Introduction

We thank the reviewers once again for their time and helpful comments. We have addressed all of their minor comments and we respond to all of them below. Reviewer comments are in black; our comments are in blue. References to line numbers in the last iteration of the manuscript are styled L.X; references to line numbers in the tracked-changes version of the last iteration of the manuscript are styled T.X; and references to line numbers in the revised manuscript are styled R.X.

Reviewer 1

Minor comments

Throughout the paper, the ambient or restoring temperature is referred to as initial temperature. As in my previous review: this appears to be inconsistent with your statement that initial conditions are irrelevant (L.130-134). I suggest the authors ctrl+F on 'initial' starting at this statement, and reconsider all following mentions whether this is the most appropriate term. Particularly Sec. 3.2.2. is titled 'ambient temperature', while the authors still refer to this as the initial temperature.

We agree with the reviewer that referring to the temperature profile as the "initial" temperature is inconsistent with our statement that the initial conditions are irrelevant. We have therefore taken their advice and replaced all instances of "initial" with either "ambient" (Figure 1 caption, R.292, R.323, R.342, R.347) or "restoring temperature profile" (R.270, R.349). The only section in which we have not done this is section 2.2 "Initial and boundary conditions", since it is this section in which we explain that the initial conditions are irrelevant.

L.368 The velocities appear to show a minimum for lambda = 0.4, with a peak at both 0.2 and 0.6. My impression is that a low iceberg density facilitates a shallow flow between the icebergs, and a high density facilitates a relatively continuous flow along the bottom of the icebergs. I suggest the authors revise this statement.

We agree with the reviewer's interpretation and have adjusted the text accordingly in R.366-369. We have also replaced instances of "velocity" with "flow speed" to be consistent with Figures 6-9 and in light of the reviewer's comment on the last iteration of the manuscript.

Reviewer 2

Minor comments

There are a few places where the new text could use some revision, as I point out below. Line numbers are from the document with tracked changes.

We thank the reviewer for taking the time to suggest alternative phrasing for sections of the text. We have adopted all of their suggestions, as detailed below.

T.13-14: "The magnitude of the simulated melange melt rate ranges from 0.26 m d^-1 to 0.92 m d^-1, which is in good agreement with observational estimates."

We have edited this as requested in R.13-14.

T.88-91: I recommend that you replace these lines with the following or something similar that more seamlessly incorporates the new references: "The melt rate of ice depends on the water velocity (Holland and Jenkins, 1999), such that variations in the magnitude and direction of water with respect to iceberg faces can influence their rate of melt (FitzMaurice et al., 2017; Hester et al., 2021). Therefore, it is likely that the distribution of icebergs within melange influences water velocity and iceberg melt rate."

We have edited this as requested in R.82-85.

T.167: Remove the sentence that starts with "Note that the iceberg…" and edit the following sentence to weave in that statement: "In light of each simulation run time (section 2.6) and the modelled melt rates (section 3.1.2), changes in iceberg geometry over time are less than the model resolution and are ignored in our simulations."

We have edited this as requested in R.159-160, with the small addition of "…and are **thus** ignored in our simulations."

T.187-191: I noted the inclusion of growlers, bergy bits, and sea ice in the melange area estimates of Enderlin et al. (2016) in my last review but my comment was anonymous so the authors relied on their interpretation of my study instead of my comment. Helheim's dense melange is likely mostly composed of small iceberg fragments, but the method that I used to estimate melange area included these fragments and sea ice, meaning there was no open ocean between the bigger icebergs. So, at least a portion of your under-estimate is due to the inclusion of small iceberg fragments and sea ice in Enderlin et al. (2016) and you should note it here because it means your big iceberg estimates are probably more similar in area to my observation-based estimates that you give credit for.

We thank the reviewer for providing more detail and insight into the methodology behind their study. We have added the point that the inclusion of small iceberg fragments by Enderlin et al. (2016) in their calculation of submerged mélange area likely contributes to the fact that the value of our simulated area is lower. We have included this point in R.177-178.

T.328-334: The second sentence in this paragraph is VERY long and complex. I'd break it apart. Also, you say "this along-fjord variation is averaged over" but it is not clear what it is averaged over. It should say it is averaged over a specific length scale.

We accept the point that this sentence was very long and therefore unclear. We have broken up and edited it slightly in R.311-314. We have also specified that the along-fjord variation is averaged over the full length of the mélange.

T.406-407: Revise and condense the last two paragraphs of this sentence to be something like “As a result, thermal forcing is relatively uniform with depth and melt rates are similar for shallow- and deep-drafted icebergs for high values of subglacial discharge.”

We have edited this as requested in R.383-385.