

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2022-60

Anonymous Referee #1

Referee comment on "Large-diameter trees control forest structure and function in successional temperate forests" by Chang-Bae Lee et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-60-RC1>, 2022

Review for BG: Large-diameter trees control forest structure and function in successional temperate forests, from Chang-Bae Lee et al.

General comments

I congratulate the authors for the manuscript, which shows the importance of large-sized trees for the biomass storage across temperate successional forests. The manuscript is very well written, the text is fluid and very well supported. In my estimation, the authors did well in the data analysis, but maybe too much for one manuscript; therefore, my main suggestion is to evaluate the needs of the two approaches to understand the effect of the chosen predictors on AGB. I hope that my suggestions contribute to the manuscript improvement. Best regards.

Specific comments

L34: I don't think that "phenomenon" is the best word to describe it here. Maybe condition suits better?

L59: To be acquisitive or conservative depends largely on the forest moisture, i.e., wet or dry forest (see Poorter et al 2019 Nature, doi.org/10.1038/s41559-019-0882-6). Thus, be cautious in making this assumption.

L77: "metric" is more likely to be related to a combination of variables, e.g. an index. In your case, the large-trees mean a variable.

L83: Why not in the understory?

L85: Does your study region have drought periods?

L87: This may not be totally true. Soil is certainly important, but light availability is as important as soil fertility.

L112: As I understood, the authors do have the information of tree dbh, but the AGB was estimated from the tree volume information. Why did you choose this approach? Did you perform any comparison from the biomass estimated via dbh or via tree volume? I am concerned about future comparisons. Most part of the AGB estimations from forests across the world are based on tree dbh, and this approach via volume may be not entirely comparable.

Table S2: The predictor's values for 99% remaining trees and understory trees are quite similar, aren't them? This makes me think if the classification adopted by the authors is the best to describe forest strata differences. Did you consider splitting the data by different size classes?

L154-L157: I am afraid that you cannot perform a PCA with those topographical data. According to Legendre and Legendre (cited), the correct procedure should be a PCoA, due to the nature of the data (non-continuous data, such as latitude and longitude). Please revise and correct.

L168-L187: The data analysis description is a bit confusing to understand. Consider showing this information in a table, it will be much easier to follow. Regarding the model selection, why did you perform a backward selection via stepAIC to select the best model, instead just a simple AIC? The backward model selection is used to test candidate models by removing variables, and if I understood, this was done again via dredge function. I suggest performing a simple AIC to compare the five candidate models, and then apply a dredge function the model with lowest AIC.

L188-L192: I did not understand why you performed multiple regressions as well as the pSEM model. In my estimation, those two analyses are too much for one manuscript, making the overall message confuse. Consider removing one of those approaches, focusing on the multiple regressions or the structural model, and not both. I suggest showing only the multiple regressions results.

L224-L226: I understand your point, but I recommend being cautious with this suggestion. To improve the carbon sequestration is good to remove more carbon from atmosphere, but by managing these forests and removing large trees, all their carbon will be released, and the balance from gains and losses (net carbon change) may become negative, which is not the intention.

Technical comments

L73: Did you mean "poorly known" instead of unknown?

L79: standing biomass?

L139-L141: You mention that four traits were selected to perform functional analysis; however, just three are described. At line 143 you mention three traits. Maybe the previous sentence is incorrect, please check it. Additionally, is there any particular reason for not using WD as a predictor?

L150: NFT or NFI?

L215: No needs to mention dbh here.

L242: Correct "severe"

L329: Correct "climatic"

