Hydrology and Earth System Sciences Discussions

Interactive
Comment

Interactive comment on "Variational assimilation of streamflow into operational distributed hydrologic models: effect of spatiotemporal adjustment scale" *by* H. Lee et al.

Anonymous Referee #1

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Data assimilation techniques have been employed to improve flood forecasting in many basins, which is a key research topic in hydrology and meteorology. In this manuscript, the authors assimilated streamflow data into gridded SAC model and a routing model with variational data assimilation technique. Effect of temporal and spatial adjustment scales were analyzed in nine study watersheds. The authors gave us abundant study cases and then concluded variable points, e.g. discussions of the over-adjustment and the overfitting problem.

Some suggestions are listed as follows:

(1) Please give an interpretation of the five SAC state variables (UZTWC, UZFWC,

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LZTWC, LZFSC, LZFPC) in section 2.2.2. Are they independent of one another? And why are these variables used in the study?

(2) According to the manuscript, the case of assimilating interior flow can improve the streamflow at outlet. Then why the outlet flow in the case of assimilating both outlet flow and interior flow showed worse results than the case of assimilation outlet flow?

(3) The authors claimed that biases in precipitation and potential evaporation (PE) were adjusted only in the abstract and conclusions, which should be discussed in the paper? How to adjust these biases?

(4) A basin named with WTTO2 appeared in the section 4.2.3. But I cannot find it in any other parts of the manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 93, 2012.

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