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Discussions

Interactive comment on "Effects of land management on large trees and carbon stocks" *by* P. E. Kauppi et al.

Anonymous Referee #1

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General comments

Kauppi and co-workers present a straightforward analysis on the growing stocks of large trees in both Finland and parts of the US and observed that growing stock is increasing in all regions except Northern Finland. Although this is an interesting finding, when presented as the sole analysis of a manuscript – as done here – it results in a very light manuscript in terms of results. Consequently, the discussion became an overview of (marginally) related studies and reasonable speculation but no new evidence-based insights related to the observed changes in growing stock are presented.

Combing the discussion and conclusions in a single section seems to be in conflict with the aim of both sections. Where the discussion allows for an in-depth discussion of the results, the conclusions are expected to concisely re-iterate the main findings. Please,

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prepare a conclusion section

The Finnish and US regions are presented as if they are balanced in terms of diversity and surface area. When this is not the case, trend detection in a smaller less diverse region is more likely than trend detection in a large diverse region. If the US regions would be further split in smaller regions (i.e. the same size as the Finnish regions), it becomes more likely that also in the US regions without increasing stocks of old trees will be found. The authors should carefully validate their approach before presenting the results. The reasoning behind the comparison of Finland and the US should be justified and discussed in the manuscript. The relevance of just comparing these two very different regions are not clear from the current presentation.

The authors touch upon defining 'large trees' under different growing conditions but fail to present a satisfying solution (i.e. page 2744 lines 4-11). A more objective approach based on the forest inventory data is achievable, i.e., the 80% quantile of observed diameters of one specific inventory year. At present, the applied thresholds seem arbitrary and are reported inconsistently in the manuscript: the caption of Table 4 reads 33 cm, the accompanying figure reads 53 cm.

Specific comments page 2743 line 11. The citation of Nabuurs et al ignores the scaling issue (see above). Detection of a trend over Europe is less likely than detection of a trend over Finland due to differences in surface areas and heterogeneity of the populations under study. Page 2743 lines 13-24. Correct but not relevant in this context. Page 2743 lines 27-28. All references refer to model studies. Due to several structural limitations in these models (i.e. big leaf assumption) these models are not necessarily capable of reproducing the expected effects. The models do not represent individual trees thus the reasoning in lines 28 e.f. is not supported by the preceding references. Please, use observation-based evidence or model-based evidence from individual tree-based models rather than big-leaf models. Page 2744 lines 19-28. Reasonable speculation but not shown/supported by your analysis. Page 2745 lines 1-14. Interesting but again a clear relationship with your analysis is lacking. Page 2745 line

19. How did you define significant. Please quantify this statement. Page 2745 lines 25-27. This should probably be the conclusion of the manuscript but the discussion needs additional evidence (i.e. harvest statistics) and analysis to support this conclusion. Caption Table 1. Consider replacing poorly by low and scrub by shrub. Table 2. Add total stock or another metric that gives some reference/frame to the reader. Combine Table 4 and table 3. Use the same scale (or at least indicate the scale) for the maps. Figure 2 and Table 2 overlap. Table 2 contains no unique information compared to Figure 2.

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