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Biogeosciences Discussions

Interactive comment on "Tree height integrated into pan-tropical forest biomass estimates" *by* T. R. Feldpausch et al.

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Feldpausch et al provide a detailed analysis on the effect on including tree height in allometric models used to estimate tropical biomass. Their analysis shows three critical insights that have relevance for tropical biogeography, carbon management, and satellite remote sensing of tropical biomass. First, at plot level, uncertainty in aboveground biomass is reduced considerably when tree height (from measurements or from diameter-height allometry) is included (on average, 52 Mg biomass ha-1). Second, biogeographic differences in biomass distributions were significant; with biomass skewed toward large diameter trees in Africa and smaller diameter trees elsewhere, reflecting the importance of stand density. And third, scaling of new plot level biomass estimates reduces pan-tropical biomass by 13%, within implications for REDD+ and a new

benchmark for satellite-derived and model-based biomass estimates.

The manuscript is very clearly written, and the figures are especially informative with the spatial and stand-level patterns of allometric bias clearly shown. The discussion on the recent pan-tropical GLAS/MODIS biomass estimates of Baccinni and Saatchi is timely because bias in spatial patterns in satellite derived biomass may be partly explained by this study.

Comments

The authors appear to suggest that wood density is a much smaller source of error (Section 4.1.6) than constraining tree height. Can an error range be estimated to clarify this from either the current study or from published studies?

In Section 4.2, how might the inclusion of wood density improved satellite derived estimates of aboveground biomass? This comment is partly related to my previous comment.

&, in Section 4.3, Saatchi et al estimate belowground biomass as a function of their aboveground biomass estimates. When describing implications for carbon sinks, do the revised biomass estimates (including tree height) alter the belowground relationship – can some insight be made on this difficult measurement from the current study?

Some minor comments

P2572, line 4-7: this sentence is somewhat unclear and would be helpful is it was re-written.

P2588, line 22: check grammar

P2591, line 8: check grammar

P2595, line 16: I suggest confirming whether height was used from Chave's allometric equations with Baccini et al

BGD

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Interactive comment on Biogeosciences Discuss., 9, 2567, 2012.