

498 Views | 153 CrossRef citations to date | 0 Altmetric

Original Articles

Estimation of above ground forest biomass from airborne discrete return laser scanner data using canopy-based quantile estimators

Kevin S. Lim & Paul M. Treitz

Pages 558-570 | Received 11 Nov 2003, Accepted 10 Aug 2004, Published online: 02 Sep 2006

🗨️ Cite this article 🔗 <https://doi.org/10.1080/02827580410019490>

Sample our
Environment & Agriculture
Journals
>> [Sign in here](#) to start your access
to the latest two volumes for 14 days

 Full Article  Figures & data  References  Citations  Metrics

 Reprints & Permissions

Read this article

Abstract

A concept of using discrete return laser scanner data to estimate above ground forest biomass from airborne discrete return laser scanner data using canopy-based quantile estimators. The results show that the proposed method is more accurate than the traditional methods, mature to 100th percentile, 75th and 50th percentile, and above ground biomass variable group. The predictive accuracy is greater than 0.8 in root-biomass, stem-biomass, bark, live biomass, respectively.

We Care About Your Privacy

We and our 842 partners store and/or access information on a device, such as unique IDs in cookies to process personal data. You may accept or manage your choices by clicking below, including your right to object where legitimate interest is used, or at any time in the privacy policy page. These choices will be signaled to our partners and will not affect browsing data. [Privacy Policy](#)

We and our partners process data to provide:

Use precise geolocation data. Actively scan device characteristics for identification. Store and/or access information on a device. Personalised advertising and content, advertising and content measurement, audience research and services development.

[List of Partners \(vendors\)](#)

I Accept

Essential Only

Show Purpose

Acknowledgments

The authors gratefully acknowledge the financial support of the Centre for Research in Earth and Space Technologies (CRESTech), an Ontario Centre of Excellence, and Geomatics for Informed Decisions (GEOIDE), a Canadian National Centre of Excellence. Mr Lim acknowledges the support from the Natural Sciences and Engineering Research Council (NSERC) of Canada through a PGS-B scholarship and the Ontario Government through an Ontario Graduate Scholarship in Science and Technology. Dr Treitz would also like to acknowledge support of the Natural Sciences and Engineering Research Council (NSERC) for financial support through research grants. B. Prenzel, C. Sheriff and V. Thomas are thanked for their assistance with data collection. K. Baldwin and I. Morrison from the Great Lakes Forestry Centre, Canadian Forest Service, Natural Resources Canada are thanked for providing data for the Turkey Lakes watershed study area. The authors gratefully acknowledge Optech Inc. and LaserMap Image Plus for their support in acquiring and processing the LIDAR data for the Turkey Lakes watershed.

Notes

Lim, K. S. S. 2013. Aerial laser scanning for forest science, Queen's University, Kingston, Ontario. Above ground forest biomass estimation using airborne laser scanning data: a comparison of quantile-based and regression-based methods.



Addit

Notes c

Kevin S. Lim

Lim, K. S. and Treitz, P. M. (Department of Geography, Faculty of Arts and Science, Queen's University, Kingston, Ontario, Canada, K7L 3N6).

Estimation of above ground forest biomass from airborne discrete return laser scanner data using canopy-based quantile estimators.

Related Research Data

The Use of Three-Dimensional Convolutional Neural Networks to Interpret LiDAR for Forest Inventory
Source: Multidisciplinary Digital Publishing Institute

Development of a Regional Lidar-Derived Above-Ground Biomass Model with Bayesian Model Averaging for Use in Ponderosa Pine and Mixed Conifer Forests in Arizona and New Mexico, USA
Source: Multidisciplinary Digital Publishing Institute

SRTM DEM Correction in Vegetated Mountain Areas through the Integration of Spaceborne LiDAR, Airborne LiDAR, and Optical Imagery
Source: Multidisciplinary Digital Publishing Institute

Comparison of ALS based models for estimating aboveground biomass in three types of Mediterranean forest
Source: Taylor and Francis Online

Forest structure estimation and pattern exploration from discrete-return lidar in subalpine forests of the central Rockies
Source: Taylor and Francis Online

Fine-scale mapping of forest structure and biomass using airborne LiDAR and the integration of multi-sensor data
Source: Taylor and Francis Online

Application of LiDAR data to assess forest structure and biomass in the Amazonian rainforest
Source: Taylor and Francis Online

Large-scale mapping of forest structure and biomass using airborne LiDAR and multi-sensor data
Source: Taylor and Francis Online

Retrieval of forest structural parameters using a ground-based lidar instrument (Echidna ®)

Source: Informa UK Limited

Modelling stand biomass fractions in Galician Eucalyptus globulus plantations by use of different LiDAR pulse densities

Source: Instituto Nacional de Investigacion y Tecnologia Agraria y Alimentaria (INIA)

Mapping stand-level forest biophysical variables for a mixedwood boreal forest using lidar: an examination of scanning density

Source: Canadian Science Publishing

Estimating above-ground biomass in young forests with airborne laser scanning

Source: Informa UK Limited

Airborne laser scanning for terrain modeling in the Amazon forest

Source: FapUNIFESP (SciELO)

Remote Sensing of Above-Ground Biomass

Source: MDPI AG

Mapping the height and above-ground biomass of a mixed forest using lidar and stereo Ikonos images

Source: HAL CCSD

Dense Canopy Height Model from a low-cost photogrammetric platform and LiDAR data

Source: Springer Science and Business Media LLC

Estimation of biomass change in montane forests in Norway along a 1200 km latitudinal gradient using airborne laser scanning: a comparison of direct and indirect prediction of change under a model-based inferential approach

Source: Informa UK Limited

Multi-sensor modelling of a forest productivity index for radiata pine plantations

Source

Reduc

Discr

Source

Linkin



Relate

A survey of remote sensing-based aboveground biomass estimation methods in forest ecosystems >

Dengsheng Lu et al.

International Journal of Digital Earth

Published online: 18 Dec 2014



Remote Sensing Technologies for Enhancing Forest Inventories: A Review >

Joanne C. White et al.

Canadian Journal of Remote Sensing

Published online: 27 Jul 2016



Information for

- Authors
- R&D professionals
- Editors
- Librarians
- Societies

Opportunities

- Reprints and e-prints
- Advertising solutions
- Accelerated publication
- Corporate access solutions

Open access

- Overview
- Open journals
- Open Select
- Dove Medical Press
- F1000Research
- Help and information
- Help and contact
- Newsroom
- All journals
- Books

Keep up to date

Register to receive personalised research and resources by email

 Sign me up

