

Interactive comment on “Half a degree Additional warming, Projections, Prognosis and Impacts (HAPPI): Background and Experimental Design” by Daniel Mitchell et al.

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The statement that the classic emission scenario approach is problematic to infer impacts for certain warming levels (line 51) is assuming that we look at the projections for a specific time period. But one can simply pick the 20yr.

"We have expanded on our discussion here to reflect the reviewers comments. L51-62."

I'd like the authors to comment on using a decadal mean SST as a boundary condition vs. time varying fields. Is there a problem of say suppressing El Nino events by fixing the SST at a long term average, and could that have an effect on the frequency of ex-

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tremes?

"We do not use a decadal mean SST, just a delta SST decadal mean. This is added to observed SSTs which still contain the time varying component. This was perhaps not clear in the initial text, so has been reworked. L126-127."

What if the magnitude or timescale of ENSO changes as a result of warming, how would that affect changes in extremes in the regions that are affected by ENSO teleconnections, and would the proposed setup account for that? It seems like testing different SST patterns will sample some uncertainty but coupled variability would not be addressed by that.

"We agree with the reviewer on this point, and have added an additional experiment set under Tier 2 to reflect this. This experiment uses another model (MetUM-GOML2) to run coupled ocean experiments and fixed SST experiments in a fashion that allows for a direct comparison. As this is a new experimental design, we have dedicated a large section of the paper explaining it. L194-250."

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