

Interactive comment on “Uncertainties in climate change projections covered by the ISIMIP and CORDEX model subsets from CMIP5” by Rui Ito et al.

Anonymous Referee #1

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Summary and General comments

The paper by Ito et al. investigates the uncertainty ranges in projections from the ISIMIP and CORDEX projects. Both of these projects selected a sub-sample from CMIP5 Global Climate Models (GCMs) to bias correct and then drive impact models (ISIMIP) or to downscale the GCM's (CORDEX). ISIMIP and CORDEX have different goals and also the number of models selected and the approach to sub-select the GCMs were different. The authors look into how well these two projects cover the uncertainty ranges provided by the original CMIP5 model set. They show that the ISIMIP and CORDEX uncertainty ranges are smaller than the original range but still larger

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than from a subset only selecting well performing models, even though the number of models selected in ISIMIP and CORDEX was smaller than the number of well performing models they were compared to. The authors also conclude that better subsets with smaller biases and/or higher scores would be possible than the current ISIMIP and CORDEX selections.

While it is interesting to see how different the uncertainty ranges of different model selections are, I am not necessarily sure if the comparison is fair, given that as far as I know neither ISIMIP nor CORDEX selected their GCMs based on these criteria. Among other points explained below, I am also missing a clear recommendation that would help the next rounds of ISIMIP and CORDEX to sub-select their GCMs.

Specific comments

For ISIMIP the main constraint in choosing GCMs was data availability, and they needed many more variables than the ones the authors consider in this study. Hence, even if “better” subsets in terms of performance based on precipitation and temperature would be possible, that does not necessary mean these subsets would have been an option for the ISIMIP project. For CORDEX data availability was also a major constraint, so again, even if better subsets based on temperature and precipitation would have been possible, if the data to drive the RCMs was not available that would not have helped the CORDEX project. These aspects should at least be discussed in the manuscript.

I was also missing the link from the performance in the historical projections to the projected uncertainty ranges. Do the sub-sampling based on lower bias/higher score cover larger, smaller or similar uncertainty ranges in the projections? The data is all there in the figures, but it is not discussed in the text.

I also find it hard to believe that neither the ISIMIP nor the different CORDEX regions did any analysis similar to what the authors provide here? At least for ISIMIP McSweeney and Jones (2016) seem to already have done this in a very comprehensive

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way. What is this study adding on top of that?

On page 8, lines 19-22, the authors mention results what would happen if a larger number of models would have been used in the Central Asia region. This result, I imagine something similar to Figure 3 in McSweeney and Jones (2016) but for the CORDEX regions, would have been very interesting. I think it would allow to show how many models would need to be selected to cover a certain uncertainty range, which would help to make a recommendation for the next round of CORDEX. I would also be curious to see if these numbers differ between different regions.

Technical corrections

Figures: While I kind of like the illustration of the graphs on the map it takes up quite a lot of space while the graphs itself are rather small. I wonder if the graphs could be increased but would take up less space in a more classical arrangement?

Supplement 1: I find this table not very informative, I would be more interested to know in which regions which models were used than in how many regions each model was used.

Supplement 4 and 5: I think the Obs are missing in these Figures.

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