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:

2019 DAS - GEO Lidar: Gilchrist, OR

1.2. Summary description of the data:

The Oregon Department of Administrative Services Geospatial Enterprise Office (DAS-GEO) contracted with Quantum Spatial, Inc. (QSI) in June 2019 to collect Light Detection and Ranging (LiDAR) data for the 2019 DAS-GEO Gilchrist LiDAR study area. This report summarizes the data collection and processing of the Gilchrist study area. A total of 192, 686 acres of eight pulses per square meter (PPSM) LiDAR data were acquired and delivered to the client. The ground survey was performed between June 7 and June 12, 2019. The LiDAR data were collected between June 1 and June 5, 2019, with final delivery to DASGEO on August 16, 2019.

The NOAA Office for Coastal Management received the data from the Oregon Department of Parks and Recreation and processed it to the Data Access Viewer (DAV) and http. 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 download at the link provided in the URL section of this metadata record. No metadata record was provided for this data set. This record was created by the NOAA Office for Coastal Management (OCM) using information from the data report.

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:

2019-06-01 to 2019-06-05

1.5. Actual or planned geographic coverage of the data:

W: -121.849, E: -121.248, N: 43.634, S: 43.264

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):

Lineage Statement:
Data were collected and processed by Quantum Spatial, Inc. for the OR DAS-GEO. The data were provided to the NOAA Office for Coastal Management (OCM) where the data were processed to make it available for custom download from the Data Access Viewer (DAV) and bulk download from https.

Process Steps:

- 2019-06-12 00:00:00 - Ground Survey QSI conducted a ground survey to support airborne LiDAR collection between June 7 and June 12, 2019. Monumentation A combination of QSI-set monuments, NGS monuments, and permanent base stations from the Oregon Real-time GNSS Network (ORGN) were used for collection of ground survey points (GSPs) using real time kinematic (RTK) and post processed kinematic (PPK) survey techniques. Monument locations were selected with consideration for satellite visibility, field crew safety, and optimal location for GSP coverage. RINEX files and final coordinates for flight support were provided using the ORGN. The coordinates used for these stations are provided as Antenna Reference Point (ARP) height in NAD83(2011) epoch 2010.00. Please see page 6 for ORGN locations and QSI and NGS monument locations in tabular and cartographic format. Ground Survey Points The ground survey for the DAS-GEO Gilchrist LiDAR project was conducted between June 7 and June 12, 2019. Ground survey data were used for data calibration and accuracy assessment purposes. Ground survey points (GSPs) were collected using RTK techniques. For RTK surveys, either the ORGN was utilized to broadcast a kinematic correction to a roving receiver; or a base receiver was positioned at a nearby monument to broadcast a kinematic correction to a roving receiver. For PPK surveys, however, these corrections were post-processed. RTK and PPK surveys recorded observations for a minimum of five seconds on each GCP/GSP in order to support longer baselines for post-processing. All GSP measurements were made during periods with a Position Dilution of Precision (PDOP) no greater than 3.0 and in view of at least six satellites for both receivers. Relative errors for the position were required to be less than 1.5 centimeters horizontal and 2.0 centimeters vertical in order to be accepted.
- 2019-06-05 00:00:00 - Airborne Survey All data for the 2019 DAS-GEO Gilchrist project area were flown between June 1 and June 5, 2019 utilizing a Leica ALS80 sensor mounted in a Cessna Grand Caravan aircraft. The LiDAR system for the Leica ALS80 sensor was set to acquire ≥333,000 laser pulses per second (i.e. 333 kHz pulse rate) and flown at 1,650 meters above ground level (AGL), capturing a 40 degree field of view. These settings and flight parameters are developed to yield points with an average native density of ≥8 over terrestrial surfaces. The native pulse density is the number of pulses emitted by the LiDAR system. Some types of surfaces (e.g., dense vegetation or water) may return fewer pulses than the laser

