

***Interactive comment on* “Characterizing Leaf Area Index (LAI) and Vertical Foliage Profile (VFP) over the United States” by H. Tang et al.**

Anonymous Referee #1

Received and published: 27 August 2015

This paper presents important regional LAI information for the contiguous USA, while comparing and evaluating results to airborne lidar, Landsat, and environmental factors. The study is very well written, with a clear narrative, and a credible conclusion. Particularly interesting is the discussion about the understory components, and the canopy layering information defined at the ecosystem level. This paper should be accepted following minor revision.

General Comments

A) Section 2.2. Leaf-off season is indeed from November to March, but for maximum foliage, it would be recommended to use May to September shots only. Can you pro-

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vide a short evaluation of shots chosen in leaf flushing and senescence periods? This factor may be responsible for your negative LAI bias.

B) Section 2.2. An equation defining the gap profile derived from the lidar waveform, and/or the choice of variables, e.g. the clumping factor if used and the g function. Just a little more information about this would be useful.

C) Section 3.2 paragraph 2. Figure 3 and Figure 6 should be in sync. Do not present 5 m intervals if your final qualitative product is in 10m intervals. Either also present the 10 m intervals or only present 10m.

D) I agree that showing the LAI for the WWF regions is significant, and an important result. What would also be useful would be to present LAIs for large gridded areas over the contiguous US, e.g. 1-3 degrees depending on the density of the GLAS pulses. This may also tie in well with the comparisons to elevation, forest cover, and precipitation. In fact, these could be presented alongside.

Specific Comments

1) P. 13681 Lin 10. 3x3 what?

2) Figure 2 & 3. Put the RMSE and R2 and bias on these figures or on the caption.

3) Figure 2 caption: 'Each VFP point represents an integrated value of foliage density at 5m height interval.' Change this to '... at each 5m height interval' or '...for all 5m height intervals'.

4) Figure 9&10. Not sure why the boxplots are of different sizes. This is cosmetic, but some would prefer the same sizes.

5) Section 3.3: By Forest Ratios do you mean canopy cover defined by some passive satellite? This is not clear. Do you use land class products under the footprint to define forested pixels vs non forested?

6) Are all your boxplots in Fig 9 & 10 equivalent to your ecoregions, or some predefined

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grid size?

7) P. 13686 line2. Pedantic...but perhaps don't use 'reasonable'.

8) P. 13687. Are GLAS LAIs derived from the raw waveform or the modelled 6 Gaussians?

Interactive comment on Biogeosciences Discuss., 12, 13675, 2015.

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