**Biogeosciences
Discussions**

Interactive comment on "Mapping tropical forest biomass with radar and spaceborne LiDAR: overcoming problems of high biomass and persistent cloud" *by* E. T. A. Mitchard et al.

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Received and published: 13 November 2011

The authors would like to thank Kevin Tansey for his detailed review, and for his positive and useful comments on our paper.

We will address each point in turn:

1. We understand your comment about REDD+ here, and of course we are not advocating this methodology for a majority of projects. However, we do believe the findings of this paper will have important implications for many groups planning REDD+ projects in tropical forest biomes, where accurate maps of AGB and deforestation are necessary to establish carbon baselines and model future scenarios.

As for your comment about resolution, on the contrary we believe a 1 ha resolution could be good enough for many REDD+ projects: maybe it is too coarse for small-scale sub-national projects under voluntary carbon standards, but for large projects (the UN process is building up to country-wide schemes) even a 1 hectare resolution will produce almost unmanageable dataset sizes, and a coarser resolution still might have to be considered. For example the DRC has an area of 234,540,000 hectares, but will hopefully be considered as one REDD project in the near future: using a higher resolution that 1 hectare over this sized area would not be feasible.

2. The authors of this paper are indeed aware of efforts to collect new data from throughout Africa's forests to enable the development of new and better allometric equations. We are very aware that this is one of the largest sources of uncertainty in estimates of aboveground biomass from forest inventory data. Data from destructively harvested trees are currently being incorporated into new pan-tropical and regional equations. More anon!

3. We have produced such a diagram as requested – it forms a new Figure 2, and is appended to this comment. We thank you for this suggestion, as it has greatly improved the clarity of the manuscript.

4. We understand that the LiDAR footprints are on average very accurate, with horizontal geolocation accuracies of <15 meters (http://icesat.gsfc.nasa.gov/icesat/publications/GRL/magruder-1.pdf)

Given the footprints are of ∼70 m diameter, we do not believe this is a cause for concern.

5. We have added details of our 'aims' to the penultimate paragraph of the Introduction, and added discussion of these in the Discussion.

6. Yes, we did indeed test others, with similar results. This is just a test for demonstration purposes, and using these 6 classes provided a good balance between having

sufficient footprints within each class, and sufficiently separating the data.

7 & 8: We purposefully chose to publish these results in an open-access journal read by a wide range of people, rather than in a technical remote sensing journal, in order to ensure that the results were read by the wide range of researchers, foresters, NGO's and government bodies working on REDD+. We feel it is important to show the capacity of active sensors to produce AGB maps, over-and-above optical sensors; and also to show a frank and detailed discussion of errors. The biases and inaccuracies here are we believe not sufficient to cause this type of data to not to be useful for REDD: it is just that many other studies which claim higher accuracies do not properly propagate their errors through the analyses (GOFC-GOLD, 2009).

We have not therefore removed REDD from sections 5/6, but we have edited some of the discussions of REDD to stress the experimental nature of this work, and distance and contrast it with the monitoring systems of most REDD projects.

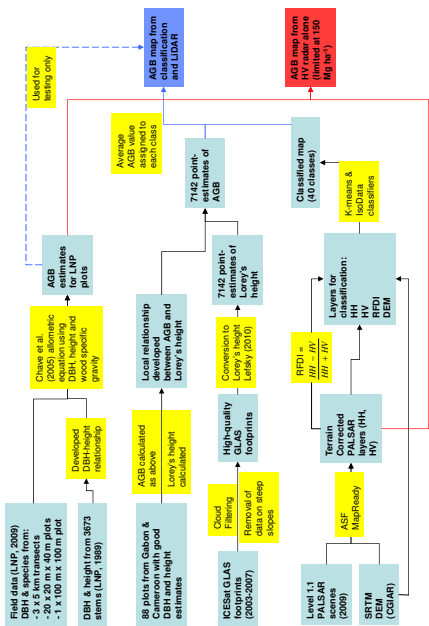Interactive comment on Biogeosciences Discuss., 8, 8781, 2011.

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Fig. 1.

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