

Interactive comment on “An integrated assessment modelling framework for uncertainty studies in global and regional climate change: the MIT IGSM-CAM (version 1.0)” by E. Monier et al.

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Authors' Response to Anonymous Referee #2

We appreciate the comments by the referee #2. We respond point by point to the comments.

Specific points

P2214, L19-23: The abstract needs to refer to the severe limitation of the method for projections of regional rainfall change, until it is developed to include regional patterns from more models.

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It will be noted in the revised manuscript that a limitation of the framework is that it revolves around one single 3D atmospheric model.

P2219, L4: I think there is a missing ‘to’ before ‘CAM’.

This will be corrected in the revised manuscript.

P2226, L5-6: Notably these decrease areas are not entirely typical of the CMIP5 ensemble. The strong decrease in rainfall in SW Australia is not present.

Decreases in land precipitation over “Europe (except Northern Europe), Northwest Africa, Southeast Africa and Patagonia” agree well with the results from the IPCC AR4 (see Figure 10.12). The decrease in rainfall in SW Australia is present in most of the IGSM-CAM simulations but certainly not as marked as in the IPCC AR4. This will be noted in the revised manuscript.

P2226, L10-11: The differences in these regions are not all that marked (and certainly much less than in CMIP5). Could these differences be just due to natural variability?

An analysis of the impact of the initial condition perturbation will be added and the role of natural variability will be discussed.

P2227, L20-29: These rainfall differences are very marked indeed, and severely limits its practical application in its current form.

While the authors acknowledge the differences are marked, the agreement with the CMIP5 projections of future precipitation change is neither guaranteed nor necessary since the IGSM-CAM constitutes a different modeling framework with an additional human component and thus different forcings. The main point of the comparison between the IGSM-CAM and CMIP5 projections is to show that within a single modeling framework (relying on a single 3D atmospheric model), the range of future changes exhibited by more than 20 climate models can be largely matched by sampling the climate system response of a single integrated modeling framework. This indicates that

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structural uncertainty is not the largest and sole source of uncertainty in future climate projections. This will be emphasized in the revised manuscript.

P2231, L5-7: The discussion here about the difference with CMIP5 in regional precipitation change is important. It needs to be reflected in the abstract.

The authors will expand the abstract to reflect the changes made to the revised manuscript.

Interactive comment on Geosci. Model Dev. Discuss., 6, 2213, 2013.