



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

**Pengcheng Su et al.**

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We appreciate Anonymous Referee #2 for his or her instructive comments of our manuscript. At present we'd like provide a general reply to these questions.

Interactive comment on “Changes in glacial lakes in the Poiqu River Basin in the central Himalayas” by Pengcheng Su et al. Anonymous Referee #2 Received and published: 24 June 2021 The manuscript is interesting to read and will attract a wider scientific audience since the impact of climate change on the Himalayas region is a big concern worldwide. Moreover, this manuscript provides some important information about the current state and historical changes of glacial lakes in the study area. That being said, this paper is within the scope of HESS and will likely be a significant contribution

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and can be recommended for publication, although, some minor changes and a few clarifications should be made.

Some parts of the manuscript seem to be too long and detailed, and, yet, some parts of the text need either more information or further clarifications about the processes (this will allow some better understanding). The scientific quality of this paper is overall good, but it feels like authors could provide more information about the WBE. My overall impression is that the authors used the available data/historical information and I do not see any see any methodological issues with their approach. However, the reliability of their proposed method/approach should be discussed a bit more. I am not suggesting that authors are not aware of this.

I am certain they are aware just feel that a few more sentences discussing this could help the paper and could provide valuable information to readers (although, some parts in the Discussion section are very well written and cover certain aspects).

Reply: Both reviewers have proposed the same advice. In the original manuscript, we did not explain the WBE model clearly enough. So in the later revision, we plan to describe the approach of calculating the WBE more clearly, and give an exhaustive formula, discuss the reliability and the possible error. It may be helpful to generalize to other case studies.

The presentation of the data/results is excellent (all figures and tables are produced to a high standard and fit well within the text).

Here are just a few minor advices to the authors:

It would be good if authors could go through their introduction again and clarify further a few things. For example, page 2, lines 14 and 15: “The reduction in the south is much larger than that in the north (Wei et al., 2014)” could follow a short explanation why is that, despite the fact it is obvious and/or could be found in the cited paper, so readers can understand better the context while they're reading.

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Reply: We will check and modify the logic of the manuscript to enhance readability. It is good for readers to understand better the context. This is our ongoing work. In the revised manuscript, we will revise 1 introduction, especially line 15-17 in the page 2, line 3-12 in the page 3, and added the research of WBE literature.

Also, it seems that references are missing in some parts. For example, page 2, lines 25 and 26: "Statistics show that the expansion accounts for 67% of the area increase, while the formation of a new glacial lake contributes only 33%." It's unclear if this statistics can be found in Wang et al., 2015 that is cited a little bit later or not? Please clarify and add references where such confusion could arise. Some sentences could be rephrased. For example, page 14, lines 16 and 17: "To understand changes in glacial lakes, it is necessary to find the changes in water volume in the lakes. Then, we must find the lake volume from the area." can be formulated something like this: To understand changes in glacial lakes, it is crucial to find the differences in water volume in the lakes. In the next step, it is necessary to find the lake volume from the area. (This is only a suggestion to authors).

Importantly, page 16 line 36 and page 17 line 1: "Physical models have incorporated many influencing factors, such as temperature and radiation intensity; thus, these models have high calculation accuracy. However, they do not apply to areas lacking a sufficient database, as in the case in the Himalayas. . ." - I believe authors should more clearly highlight this somewhere in the beginning of the manuscript as it is important to state the lack of data from this region (which is a fact) and how such lack of data influence scientific decisions in terms of study design immediately to readers.

Reply: Thank the reviewer so much for giving us many useful suggests. We plan to modify our sentences throughout the manuscript. The chapter 2 "study area" will be highlighted that the region is the absence of data in the study area background presentation. And we also consider to add a chapter 3.1.2 to introduce the source and accuracy of the image data and meteorological data. At the same time, we will supplement the literature to review of relevant models in section 1 "Instruction" and

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discuss defects of existing models and methods. In the section 6 "Discussions", we will discuss the characteristics and accuracy of our WBE method.

Please also note the supplement to this comment:

<https://hess.copernicus.org/preprints/hess-2020-20/hess-2020-20-AC5-supplement.pdf>

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2020-20>, 2020.

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