

Interactive comment on “Comparison of glaciological and volumetric mass balance measurements at Storglaciären, Sweden” by M. Zemp et al.

M. Pelto

mauri.pelto@nichols.edu

Received and published: 10 April 2010

Zemp et al. (2010) provide a detailed comparison of the geodetic and surface mass balance records of the Storglaciären. Storglaciären has arguably the most reliable long term field derived mass balance record in the world, further the systematic remapping provide one of the more complete geodetic records of glacier area and volume change. Hence, it is not surprising that the comprehensive reassessment using the most consistent methods yields good agreement between the two records. This is a valuable case study as it relies upon the most complete and carefully adjusted mass balance field data set available, with data from several periodic comprehensive remapping cam-

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paigns and an ideal approach to the geodetic methods of mass balance assessment. On other glaciers seldom is there a combination of such high density consistent field data and frequent high quality geodetic data. For application to other glaciers with less detailed data this study provides a good test of what adjustments are key to make and the likely range of their influence. This paper will be critical guide to the important task of homogenization of long mass balance observation records. I can find extremely little to be critical of in the paper, just two points that could be given more attention.

391-18: With respect to internal accumulation, the adjustment (D) used is clearly too large. Miller and Pelto (1999) found 1-2% internal accumulation on Lemon Creek Glacier. On this glacier no winter balance measurement are made. Two points of relevance it was noted on Lemon Creek Glacier during warm winters, such as 1998 that there was no internal accumulation, so a consistent adjustment would not be appropriate. It was further observed that some of the internal accumulation occurred after the winter balance would have been recorded, but prior to summer balance assessment, which could represent a redistribution internal accumulation not a net gain in accumulation. This impact would depend upon how much the winter balance data is relied upon in mass balance extrapolations at the end of hydrologic year, on Storglaciären the winter balance network is noted as twice the density of the summer balance assessment so this potential exists. Lastly internal accumulation also impacts mean density assumptions, is this also an issue? An additional figure bar or column that compared the annual balance from Holmund et al. (2005) this study adjustments using A, B, C and using adjustments A, B, C, D, would be useful.

Table 1: Caption should be expanded somewhat to better explain each column. I am curious as to why in 1959 since the survey post dated the end of summer why the correction is also positive.

Interactive comment on The Cryosphere Discuss., 4, 381, 2010.

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