

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2022-80

Anonymous Referee #1

Referee comment on "Allometric equations and wood density parameters for estimating aboveground and woody debris biomass in Cajander larch (*Larix cajanderi*) forests of Northeast Siberia" by Clement Jean Frédéric Delcourt and Sander Veraverbeke, Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-80-RC1>, 2022

Dear. Editor

The current paper aims to parameterize i) allometric questions for aboveground biomass using an existing database and ii) an equation to estimate woody debris on the forest floor using data based on field survey, for Siberian *Larix cajanderi*.

Authors demonstrate significant spatial variations of biomass of standing trees and woody debris estimates on the forest floor, depending on equations and parameters, comparing their estimated parameters with published ones. They come to the conclusion that the developed functions can be applicable to the species in Siberian forests.

I consider that the paper would fail to fit within the journal's scope as well as may fail to attract a broad readership, because i) the study develops a tool, with no application of the tool, thus to fail to draw geo- or biological conclusion, ii) even the developed tools are only applicable at a relatively small scale, as no testing for the feasibility of a large scale application was made, while such tools for a large scale application already exist from national to continental scales, and iii) the estimated parameters were unjustly compared with published parameters, as to overfitting and comparing between different population distributions; for example, published equations were based on smaller and older trees, compared to the data set, based on which allometric questions were developed.

Here come specific comments.

L 15. "... at breast height (DBH)"

Depending on regions, the breast height differs. Specify the height (m).

L51. "The line-intersect..."

Authors may begin a new paragraph before "The line- ..."

2.1 Fine woody debris sampling

This section may be expanded and articulated. For example, papers that have been cited here (Sackett 1980; Van Wagner 1982; Nadel et al. 1997; 1999) articulate the formulation. Because the formulation is of great importance in the paper, it has to be well explained, and readers would not want to check back those papers to understand the formulation and meanings of parameters.

L130. Volume of a sample was first dried and then estimated. Would it underestimate volume of the sample due to shrinkage during drying?

L 305. Figure 3.

I would recommend to add data points in the figures. Ranges of the independent variable

(DBH) differ significantly between functions. For example, DBH in Yakutia ranges 1.9 – 18.9 cm, while DBH in Magadan ranges 3.9 – 52.8 cm. Comparing and merging two populations, each of which has a different DBH distribution, may result in a bias outcome. Moreover, it is invalid to compare it with other published studies, where the populations of size and age of sample trees were out of the current study samples' distribution.

L325. Figure 4.

The meaning of error bars needs to be explained. And how can the estimates of aboveground biomass be 0 (lower ending of the estimates are all 0)?