Response to Editor:

Thank you, we have received Reviewer #3's comments, which are helpful and insightful, and made minor revisions accordingly that we think improve the manuscript. We also found a small handful of additional typos and corrected them (all changes are tracked in the appropriate submitted document), as well as a few errors in our references list that crept in while editing. Please let us know if there is anything else needed, and thank you so much.

Response to Reviewer 3:

Hello,

We thank our third reviewer both for their positive remarks, and for their genuinely insightful comments and suggestions. These were extremely helpful and we've taken them to heart.

line 43: *is* intended

> Fixed, thank you! It's always amazing how even after dozens of sets of eyes, typos can still be found.

57: rather "... is not the focus of the current work." or similar. "furure work" should rather appear in a perspectives section/paragraph towards the end of the manuscript.

> Thank you. We elected to keep this paper to a dataset description only and omit a "future work" section. This sentence was added in response to a previous reviewer's suggestion, but upon reread it is likely not necessary to even mention. We have omitted that sentence and will keep the focus on the current dataset.

199: Copernicus DEM being from altimetric radar. While conceptually correct, this is potentially misleading. "Radar altimeters" are typically nadir looking. The Copernicus DEM is mainly (not only) from the TanDEM-X radar interferometry mission, a different technique than altimetry (as typically understood in the remote sensing community).

> You're completely right on all counts, and thank you so much for pointing that out. Our statement about Copernicus data was oversimplified as stated there, and unintentionally misleading. We deleted the phrase "from spaceborne altimetric

radar measurements” (which you’re right, although not stating it, can by-default imply nadir Jason-style radar altimeters, of which TanDEM-X is not). We replaced it with "primarily using the TanDEM-X synthetic aperture radar.” We hope this conveys the basics more clearly and accurately while not drowning the reader in too much detail about Copernicus processing (which they can go to the CopernicusDEM, 2022 reference if they wish to read more detail).

381 and following: the difference between ICESat-2 and Copernicus DEM over ice can have many other reasons than blowing wind. E.g. elevation change over time (the Cop DEM consists mainly of TanDEM-X in the early 2010s; TanDEM-X is an X-band radar mission with potential penetration into the firn of several metres.

Thank you, you’re right, we mentioned one potential source of these biases but omitted others, which in retrospect is potentially a greater cause of the biases. We have added a sentence to address that before one that mentions blowing snow.

Although glacial drawdown may play a role as well over outlet glaciers, these biases were widespread enough (across the interior of both the Greenland and Antarctic plateaus) that they are probably not the cause of this.

Which direction has the bias you mention?

It’s a negative DEM bias, indicating ETOPO surface was several meters beneath what ICESat-2 was saying in those specific regions. This direction is consistent both with snow-penetration effects (which will lower the stated DEM surface below the “true” surface) and blowing snow (which would raise the elevation of ICESat-2 returns above the “true” surface). We did not have the necessary data to do a full sub-study into the relative effects of each, but we mention them both in the results here to make the reader more aware. Thank you, this was genuinely helpful.

Fig. 7 is interesting. At least in the jpg-compression the grid lines become quite thick and disturb the RMSEs. Make the grid lines thinner, or even remove them?

Excellent Point. We replaced Figure 7 with an identical figure that has the grid lines much thinner and light-grey (almost invisible), which does make it noticeably easier to read. We want to keep some hint of the lines to avoid mid-ocean “island” cells from being nearly invisible in the image.

Optional, the authors might want to consider a short (sub-)section about "known limitations" for the use of the data set. This might be quite useful and important for users, as some might use the data set in unanticipated ways.

> Thank you, we have added a section “8 Known Issues and Limitations” that I think will help the reader in the ways you described, and put a couple paragraphs that may help guide and warn users about potential pitfalls and suggestions for each.

Again, thank you for your time and comments, they were genuinely helpful.