

Earth Syst. Dynam. Discuss., referee comment RC2
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Comment on esd-2022-14

Anonymous Referee #2

Referee comment on "STITCHES: creating new scenarios of climate model output by stitching together pieces of existing simulations" by Claudia Tebaldi et al., Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2022-14-RC2>, 2022

Review of "STITCHES: creating new scenarios of climate model output by stitching together pieces of existing simulations" by Tebaldi et al.

Climate model analyses have been limited to some extent by the scenarios used in projects such as CMIP6 and this study seeks to provide a framework for filling in some of the gaps left by the set of scenarios that exist. The authors perform a comprehensive evaluation of their framework primarily focussed on global mean temperatures and demonstrate its potential utility.

This study addresses an important issue and is a major contribution to the field. I only have minor comments for the authors to consider which I list below. I will admit that it took me a while to understand the methodology which isn't to fault the explanation given here, but I would suggest that the authors carefully read through the manuscript with a view to making the framework more easily understood where possible.

Minor comments:

L62-64: I agree that the SSP-RCPs span a range of forcings that probably covers the real-world outcome over this century but I think this sentence sounds a bit over-confident and could be dialled back a touch as "exhaustive" seems too strong a descriptor.

L71: Could also cite (Hawkins and Sutton 2009) as the paper where the method used in Lehner et al. originates.

L98: The focus on “transient” warming levels is introduced rather abruptly and I suspect the significance of this point may not be obvious to some readers. Perhaps a sentence or two explaining this could help. Papers that may be of use for an explanation include (Manabe et al. 1991; King et al. 2020; Callahan et al. 2021).

L127: “dimension” should be “dimensions”

Figure 1: It might be worth reminding the reader either in the plot or caption that this is global mean temperature.

L227-228: Technically there is a lower bound of the level of global warming at the start of the simulations too presumably.

L259: “do” should be “does”

L387-388: This sentence needs to be rewritten.

L473-475: Remove “If” before “ENSO” and add “but” before “there exist”.

L501: “haven’t” should be “have not”

References

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Hawkins, E., and R. Sutton, 2009: The potential to narrow uncertainty in regional climate predictions. *Bull. Am. Meteorol. Soc.*, **90**, 1095–1107, <https://doi.org/10.1175/2009BAMS2607.1>.

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