

## ***Interactive comment on “GAPPARD: a computationally efficient method of approximating gap-scale disturbance in vegetation models” by M. Scherstjanoi et al.***

### **Anonymous Referee #2**

Received and published: 5 April 2013

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

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

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?

The authors claim the parameterization is successful pg 1035, ln 6 but do not give sufficient justification. The cutoff of 0.67 used in Table 3 is never justified.

Figure 2 might benefit from including a plot of the result of the GAPPARD, that is as I understand it the sum of  $b_1$  and  $b_2$ .

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. – 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, and provides no units.

#### Technical Comments

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

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

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

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Interactive comment on Geosci. Model Dev. Discuss., 6, 1021, 2013.

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