

# Lidar Canopy Cover Estimate For Vegetation Within 5 m Above Terrain 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 a customized metric representing a percentage of vegetative canopy cover estimated at 5.0 metres above the ground surface.

## *Methods*

The canopy cover estimate for vegetation within 5.0 metres above the ground surface (cce500) is produced using the LidR package<sup>1,2</sup> and dependencies in R. Custom metrics are applied using the function called metricsFunction() and are based on elevation, intensity and return attributes in the las file. The pixel metric calculation function called pixel\_metrics() is used to apply the custom metrics to each pixel of the raster grid filtering points below 5.0 metres (filter function nlas500). The resulting cce500 raster output is GeoTiff format with a file name derived from the original las file name appended with “\_cce500.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:

Geospatial Centre  
Alberta Biodiversity Monitoring Institute

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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>.



CW 405 Biological Sciences Centre  
University of Alberta  
Edmonton, Alberta, Canada, T6G 2E9  
Email: abmiinfo@ualberta.ca

### *Keywords*

Lidar, Canopy Cover Estimate, Vegetation Analysis, Canopy Density, Custom Metric, LidR

### *Citation*

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### *Use Limitations*

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## Data Product Specifications

### *Spatial Resolution*

The spatial resolution for cce500: 1 metre

### *Processing Environment*

The processing environment to produce the GeoTiffs 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  
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    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 cover estimate for vegetation within 5.0 metres above terrain was built using ABMI collected lidar data. This dataset is divided into tiles and represents canopy cover estimates at 5.0 metres above the ground on the landscape, as processed from the available lidar data.