







On Tuesday 1 July 2025, 04:00-21:00 GMT, we'll be making some site updates on Taylor & Francis. Online. You'll still be able to search, browse and read our articles, where access rights already apply. unavailable during this scheduled work.

Home ▶ All Journals ▶ Geography ▶ International Journal of Remote Sensing ▶ List of Issues ▶ Volume 32, Issue 2 ▶ Estimating above-ground biomass in young

International Journal of Remote Sensing > Volume 32, 2011 - Issue 2

665 64

Views CrossRef citations to date Altmetric

Original Articles

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

Erik Næsset

Pages 473-501 | Received 29 Apr 2009, Accepted 30 Sep 2009, Published online: 06 Feb 2011

66 Cite this article

https://doi.org/10.1080/01431160903474970

Sample our **Environment & Agriculture**

We Care About Your Privacy

Full Ar

Repri

Abstra

Total abo



from cai a point of m² and

from 2.2

threshol derived

We and our 909 partners store and access personal data, like browsing data or unique identifiers, on your device. Selecting "I Accept" enables tracking technologies to support the purposes shown under "we and our partners process data to provide," whereas selecting "Reject All" or withdrawing your consent will disable them. If trackers are disabled, some content and ads you see may not be as relevant to you. You can resurface this menu to change your choices or withdraw consent at any time by clicking the ["privacy preferences"] link on the bottom of the webpage [or the floating icon on the bottom-left of the webpage, if applicable]. Your choices will have effect within our Website. For more details, refer to our Privacy Policy. Here

We and our partners process data to provide:

I Accept

Reject All

Show Purpose

e different

ights

s derived

S) data with

200-232.9

nass ranged

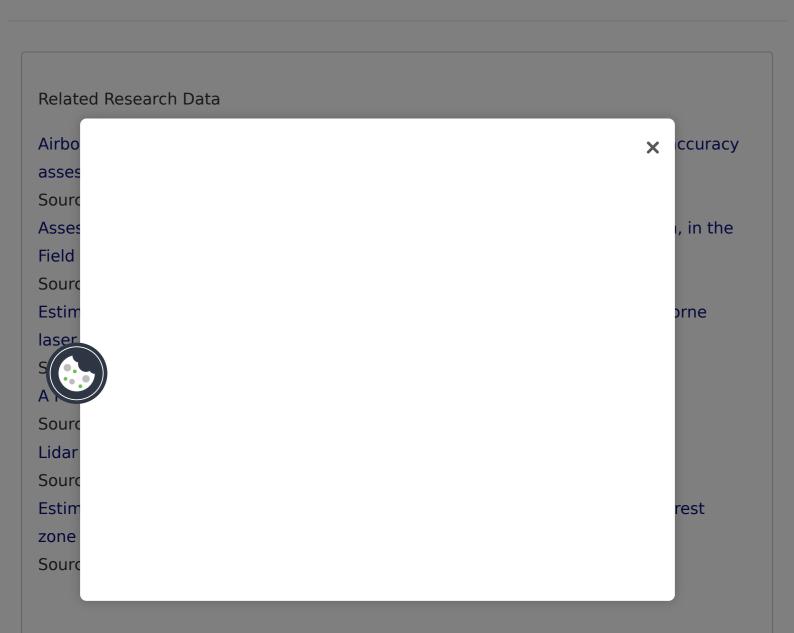
) canopy

and ALS-

ear models.

models with logarithmic transformation of the response and explanatory variables, and

models with square root transformation of the response. The different canopy thresholds considered were fixed values of 0.5, 1.3 and 2.0 m defining the limit between laser canopy echoes and below-canopy echoes. The proportion of explained variability of the estimated models ranged from 60% to 83%. Tree species had a significant influence on the models. For given values of the ALS-derived metrics related to canopy height and canopy density, spruce tended to have higher above-ground biomass values than pine and deciduous species. There were no clear effects of model form and canopy threshold on the accuracy of predictions produced by cross validation of the various models, but there is a risk of heteroskedasticity with linear models. Cross validation revealed an accuracy of the root mean square error (RMSE) ranging from 3.85 to 13.9 Mg ha $^{-1}$, corresponding to 22.6% to 48.1% of mean field-measured biomass. It was concluded that airborne laser scanning has a potential for predicting biomass in young forest stands (> 0.5 ha) with an accuracy of 20–30% of mean ground value.



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

Source: Scandinavian Journal of Forest Research

A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for

Heteroskedasticity

Source: Econometrica

Surface Lidar Remote Sensing of Basal Area and Biomass in Deciduous Forests of

Eastern Maryland, USA

Source: Remote Sensing of Environment

Use of Large-Footprint Scanning Airborne Lidar To Estimate Forest Stand

Characteristics in the Western Cascades of Oregon

Source: Remote Sensing of Environment

Effects of different sensors, flying altitudes, and pulse repetition frequencies on forest canopy metrics and biophysical stand properties derived from small-footprint airborne laser data

