The Cryosphere Discuss., 4, C1765–C1768, 2011
www.the-cryosphere-discuss.net/4/C1765/2011/

The Cryosphere Discussions

Interactive comment on "Longest time series of glacier mass changes in the Himalaya based on stereo imagery" *by* T. Bolch et al.

T. Bolch et al.

tobias.bolch@geo.uzh.ch

Received and published: 24 March 2011

Reply to the comments by Duncan Quincey

Reviewers comment: (. . .) The paper is well written and I only have a number of minor comments. The title could be more specific to reflect the content of the paper. It should at least include 'Everest-region' and 'Nepal'.

Authors reply: We changed the title to: "Multi-decadal mass loss of glaciers in the Everest area (Nepal, Himalaya) derived from stereo imagery" as suggested by the other reviewer.

RC: 2594-1 The real impact of losing glacier ice on long-term water supply (certainly in terms of spatial and temporal distributions) is yet to be fully quantified, so I think

it's important to avoid generalised statements such as this opening sentence. Perhaps you can modify it to 'changing runoff distribution' or something similar.

AR: We agree in principle. Some recent studies show that the portion of glacier water in the river flow downstream can be very low, but can significantly matter for local population living below a glacierized catchment. But we did not write "declining runoff" but "declining water resources" and this is the case if there is less ice. However, we modify the statement as suggested to avoid misinterpretation.

RC: 2594-12 'at an increasing rate' – I am not convinced your results bear this out (except perhaps for the Khumbu Gl.), at least not within the stated errors. I suggest you play this statement down or remove it.

AR: We agree and write now: "Comparisons of the recent digital terrain models (DTM) with earlier time periods indicate an accelerated mass loss. This is, however, statistically hardly significant due to the higher uncertainty especially of the lower resolution ASTER DTM."

RC: 2595-8 it would be good to reiterate the numerical results of the earlier paper here

AR: We included the information.

RC: 2595-16 missing 'the' before 'nine'

AR: We studied ten glaciers. We write now: "The tongues of nine of the ten studied glaciers. . ." for clarification

RC: 2596-8 Is there a reference for the RSG software? I am unfamiliar with it, so expect other readers would be too.

AR: We are not aware of a reference which describes the software and its performance. We therefore include a link to the current website of the software (http://dib.joanneum.at/rsg/).

RC: Section 2 - it would be interesting to know the spatial distributions of the GCPs,

TCD

4, C1765–C1768, 2011

TPs and check-points, even if it is just mentioned in the text.

AR: We include some information in the text as suggested.

RC: 2597-24 should this reference not be Koblet et al., 2010 as well?

AR: Zemp et al. 2010, TC builds upon Koblet et al. 2010 but here Zemp et al. 2010 is the correct citation.

RC:2600-10 to 20 have you considered the role of different catchment topographies on the spatial variation in surface lowering rates? And/or the role of avalanche accumulation? A couple of lines about this might enhance this section.

AR: We included now a short discussion about the effect of the different catchment topographies and the accumulation as suggested.

RC: 2600-24 to 29 I think you only have 1984 data for the Khumbu Gl so to state that all the studied glaciers show an accelerated loss since then is misleading. And can you really place so much faith in the derived data 2002-2007? At least sufficient faith to claim there has been increased mass loss in this short period? This paragraph needs toning down, or could even be removed.

AR: We agree and write now: “Khumbu Glacier, for which data from the year 1984 was available, showed a higher ice loss for the period 1984 – 2007 in comparison to 1962 – 1984. The recent trend of more negative mass balances since 2002, however, needs further investigation, as it is not statistically significant.”

RC: Table 1: could you provide the image ids?

AR: We provide now the ids of the utilized images as suggested.

RC: Figure 1: would benefit from a grid or similar showing lat/longs for the area

AR: We already included a grid and lat/longs in the figure, however, hardly visible. We enlarged now the numbers.

TCD

4, C1765–C1768, 2011

All technical comments were included as suggested.

Interactive comment on The Cryosphere Discuss., 4, 2593, 2010.