Geosci. Model Dev. Discuss., 4, C1085–C1087, 2011
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Geoscientific
Model Development
Discussions

Interactive comment on "Vegetation height products between 60deg; S and 60deg; N from ICESat GLAS data" *by* S. O. Los et al.

Anonymous Referee #1

Received and published: 16 November 2011

General comments:

This paper describes a method to map canopy height and fraction cover at 0.5x0.5 degree resolution based on ICESat/GLAS data (GLAS14 product). The GLAS shots are selected if they fit some criterias ("filters") which have been design from a L1A campaign subset over a desert in Algeria. All ICEsat campaigns are aggregated within resolution cells to obtain final canopy height. The effect of criteria strength is analyzed and discussed.

The paper has three major flaws:

1-Why design the GLAS shot filtering procedure from a small desert area in Algeria and using only L1A data? Since the mapping is global, all desert areas could be used

with all laser campaigns.

2-Computation of the bare ground fraction does not take into account the filtering procedure which has a major impact on the number of selected GLAS shots. (i.e. The selection process removes more forest shots than bare ground).

3-The comparison with Lefsky's map lacks a quantitative analysis.

Specific comments:

p 2336: it is puzzling that a threshold of 8meters is selected. As mentioned in the paper, the bias due to presence of vegetation will be significant. Thus such threshold does not make sense once it is applied to forest areas.

The ICESAT/GLAS elevation provided in GLA14 is computed from the full waveform (not the last peaks) so that the 8 meters defined from desert areas may not be appropriate.

p 2331 line 12: add GLA14 product when talking about the Gaussian fits.

section 3.1.2 In the GLA14 product there are spurious shots with much larger DEM error. Any relationship with tree height?

Section 3.1.3 You use 1 or Gaussians. How is the area of the 2nd changing?

Conclusions on line26: How can you reach such conclusion given the test is over the desert?

section 3.1.5 It lookks like tht spread of heights is larger for low values...explain.

section 4.1 The filters are applied sequentially. What happens when the order is changed?

section 4.2 line 17: wasn't that done for other sites? line 25: Why did you sample the airborne lidar data to a 50m grid cell that is not centered on the GLAS shots? Why not use the all airborne shots within the GLAS shot like you haved done for the Peru site.

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In that case Figure 3b would bot be necessary.

p2341 line 16: Doesn't the use of "max tree height" least sensitive to variability? As long as the tallest tree is somewhere within the footprint, one should obtain the same height. please discuss.

p2342 line 2: sub-meter GLAS location accuracy. I have strong doubts. Can you prove that? line6-8: This argument is far from being convincing when Figure 3C shows a correlation of 0.25.

p: 2343 line 5: what about k=0 or 0.5?

p: 2344 line 6-17. Lefsky's map is not 1km resolution. Large scale segments are used. This comparison should be done quantitatively (simple subtraction could be performed.

In section 4.5, Filtered shots are used to compute bare ground cover fraction (p2330 line 20). The computation of bare soil fraction must be strongly driven by you filter selection method. More shots are removed in forest areas as indicated in table 2.

p:2348 line19: The paper does not show the substantial improvement over existing products as no quantitative analysis is provided.

technical comments: Caption of Table 1: there is no "double" line.

Interactive comment on Geosci. Model Dev. Discuss., 4, 2327, 2011.