

## *Interactive comment on* "Decadal changes from a multi-temporal glacier inventory of Svalbard" *by* C. Nuth et al.

## Anonymous Referee #2

Received and published: 9 August 2013

The manuscript by Nuth et al. presents a valuable glacier data set for Svalbard, and adds to the growing body of literature addressing issues of change reporting from multi-temporal glacier inventories. The inventories, based on maps for the early inventory and satellite imagery for the latest, are well described, and the change analysis is well depicted in the informative figures. The authors make excellent use of color in the figures, which are all rich in information. In general I recommend this manuscript for publication in this journal. However, the following comments should be addressed first.

General comments:

- I would like to see a clearer description of glacier mapping methods, summarized clearly for each inventory. On page 2495, line 18, it isn't clear where exactly the "1990 outlines" come from. And to do the manual trimming or reshaping as described in

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Section 3.2, what is the basis for the reshaping? Is it simply visual interpretation of a false-color IR image? Is any algorithm, such as contrast stretching or band ratioing, applied to the image to aid in the interpretation?

- Some of the headings could be clearer. For example, there is Section 4.2, "Comparison between H93 and Gl00s", and Section 4.3, "Comparison of the digital glacier inventories". Are H93 and Gl00s not digital inventories? It should be clear at a glance what the difference is between the sections, but currently it is not.

- A better description of the calculation of change rates is needed, given the various timestamps on the different glaciers. Is the exact year known for each glacier in all three inventories? If so, state that clearly.

- Conclusions: One of these data sets has been ingested into GLIMS; the text should be updated to reflect this.

Specific comments (numbers are page.line)

2490.3 or -> covering

2490.4 glaciated -> glacierized

2490.5 summed -> total

2490.5 glaciated -> glacierized

2490.24 did -> does

2491.1 border -> outline

2491.9 and elsewhere: glaciated -> glacierized

2492.10 manual photogrammetry? What about "optical analog photogrammetry"?

2500.4 represent -> were derived

2501.22 Change "...changes are an integrated length change reduced from area

changes that include also lateral losses" to "...changes are an integrated change that also includes lateral losses".

2501.27 I think it's better to separate the expressions for average and median: "with average of -40 m/a and median of -30 m/a for both epochs."

2502.1-6 Discussion of changes is a bit confusing. For example, "number of glaciers with mean length changes less than -40 m/a has increased". Does that mean "more negative"?

2503.24 less then -> less than 2503,2504,2528 Replace "Student-t distribution" with "Student's t-distribution".

2503.8 Add period after "cancelled".

2504.15 Add "based on spectral appearance" after "delineating glaciers".

2505.18 infer -> imply

2505.23,24 Change to read, "Changes in glacier area and length reflect the glacier's total response (Oerlemans, 2001)."

2506.5 Define "earlier".

2506.7 Check spelling of "Le Fauconnier".

2508.10 Update this text to state that the GI00s is in the GLIMS database.

2519 Table caption, change last sentence to "All area estimates have unit km<sup>2</sup>"

2524 Clarify the last sentence in the caption, particularly the different between "glacier mean aspect" and "glacier DEM aspect".

2525 Size-proportional is by area, not radius, right? Please state which.

End of review.

Interactive comment on The Cryosphere Discuss., 7, 2489, 2013.

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