by the United States Geological Survey (USGS), in collaboration with the Washington Department of Natural Resources (WADNR), to collect Light Detection and Ranging (LiDAR) data for the Western Washington 3DEP QL1 LiDAR project site in the state of Washington. The Western Washington 3DEP LiDAR project area covers approximately 3.5 million acres within portions of thirteen counties in the state of Washington.

Dataset Description: RAW flight line swaths were processed to create 13206 classified LAS 1.4 files delineated in 1/100th USGS Quadrangle tiles. Each LAS file contains LiDAR point information, which has been calibrated, controlled, and classified. Additional derived products include intensity images, hydro-flattened DEMs, highest hit surface models, and 3D breaklines of rivers and lakes within the study area.

Ground Conditions: Data was collected during the time when the least ground snow coverage was present in the area. Areas where snow was observed have been delineated in a provided snow polygon shapefile. Acquisition below aircraft free of smoke, fog and cloud cover.

The NOAA Office for Coastal Management (OCM) downloaded the WA\_Western-North\_2016 and WA\_Western-South\_2016 Digital Elevation Model (DEM) files from this USGS site: <ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/OPR/> and processed the data to the Data Access Viewer (DAV) and https.

In addition to these bare earth Digital Elevation Model (DEM) data, the lidar point data that these DEMs 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.

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:**

2016-03-17 to 2017-06-06

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

W: -123.892239, E: -120.697868, N: 49.024049, S: 45.539222

**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?

### 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:

- 2017-08-31 00:00:00 - LiDAR Pre-Processing: 1. Review flight lines and data to ensure complete coverage of the study area and positional accuracy of the laser points. 2. Resolve kinematic corrections for aircraft position data using kinematic aircraft GPS and static ground GPS data. 3. Develop a smoothed best estimate of trajectory (SBET) file that blends post-processed aircraft position with sensor head position and attitude recorded throughout the survey. 4. Calculate laser point position by associating SBET position to each laser point return time, scan angle, intensity, etc. Create raw laser point cloud data for the entire survey in \*.las format. Convert data to orthometric elevations by applying a geoid03 correction. 5. Import raw laser points into manageable blocks (less than 500 MB) to perform manual relative accuracy calibration and filter erroneous points. Classify ground points for individual flight lines. 6. Using ground classified points per each flight line, test the relative accuracy. Perform automated line-to-line calibrations for system attitude parameters (pitch, roll, heading), mirror flex (scale) and GPS/IMU drift. Calculate calibrations on ground classified points from paired flight lines and apply results to all points in a flight line. Use every flight line for relative accuracy calibration. 7. Adjust the point cloud by comparing ground classified points to supplemental ground control points.
- 2017-08-31 00:00:00 - LiDAR Post-Processing: 1. Classify data to ground and other client designated classifications using proprietary classification algorithms. 2. Manually QC data classification 3. After completion of classification and final QC approval, calculate NVA and VVA, and density information for the project using ground control quality check points.
- 2017-08-31 00:00:00 - Hydroflattening Breaklines and Hydroflattened DEM creation: Water boundary polygons were developed using an algorithm which

weights LiDAR-derived slopes, intensities, and return densities to detect the water's edge. The water's edge was then manually reviewed and edited as necessary. Elevations were assigned to the water's edge through neighborhood statistics identifying the lowest LiDAR return from the water surface. Lakes were assigned a consistent elevation for an entire polygon while rivers were assigned consistent elevations on opposing banks and smoothed to ensure downstream flow through the entire river channel. These breaklines were incorporated into the hydro-flattened DEM by enforcing triangle edges (adjacent to the breakline) to the elevation values derived from the breakline. This implementation corrected interpolation along the hard edge. Breaklines were also used to classify all ground points within the identified water bodies to class 9 (water).

- 2018-03-02 00:00:00 - The NOAA Office for Coastal Management (OCM) downloaded 793 WA\_Western-North\_2016 and WA\_Western-South\_2016 Digital Elevation Model (DEM) files from this USGS site: <ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Elevation/OPR/>. The data were in WA State Plane South coordinates and NAVD88 (Geoid03) elevations in feet. The bare earth raster files were at a 3 ft grid spacing. OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. Converted the raster files from elevations in feet to meters using `gdal_translate` 2. Copied the files to `https`.

**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/52295>

**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=8481>

[https://noaa-nos-coastal-lidar-pds.s3.us-east-1.amazonaws.com/dem/WA\\_Western\\_WA\\_DEM\\_2016\\_84](https://noaa-nos-coastal-lidar-pds.s3.us-east-1.amazonaws.com/dem/WA_Western_WA_DEM_2016_84)

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

Data is available online for custom and bulk 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.*