

# Lidar Canopy Height Model Metadata

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**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 is derived from subtracting the elevation values of the bare earth data from the full feature digital surface model (DSM). This dataset provides height values of the vegetation and above-ground features.

## Methods

The Canopy Height Model (CHM) is produced using the LidR package<sup>1,2</sup> and dependencies in R. The input las file is read using the readLAS function and then stored as a variable. The noise class is filtered using the drop\_class 7 argument. The algorithm's argument is set to tin() to utilize a Triangulated Irregular Network (TIN). The normailize\_height() function is used to normalize the heights of the LAS points. Filtering options are applied using the filter\_poi() function to remove points based on z values. The grid\_canopy function uses the filtered points to calculate vegetation height above the ground surface with a grid resolution set to 0.25. The resulting CHM raster output is in GeoTiff format with a file name derived from the original las file name appended with "\_chm.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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<sup>1</sup> 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>.

<sup>2</sup> 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, Canopy Height Model, Height Above-ground, Tree Height, Vegetation Height, Vegetation Analysis, Canopy, LidR

### *Citation*

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## Data Product Specifications

### *Spatial Resolution*

The spatial resolution for CHM: 0.25 metres



### *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 Canopy Height Model was built using ABMI collected lidar data. This dataset is divided into tiles and represents height values of the vegetation and above-ground features on the landscape, as processed from the available lidar data.