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:
2021 AK DGGS Lidar: Tuntutuliak, AK

1.2. Summary description of the data:
Lidar-derived elevation data for Tuntutuliak, Southwest Alaska, collected August 18, 2021, Raw Data File 2023-17, provides aerial lidar derived classified point cloud data, a digital surface model (DSM), a digital terrain model (DTM), and an intensity model of Tuntutuliak, Southwest Alaska. Data were collected during leaf-on ground conditions. The survey provides snow-free surface elevation data for assessing coastal erosion and flooding hazards. Ground control data and aerial lidar data were collected on August 18, 2021, and subsequently processed using a suite of geospatial processing software. All files can be downloaded from the Alaska Division of Geological & Geophysical Surveys website (http://doi.org/10.14509/31033).

This metadata record supports the data entry in the NOAA Digital Coast Data Access Viewer (DAV).

The NOAA Office for Coastal Management (OCM) downloaded laz point data files from the AK DGGS (Alaska Division of Geological and Geophysical Surveys) website (https://dggs.alaska.gov/pubs/id/31033). The data were processed to the NOAA Digital Coast Data Access Viewer (DAV) to make the data available for bulk and custom downloads. 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.

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:
2021-08-18

1.5. Actual or planned geographic coverage of the data:
W: -162.718058, E: -162.612191, N: 60.374823, S: 60.320544

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 by the Alaska Division of Geological and Geophysical Surveys (AK DGGS). The data were downloaded by the NOAA Office for Coastal Management (OCM) and processed to make it available for custom download from the NOAA Digital Coast Data Access Viewer (DAV) and for bulk download from AWS S3.

Process Steps:
- 2021-08-18 00:00:00 - Ground survey - We deployed a Trimble R10 GNSS receiver at Tuntutuliak Airport. It provided a base station occupation and real-time kinematic (RTK) corrections to points we surveyed with a rover Trimble R8 GNSS receiver (internal antenna). We collected 43 ground control and checkpoints to use for calibration and to assess the vertical accuracy of the point cloud. Points were collected on bare earth, boardwalks, and vegetation (tall grass or alder). We processed and delivered all data in NAD83 (2011) UTM3N and vertical datum NAVD88 GEOID12B.
- 2021-08-18 00:00:00 - Aerial survey - DGGS used a Riegl VUX1-LR laser scanner integrated with a global navigation satellite system (GNSS) and Northrop Grumman LN-200C inertial measurement unit (IMU). The lidar integration system was designed by Phoenix LiDAR Systems. The sensor can collect up to 820,000 points per second at a range of up to 150 m. The scanner operated with a pulse refresh rate of 400,000 pulses per second at a scan rate of 200 lines per second. We used a Cessna 180 fixed-wing platform to survey from an elevation of ~200 m above ground level, at a ground speed of ~40 m/s, and with a scan angle set from 80 to 280 degrees. The total survey area covers ~19 km2. We flew the aerial survey on August 18, 2021, taking off from Bethel Airport and landing at Tuntutuliak Airport. Data was collected from 12:10 pm to 1:10 pm AKST. The weather throughout the survey was clear, with no wind.
- 2022-01-01 00:00:00 - Lidar dataset processing - We processed point data in SDCimport software for initial filtering and multiple-time-around (MTA) disambiguation. MTA errors, corrected in this process, result from ambiguous interpretations of received pulse time intervals and occur more frequently with higher pulse refresh rates. We processed IMU and GNSS data in Inertial Explorer, and we used Spatial Explorer software to integrate flightline information with the point cloud. We calibrated the point data at an incrementally precise scale of sensor movement and behavior, incorporating sensor velocity, roll, pitch, and yaw fluctuations throughout the survey. We created macros in Terrasolid software and

classified points in accordance with American Society for Photogrammetry and Remote Sensing (ASPRS) 2019 guidelines. Once classified, we applied a geometric transformation and converted the points from ellipsoidal heights to GEOID12B (Alaska) orthometric heights. We used ArcGIS Pro to derive raster products from the point cloud. The DSM was interpolated from maximum return values from the ground, vegetation, bridge deck, and building classes using a binning method. The DTM was interpolated from all ground class returns, also using a binning method and minimum values. In ArcGIS Pro, we produced an intensity image by binning and averaging ground, vegetation, building, and bridge deck classes.
- 2024-03-06 00:00:00 - The NOAA Office for Coastal Management (OCM) downloaded 34 laz point data files from the Alaska Division of Geological and Geophysical Surveys (AK DGGS).   The data were in UTM Zone 3 (NAD83 2011), meters coordinates and NAVD88 (Geoid12b) elevations in meters. According to the lidar report, the data were classified as: 1 - Unclassified, 2 - Ground, 3 - Low Vegetation (0. 05 m - 0.2 m), 4 - Medium Vegetation (0.2 m - 3 m), 5 - High Vegetation (3 m - 40 m), 6 - Building, 7 - Low Noise, 10 - Bridge Decks, 18 - High Noise. There were also points that were classified as 20 and 31 that were not listed in either the lidar report or in the provided metadata. These points were assumed to be Noise classes by OCM. AK DGGS confirmed that the class 20 and 31 points should be re-classified as 18 - High Noise. The Class 10 points were re-classified to Class 17 - Bridge Deck in order to be in line with the USGS spec.   During review of the data, OCM also noted that there are points that fall in ponds/lakes and streams/rivers that are classified as ground. OCM processed all classifications of points to the Digital Coast Data Access Viewer (DAV), the classes available for download from the DAV are: 1, 2, 3, 4, 5, 6, 7, 17,18. OCM performed the following processing on the data for Digital Coast storage and provisioning purposes: 1. Internal OCM scripts were run to check the number of points by classification and by flight ID and the gps, elevation, and intensity ranges. 2. Internal OCM scripts were run on the laz files to: a. Re-classify the Class 20 and 31 points to 18 - High Noise and the Class 10 points to 17 - Bridge Deck   b. Convert from orthometric (NAVD88) elevations to NAD83 (2011) ellipsoid elevations using the Geoid12b model   c. Convert the laz files from UTM Zone 3 (NAD83 2011), meters coordinates to geographic coordinates   d. Assign the geokeys, sort the data by gps time and zip the data to database and to AWS S3.

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/72102

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=10072/details/10072
https://noaa-nos-coastal-lidar-pds.s3.amazonaws.com/laz/geoid12b/10072/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_NC

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 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.