

## Response to Editor (Penelope Maher)

We thank you and the reviewers for all the helpful comments and hope that we have addressed them adequately. Below are our responses to the editorial comments (in blue).

In papers which describe the methodology of a new MIP, all the relevant technical details should be in the manuscript or supplementary. I would recommend you include all relevant technical information in the manuscript, and any additional information which is helpful be added to the supplementary (as it currently stands there is repetition between the full description and the manuscript). This will help people who may wish to contribute to the MIP. Further, this means the full method has undergone peer review, rather than the archive which has not technically been peer reviewed as part of the manuscript.

We have inserted all relevant information into the manuscript (section 3, section 5 and Appendix A).

Tier 3 experiments in Table 1. There was a bit of a disconnect here between the manuscript (which does not explain Tier 3 experiments other than to say they are planned) and the full description in the archive (which suggests possible experiments). Personally I think it would be clearer to only describe Tiers 1-2 in the table and then have a section description of possible directions for further work for the Tier 3 experiments (which would presumably be part of TBIMIP2 or are you planning as part of TRIMIP? ).

We believe it is important to mention in the main text that additional experiments are under consideration. These experiments are expected to be part of TBIMIP. There are currently no plans for a TBIMIP2.

We now mention that some suggestions for additional experiments are given in the Appendix. We have also deleted the mentioning of Tier 3 experiments in Table 2 (now Table 3).

### Optional editing to the manuscript

- Fig 1: please include units (it is obvious but best practice to include).

Done.

- L99: The proxy record are important parts of the observational record and I find the comment "This makes paleo proxies subject to uncertainties and inhomogeneities" a little dismissive. All datasets and models we use are subject to uncertainties so perhaps rewording to ", which can contribute to uncertainties."?

Changed.

This passage discusses the strengths and weaknesses of observations, model simulations, and paleo proxies. There was no intent to be particularly dismissive of any particular approach.

- Table 1: The ESGF database use lowercase for all experiment names. I suggest you follow this approach in the manuscript.

We have changed the experiment names to lowercase, except for the TBI acronym and the letters designating the three basins (P, A, I). Mixed lower/upper case experiment names are quite common in CMIP (e.g., "1pctCO2", "hist-resAMO").

- Take care with statements like the following which may not get updated and are therefore not encouraged: "This is IPRC publication X and SOEST contribution Y."

It is an institutional requirement for co-author Malte Stuecker to add this statement to any publication. These numbers are issued upon acceptance of the manuscript and are updated during the proofing stage. We have never encountered any issues with this procedure and hope that GMD can accommodate these requirements.