

Point-by-point reply to the editor – Manuscript entitled: Evaluation of satellite methods for estimating supraglacial lake depth in southwest Greenland, authored: Melling et al.

Manuscript iteration: Revision post review

Editor: Joseph MacGregor

We thank the editor for his comments on, and suggested edits to, our paper. Please find each comment given below in bold type, with our response following in normal text. All line numbers refer to the original manuscript.

1) “18: I don’t see what the sentence starting with “Our analysis...” adds to the sentences that precede it. It has just been made clear RTE uncertainty affects lake depths. Suggest deleting.”

We agree and have removed the sentence starting on line 18 from the revised manuscript.

2) “21: Simpler: “likelihood is poorly constrained””

We have changed line 21 to read, “...which could mean that hydrofracture likelihood is poorly constrained...” in the revised manuscript.

3) “23: Simpler: “cryoconite on lakebed reflectance””

We have altered line 23 to read, “*cryoconite on lakebed reflectance*” in the revised manuscript.

4) “24: This study is clearly “data-driven”, so this wording is odd. Although the RTE method includes a model, it is not so different from many other remote sensing analyses that apply a simple model to derive a higher-level product. Given what is written in the Discussion, I suggest changing “data-driven” to “multi-sensor” or “multi-mission”. Another term may be more appropriate.”

We agree with the editor and have changed line 24 to read, “*multi-sensor*” as opposed to “*data-driven*” in the revised manuscript.

5) “Figure 3: Could the RMSD and correlation numbers in the boxes be bolded to be more visible?”

In the revised manuscript, we have bolded the annotations of Figure 3.

6) “Figure 4: Most of the plots are indistinct blue or red blobs for which it is nearly impossible to meaningfully distinguish the depth/depth-difference values. I strongly suggest using a discrete coloring scheme at 1 m intervals instead (also apply to color bar). There is a minor loss of precision relative to what the methods can do but much is gained for the reader.”

We agree with the editor and have altered Figure 4 accordingly.

7) “Figure 5: Bigger a/b panel labels. Suggest discrete coloring scheme again at 250# interval but not as critical as for Figure 4.”

We have altered Figure 5 accordingly within the revised manuscript.

8) “323: result”

We are unsure as to what the editor is referring to in this case and would ask for further clarification should the editor find the comment still relevant.

9) “340-344: The last two sentences just seem like a repeat of earlier in the paragraph and don’t add new information. I suggest some sort of “vice versa” for the sentence currently starting with “Constrastingly” (awkward) in the lake volume underestimation case.”

We have changed lines 340-344 to read, *“Conversely, use of the red band RTE can lead to underestimations of 63 % of the lake volume compared to ArcticDEM, which would potentially yield contrasting implications for our understanding of ice sheet dynamics.”* in the revised manuscript.