Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-47-SC1, 2018

Hydrology and Earth System Sciences
Discussions
Open Access
EGU

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

C.-Z. Qin

qincz@lreis.ac.cn

Received and published: 22 February 2018

This manuscript compared the effects of four flow direction algorithms (D8, D-inf, MD8, and MD-inf) applying to a distributed ecohydrological model, CHESS. I would suggest authors' possible consideration on one more multiple flow direction (MFD) algorithm, i.e. MFD-md proposed by Qin et al. (1997), which is adaptive to local terrain condition. MFD-md can achieve more accurate results than D8, D-inf, and MD8, based on evaluations with different artificial DEMs and their theoretical specific catchment area distributions (Qin et al., 2013). And one of recent evaluation researches on effects of

Printer-friendly version

Discussion paper

different flow direction algorithms on calculating topographic wetness index (TWI) and explaining soil moisture in real catchments (Radula et al., 2018) also showed that the strongest relationship between TWI and soil moisture was obtained by MFD-md, compared to several existing algorithms (such as D8, D-inf, MD-inf, MD8, Rho8, DEMON, KRA, BR, MFM, as well as Ellenberg's indicator values).

Qin C, et al. An adaptive approach to selecting a flow-partition exponent for a multiple-flow-direction algorithm. International Journal of Geographical Information Science, 2007, 21(4): 443-458.

Qin C-Z, et al. Artificial surfaces simulating complex terrain types for evaluating grid-based flow direction algorithms. International Journal of Geographical Information Science, 2013, 27(6): 1055-1072.

Raduła, et al. Topographic wetness index explains soil moisture better than bioindication with Ellenberg's indicator values. Ecological Indicators, 2018, 85: 172-179.

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