

Review of

National Weather Service Alaska Sea Ice Program: Gridded ice concentration maps for the Alaskan Arctic - Revision 01

by

Pacini, A., et al.

Summary: I don't give another summary, see my review of the first version of this manuscript

General Comments:

I don't have any general comments and concerns anymore. The authors did a great deal in improving the manuscript. I only have a few specific comments where I would like the authors to invest some thought and accordingly, if they see fit, change their wording to explain a few things with even more clarity. I also found a few typos.

Thank you for your comments and suggestions, which have strengthened the manuscript. Please find our detailed responses in blue below.

Specific Comments:

L304-306: Please provide a reference to where this step is described in the context of the AMSR2 3.125 km sea ice concentration product you used.

Done. We have added a reference to Melsheimer, 2024.

Melsheimer, C.: ASI Version 5 Sea Ice Concentration User Guide, <https://data.seaice.uni-bremen.de/amsr2/ASIuserguide.pdf>, 2024.

L313-315: "Many studies ... 2015)." --> I agree, several studies exist that looked at the ASI algorithm sea ice concentration data at 6.25 km or coarser grid resolutions. But no study does exist yet which - similarly to Kern et al., 2019 / 2020 / 2022 provided a systematic evaluation of the AMSR2-based ASI sea ice concentration data at 3.125 km. The paper of Beitsch et al. (2014) which you cite in the next sentence demonstrates that this fine resolution product is capable to resolve small-scale sea ice concentration variations better than coarser resolution products. But this is an example for an application rather than an independent evaluation. To my knowledge, such a work is still pending and has not yet been performed. Hence, in contrast to basically all other existing products one can obtain, the 3.125 km product is super nice, but is not yet evaluated.

Thank you for your comment; we agree that the Beitsch et al. (2014) demonstrates that the 3.125 km product is useful for a specific application, but no study exists, to our knowledge, that performs an independent evaluation of this product. It would be great to see this done in the future.

L348-350: Could you remind the reader why you chose 20% for grASIP and AMSR2 SIC data

while the MASIE product uses 40%. Possibly you mentioned already earlier in the manuscript that it does not make a difference whether one uses 20% or 40%? Particularly, in light of your note in line 289 where you said that saildrone SIC observations rarely report values > 40% because the saildrones are not designed to operate in ice-covered waters would - in my eyes - rather call to use 40% as a threshold. With that the saildrone observations would mostly be an indicator of open water conditions, yes, but this seems more reasonable to me than assigning SIC between 20% and mostly less than 40% SIC as 100% ice.

Reading the paper and coming to the results sections reveals that you actually did use other thresholds than 20% quite often. I am wondering whether you could change the information given in these lines, in such a way that the 20% threshold appears to be less strictly used. As you can see from my comments / questions I got puzzled a bit.

We have updated the text to state that "This conversion is done for a variety of SIC values. Unless otherwise stated..."

L396: "the 0.5 contour is chosen" --> I am not entirely sure what you mean by this. Do you mean that you used the half-way-distance between the centers of two neighboring 0.05 degree grid cells with one showing ice (aka a value of 1) and the other one showing no ice (aka a value of 0) to delineate the ice edge position in the vicinity of these two grid cells?

Correct.

L617-620: What you state in this paragraph is backed up by the results of your study, but I was wondering whether you could perhaps mention the time period for which your results are obtained - basically mid May to October - aka spring/summer/fall.

Done.

L647/648: "imagery may ... the ice pack" --> I find this combination of statements a bit contradictory. First you state, that there might be no images available for a day or even a series of days which means that the ASIP sea ice information is not updated. But then you state that ASIP is better suited to understanding the daily state.

The argument that we are making is that on a day with available imagery, then ASIP represents high resolution SIC information and provides a high-resolution daily estimate of the ice pack. Of course, if imagery is not available, then that specific day is based off of fewer input data sources.

L660-662: "Furthermore ... details.)" --> This is not entirely true because for the ice pack and also for "fair weather conditions" the AMSR2 SIC is primarily based on the high-resolution channel with near 3 km footprint size. The coarser resolution channels only come into play for the open water and/or cases where severe weather causes the original ASI-algorithm SIC to fail and to produce too high SIC values which are then filtered out using the SIC information derived from the coarser resolution satellite sensor channels.

We agree, but we maintain that these coarser resolution channels are used in certain scenarios, as the reviewer notes, and therefore as a whole, AMSR2 SIC is a blend of various channels.

Editoral Comments / Typos:

Table 2: The saildrones entry of 2019 has a typo: "Octo." --> "Oct."

Done.

L256: "Bietsch" --> "Beitsch"

Done.

L331: Helfirch --> Helfrich

Done.

L381: "are often order" ? Did you perhaps mean "are of the order of"

We have updated the phrasing to say “which are often on the order of 20%”.

L448: "estaimtes" --> "estimates"

Done.

L448: "exclude the binary ..." --> which essentially means that you exclude the saildrone data, correct? You could write this accordingly.

Done.

L624: "is larger the" --> "is larger than the"

Done.

L630: "the Ice Watch" --> the ship-based"

Done.

L632: "Bietsch" --> "Beitsch"

Done.