

Interactive comment on “Glacial lake inventory of High Mountain Asia (1990–2018) derived from Landsat images” by Xin Wang et al.

Anonymous Referee #1

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The present study provides an important glacial lake dataset across the High Mountain Asia using the Landsat images and manual visual interpretation. It will be served as a baseline for the further studies, such as changes in regional water resources and glacier-related hazard, especially the GLOFs, etc. The paper was well organized and written but there are still a lot of issues that need to be resolved before publishing in ESSD.

General comments:

1. The authors used the glacier boundaries and region divisions from RGI dataset 5.0. We know that both have been updated to the 6th version in 2017. Despite the small differences between the two versions in glacier divisions, the authors should carefully examine the differences in glacier boundaries between the two versions and use the

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latest version as a basis because it is important for an up-to-date glacial lake inventory. Also, the authors merged some subregions in this study, which is different with the original region divisions in RGI dataset 5.0. I suggest the authors use the region divisions provided by RGI dataset 6.0 directly, if not, the authors should give the reasons for such mergers.

2.The authors got the total uncertainty of the lake area for the entire study region or subregions only by adding the uncertainty of each lake area. It would be wrong because the accumulation of errors should be based on error propagation theory rather than simple addition. I suggest the authors to download the document from the link: http://ipl.physics.harvard.edu/wp-content/uploads/2013/03/PS3_Error_Propagation_sp13.pdf, which include the detailed introductions on how errors are propagated.

3.For the High Mountain Asia, there are a lot of regional or river basin-based studies have been made on dynamics and evolutions of glacial lakes, and their potential hazard and risk assessments also primarily based on satellite images and GIS technology. Based on this, many glacial lake datasets have been produced, hence I suggest the authors add a sub-section at the end to collect and compare these regional or basin-based datasets with the dataset produced by the authors. It is important for data paper and will improve this manuscript.

4.The language of this paper still needs further polishing due to some inappropriate sentence's constructions. I had trouble in understanding and following some sentences, and suggest seeking a professional editor before publication.

Specific comments:

P1 L1: Please rephrase the title so that it can contain a more explicit time information because the present title seems to be a long time series dataset, but the authors only provided two periods of dataset.

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P3 L28: ... are shown in Figure 1.

P3 L29: It would be better to include the specific latitude and longitude ranges.

P4 L7: Add the reference(s) for the annual average glacier meltwater.

P6 L15: 4.2

P7 L5: Landsat TM/ETM+.

P7 L11-13: Provide more information about this step, i.e., how to determine the thresholds for different regions?

P7 L14: For the High Mountain Asia, a lot of regional or basin-based studies on glacial lakes have been made during the past decades. Hence, it is a better choice that the authors can collect these published glacial lake data to help identify and locate the glacial lakes except for the method the authors used because we know the water bodies automatically extracted contains many errors because of mountain shadows and snow cover.

P9 L3: Please check this reference format: Weicai et al., 2014

P10 L25-27: Please provide more details on how to use these ancillary data to distinguish the glacial lake types because it is important as a guide for similar studies in the future and in fact, we know that the subsurface channels are ubiquitous. Have the authors considered this problem and how to solve it?

P16 L3-4: This description is the opposite of that in the legend in Figure 6. In fact, it can be removed because it is already clear in the legend.

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