

Interactive comment on “Record mass loss from Greenland’s best-observed local glacier” by S. H. Mernild et al.

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Mernild et al (2011) examination of the mass balance response of Mittivakkat Glacier to climate is a valuable record as it is the only comprehensive record of mass change for an entire glacier of more than several years from Greenland. The paper quantifies the substantial changes of Mittivakkat Glacier and its specific extensive ablation during the 2009/10 season. The paper would benefit from adding several figures to better document the spatial variation of mass balance on the glacier, the ELA position, mass balance measurement site locations and glacier elevation contours. Such additions would expand the readers ability to analyze and appreciate the specific mass balance data set. In particular since we rely a great deal on satellite imagery to assess GIS glaciers it would be useful to include a satellite image view of the glacier that elucidates

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the ELA, terminus position and potentially transient snowline change through a melt season such as 2009/10.

Title: Add Mittivakkat Glacier to the title.

464-8: Expand the discussion or include a table of the various terminus changes for the intervals noted in Figure 1.

464-20: Include a figure illustrating the balance gradient of the glacier. This is the single key figure that is helpful in analyzing mass balance, particularly with respect to a glacier's future response to climate change.

464-21: A satellite image with glacier contour lines and basic measurement profiles noted should be included since this is the first detailed mass balance report on this glacier.

465-6,8,9: For clarity refer to mass balances losses with a negative sign before the value, as -0.34 m etc.

465-11: What was terminus ablation in other high years such as 2005 and 2007, did 2010 substantially exceed all?

465-24: What was the winter balance in the typical accumulation zone above 600 m in 2010? At present we are given very little information on accumulation zone. Given the low AAR it is expected that ablation will be of greater focus.

465-25: When was the terminus exposed in 2010. Are there any other transient snowline elevations noted during the course of the melt season. It would be interesting to know the length of exposure to melting of the various elevation bands.

467-3: Is the annual ELA observed in the field or via satellite images?

467-15: Since 4 out of the last 10 years have led to the loss of essentially the entire accumulation zone, and other very low AAR suggest the lack of a persistent accumulation zone. Without an accumulation zone a glacier cannot survive Pelto (TC: 2010).

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Interactive comment on The Cryosphere Discuss., 5, 461, 2011.

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5, C48–C50, 2011

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