

Comment on **essd-2022-261**

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Community comment on "Mass balance of the Greenland and Antarctic ice sheets from 1992 to 2020" by Inès N. Otosaka et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-261-CC1>, 2022

I want to start declaring some conflicts of interest I have with this paper, but I have thoughts and comments that I would like to give, so I am providing this public review.

Conflicts: I am the Chief Editor (Ice) for ESSD, but have declined to edit this paper because I contributed to some data used in it - but not enough that I should be a co-author. I am also a contributor to the next version of IMBIE. I also make reference to my own recent paper and suggest citation of it, and correction of some of your text based on it. Please take all this into consideration while reading my review, comments, and suggestions. I am choosing to submit this as a "community comment" not an "Chief editor comment".

+ "A to B", in this case "1992 to 2020" is ambiguous. Or at least not as clear as it could be. Is 2020 included or not? I suggest changing all "to" to "through", as in "1992 through 2020".

+ Last line of abstract should follow ESSD standard: Cite data product.

+ L101-103: Again, "through" rather than "to" so it is clear the last year is included.

+ L135: When discussing IO method you should probably cite Mankoff /et al./ (2021). L137 mentions "year-to-year" but Mankoff /et al./ (2021) show that IO can provide daily estimates of mass change. L138 " The technique provides moderate (annual) temporal sampling" <-- Or daily, or whatever resolution the RCMs output. I do take 12-day velocity data and resample to daily, which you may have issue with. But even 12 day is more frequent than annual.

+ Paragraph 1 of section 2 is methods or background, not data.

+ Paragraph 2 of section 2 is intro to data. It would be good to talk about the actual input data. Your Appendix Table A1 is appropriate as an Appendix in other journals, but is the core of an ESSD product, and should not be hidden in an Appendix. This should be in Section 2, "Data".

+ Feel free to split "Data" into "Input Data" and "Output Data".

+ Paragraph 3 of Data talks about masks and ROIs. Can you share these? I think not,

because each data set used their own and then told you the area of the basins, but did not provide you with the boundaries themselves (is this correct?). But it may be worth pointing out that many different input products may have used many different masks.

+ No mention of peripheral glaciers, and their inclusion or exclusion from each of the 50 products. Does this explain some of the disagreements?

+ I believe RACMO has a binary ice sheet mask: 1 or 0. On the other hand, MAR has a floating point mask, and it is up to MAR users to decide if the cutoff for "ice sheet" is 0.5 or some other value. Is this worth discussing? Does this explain some of the differences between estimates?

+ Table 1: "X" and gray is redundant. Could be visually cleaner if you just did gray and no "X"?

+ 3 Methods: I am happy to see that you shared your code. Maybe mention this here, and even reference specific functions in the code? Code should not just be on GitHub, where it is likely to change. Or if it is, reference a specific git hash. Or export from GitHub and release a 'frozen' version on Zenodo or some other service where you can DOI your code.

+ IMBIE has the opportunity here to do really transformative "open science" and set a standard for how it could be done. Can you ask all 50 data providers if they are willing to share (publish) the data that they provided with you? If so, you could provide the input data, and the full processing pipeline to generate the output data. This would let people re-run the analysis but with different methods and assumptions, if they choose.

+ L196/197: " The associated error is calculated as the root mean square of the contributing time-series errors." I take this to mean that errors reduce in quadrature? And that as you add more data products, your errors decrease? I am not sure that assuming all errors are random, and that more measurements reduces error, is reasonable. It is quite likely that there are some biases in the data, that remain with the same sign through time, or are the same for different products.

+ L202: See previous comment.

+ Fig 1: Can remove all but one Y axis labels (L & R) since they are all the same.

+ Fig 1: 2020 shows 1 method, but the bar is 'black' implying 'all'. Does this mean "all" is not "all methods" but "average" or "mean" or "median" of "all available data in a given year"? Or something else?

+ Section 5 Discussion Paragraph 2 and Figure 4: I'm not sure this is relevant or appropriate for ESSD - It is science outside of the dataset. I would reframe Section 5 Paragraph 1 as "Validation" - basically admitting you cannot easily validate this against anything because you've incorporated all datasets, or if you did validate against the one not incorporated (Mankoff /et al./, 2021) it would only be useful in pointing out issues with that dataset, not the 50 that make up your dataset. Perhaps the last paragraph of Section 4 could be combined with this - there you basically validate against the last version of IMBIE. I'm not sure this is a "Result".

+ L398 Acknowledgements: This should probably be more comprehensive given the length of your author list.

+ Figure A1: This highlights what I believe is a significant deficiency in your error handling. It appears that when you have fewer products, your errors decrease. Shouldn't your uncertainty increase when you're relying on only 1 product?

