

Interactive comment on “Recent above-ground biomass changes in central Chukotka (Russian Far East) using field sampling and Landsat satellite data” by Iuliia Shevtsova et al.

Anonymous Referee #1

Received and published: 9 December 2020

The research results presented by Shevtsova et al in the manuscript "Recent above-ground biomass changes in central Chukotka (Russian Far East) using field sampling and Landsat satellite data " make a great contribution to understanding the response of terrestrial ecosystems to climate changes in a relatively poorly studied region of the Subarctic, in particular, on the level of biomass accumulation of plant communities. Although the methods and approaches used in the collection of materials and their analysis in the study of such phenomena are valid in general, but additional clarifications are required in some points before manuscript will be published finally. Thus, on lines 94-95 it was written and on Fig.2 was demonstrated that each sample plot is round and has radius 15 m, but in Appendix A it was written on lines 468, 487, 531,

580, 609 calculations were done " for a 30 x 30 m sample plot ". In the case of round plot with 15 m radius, area of sample plot is 706,5 m² ($=3.14*15*15$), but in case of a 30 x 30 m square plot, it is equal 900 m², and the last value was used for calculation in Appendix A on lines 485-486 (A5). Please, clarify for what area was done calculation. Also it is not entirely clear how the biomass of all branches and foliage was calculated, since it is not said in lines 117-123 (for trees) or 127-129 (for shrubs), or in Appendix A, how the number of branches (from small to large) in model trees and bushes were estimated - by eye or by direct counting after they have been felled. On line 124 it was indicated that "exponential models" were used, but does not indicate where these models are presented. It should be noted that they are also listed in Appendix A (A29-A34) and it will be great if some relations between biomass of wood or needles and tree height (or stem diameter) will be demonstrated in a form of graph (figure). On lines 115-116 it was written that "heights of all trees were visually estimated in the 15 m radius plot after training with a clinometer (SUUNTO, Finland)". As a rule, the data obtained in this way have a large error (+/- several meters) if the trees are tall (more than 15 m), and the stand is dense. Such an error does not allow to accurately calculate the biomass of each tree (i.e. +/- 5-10%) on the sample plot. It was better to measure the height with a measuring rod (the average error in the presence of experience is 0.2-0.4 m) or to use for calculations also the diameter (perimeter) of the trunk, specially measured for that in the field at the stem base or on height 130 cm. The error would then decrease to 1-2%. On lines 140-143, in order to understand how a developed "redundancy analysis (RDA) model", an unprepared reader needs to familiarize himself with a significant part of the article "Shevtsova et al., 2020a". This is inconvenient for any reader, so I propose to reveal in more detail the essence of the method for developing this model in the text of the manuscript or at least in the Appendix. On lines 327-328 it was written that "stem diameter measurements (stem perimeter) were not available for all trees". What does it mean ? No measurements were taken or was it difficult to do it for some reason? It is well known that larch trunks are usually well accessible for measuring their diameters. On line 329 - I agree with

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the statement that the diameter and height of trees usually correlate well with each other. And if such data were obtained, it will be great to demonstrate them in Appendix. Also, in order to be sure of the accuracy of the measurements of the biomass of trees through their height, it would be good to compare the total trees AGB calculated using the height and diameter. This is also connected with the fact that the authors of the manuscript themselves in the "Discussion" indicate some discrepancies with the data of other researchers, and therefore, in order to prove the accuracy of their calculations, such a comparison must be made. In general, in my opinion, scientific results and conclusions presented in a clear, concise, and well structured way, but in Fig. 1, it is desirable to change the color of the line denoting treeline to a more distinguishable one against the main green background, for example, red.

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2020-416/bg-2020-416-RC1-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-416>, 2020.

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