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Hydrology and Earth System Sciences
Discussions
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Interactive comment on "Hydrological modeling in glacierized catchments of Central Asia: status and challenges" *by* Yaning Chen et al.

Anonymous Referee #1

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This manuscript reviews the present status, limitations and future challenges of hydrological modelling in glacierized, data-scarce Central Asia. It is a comprehensive review on recent development in hydrological modeling in glacierized catchments of Central Asia. The authors summarized hydrological responses to climate change during the past few decades and for the future period in literatures. Importantly, the limitations of hydrological modeling in the glacierized regions are summarized and discussed in terms of model inputs, model structure and model calibration. This is an interesting and important study, in particular, to discuss the specific module (glacier melt) and its limitations in hydrological modeling in Central Asia. I believe that the manuscript shed light on data-sharing and multi-objective calibration, that should be effective to help us understand the hydrological processes in data-scarce Central Asia.

I believe this manuscript has provided a comprehensive and timely review and de-

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Discussion paper

serves to be published in Hydrology and Earth System Sciences. However, the following major comments should be addressed in the further revision processes.

(1) Studies on fieldwork, e.g., glacier retreat monitoring, glacier melt modeling, should be additionally reviewed and discussed.

(2) Line 161-209: The glacier melt model (Lines 183-192) should come first in section 3.2, and then its coupling with hydrological models (for example, distributed hydrological models).

(3) If one want to quantify the hydrologic responses to climate change in central Asia (section 2.1), it would be interesting to compare researches on other parts of the world (e.g., the Alps, the Andes, the Himalayas, etc.). That would be more relevant to a general expectation in glacierized catchments.

(4) Line 82-84: need references on that.

(5) Line 85: Reorganize this sentence “glacier inflection points will or have already appeared, the amount of surface water will probably decline or remain at a high state of fluctuation”.

(6) Line 100: Section 3.1 should be “Meteorological input in hydrologic .. “ instead of “Input in hydrologic. . .”. Only the meteorological inputs are discussed here and other inputs (soil, snow cover, landuse) are not well described.

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