Lidar Highest Point of Individual Tree/Shrub Metadata

June 2024

ABMI ALBERTA BIODIVERSITY
MONITORING INSTITUTE

Overview

Summary

This dataset consists of vector data in shapefile 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

This dataset provides point features that represent individual treetops and contain attribute information about the location and height of each individual tree.

Methods

The TreeTops shapefile (TreeTop) is produced using the LidR package[1, 2] and dependencies in R. The find_trees() function is applied to the filtered nlas points. The function detects tree points within the point cloud. The resulting tree top points are stored as an object (treetops) and written to a shapefile using the original las file name.

Credits

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

Acknowledgements

We would like to acknowledge Brank Hricko, Stephanie Andrews, Amber Becker, John Simms and other ABMI staff, for the processing of lidar data to derivative files provided here. We would also like to acknowledge several funders who supported the project including the Government of Alberta and the Oil Sands Monitoring Program.

Contact Information

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

> Geospatial Centre
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> CW 405 Biological Sciences Centre
> University of Alberta
> Edmonton, Alberta, Canada, T6G 2E9
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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.

Keywords

LiDAR, Shapefile, Tree Detection, Canopy, Crown, Tree Crown Delineation, LidR

Citation

Alberta Biodiversity Monitoring Institute. Lidar Highest Point of Individual Tree/Shrub Metadata (Version 1.3). Last modified June 11, 2024.

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Data Product Specifications

Spatial Resolution

The spatial resolution is not applicable to this shapefile dataset.

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

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

Lineage

The ABMI's Highest Point of Individual Tree/Shrub dataset was built using ABMI collected lidar data. This dataset is divided into tiles and represents individual treetops and attributed information about the location and height of each individual tree on the landscape, as processed from the available lidar data.