Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-47-AC1, 2018

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Similarity and dissimilarity in model-results between single and multiple flow direction simulations based on a distributed ecohydrological model" *by* Zhenwu Xu and Guoping Tang

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Received and published: 17 March 2018

Dear Dr. Qin,

We greatly appreciate your valuable comments on our manuscript (discussion version: hess-2018-47). We have run model simulation based on the "MFD-md" algorithm and compared simulation results with those based on other flow routing algorithms. Our results suggest that: 1) All flow routing algorithms (including MFD-md) performed in an extremely similar way in simulating stream flow at the watershed outlet. When aver-

aged for the watershed, the modeled values of eco-hydrological variables are also similar among all routing algorithms, including MFD-md. We added additional results based on MFD-md in the supplements (e.g., Table. 1, 2 and 3). 2) In addition, differences in simulated values of ecohydrological variables between "MFD-md" and SFD (e.g., D8) algorithm also show same pattern/tendency as we discovered in the manuscript. For hydrological variables, differences at cell level tend to increase as the distances of cells from channel increase. For the modeled values of ecological variables, this tendency is reversed. We also added relevant results in the supplements (e.g., Fig. 1, Fig. 2 and Fig. 3) Overall, our results still indicate that difference in simulated values of eco-hydrological variables between MFD and SFD algorithms mainly occur at individual cell level. This is applicable when comparing "MFD-md"-based results with other SFD-based results. However, due to lack of field observed data, it is hard to conclude if a routing algorithm is superior to another, which is somewhat beyond the scope of our existing study but could be part of our future relevant research. Again, we highly appreciate your valuable comments on our manuscript. We will definitely cite your great work in the revised manuscript (if there is a chance). Best regards,

Zhenwu and Guoping

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-47/hess-2018-47-AC1-supplement.pdf

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