Author's response: Accepted with corrections

Anonymous #1

L98: Nakayama et al. (2018) is cited here, but that paper investigates the origin of warm water inflow onto the Amundsen and Bellingshausen Sea continental shelves, so I think this citation is not appropriate. If the sentence refers to warm water intrusions off Totten, the following paper would be a more suitable citation: Rintoul et al., 2016: Stephen Rich Rintoul et al. ,Ocean heat drives rapid basal melt of the Totten Ice Shelf.Sci. Adv.2,e1601610(2016).DOI:10.1126/sciadv.1601610

Fixed. We agree that citing Rintoul et al. (2016) rather than Nakayama et al. (2018) fits better in this context.

L96–99: The text states that "off the coast of East Antarctica, including the Totten and Denman sectors, is broadly consistent with the literature." Does "consistent" here mean consistent with the model results? In Figure 1, WOA2023 shows warm water intruding onto the continental shelf off Totten, whereas the NEMO model does not appear to reproduce this. I recommend describing this point accurately in the paper.

The referee is right, the current sentence is inaccurate and can lead to misunderstandings. Now the whole sentence can be read as: "In terms of water-mass distribution, the model captures the main large-scale features associated with relatively warm Circumpolar Deep Water (mCDW; usually characterized by $\theta > 0$ °C and salinity > 34.8) in the Amundsen and Bellingshausen Seas, although WOA23 seems to underestimate its temperature and salinity on the eastern Amundsen Sea continental shelf (Figure 1b,e). In East Antarctica, WOA23 shows mCDW intrusions onto the continental shelf reaching several ice shelves, including Totten, Rennick, Moscow University, and Denman (e.g., Rintoul et al., 2025, 2016), whereas in the model the continental shelf remains cold, with temperatures below -0.2 °C in these regions."

#Editor

The data availability one however needs a bit of work though; whatever is done at the moment is not sufficient at the moment. Line numbers refer to the tracked file; these are all I can see or bother to write down, and there may be more.

We have added the following statement for data availability: "The monthly WOA23 dataset used for comparison is available in open access at www.ncei.noaa.gov/access/world-ocean-atlas-2023. The resulting dataset from this study is publicly available on Zenodo under the following DOI: 10.5281/zenodo.23474735. It includes the 15-year annual and monthly climatologies of the three-dimensional iceberg meltwater flux distribution for all experiments, covering the entire Southern Ocean south of 52.25°S, both in absolute and normalised terms."

* "units" for salinity: Currently the paper uses all variants I know of (psu in line 29, unitness in Fig. 1, g/kg in Fig. 7, thought there was a "literally nothing" somewhere in text also). Please choose one and be consistent with it; I would suggest "g kg-1" with the "-1" power rather than the "/" to be consistent with usage elsewhere, and do this everywhere (e.g. Fig 1d,e,f). Done. Since it corresponds to practical salinity, we specified it as unitless throughout the manuscript.

* line 78: Comma to replace "and is", so "...vertical levels, forced by a...". Done.

* line 106: "...as the validity of these EMPIRICAL formulation..." to be specific about that the subject referred to is not "physically based alternatives". Done.

* line 124, 565: No indent here (don't line break after the equation). Done.

* line 167: remove brackets around the years in reference to be consistent with usage in e.g. line 167. Done.

*line 172, fig 3 caption: Roman C for Celsius to be consistent with elsewhere. Done.

* table 2 and elsewhere: minus signs where they are meant should be rendered in math font and included within the dollar signs, e.g. "$-$" or "-34", otherwise they render as dashes/hyphens. Done.

* fig 2: Both occurrences of "Gt/yr" and "Gt yr-1", inconsistent, choose one (the latter presumably). Done.

*fig 5 caption: Dollar signs around the "x" in "x-axis". Done.

* line 291, 298, 299, 339, 520: inconsistent use of hyphens and dashes (cf. line 292, 344), choose one. (Probably hyphen, since e.g. "Figure 6g-i" is rendered as a hyphen; just don't put it in dollar signs there). I make this point because e.g. line 239 is rendered the dashes and hyphens with a clear intent. Done.

*fig 6: For consistency should be "kg m-2 day-1", "Gy yr-1" etc. Done.

* fig 7: For consistency should be "g kg-1". Done.

* line 329, 463: Not sure what the deal is with the comma (probably meant "\," for the whitespace?) Done.

* fig 8: "Gt season-1"? Done.

* line 363: I feel some brackets here (e.g. "(0.4 \pm 0.29)\%") is warranted, because it made me read this three times, partly because "standard deviation" is also talked about which I tend expected to the "units" to be years). There might be better ways of to make it more clear also. Done.

* line 383: I would mirror the formatting used in line 390-391, so e.g. "...modest decline of 192 km2 (1.6%), ... for SLB ..." or that in line 395-398. Or even better use one format and stick with it. Done.

* fig 9: "kg m-2 day-1". Done.

* fig 10: The minus signs there should be in dollar signs. The caption however should probably not since it is "panels a to c" and "d to g" that is meant. Done.

* line 462: Plus sign and minus sign should be in dollar signs. Done.

* line 473: Should be "kg-1" right? Done.

* data statement: For consistency with FAIR policy and what not the relevant code and at least samples of the simulation data should be archived and provided with a link (e.g. Zenodo). I assume the simulation data is large, but sub-samples can and should be made. If doing Zenodo, I would also recommend not putting everything in one zip file, because then it could be a case someone would have to download all the data associated with it even if they just look at the code (having gone through recent experience with this, wanting two particular text files but having to download 20 GBs of data that I immediately deleted on downloading...)
The resulting dataset from this study will be publicly available on Zenodo under the following DOI: 10.5281/zenodo.23474735. It will include, at least, the 15-year annual and monthly climatologies of the three-dimensional iceberg meltwater flux distribution for all experiments, covering the entire Southern Ocean south of 52.25°S, both in absolute and normalized terms.

* fig B1: "g kg-1", "kg m-2 s-1" (I think, because I can't read it...(f) is inconsistently placed (because you could and have done it like in a,b,c also...). Done.

* acknowledgements: Please acknowledge referee(s) and handling editor if you think their comments actually improved the paper. Done.