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The Cryosphere Discussions

Interactive comment on "The new Landsat-derived glacier inventory for Jotunheimen, Norway, and deduced glacier changes since the 1930s" *by* L. M. Andreassen et al.

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Andreassen et. al., have prepared an exceptionally complete and valuable examination of glacier area change for Jotunheimen, Norway. This paper provides an important benchmark, and data base development for future observations and comparisons of glacier change using either aerial photography or remote sensing. The following are points that could be clarified to make the paper even stronger.

1. 303-10 In reviewing the history of mass balance for the region it is noted that an increase in winter snowfall drove the widespread positive mass balance of the 1989-1995 period. The cause of the positive mass balance for the more maritime western

Jotunheimen glaciers from 1962-2000 is not identified. What is the underlying cause of the positive trend for the western glaciers compared to negative trend for the eastern glaciers?

2. 308-10, 309-10 and 313-7. Why is the minimum glacier size of 0.01 km2 utilized? This is quite small and is less than that recommended by two of the co-authors in a Swiss Glacier inventory,..a smallest glacier size of 0.1 km2 is recommended for comparison of TM-derived areas with glacier inventory data derived from aerial photography... (Kaab et. al, 2002). The selection of the smaller glacier size is attributed in the paper for some of the disparate results observed in glacier changes in the northwest section of the study area. These small glaciers many certainly non-glacier areas are the most difficult to accurately assess and provide the most disparate results for the same reason. This also led to a doubling of the number of glaciers identified. This is not a robust number though.

3. Table 2 and 3. I would like to see an additional column added to show the percent change in glacier area for each size class. This would compliment Figure 7.

4. Figure 2 needs and expanding caption illustrating better the utility of TM4/TM5, over surface water area at a minimum.

5. Figure 5. Excellent diagram, I would like to see a more expanded discussion in text of the potential reasons for the larger glacier change across the northern tier of Jotunheimen. The change is more robust across size classes than the text seems to indicate at this juncture. 313-8 notes this increase in the NW is assumed to be due to overestimates from snow conditions from for the N50 maps. This figure does not appear to support this conclusion.

6. Figure 10 provides a useful comparison of N50 to Atlas88. The same figure comparing N50 to L2003 would be useful.

References:

Kääb, A., Paul, F., Maisch, M. and Hoelzle, M. and Haeberli, W. : The new remote-sensing-derived Swiss glacier inventory: II. First results. Ann. Glaciol., 34: 362-366, 2002.

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Interactive comment on The Cryosphere Discuss., 2, 299, 2008.