

**Re-review of Kindstedt et al.: *Ongoing firn warming at Eclipse Icefield, Yukon, indicates potential widespread meltwater percolation and retention in firn pack across the St. Elias Range***

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I would like to thank the authors for engaging seriously with the reviews from both me and the other reviewer. I think the paper has been improved and would make a good addition to The Cryosphere. Many of my comments are stylistic or technical; however, I have three main comments that I think should be considered before the manuscript is ready for publication.

**Main Comments:**

[1] I would encourage the authors to define “extreme melt events” or “extreme individual melt events”. It appears the author’s definition of “extreme” is “high-intensity”. What is the intensity threshold that makes it extreme? It may be better to just say “intense melt events” rather than extreme, as in Greenland, extreme melt events commonly refer to the melt extent.

[2] In the abstract the authors state, “...*the development of year-round deep temperate firn at Eclipse Icefield is promoted by an increase in extreme individual melt events, rather than a greater number of small melt events or a prolonged melt season*” (L6-8). I still am a bit unclear on how the authors arrive at that conclusion. Across most years, the median PDDs, number of melt events, and melt event magnitude are all significantly greater in model runs that produce temperate firn (Table B2), so why zero-in on the extreme individual events? How do the authors know that is driving firn warming more than the number of melt events?

I think Figure 10 could be improved by making this a 3-panel plot (although I’m happy to consider other changes to the plot that the authors see fit). Similarly to how PDDs are displayed currently, additional panels could show the distribution of number of melt days between models that produce temperate firn and those that don’t, as well as the distribution of melt intensity per melt event between models that produce temperate firn and those that don’t. Since these are the three significant drivers producing temperate firn, it would be nice to see them displayed in a figure, and it may allow the authors to make their point clearer about why more intense melt is the main driver.

As it stands, the authors state their conclusions slightly differently throughout the text. Just to highlight, on L457-459 in the Discussion, the authors state: “*Model results for Eclipse show the development of year-round temperate firn at 15 m depth associated with an increase in total PDDs throughout the melt season, as well as with a greater number and more extreme melt events, rather than an earlier or prolonged melt season*”. That is slightly different from the abstract, though better supported by the statistics. Lastly, in the Conclusion on L489-490, the authors state “*Development of year-round temperate firn at Eclipse is associated with an increase in total PDDs throughout the melt season and more extreme individual melt events rather than a greater number of melt events or prolonged melt season.*” This appears to be more similar to what is stated in the introduction. I would try to be as consistent as possible.

[3] I appreciate the revision of the tables in Appendix B. The editor and authors may feel this is unnecessary, but I am partial to reporting the true p-values to the readers. P-values that are significant

below the author's confidence threshold could be highlighted or in bold text. Also, it may be nice to report the statistics being evaluated (e.g. difference in median PDDs, difference in median number of melt events, and difference in median melt event magnitude). It may make the authors conclusions clearer and less "hidden" behind the statistics. I would also consider moving these to the main text since they directly support the authors' conclusions. I think there are some figures/tables that could be moved to the appendix to make space (e.g., Figure 3, Table 1, Table 2).

## Minor Comments

- **L14:** Remove the word "represent" where it says "... *would represent likely indicate*..."
- **L30:** "*Firn aquifers account for much of observed firn water storage*"... Much seems a little vague here. Maybe the authors could provide an estimate? An approximate water storage volume or areal extent of firn aquifers compared to a melt area extent? Not a big deal but could strengthen the sentence.
- Upon rereading the manuscript, I'm wondering if in the paragraph from **L176-188** along with **Table 2**, it may be appropriate to move to the appendix since it is more detailed sensitivity tests that, while interesting and useful, could be available for interested readers at the end, which would shorten some of the main text. I think it also will keep more focus on running CFM under a suite of climate scenarios as the authors describe in the following paragraph.
- **Section 3.1.** I would recommend including a sentence in the beginning paragraph to highlight what the authors would like for readers to take away from this. It gets quite dense when describing the detailed stratigraphy in each paragraph. Maybe just highlight the key point for readers to have something to hold onto... maybe indicating that these measurements are important to demonstrate the substantial variability between cores, even spaced less than 1 m apart?
- **Section 3.2.** A similar suggestion as above. The authors may even be able to start with the sentences: "*In general, density increases with depth throughout the core. However, cyclic variations can be seen, which are likely seasonal, particularly in the top 10 m. Individual ice layers can also be identified by peaks in density*" and reference Figure 4. I think it is helpful to know what the authors want the reader to see in the figure when referencing it. As it stands, the initial sentence to start 3.2 does not really provide any information for this section.
- **Line 298:** Where the authors say "at least some" could they just say how many runs?
- **Line 327:** Show the same results as in 2016? Maybe clarify this in the sentence.