

## ***Interactive comment on “Distribution and recent variations of supraglacial lakes on dendritic-type glaciers in the Khan Tengri-Tomur Mountains, Central Asia” by Q. Liu et al.***

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Liu et al (2013) provide a detailed inventory of supraglacial lakes in the Khan Tengri-Tomur Mountains. The value of the paper is providing a baseline for the number and location of supraglacial lakes. Of additional value is the important analysis of the distribution in terms of slopes, elevation and debris cover. There are three key issues to address to strengthen the paper. The first is that the actual area of the supraglacial lakes is at present minor, well under 1%, and cannot at present be important to overall ablation processes. This must be emphasized in the conclusion and abstract. A second issue is the over reliance on supraglacial lakes in Greenland for reference, instead

C2008

of on alpine glaciers. The lakes in Greenland are not a good analog for most aspects of this study. Third is examining the persistence of particular lakes, it does not have to be all lakes. This is critical to evaluating the potential for expansion, since if they do not persist they cannot expand rapidly. This is also critical to the assertion that the lakes are highly variable in space and time. This may be true for the total number or total area, but is it true for the most significant lakes? If it is then the expansion and coalescence is limited. If many significant lakes persist then expansion would be anticipated.

4546-3: Remove second sentence, this would belong in introduction not abstract. This point cannot be supported for region covered here.

4546-7: Replace “lower area limit of ” with “minimum extent of”

4546-10: Replace “beyond” with “above”

4546-13: Replace “where the clean ice simultaneously disappears. “ with “the lower boundary of clean ice.”

4546-17: Increased noticeably with a % change.

4546-20: Peak timing?

4548-18: Can be highly variable in some areas they are quite persistent and recurring in the same location, but often they are not?

4548-20: Some of the lakes are not very temporary.

4550-3: Restate, There are 1375 glaciers” . . . . .

4550-12: Restate, “a high mass turnover”

4550-13: Remove “at”

4550-18: Note that these are summer accumulation type glaciers.

4552-26: Give range of slope do not just say steep.

C2009

4553-23: How many are the same lakes?

4554-14: Specify the months or dates.

4554-21: This is quite small compare to full glacier area or ablation area.

4555-4: Minor % of glacier area or ablation area. Hence it cannot be significant for enhancing or even collecting glacier melt.

4555-22: Why not 0.02 km<sup>2</sup> to agree with below statement.

4556-12: Specify the duration more precisely.

4559-21: It has not been demonstrated that lakes are highly variable in space and time. This requires evaluating how many lakes persist from image to image. The actual number may vary with time, but does the location?

4562-8: This could be the case, cite examples where this has occurred such as on Tasman Glacier, Rongbuk Glacier etc.

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Interactive comment on The Cryosphere Discuss., 7, 4545, 2013.