

Interactive comment on “IMOGEN: an intermediate complexity model to evaluate terrestrial impacts of a changing climate” by C. Huntingford et al.

Anonymous Referee #2

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GENERAL COMMENTS:

This paper proposes a simple model to represent the response of a GCM. Basically the structure of the system is reasonable and worth to be published.

However, for publication as a peer-reviewed paper I felt more discussion is needed on why, as presented as Fig 3, EBM 1 can't represent the GCM's response, in particular:

- (1) How well the pattern scaling could represent the GCM's climatic field (particularly precipitation and radiation), and how influential is it to the difference in carbon storage?
- (2) How was the representability of marine carbon storage?—in case of an emission scenario, marine carbon uptake may be trade-off with terrestrial uptake.

These discussions will be helpful to think about the limitation of the model, and what

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the users should take care of when the model is used for other scenarios or GCMs.

In addition, if the authors want to say the model is applicable for regional assessments, the spatial distribution of the error from the GCM (in NPP, runoff and other important variables) should be checked (looking at the spatial distribution of error in carbon storage may tell the authors something important).

SPECIFIC COMMENTS:

Page (p) 1163, Abstract: It may be too short. The possible limitation and the problems remained should be mentioned.

P1168 L9-11: It seems that even EBM2 still has around 50GtC error in 2100 (and the error will be larger afterward). So my understanding is that basically (the current version of) the system is only applicable up to 2100, is it correct?

p1169 L16: What degree is used in the “temperature cut-off”?

p1169 L21-24: Is the number of PFTs smaller than that of the GCM? Is it not so influential to the carbon balance?

p1172 L28-p1173 L1: Will you comment on the contribution of changing climate (precipitation, temperature etc) and that of stomatal closure to the change in runoff?

p1174 L28: How deep is the first atmospheric GCM model layer?

TYPOS: p1170 L27: of. -> of (delete a period)

p1174 L29: windspeed -> wind speed

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