originally emitted. Therefore, the delivered density can be less than the native density and vary according to distributions of terrain, land cover, and water bodies. The study area was surveyed with opposing flight line side-lap of ≥60% (≥100% overlap) for the ALS80 sensor to reduce laser shadowing and increase surface laser painting. The system allows for an unlimited number of LiDAR return measurements per pulse, and all discernible laser returns were processed for the output data set. The LiDAR sensor operators constantly monitored the data collection settings during acquisition of the data, including pulse rate, power setting, scan rate, gain, field of view, and pulse mode. For each flight the crew performed airborne calibration maneuvers designed to improve the calibration results during the data processing stage. The LiDAR coverage was completed with no data gaps or voids, barring non-reflective surfaces (e.g., open water, wet asphalt). All necessary measures were taken to acquire data under conditions (e.g., minimum cloud decks) and in a manner (e.g., adherence to flight plans) that prevented the possibility of data gaps. All QSI LiDAR systems are calibrated per the manufacturer and our own specifications, and tested by QSI for internal consistency among every mission using proprietary methods. To solve for laser point position, an accurate description of aircraft position and attitude is vital. Aircraft position is described as x, y, and z and was measured twice per second (two hertz) by an onboard differential GPS unit. Aircraft attitude is described as pitch, roll, and yaw (heading) and was measured 200 times per second (200 hertz) from an onboard inertial measurement unit (IMU). Weather conditions were constantly assessed in flight, as adverse conditions not only affect data quality, but can prove unsafe for flying.
- 2019-01-01 00:00:00 - Processing Once the LiDAR data arrived in the laboratory, QSI employed a suite of automated and manual techniques for processing tasks. Processing tasks included: GPS, kinematic corrections, calculation of laser point position, relative accuracy testing, classification of ground and non-ground points, and assessments of statistical absolute accuracy. The general workflow for calibration of the LiDAR data was as follows: Resolve GPS kinematic corrections for aircraft position data using kinematic aircraft GPS (collected at two hertz) and static ground GPS (one hertz) data collected over geodetic controls. Develop a smoothed best estimate of trajectory (SBET) file that blends post-processed aircraft position with attitude data. Sensor heading, position, and attitude are calculated throughout the survey. Calculate laser point position by associating SBET information to each laser point return time, with offsets relative to scan angle, intensity, etc. included. This process creates the raw laser point cloud data for the entire survey in *.las (ASPRS v. 1.4) format, in which each point maintains the corresponding scan angle, return number (echo), intensity, and x, y, z information. These data are converted to orthometric elevation (NAVD88) by applying a Geoid 12B correction. Import raw laser points into subset bins (less than 500 megabytes, to accommodate file size constraints in processing software). Filter for noise and perform manual relative accuracy calibration. Classify ground points and test relative accuracy using ground classified points per each flight line. Perform automated line-to-line calibrations for system attitude parameters (pitch, roll, heading), mirror flex (scale), and GPS/IMU

drift. Calibrations are performed on ground classified points from paired flight lines. Every flight line is used for relative accuracy calibration. Assess non-vegetated vertical accuracy via direct comparisons of ground classified points to reserved ground survey data. Assign headers (e.g., projection information, variable length record, project name, GEOTIFF tags) to *.las files.
- 2021-05-24 00:00:00 - The NOAA Office for Coastal Management (OCM) received 662 lidar point cloud files in laz format from the Oregon Parks and Recreation Dept. The files contained lidar elevation and intensity measurements. The data were in Oregon Lambert Conformal Conic (NAD83 2011), international feet coordinates and NAVD88 (Geoid12B) elevations in feet. The data were classified as: 1-Unclassified, 2-Ground, 7 - Low Noise, 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, 7, 17, 18. No metadata record was provided for this data set. This record was created by the NOAA Office for Coastal Management (OCM) using information from the data report. OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. An internal OCM script was run to check the number of points by classification and by flight ID and the gps and intensity ranges. 2. 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 Oregon Lambert Conformal Conic (NAD83 2011), international feet coordinates to geographic coordinates, to convert vertical elevations from feet to meters, 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
- 5.2. Quality control procedures employed
- 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/64685

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?
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=9305/details/9305
https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid18/9305/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)

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.