

## Comment on cp-2021-186

Arthur Oldeman

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Community comment on "The warm winter paradox in the Pliocene northern high latitudes" by Julia C. Tindall et al., *Clim. Past Discuss.*,  
<https://doi.org/10.5194/cp-2021-186-CC1>, 2022

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Dear authors,

I would like to start my comments by saying that you produced a great study on the data-model comparison in the mPWP. It is a well-written and complete study that improves data-model comparison and explains certain existed data-model discrepancies. I have some minor comments and questions, and two suggestions for studies for your references, that I think can be of added value to your manuscript.

Comments and questions:

- L37: the abbreviation SST is not mentioned before, would be good to write out.
- L78: Figure 1: is this annual mean data? It is currently not clarified in the text or caption.
- L406-407: 'despite January Arctic SIE being reduced by up to 76%' – where can I find these results? In your manuscript or in a referenced paper? Is this a multi-model mean value?
- Table 1: Baatsen et al. is currently out as preprint and can be referred to with doi: <https://doi.org/10.5194/cp-2021-140> (at the time of writing, the revised manuscript has been accepted, so you can hopefully refer to the accepted version and doi in your revised manuscript).

Furthermore, I miss two studies in the introduction and/or discussion that I believe are relevant to this study:

- De Nooijer et al. (2020), that assess Arctic warming in the PlioMIP2 ensemble, <https://doi.org/10.5194/cp-16-2325-2020>
- Menemenlis et al. (2021, preprint), investigating data-model comparison discrepancies in southwestern US, using a selection of PlioMIP2 models, <https://doi.org/10.31223/X5P03R>

De Nooijer et al. state "A consistent underestimation of the temperature estimates from SAT reconstructions is present in the PlioMIP2 ensemble.", clearly visible from their Figure 7 & 8. I would expect the results of this study to be cited in the Introduction, for example in the paragraphs starting in L78, L85 or L89, where the problem (terrestrial model-data discrepancy) is stated based on previous research, as well as in section 3.1 in the paragraph L177-L181.

Menemenlis et al. focuses on hydroclimate reconstructions, including local temperature reconstructions, and I believe that makes it a relevant study to include. I am specifically triggered in your section 4.2 on local climate effects. L325-326 states: "However, most models do not accurately simulate the climate stabilizing effects of the lake and their prediction of climate at this location is more representative of the wider region than the local site". A part of the study by Menemenlis et al. treats the possible mismatch of PlioMIP2 climate models with regards to local or smaller than grid-scale climate, with a specific focus on reconstructions around lakes, albeit in the Southwestern US and not Lake Baikal. Still, I would suggest referring to this manuscript, as you mention local data-model discrepancies and that is partially what their study is about.

Much of luck with the possible revisions.

Best regards,

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