Ocean Science Discussions

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Comment on os-2021-102

Anonymous Referee #1

Referee comment on "Seasonal extrema of sea surface temperature in CMIP6 models" by Yanxin Wang et al., Ocean Sci. Discuss., https://doi.org/10.5194/os-2021-102-RC1, 2021

I find that the paper is a valid contribution and I find that the methodology applied is right. I have few minor comments that the authors will hopefully polish for next version of the paper.

1. Page 2, line 58. The authors mention that they assign a 2ºC threshold to the biases in Tmax and Tmin to exclude points from the analysis. I wonder whether they have previously performed some sensitivity analysis to analyze the impact of this threshold. I guess that such an error might be more or less important at points with higher or lower variances of SST. I think this should be checked.

2. Page 4, line 70. “a small bias in a multi-model mean...individual models” seems like a little tautology to me.

3. I find that the RMSE values in figures 2, 3, 5 and 6 might be joined in a single table, so that a better analysis of systematic behaviors (if any) could be performed.

4. I find the palettes in Figures 5 and 6 difficult to grasp. Probably the fact that some isolated points are high in absolute value require a large scale. However, since most points are of a low absolute value, it is difficult to grasp the differences from one map to another. I suggest that perhaps the authors should use a non-equally spaced palette to increase resolution in lower values.

5. In Figure 7, I suggest some labels referring to regions are added to the individual panels to improve readability “WestEqPac” in panel “a)”, “NWIndOc” in “b)” and so on.

6. Page 12, line 120. I am not sure that the increase in storminess can be assigned to heat fluxes into the storms but separated from increased atmospheric baroclinicity (Kushnir, 2002), not explicitly mentioned by the authors. I think this point must be revised.

7. Page 12, lines 126-129. I guess that Myers et al. (2021) is a good reference to support the authors' hypothesis here.

8. Page 14, lines 179-181. I suggest the authors to fit a simple sinusoidal signal here (period T=12 months) and the fraction of variance explained would allow the authors to show which areas respond to one or the other case.

Kushnir, Y., Robinson, W. A., Bladé, I., Hall, N. M. J., Peng, S., & Sutton, R. (2002). Atmospheric GCM Response to Extratropical SST Anomalies: Synthesis and Evaluation, Journal of Climate, 15(16), 2233-2256. https://journals.ametsoc.org/view/journals/clim/15/16/1520-0442_2002_015_2233_agrtes_2.0.co_2.xml

Myers, T.A., Scott, R.C., Zelinka, M.D. et al. Observational constraints on low cloud feedback reduce uncertainty of climate sensitivity. Nat. Clim. Chang. 11, 501–507 (2021). https://doi.org/10.1038/s41558-021-01039-0