The Cryosphere Discuss., 8, C1124–C1125, 2014
www.the-cryosphere-discuss.net/8/C1124/2014/

The Cryosphere
Discussions
Open Access

Interactive comment on "Spatially continuous mapping of snow depth in high alpine catchments using digital photogrammetry" *by* Y. Bühler et al.

Dr. Lato (Referee)

mjlato@gmail.com

Received and published: 7 July 2014

Overall the paper is very interesting, the use of photogrammetry for snow mapping is certainly coming to the forefront right now with research in Switzerland and in Canada.

One area of concern in particular is that the authors state the disadvantages of ALS for measuring snow thickness is that it is limited to fair weather flight days and the cost of data collection. Three questions arise from this statement that the authors should address:

1) Is digital airborne photography/photogrammetry not limited to fair weather flight days? 2) Does the cost account for the processing time to generate digital DTMS from the 2D photographic data? The cost savings of data collection is also unclear,

both technologies can be collected from the same airborne platform, requiring similar flight time and a similar INS/GNSS solution. Furthermore, ALS does not have limitations in sun/shade as photogrammetry can. Where does this cost savings come from? 3) The paper discusses the comparison of ALS and photogrammetry for a summertime DTM, not a snow thickness comparison. Did the authors not do an ALS snow thickness comparison?

When writing about a given technology and its application, I do not think the authors need to say it is better than a technology they did not test - eg ALS. It does not bring credibility to their work to state advantages over a techniques they have not proven or tested. These are comments for a discussion section about further testing and other technologies that may be beneficial to the area of study.

The authors repeat various times the cost is more economical to use photogrammetry, if this is a main find of the paper they should publish those costs. These costs for all methods should include data collection, processing, and interpretation of imagery/DTM - even if just the hours required are published.

It would also be very beneficial to the reader to show a 2D cross section through an area assessed by all technologies that illustrates the snow thickness variability between measurements.

Finally, the paper should include more on the limitations of airborne photogrammetry. Given it is a 'new' technology for snow science it would be beneficial to the reader to understand the challenges face by the researches, how they were overcome and what are the significant challenges remaining and how future work will overcome these.

Be constant about a space between numbers and units (p.5: line 23: 2.3 m - line 24 2m). There should always be a space. Line 28: Terrestrial Laser Sanning (TLS) not Terrestrial Laserscanning.

Interactive comment on The Cryosphere Discuss., 8, 3297, 2014.