

Interactive comment on “Freshwater flux to Sermilik Fjord, SE Greenland” by S. H. Mernild et al.

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Mernild et al., 2010 attempt to quantify the magnitude of the various sub-catchments and various contributing sources of freshwater to Sermilik Fjord (SF). This is an important task and the results demonstrate the dominance of ice discharge as a mechanism for delivering freshwater to SF. I look forward to revisions that will clarify this important research. I will focus on four specific points that would strengthen this paper.

Abstract: I had to read the entire paper before I could make sense of portions of the abstract. The abstract does not mention that ice discharge is the primary contributor of freshwater to SF. That should be the headline ice discharge is the dominant source of freshwater to SF. It is not clear that the 3.8 m of runoff from the Helheim sub watershed is the surface terrestrial runoff, and further that this is runoff from melting and

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precipitation. Though the Helheim sub-catchment provides 25% of the surface terrestrial runoff, is it not more important to note that it provides 65% of the freshwater flux via ice discharge to SF and that the three glaciers combined provide 85% of the flux via ice discharge? Specify what the role of changing glacier cover was on the variation of runoff.

Table 2: Has a duplicate row of data for Helheim. It also has a few stray values, such as at the end of the Fenris Glacier row, that I can understand after careful consideration.

3.2-1201: The 38% error in the cumulative runoff calculation using the model versus the runoff from Mittivakkat Glacier catchment needs more exploration. Four potential errors are mentioned for this difference. One, the potential loss of water across divides does not seem like a likely source for a large portion of this, unless the topography is unusual. A better map or satellite image of the watershed and glacier would help the reader assess this. A photograph of the gaging station with the watershed in the background would be nice. Potential errors 2 and 3 need to be better addressed here. I understand the data may not allow much better quantification and the discussion may be only qualitative, but it would help this reader. This is the primary test for the overall model and the initial result is poor. The verified model does look good. It is crucial to explain what was done to adjust the model was it a physical model adjustment or just a mathematical adjustment factor.

Conclusion: In the end the freshwater flux is dominated by the ice discharge from the main glaciers in the SF watershed. The 85% figure is mentioned in the conclusion. The contrast in the net contribution from melting versus ice discharge needs to be emphasized in the abstract and more bluntly pointed out in the conclusion.

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