

Interactive comment on “Assessment of Evolution of Mountain Lakes and Risks of Glacier Lake Outbursts in the Djungarskiy (Jetysu) Alatau, Central Asia, using Landsat Imagery and Glacier Bed Topography Modelling” by Vassiliy Kapitsa et al.

Anonymous Referee #2

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General comments. The paper provides comprehensive assessment of evolution of mountain lakes in the Djungarskiy Alatau based on comparison of multi-temporal Landsat imagery, with identification of 50 potential GLOF hazardous lakes. GlabTop2 approach was tested on data obtained and applied to predict appearance of new lakes following deglaciation. It is substantive study with good regional coverage and I recommend accepting this paper after minor revisions.

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Specific comments. Line 16. “In 2002 and 2014, 599 lakes with a combined area of 16.26 ± 0.85 km² and 636 lakes with a combined area of 17.35 ± 0.92 km² respectively were identified”. In this context, it looks like the area change lies within the uncertainty in measurements.

Lines 55-64. It seems quite appropriate to mention here (and discuss somewhere in the text) the new glacial lake inventory with assessment of their outburst potential for Central Asia: Petrov M. A., Sabitov T. Y., Tomashevskaya I.G., and others (2017). Glacial lake inventory and lake outburst potential in Uzbekistan. *Science of the Total Environment*, 2017 Aug 15; 592: 228-242. doi: 10.1016/j.scitotenv.2017.03.068. Epub 2017 Mar 17.

Lines 171-172. Channels 7, 4, 2 and panchromatic channel 8 of Landsat 7 are not the same as of Landsat 8. Their numbers are different and, in some cases, their wavelength bands also

Lines 173-174. The threshold of digitization should be 675 m² but not 700 m² (taking three 15×15 m pixels as lowest limit of lake identification).

Line 346. The absolute vertical accuracy of ASTER GDEM2 of 17 m is given from (Meyer et al., 2011). But what is the vertical accuracy of ASTER GDEM2 relative to ice-free areas on topographic maps of Djungarskiy Alatau?

Line 666. I suggest to specify in the Conclusions : in which areas (basins) of the Djungarskiy Alatau the formation of a large number of new lakes is expected.

Technical corrections.

* In general, the text of the paper can be slightly reduced without affecting its content.

Lines 238-240. This phrase looks too heavy: “While increase in lake area is a factor making lakes outburst more likely (Bolch et al., 2011), no change or reduction in lake area is not a guarantee that outburst will not occur because 240 potential thawing of ice contained within the morainic dam (Jansky et al., 2010; Herget et al., 2013; Evans

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and Delaney, 2015) or blockage of channels within the dam (Narama et al., 2010b) can lead to its breach in a short period of time”.

Lines 443 and 444. The paper (Farinotti et al., in Press) is already published: Farinotti et al., 2017

Line 724. The paper is already published: Farinotti, D., Brinkerhoff, D. J., Clarke, G. K. C., Fürst, J. J., Frey, H., Gantayat, P., Gillet-Chaulet, F., Girard, C., Huss, M., Leclercq, P. W., Linsbauer, A., Machguth, H., Martin, C., Maussion, F., Morlighem, M., Mosbeux, C., Pandit, A., Portmann, A., Rabatel, A., Ramsankaran, R., Reerink, T. J., Sanchez, O., Stentoft, P. A., Singh Kumari, S., van Pelt, W. J. J., Anderson, B., Benham, T., Binder, D., Dowdeswell, J. A., Fischer, A., Helfricht, K., Kutuzov, S., Lavrentiev, I., McNabb, R., Gudmundsson, G. H., Li, H., and Andreassen, L. M.: How accurate are estimates of glacier ice thickness? Results from ITMIX, the Ice Thickness Models Intercomparison eXperiment, *The Cryosphere*, 11, 949-970, <https://doi.org/10.5194/tc-11-949-2017>, 2017.

Lines 869 and 900. Abbreviation “DGLOF” in caption of Figure 1 and in legend on this figure is not explained. The rest of the text uses the “GLOF” abbreviation. What is the difference? Unify. . .

Lines 930 and 935. It would be good to increase the readability of lines indicating “Lakes 2014” on Figures 9b and 10b.

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/nhess-2017-134>, 2017.