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The Cryosphere Discussions

Interactive comment on "An inventory of glacier changes between 1973 and 2011 for the Geladandong Mountain area, China" *by* J. Zhang et al.

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Zhang et al (2013) provide an inventory of the Geladangong Mountains, China over the last four decades. This inventory can be of value, but needs more detailed explanation so reader confidence will be high. I am particularly concerned with the potential bias introduced by using a June 1973 image. I did not observe discussion of any adjustments for this being a June image, whereas the rest are either August or September. When examining areal extent particularly at higher elevations seasonal snowcover would be more extensive in June and in some areas tough to distinguish from glaciated areas. How has this been distinguished? A comparison of changes in the lower reaches of

outlet glaciers would be a means of avoiding this problem. I also wonder how many of the areas that are identified as being where a glacier was lost could be an area of seasonal snow in June. How has this been approached? The same issue could apply to the 2004 versus 2011 imagery which are a month apart in timing. Again this will matter little to ice extent observations at lower elevations, but above the transient snow line peripheral areas would likely have more snowcover and appear glaciated in early August than in early September. From Figure 7 it appears that little of the change in area from figure to figure is at higher elevations and if so much of this problem has been addressed, but how needs explanation.

508-20: Why use overlapping time periods in the abstract 1973-2004 and 1974-2011 versus 1973-1992 and 1992-2011? The latter are also equivalent in length.

509-11: These are old references update with references such as WGMS, 2008.

509-25: Again update with newer references such as Yao et al, 2012.

512-9: Do not use Wikipedia as a reference here.

515-11: Do you mean advancing or surging? Likely the former, if the latter how determined?

515-22: Can you quantify the size of the areas lost? Are these clearly glaciers or residual annual snowpack in the early 1973 image?

515-24: Any further glaciers lost 1992-2011?

516-20: There are at least two notable proglacial lakes at the end of glacier exiting ice mass C. These are worth noting. Have these lakes expanded?

Figure 7 The four small figures do not allow good comparison, it would be better to have one large image that used varied colors to identify the changes. Figure 6 already has the four small images.

WGMS 2008: Global Glacier Changes: facts and figures. (UNEP-World Glacier Moni-

toring Service, Zurich, Switzerland, 2008)

Yao, T et al: Different glacier status with atmospheric circulations in Tibetan Plateau and surroundings. Nature Climate Change, 2, 663-667, doi:10.1038/nclimage1580, 2012.

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