

Interactive comment on “Hydrologic modeling of a Himalayan mountain basin by using the SWAT mode” by Sharad K. Jain et al.

Anonymous Referee #3

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General comments

The manuscript ‘Hydrologic modeling of a Himalaya mountain basin by using the SWAT model’ it used in the northwestern Himalaya which is part of the larger Ganga River Basin. General comments for this paper are summarized below. 1. Although the paper addresses an issues of importance regarding the need for hydrological studies in the NW Himalaya, the paper in itself does not address any relevant scientific questions. 2. As a result, the paper lacks novelty and simply appears as a hydrological modeling exercise for this region. 3. Most of the paper also focuses on the model details and parameterization rather than any scientific question. 4. The paper also lacks references

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to major studies conducted in the Himalayan region that have advanced our understanding of the hydro-climatology of the region. (see below in specific comments) 5. I suggest the authors to go back and formulate specific scientific questions they want to address regarding the high-altitude hydrology in the NW Himalaya. As it stands, the paper needs a complete revision and would suggest the authors to perhaps resubmit as a new submission.

Specific comments

1. The title of the paper is too generic.
2. The first paragraph in the introduction section is lacking any citation or reference.
3. Line 116. At the same time, there has been a number of studies that have used spatially distributed hydrological models in the context of Himalayan regions to simulate streamflow (Immerzeel et al., 2013; Lutz et al, 2013).

Lutz, A.F., Immerzeel, W.W., Shrestha, A.B. and Bierkens, M.F.P., 2014. Consistent increase in High Asia's runoff due to increasing glacier melt and precipitation. *Nature Climate Change*, 4(7), pp.587-592

Immerzeel, W.W., Pellicciotti, F. and Bierkens, M.F.P., 2013. Rising river flows throughout the twenty-first century in two Himalayan glacierized watersheds. *Nature geoscience*, 6(9), pp.742-745.

4. Line 255. APHRODITE tends to underestimate high-altitude precipitation. It might be important to use station data where appropriate and valid. Underestimation of monsoon in Figures 9 and 10 are probably as a result of using APHRODITE data.
5. A majority of the results and discussion is spent on calibration/validation and model parameterization and performance. Only the last paragraph discusses some of the model outcome which I find the most interesting part of the entire study. Further discussion detailing these results would shed more light on perhaps the more interesting scientific questions of this study.

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6. I am not certain if Figures 2-4 are completely necessary by themselves are necessary. These can be combined into one figures.

7. Figure 9 compares the average monthly simulated and observed streamflow. Why not plot the observed and simulated monthly streamflow for both the calibration and validation period?

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