

## ***Interactive comment on “Trends in sea-ice variability on the way to an ice-free Arctic” by S. Bathiany et al.***

### **Anonymous Referee #1**

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As the answer to my review raises points that are still problematic in my opinion, a few new comments:

In reply to point 1, Hezel et al. (2014) find that “in all but two models, however, sea ice volume demonstrates a continuing linear or slower rather than faster rate of decline through the disappearance of winter ice, and thus we conclude that apparent threshold behavior is not occurring in this set of models as the winter sea ice disappears”. With the MPI-ESM-LR model being the model that shows the most notable non-linear decline in sea ice towards an ice-free state. Which is opposite to the claim of the authors that “MPI-ESM is no outlier in terms of the underlying mechanism, and we will clarify this point in the revised version”, and supports my concern that the MPI model is not the right model to use for this study, as it behaves differently than other CMIP5 GCMs.

In regards to point 2, the authors description of the CMIP5 model simulations they used did not at all reflect that they used the extended concentration pathway simulations (but I can see now that the lines in Fig 8 extend past 2100). The use of the term RCP8.5 (which describes simulations from 2005-2100), and the reference that “reaching a radiative forcing of approximately 8.5 Wm<sup>2</sup> in the year 2100” directly before the statement that these models all loose their winter sea ice in RCP8.5 is very misleading, and also shows a lack of familiarity with the CMIP5 models/scenarios (also shown in the absence of any references for these scenarios/simulations, which could have clarified the text for the informed reader). Hezel et al. (2014) used RCP8.5 to refer to the continous simulations (2005-2300), but clearly explained what they were doing and cited the relevant literature, which was both not done here and needs to be improved upon greatly if the editor decides to request a revised submission. The relevant papers for the extended concentration pathway experiments the authors used are Moss et al. (2010) and Meinshausen et al. (2011).

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[Interactive comment on The Cryosphere Discuss.](#), doi:10.5194/tc-2015-209, 2016.

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