Geoscientific
Model Development
Discussions

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Interactive
comment

Interactive comment on "Evaluation of the atmosphere-land-ocean-sea ice interface processes in the Regional Arctic System Model Version 1 (RASM1) using local and globally gridded observations" *by* Michael A. Brunke et al.

Anonymous Referee #1

Received and published: 16 July 2018

Overall, I think the content of the paper is fine. I have a few minor suggestions for improving some of the details. My major quibble with the paper is the presentation: most of the paper is a recitation of similarities and differences among various simulations and data sets, which could be useful in and of itself to other users of the RASM model, but the paper was quite uninteresting to me until I read the Conclusions section where, finally, there was some indication of what scientific interest the paper might hold. I would prefer to see these things laid out earlier and/or more explicitly, as the take-home points, e.g. in the abstract.

For example, this paper compares not only RASM1, but also several different reanalysis data sets (which are also model output) to observed data. The results of the reanalysis-data comparison are interesting. Have other authors already made these comparisons? If so, cite them, e.g. in the first paragraph of section 3.2.

The insight gained from looking at diurnal cycles is another interesting aspect of the paper. It is mentioned in the abstract, but what is interesting about it is not there, only that it is related to the biases. Explaining a bit more would make the paper more compelling, so readers might actually plow through the recitation of similarities and differences.

I would like to see this in the abstract and/or introduction: What did you learn from this exercise that is new and applicable more generally than just this RASM model? Please make any new physical insights into the system the centerpiece of the paper, rather than just saying that it's a comparison of RASM with data and some other models.

More specific comments:

Abstract: In my opinion, statements like "The possible reasons for this result are discussed" are wasted words. Why not put a summary of the reasons themselves in the abstract?

page 2 line 28: is a paper published in 2011 really suitable support for a claim that something "cannot be represented within the computational constraints of the current generation of ESMs"?

In the first sentence of section 3, land biases are blamed on Arctic Ocean (sea ice?) biases. Do you know that it goes that direction? Why wouldn't the biases in/over the ocean be attributable to land biases?

page 16 lines 28-29: why was a new baseline run done? Is this why? If so, was it worth it?

page 17 line 18: why might WRF 3.2 improve the situation?

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Discussion paper

page 17 lines 26 and following (the last paragraph of the paper) should be mentioned in the abstract.

The paper is pretty sloppy. For instance,

English grammar and spelling is quite poor in this manuscript. E.g. lines 3 and 4 on page 2: "Sea ice thickness also decreased along with the sea ice extent decline . . . decreaces . . ."

Acronyms are not defined, or are defined long after they are first used. E.g. GCM, ESM, SAT.

Figure numbers are wrong, e.g. page 9 line 12 should refer to fig 2, not 3; line 11 of page 16 should refer to fig 15, not 14; fig 6 in the fig 5 caption should be fig 4 (I think)

Fig 10 and 14 captions refer to a purple trace as RASM1a, which is not shown.

Why is there a break in the plotted data of panel a in fig. 13?

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