

Interactive comment on “Assessment of Arctic sea ice simulations in CMIP5 models” by Liping Wu et al.

Anonymous Referee #1

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The study applies a new metric to assess the ability of CMIP5 models to accurately simulate Arctic sea ice evolution. Based on their results, they suggest that model performance strongly depends on ozone datasets and how well the Barents and Kara seas are simulated.

Originality: I very much like the idea of using physical mechanisms to examine the accuracy of Arctic sea ice evolution in climate models.

Scientific Quality: The authors, motivated by a number of studies outlined in the introduction, choose a metric to group the models based on how well they simulate the Barents and Kara seas. However, their choice of metric seemed arbitrary at best, and there was little analysis done to validate this method. For example, perhaps it could be useful to examine the relationship between BK sea ice trends vs pan-Arctic sea ice

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trends. This might help to convince readers of the method, and therefore make the rest of the analysis more convincing.

Additionally, I was a bit surprised to not see Stroeve and Notz 2015 referenced in this paper. Stroeve/Notz go into great detail regarding how well Arctic sea ice is simulated by CMIP5 models

Significance: I really like the idea of this sort of analysis, but it was not clear to me how this method improves on earlier studies that examine how well sea ice is simulated in climate models (e.g. Stroeve and Notz 2015). For example, it could be really interesting to examine what is learned by using their metric versus just examining the pan-Arctic, as is often done in these sorts of analyses?

Presentation: There were a number of grammatical errors and typos throughout. Further, the introduction was a bit long, unclear, and took up about a 1/3 of the paper. Also, there seemed to be several references to Antarctic sea ice papers, though this was entirely an analysis of the Arctic sea ice. There wasn't a clear indication as to why results on Antarctic sea ice would be relevant here.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2018-26>, 2018.

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