

Dear Dr. Stefan Kruse,

Please address the following items. This would be the last step for accepting your manuscript for publication.

Item 1

A comment of the Reviewer #1:

"405-407: How can the simulation of a single species help to overcome the difficulties introduced by lumping several species into one artificial PFT??? Either explain or omit."

Your response:

This statement holds (so far) only for the Siberian treeline ecotone with single-species dominated forests. Thus, we deleted the part of the sentence. However, we started to introduce several tree species of the Siberian boreal forests into the model and with this the model can be applied at a larger scale covering not only the latitudinal treeline ecotone.

The corrected sentence (Line308~ in the rrevised manuscript):

With this, it bears great potential to evaluate whether the difficulties caused e.g. by the plant functional type grouping many species with a variety of traits together as used in DGVMs (e.g. Lee 2011, Snell et al. 2014).

My comment:

I am not satisfied with your response here. Your model simulates a forest, where larch trees monopolize, and hence you can just avoid complicated works to classify varieties of woody species into smaller number of PFTs. There are no reason to expect that the model bears potential to evaluate difficulties caused by PFT classifications.

Item 2

A comment of the Reviewer #2

What is the exact transect for the sensitivity study - are these 10 100x100m plots with homogeneous climate (on each/all plots) or is this one 1000? It's a north-south transect, correct? In the review response the authors state that "seed dispersal was allowed on the meridional borders but not the latitudinal limits". I think this information is still missing in the current manuscript.

Your response:

The transect consists of only one plot. For these simulations we allow only establishment in the southernmost part of it in the beginning during stabilisation. In the following years, trees can establish in the remaining area northwards and the colonisation of the empty area can be observed.

We added the regarding information on the newly introduced mode of boundary conditions for seed dispersal only along meridional borders here and before in chapter 2.1. see also our answer to comment R2 [105].

The corrected sentence (Line104~111 in the revised manuscript):

The absorbing boundary condition had to be revised to allow the simulation of larger areas. Hence, we introduce a new mode of periodic boundary conditions that allows seeds leaving the simulated area to reenter on the opposite side, so that the borders of a simulation plot are connected along all borders. This mimics a tree stand within a homogeneous forest, similar to forest gap models (e.g. Brazhnik and Shugart, 2016; Pacala et al., 1996; Pacala and Deutschman, 1995; Zhang et al., 2011) and we used it in the simulations used for verification and parameterisation for this manuscript. A second mode was implemented for simulations of hypothetical north-south transects, which were used 110 in the sensitivity analyses, allowing seed dispersal only on the meridional borders but not the latitudinal limits.

My comment:

For making the description easily understandable, how about stating sizes of the periodic grid (100m × 100m) and the transect (100m × 1000m) here? Also, delete "110" in the last sentence.