Source: Remote Sensing of Environment

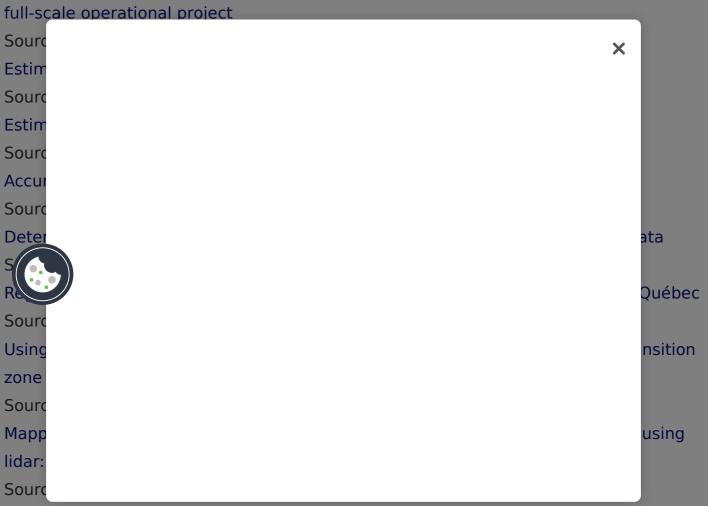
Estimating forest biomass and volume using airborne laser data

Source: Remote Sensing of Environment

Why do we still use stepwise modelling in ecology and behaviour?

Source: Journal of Animal Ecology

Accuracy of forest inventory using airborne laser scanning: evaluating the first nordic



Prediction of tree height, basal area and stem volume in forest stands using airborne laser scanning Source: Scandinavian Journal of Forest Research Above-ground biomass estimation in closed canopy Neotropical forests using lidar remote sensing: factors affecting the generality of relationships Source: Global Ecology and Biogeography Separating the ground and airborne laser sampling phases to estimate tropical forest basal area, volume, and biomass Source: Remote Sensing of Environment Quantifying forest above ground carbon content using LiDAR remote sensing Source: Remote Sensing of Environment Comparing stand inventories for large areas based on photo-interpretation and laser scanning by means of cost-plus-loss analyses Source: Scandinavian Journal of Forest Research Predicting forest stand characteristics with airborne scanning laser using a practical two-stage procedure and field data Source: Remote Sensing of Environment Accuracy of Airborne Lidar-Derived Elevation Source: Photogrammetric Engineering & Remote Sensing Airborne laser scanning: basic relations and formulas Source: ISPRS Journal of Photogrammetry and Remote Sensing Assessing effects of laser point density, ground sampling intensity, and field sample plot s ata X Sourc **Pract** nning laser Sourc Influe Sourc Sensi ical Weib on Sourc Meas Sourc Error Sourc Quan footprint airborne laser scanning data

Source: Canadian Journal of Remote Sensing

Functions for Biomass Estimation of Young Pinus sylvestris, Picea abies and Betula spp.

from Stands in Northern Sweden with High Stand Densities

Source: Scandinavian Journal of Forest Research

Airborne laser scanning—an introduction and overview

Source: ISPRS Journal of Photogrammetry and Remote Sensing An Analysis of Variance Test for Normality (Complete Samples)

Source: Biometrika

LiDAR remote sensing of forest structure

Source: Progress in Physical Geography Earth and Environment

An Application of LiDAR in a Double-Sample Forest Inventory

Source: Western Journal of Applied Forestry

Applied Linear Regression (2nd ed.).

Source: Journal of the American Statistical Association

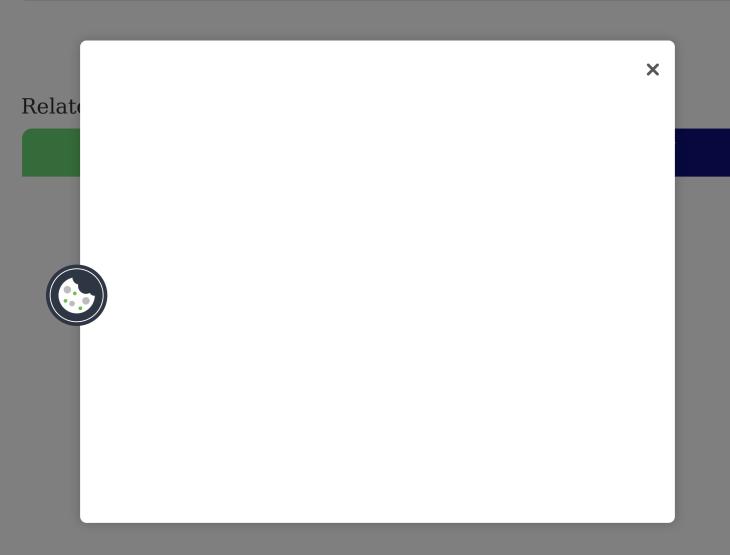
Regression Estimation Following the Square-Root Transformation of the Response

Source: Forest Science

Applied Linear Regression.

Source: Journal of the Royal Statistical Society Series D (The Statistician)

Linking provided by Schole plorer



Information for Open access **Authors** Overview R&D professionals Open journals Editors **Open Select** Librarians **Dove Medical Press** Societies F1000Research Opportunities Help and information Reprints and e-prints Advertising solutions Newsroom Accelerated publication Corporate access solutions Books Keep up to date Register to receive personalised research and resources by email Sign me up X or & Francis Group Copyright