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Biogeosciences Discussions

Interactive comment on "Height-diameter allometry of tropical forest trees" *by* T. R. Feldpausch et al.

Anonymous Referee #1

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Does the paper address relevant scientific questions within the scope of BG?

While height - diameter relationships are usually a foresters issue, they are of large importance for the determination of forest biomass. The paper shows that these relationships are significantly different for different regions in the world. I think that the link to biomass estimations should be more highlighted. I remember that for example biomass equations for central America give higher values than for the Amazon which seems to agree with the present data.

Does the paper present novel concepts, ideas, tools, or data? The data are novel. The statistical concepts are standard but are used in a new global context.

Are substantial conclusions reached? The paper demonstrates that trees in different

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regions have different hight diameter relationships.

Are the scientific methods and assumptions valid and clearly outlined?

The scientific methods are valid and mostly clearly outlined. In terms of stand structure I was missing explicit competition indeces and I was wondering if tree specific competition indeces (for example the basal area of all tree larger than the sample tree) were explored.

The soil index also remained a bit obscure to me and should be better documented.

On page 7742 the authors talk of the use of so called dummay variable for fixed effects.... I tried to understand the equation and did not understand how these dummy variables are different from standard cathegorical fixed effects. If these are not different they should be just named fixed effects since the term dummy variables is confusing (and refers usually to variables that take only values of 0 or 1. (I am not shure on the exact terminology in hte LME package since I used another R-package for mixed models). I am questioning the validity of some of the results (on different subregions) where wet, dry etc regions behave differently. There seems to be a lot of random results as seen in the table A3 where slopes and other values vary wildely with region.

The use of a simple power relationship between height and diameter is a simplification and other functions have been quite frequently used in forestry (see for example Kiviste et al. 2010 European Journal of Forest Research DOI 10.1007/s10342-010-0434-8 and the literature therein). This literature should also be more referenced. The current function differs from the forestry functions by not having an asymptote. I am wondering what are the implications of using a simple model for the implications of the choice of the model. Expecially, I am worried by the model being biased at different diamters (either high or low). These biases could then explain differences between regions (that have different average tree sizes).

In the case that some of the results are due to these biases a more appropiate equation

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should be used and the paper should be recalculated.

Are the results sufficient to support the interpretations and conclusions? Yes

Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes

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Interactive comment on Biogeosciences Discuss., 7, 7727, 2010.