Earth Syst. Dynam. Discuss., 5, C239–C241, 2014
www.earth-syst-dynam-discuss.net/5/C239/2014/

Earth System Dynamics
Discussions

Interactive comment on "The impact of land-use change on the sensitivity of terrestrial productivity to precipitation variability: a modelling approach" *by* L. Batlle-Bayer et al.

Anonymous Referee #1

Received and published: 13 June 2014

This is a legitimate and interesting methodology to examine a valid question, butthe methodology needs to be extended to be robust. In my judgment the authors should be able to revise this paper to be a useful contribution to the literature. However, in its present form it lacks considerable detail and clarity which made it difficult for me to fully appreciate what the authors did. I also have question marks over thier results and the robustness of the results that I think need to be taken into account.

In terms of the methodology, the authors use one model (LPJmL). This immediately flags a problem since how robust the results are to the use of one model is not clear. The authors use one forcing data set (TS3.10). I do not believe there is anything wrong with this data set but it immediately flags a problem since how robust the results are to

the use of one forcing data set is not clear. The authors then use a single definition of LUC - 20%. Again, this immediately flags a problem since how robust the results are to the use of one definition of LUC is not clear. The authors methodology is overall too simple. I accept its hard to use many DGVMs and I do not suggest they do. However, one could replace the rainfall in the CRU data with other estimates, similarly one could replace the temperature data, and perhaps the cloud data or perturb the number of rain days and one could do this lots of times within the uncertainty of the observations and see which of the results remain robust. Given a lot of the interesting results appear co-loated with where I suspect the forcing data is least certain I suspect the conclusions might turn out differently if this was tried.

The 20% criteria for LUC similarly could be tested - with say 10%, 15%, 25% and 30%. Do the conclusions hold ? This is legitimate to test I think since the 20% value is not defensible more than 25% or 15%.

In short, this is a nice illustration of a possible result. It is something that now has to be explored in detail to determine if the results and conclusions are robust to the methodology and associated assumptions.

A second major issue I have with this paper is the level of explanation. Section 2.4 is light on explanation of why 20% was used. The results (Section 3.1) is light - thisdiscussion of Figure 3 does point to a few interesting results but it is not thorough and assumed the reader will look carefully at the figure and decide for themselves what the results mean. Section 3.2 is worrisome for the resasons discussed above. I had to guess which regions were the least reliable in terms of the meteorological forcing I would guess India, lots of Australia, Asia, South America etc. The author, in other words, focus a lot of their regional analysis on regions I suspect are least robust. The Discussion is also very light - most of it is quite obvious and does not get into detail.

Finally, there are many sentences that do not quite make sense. For example:

Page 586, Line 15 - "the significance of our results focussing at isolation of the land-use

effect is limited" does not make sense. If its re-written "the significance of our results focussing on the isolation of the land-use effect is limited" it helps but even so, I am still not sure what it means.

Page 587, line 12, and line 24 are unclear .

There are many more - but I suggest that if this manuscript is fully re-written most will get caught so I have not attempted to thoroughly document them here.

In short, a potentially useful and relevent paper that has demonstrated a result that should now be explored thoroughly. There are other ways to do this that noted above, but I want to know not merely the result fro ma single model set up, I want to know if the results and conclusions are robust to this methodology.

Interactive comment on Earth Syst. Dynam. Discuss., 5, 585, 2014.