Lidar Bare Earth DEM Metadata

June 2024

ABMI ALBERTA BIODIVERSITY MONITORING INSTITUTE

Overview

Summary

This dataset consists of files in GeoTiff format. The dataset is derived from lidar point cloud data. The dataset is intended to aid in the visualization and interpretation of point cloud data for use in landscape and vegetation analysis.

Description

The dataset is a digital terrain model (DTM) representing elevation of the ground surface without vegetation or other above-ground features.

Methods

The Bare Earth Digital Elevation Model is produced using the LidR package[1, 2] and dependencies in R . The input las file is read using the function readLAS and stored as a variable. The noise class is filtered using the argument -drop_class 7. The DTM is generated using the grid_terrain() function, which uses the ground classified points within the input las file. The algorithm's argument is set to tin() to utilize a Triangulated Irregular Network (TIN). Grid resolution is set to 1. The resulting be_dem raster output is GeoTiff format with a file name derived from the original las file name appended with "_be.tiff".

Credits

This dataset includes products derived from lidar data collected and processed by the ABMI.

Acknowledgements

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Contact Information

If you have questions or concerns about the data, please contact:

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[1] Roussel J, Auty D, Coops NC, Tompalski P, Goodbody TR, Meador AS, Bourdon J, de Boissieu F, Achim A (2020). "lidR: An R package for analysis of Airborne Laser Scanning (ALS) data." Remote Sensing of Environment, 251, 112061. ISSN 0034-4257, doi:10.1016/j.rse.2020.112061, https://www.sciencedirect.com/science/article/pii/S0034425720304314.

[2] Roussel J, Auty D (2023). Airborne LiDAR Data Manipulation and Visualization for Forestry Applications. R package version 4.0.3, https://cran.r-project.org/package=lidR.

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Keywords

Lidar, Digital Elevation Model, Digital Terrain Model, Ground Surface, Topography, Terrain Analysis, Bare Earth, LidR

Citation

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Data Product Specifications

Spatial Resolution

The spatial resolution for Bare Earth DEM is: 1 metre

Processing Environment

The processing environment to produce the GeoTiffs and shapefiles is the R programming language, which includes R 4.2, Rtools 4.2 and RStudio Version:2023.06.0. The list of packages utilized includes LidR, raster, rgdal, sf, sp, spatial, and terra.

Resource Maintenance

Resource maintenance update frequency: as needed

Spatial Reference

Projected Coordinate System: NAD 1983 CSRS UTM Zone 11N
Projection: Transverse Mercator
WKID: 2955
Authority: EPSG
Linear unit: Metres (1.0)
False Easting: 500000.0
False Northing: 0.0
Central Meridian: -117.0
Scale Factor: 0.9996
Latitude Of Origin: 0.0
Geographic Coordinate System: NAD 1983 (CSRS)
Angular Unit: Degree (0.0174532925199433)
Datum: D North American 1983 CSRS
Spheroid: GRS 1980
Semimajor Axis: 6378137.0
Semiminor Axis: 6356752.314140356
Inverse Flattening: 298.257222101

NAD_1983_10TM_AEP_Forest
WKID: 3400 Authority: EPSG
Projection: Transverse Mercator
False Easting: 500000.0
False Northing: 0.0
Central Meridian: -115.0
Scale Factor: 0.9992
Latitude of Origin: 0.0
Linear Unit: Meter (1.0)
Geographic Coordinate System: GCS_North_American_1983
Angular Unit: Degree (0.0174532925199433)
Prime Meridian: Greenwich (0.0)
Datum: D_North_American_1983
Spheroid: GRS_1980
Semi-major Axis: 6378137.0
Semi-minor Axis: 6356752.314140356
Inverse Flattening: 298.257222101

Projected Coordinate System: NAD 1983 CSRS UTM Zone 12N
Projection: Transverse Mercator
WKID: 2956
Authority: EPSG
Linear unit: Meters (1.0)
False Easting: 500000.0
False Northing: 0.0

Central Meridian: -111.0
Scale Factor: 0.9996
Latitude Of Origin: 0.0
Geographic Coordinate System: NAD 1983 (CSRS)
Angular Unit: Degree (0.0174532925199433)
Datum: D North American 1983 CSRS
Spheroid: GRS 1980
Semimajor Axis: 6378137.0
Semiminor Axis: 6356752.314140356
Inverse Flattening: 298.257222101

NAD_1983_10TM_AEP_Forest
WKID: 3400 Authority: EPSG
Projection: Transverse Mercator
False Easting: 500000.0
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Central Meridian: -115.0
Scale Factor: 0.9992
Latitude of Origin: 0.0
Linear Unit: Meter (1.0)
Geographic Coordinate System: GCS_North_American_1983
Angular Unit: Degree (0.0174532925199433)
Prime Meridian: Greenwich (0.0)
Datum: D_North_American_1983

Spheroid: GRS_1980

Semi-major Axis: 6378137.0
Semi-minor Axis: 6356752.314140356
Inverse Flattening: 298.257222101

Lineage

The ABMI's Bare Earth DEM was built using ABMI collected lidar data. This dataset is divided into tiles and represents the elevation of the ground surface without vegetation or other above-ground features on the landscape, as processed from the available lidar data.