

Answer to Anonymous Referee #2 RC C199

black: referee

blue: answer

This paper accomplishes two significant tasks. First the paper provides a new scheme for modeling stochastic gap disturbance in DGVMs. Second the paper provides a parameterization of LPJ for a new region and species. The paper is well written and the progress the authors make on modeling gap disturbance is important. However, I found the parameterization at times distracting from the issue of tradeoffs between computational speed and accuracy in modeling gap disturbances. The parameterization is important, but as the interpolation method takes the headline of the paper and introduction, its performance should be prominent in the discussion.

Specific comments: Some sort of presentation of the decrease in precision with the use of LPJ-GUESS-G and increase in computation speed as it departs from LPJ GUESS by using sparser and sparser runs for interpolation would be useful to readers before comparing the results in a particular case.

In fact, different sets of deterministic simulations to interpolate with the GAPPARD method would be interesting to have. However, our main aim is to introduce the method. Like discussed, a detailed analysis of the influence of such nodes and their positioning preferably should be combined with extreme climatic events and could be a topic of a following paper. Concerning the simulation times, different starting points for simulations without disturbances would not have a big influence: the most simulation time consuming run is the one that includes the spinup (important to also consider old trees). I added some sentences to the results chapter explaining that.

In the least, Figure 8 should be placed earlier in the results.

exchanged figures 6 and 8

The parameterization takes up a large portion of the paper and its results are mentioned first in the discussion. This level of treatment deserves more consideration in the introduction. Explain why this parameterization is a good test of the model, what should readers expect as a good fit to this type of data from LPJ-GUESS – i.e. how well have people done before?

We added a paragraph to the introduction to inform about existing LPJ-GUESS parameterizations and their characteristics and to highlight the need for our parameterization.

The authors claim the parameterization is successful pg 1035, ln 6 but do not give sufficient justification.

The explanation comes in the following sentence: 'high accordance between the used NFI and the simulated data...'

The cutoff of 0.67 used in Table 3 is never justified.

The chosen value 0.67 is only due to increase the clarity of the table. To make this clear we added some explanations in the table header.

Figure 2 might benefit from including a plot of the result of the GAPPARD, that is as I understand it the sum of b1 and b2.

Included a result trajectory to the figure.

Description of information in tables and figures can often be found in the text, but these items should stand on their own as much as possible.

Table 3 should indicate what output of the model (carbon mass) is being compared with the data, reference Appendix B and explain why 67 is the chosen value of significance.

added 'carbon mass', referenced AppendixB and explained why we chose 0.67

Table 2 RID – text says that this is the RID (years) is the value that best fits the data. But the table represents it as if it is data,

changed the title of the table to "Specified characteristics and used return intervals for disturbances"

and provides no units.

added 'in y'.

Technical Comments

Remind readers of acronym meanings in each section of the manuscript. (I.E. pg1035, ln 9; pg 1037, ln 10)

done

Typo on pg 1040, ln 3 “Despite of all”

deleted "of"

Figure text is too small to be easily read in many places.

We improved the readability of all figures by applying larger font sizes and thicker lines.

Additional changes

Changes due to the comments of Anonymous Referee #1 RC C81

We included the former sections 2.1 and 2.2 into the introduction, because they only sum up existing methods. Moreover, some of their content already was included in the introduction, and thus redundancy occurred.

Abstract, p.1022, line 10
deleted ",and to explore patterns of spatial scaling in forests"

Abstract, p.1022, line 24
replaced " With GAPPARD applied to LPJ-GUESS results were insignificantly different from the output of the original model LPJ-GUESS using 100 replicate patches, but simulation time was reduced by approximately the factor 10."
by "We obtained results insignificantly different from the output of the original LPJ-GUESS model that uses 100 stochastic replicates, but simulation time was reduced by approximately the factor 10."

Abstract, p.1023, line 1
replaced " and comparisons with large-scale datasets and forest models"
by " and comparisons with large-scale datasets and results of other forest models"

replaced
'Pinus Montana' by 'Pinus Mugo' in figures and tables

renewed AppendixC