

Interactive comment on “An enhanced forest classification scheme for modeling vegetation-climate interactions based on national forest inventory data” by Titta Majasalmi et al.

Anonymous Referee #1

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Review of bg-2017-301: An enhanced forest classification scheme for modeling vegetation-climate interactions based on national forest inventory data

Summary

The authors present a species-based structural classification of forest types based on field and other data and apply it to a global land cover product. The more detailed forest classification considerable changes the forest cover in the global product.

This is an interesting project that has results that are potentially useful to a wider community, but there are several shortcomings that need to be addressed prior to being considered for publication. These are the main issues, with specific comments follow-

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ing:

- 1) The introduction lacks a literature review and does not present an appropriate context.
- 2) The methods are incomplete and confusing. The use of crown length and LAI seem extraneous and complicate the classification.
- 3) The significant difference between this study's classification and the global product is one of the major findings, yet it is not presented as such and the implications of it is not discussed
- 4) The discussion should discuss the implications of the findings rather than speculate about ecosystem modeling of structural attributes.

Specific comments and suggestions:

Abstract

Be specific that the key structural variables used are volume and lorey's height. It seems like another key finding here is how much the CCILC land cover classification changed. It appears that there was only ~65% agreement between the CCI data and the NFI data.

Introduction

This introduction needs a context, and also a literature review.

It seems that linking forestry and earth system modeling is a desired context, but this is not developed. A context needs to presented and explained up front, showing where this classification fits in to improve earth system projections.

Actually, the better context here may be land cover classification, as that is what the project is, and there is a major difference between this study and the global product. Classification has been done at many scales with many methods, and here you merge

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a couple of levels of data and products. Maybe this should be the focus of your literature review.

Also, there are little to no citations, but a lot of assertions. For example, management intensity affects forest structure, or climate modelers can't use forest information, or intervention and forest structure relationships are well known.

There are actually several dynamic vegetation models (no citations there either) that simulate succession and have height classes, and global data sets that include primary and secondary forest area and transitions.

page 2, line 9 LAI quantifies the areal exchange interface between vegetation and the atmosphere

Materials and Methods

The intro section 2.2 is too long and confusing. Make just a brief summary and rely on the figure for the overview, then go through the process in order. And section 2.3 is also part of the section 2.2 summary, which means it should be organized accordingly.

page 4, line 6 what type of clustering analysis?

page 4, lines 7-8 what classification scheme?

page 4, line 8 what are these maps? you mention later that they are land cover maps. But even later it sounds like they have more info than that. resolution? what are the data sources?

page 4, lines 8-11 this is confusing. are the MS-NFI maps made already, or do you make them? what data do you use for the extrapolation? what role do the MS-NFI maps play?

page 4, lines 14-15 what classified high resolution maps?

page 5, line 1 what about the decrease in the sum vs the increase in clusters deter-

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mines the optimum? also, is this the number for each of the species groups?

page 5, line 31 what method did you use to assign the MS-NFI data to the classes? The lookup table just has single numbers for V and H (presumably the cluster centers?). the maps likely have a range of values.

page 6, lines 1-6 if you classify based on V and H, why do you originally cluster with CL and LAI? Especially since you correct the original clusters with V and H and MD? It seems like you have an extra, unnecessary step. This also appears to split up your subgroups in strange ways (see figure 2 for non-contiguous groups in VH space)

page 6, line 12 you went from figure 1 to figure 4. please number your figures in the order of reference.

page 6, lines 8-19 what does this have to do with the structural classification? this seems to just be cover percent based on resampling the high-res forest cover.

page 7, lines 17-18 euclidean distances for 4 variables, not just V and H. in 2-d space the euclidean distance would give circular boundaries with contiguous groups. It isn't clear why CL and LAI were used.

page 8, line 4 reference your tables in numerical order

page 8, lines 1-19 there seems to be a very large difference between the CCI LC data and your data. This is a key finding and should be discussed with respect to which data may be more accurate, or whether this is simply a large level of land cover uncertainty.

Figures and Tables

Figure 3 What are the subgroups?

Table 4 is not referenced at all

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