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Reply on CC1

Yang Wang and Hassan A. Karimi

Author comment on "Impact of Spatial Distribution Information of Rainfall in Runoff Simulation Using Deep-Learning Methods" by Yang Wang and Hassan A. Karimi, Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-371-AC3>, 2021

Authors' response:

Thank you for the comments.

Response to comment #1. We did not use the raster type precipitation data for the following two reasons:

(a) Data quality . Currently, the commonly used raster type precipitation data are mainly derived from climate models. These data have errors compared with the actual rainfall measurements and often need to be adjusted before they can be used, which was not the focus of the study. Using measured rainfall data to describe spatial distribution information can reduce the impact of rainfall errors on the final results.

(b) Raster data precipitation resolution. Considering the relatively small size of our chosen study area, if we use raster data, the number of grids covering the study area should be smaller than the number of HUI.

As we mention in the conclusion section, with high-resolution, high-quality raster type precipitation data, we can use, for example, CNN to process the precipitation to obtain spatial distribution information, which may improve our model. This is one work we want to perform in future.

Response to comment #2. This study was conducted on a long series of rainfall-runoff relationships. If a single rainfall event is simulated, the time interval of the rainfall data may need to be set to hours. In this case we need to consider the rainfall for the whole rainfall period. The look-back window would be different for different rainfall events. We think this is an idea worth trying, which requires a different setup in our model. However, our conclusions are still valid for the simulation of a single rainfall event. That is, we can improve the simulation results by adding the spatial distribution information of rainfall when performing single rainfall event simulation.