

## ***Interactive comment on “Towards ground-truthing of spaceborne estimates of above-ground biomass and leaf area index in tropical rain forests” by P. Köhler and A. Huth***

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Received and published: 14 June 2010

Review, manuscript number: bg-2010-127

General comments:

This study evaluates the potentiality of using a forest growth model to simulate the above ground live biomass (AGLB) in undisturbed and disturbed forests by logging considering different logging methods and intensities. The authors compared their results with field measurements and, although their model was not calibrated for the forest studied in this research, they reported significant correlations.

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I consider this study very relevant, given the scarcity of field data and more importantly due to the inaccessibility of many forest sites. However, I do not agree with the author's perspective in this study by arguing that remote sensing (RS) would be the only practical solution for estimating and monitoring the above ground live biomass in tropical forests. First, due to the spatial resolution of the appropriate remote sensing datasets for the biomass estimation of large forested areas (e.g. 20 x 20 m, emphasised by the authors) makes this task not achievable. As the temporal resolution is also dependent of the spatial resolution, the monitoring of these forests is, therefore, not realistic. Secondly, comparing the most recent above ground live biomass estimations for Amazonia (Malhi et al., 2006, Saatchi et al., 2007), one can conclude that there is no high disparities between both maps/estimations. Hence, in primary forests, I think that the biggest contributions for uncertainties is the estimation of the below ground biomass, which can not be carried out with RS data.

Taking into consideration these two points, I believe that the main contribution of the model and methodology developed by the authors are the potentialities for estimating and modelling changes in above ground live biomass over time in disturbed forests. Therefore, I would suggest for the authors, in order to make a more pertinent and actual point with their study, to re-write the introduction and discussion, exploring the importance of estimating and predicting above ground live biomass in disturbed forests for not only the better understanding the spatial patterns of AGLB and carbon fluxes, but also as a main supporting information for the REDD policies.

Malhi, Y., Wood, D., Baker, T.R., et al. (2006) The regional variation of aboveground live biomass in old-growth Amazonian forests. *Global Change Biology*, 12(7): 1107–1138.

Saatchi, S., Houghton, R., Avala, R., Yu, Y., Soares, J-V., 2007, Spatial Distribution of Live Aboveground Biomass in Amazon Basin, *Global Change Biology* (2007) 13, 816–837.

Specific comments:

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**Abstract** The abstract might be changed if the authors decide to follow my suggestions. Nonetheless, they should make clear that they are estimating above ground live biomass. Also, line 15-19 is a bit confused: is one of the objectives to test the effects in different spatial scales? Include the p value for the correlations. It is not clear how the authors evaluate the 0.04 ha and make a statement about the 1 ha in the conclusions.

**Introduction** Page 3229, line 10: Include reference for the carbon emission estimates. Line 18-26. Please specify that these studies are for the Amazon. Also, would be interesting to include something in relation to wood density. Is wood density more important than canopy height for a more accurate biomass estimation? Line 25: Please consider excluding the reference Phillips et al., 2009, and including Aragão et al., 2009.

Aragão, L. E. O. C., Malhi, Y., Metcalfe, D. B., Silva-Espejo, J. E., Jiménez, E., Navarrete, D., Almeida, S., Costa, A. C. L., Salinas, N., Phillips, O. L., Anderson, L. O., Baker, T. R., Goncalvez, P. H., Huamán-Ovalle, J., Mamani-Solórzano, M., Meir, P., Monteagudo, A., Peñuela, M. C., Prieto, A., Quesada, C. A., Rozas-Dávila, A., Rudas, A., Silva Junior, J. A., and Vásquez, R.: Above- and below-ground net primary productivity across ten Amazonian forests on contrasting soils, *Biogeosciences Discuss.*, 6, 2441-2488, doi:10.5194/bgd-6-2441-2009, 2009.

Page 3230, line 6: Please re-write taking into consideration Saatchi et al., 2007. Line 20-21: For which landscapes/forest types? Last paragraph: It is not clear if the authors attempt to test the effects of different spatial resolutions. Please specify the objectives.

#### Methods

Page 3232, Lines 6-16. Please provide an average value for typical crown size. Line 23. Please provide the time step for the leaf area. Line 29. Please specify why senescent trees die. Can you also provide details for the dynamics of the evergreen trees? Page 3233. Line 11. Please specify "a.s.l". Page 3234. Line 20-25. Please re-write, it is very confusing.

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#### Results

Pg. 3236, Line 1-7. Do all trees that die falls? Lines 7-14. Figure 1b is not mentioned. Please specify p value. The authors may want to consider removing the power-law equation, as you add complexity without a great improvement in the results.

Page 3237, Line 11-22. Would be possible to add a comparison of the number of emergent trees between disturbed vs. undisturbed forests?

#### Discussion and Conclusions

Please see "general comments" section.

#### Figures quality

Ok.

#### Tables

Table 2. Add p value.

#### References

Appropriate. Please check again references in the text vs. reference list.

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Interactive comment on *Biogeosciences Discuss.*, 7, 3227, 2010.

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