Response to referee comments

I really appreciate that careful review. I have prepared this revision considering the reviewer's comments as well as the editor's suggestion.

I accept the argument for the lower estimate of warming in this configuration of MCEv1.2 than in say Sherwood et al. (2020) for ECS and AR6 for warming projections is caused by a lower estimate of ocean heat content in RCMIP2. It is curious though that this is having such a large influence on the posterior here. Referring to figure 1 of Nicholls et al. (2021), we can see that MCE indeed has a low projection of ECS compared to other models using this same set of constraints. Anyway, we know that how simple models are each constrained slightly differently and as the author points out, the constraints are inconsistent. As in my previous review I don't suggest running new simulations. However, I do think that the results should be put in context of the warming projections in AR6, even though the study was prepared before then, because it is a landmark publication and the reasons for the differences between your projections and those in AR6 be explained because readers will question this. In fact, the projections are significantly below what would be implied from an AR5 distribution of ECS, also.

I have revised the second paragraph of 4.2 to draw more attention to possible biases in the constrained ensemble run. To put this in context of the warming projections in WGI AR6, I have cited its SPM.

In fact, conforming to given constraints in the RCMIP2 was tricky, and MCE was configured to preferentially match observed surface warming and ocean heat content increase in recent past rather than proxy-assessed climate sensitivity. Although the results may be biased from AR6-assessed indicators, I think the constraining procedure is a good example in this model development paper.

Minor: fig. 13a — just want to bring up a comment from the first review. Is it definitely 13–83%? This is an asymmetric range. 17–83% is not uncommon as is the middle 2/3 and approximately 1 s.d. from a normal — did you mean this?

I have corrected the legend label to 17–83%. I apologize that I didn't properly respond to the reviewer's original indication on this error.