



Interactive comment on “Changes in glacial lakes in the Poiqu River Basin in the central Himalayas” by Pengcheng Su et al.

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The Himalayas is one of the most sensitive regions to climate change, which present conspicuous changes in glaciers and glacial lakes. This manuscript is interesting in that it gives detailed annual variations of several lakes and reconstructs the history, which fills the gap of lacking case studies in the area. The major flaws are the data reliability and the parameter estimation in the construction of the water balance equation. For instance, the following should be further clarified.

1) The climate and hydrology in section 2.2 are irrelative to the topic because the description gives only the present situation, which is insufficient to reflect their long-term changes. The gross trend of both should be mentioned to some extent. 2) Section 3.3

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says that Table 5 lists tributary parameters crucial for lake evolution, but one cannot see how they influence lake evolution. In general, what are the major factors influencing the glacial lakes, the climate or the local geomorphology? This is especially important when we find that the climate data present in the manuscript does not show any positive correlation to the changes in glacial lakes (i.e., section 4.2). 3) Section 4.1 shows three patterns of lake variations, which seem to be related, partly, to the elevation. As mentioned above, the effects due to local morphology and hydrology should be discussed as possible influential agencies. After all, there are hydrologically connected lakes, as mentioned in the text. 4) The relation between glaciers and glacial lakes is clearly revealed, but their relations to the climate data are not well identified in Fig.15 ~ 17. This is related to the problem mentioned in 2). 5) The reconstruction of the lake in section 5 needs further clarification to guarantee the reliability of the volume estimation, which is the base for the WBE establishment. 6) Because so many parameters are involved in Eq.6-15, more details should be added to the estimation methods and accuracy. It would be better if related data were used for comparison, even in other areas. For example, for the infiltration, the text has cited empirical formula in literature, but it does not provide details about how these are really used for individual lakes. In short, all the estimations are not well-grounded. 7) There are 147 lakes mentioned in the study area, but only 5 lakes are studied in detail. Although it is perhaps supercritical to require such investigation to every lake, it is reasonable to ask for a general understanding of the lakes based on the case studies. However, the text seems to end with the several lakes, almost ignoring the overview of the lakes in the central Himalayas just as emphasized in the title. Therefore, it is suggested that there should be some discussions on this missing point.

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