Lidar Mean Intensity of Return 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

This dataset provides the mean intensity values of the returned signals to the lidar sensor. Intensity values are a measure of the strength of the returned signal to the lidar sensor.

Methods

The Mean Intensity of Return (mInt) is produced using the LidR package[1, 2] and dependencies in R. The pixel_metrics function is used taking the nlas as input and applies the mean(Intensity) function to each pixel on the raster. The resulting mInt raster output is GeoTiff format with a file name derived from the original las file name appended with "_mInt.tif".

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:

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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, Mean Intensity, Intensity, LidR, Radiometric, Energy Measurement, Pulse Return, Electromagnetic, LidR

Citation

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Data Product Specifications

Spatial Resolution

The spatial resolution for mInt: 1 metre

Processing Environment

The processing environment to produce the GeoTiffs and shapefile 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 Mean Intensity of Return was built using ABMI collected lidar data. This dataset is divided into tiles and represents the mean intensity values of the returned signals to the lidar sensor, as processed from the available lidar data.