Hydrol. Earth Syst. Sci. Discuss., 9, C6743–C6745, 2013
www.hydrol-earth-syst-sci-discuss.net/9/C6743/2013/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Assessing the hydrological effect of the check dams in the Loess Plateau, China by model simulations" *by* Y. D. Xu et al.

Anonymous Referee #2

Received and published: 14 February 2013

This paper assesses the hydrological effect of the check dams in the Loess Plateau in China by using model simulations. The authors calibrated and validated the SWAT hydrologic model during 1954-1966 before check dams were constructed, and using the calibrated parameters to simulate the hydrological for the period after check dams were constructed. The authors then compared the difference between the observed and simulated hydrology for identifying the hydrologic effect of constructing check dams.

After careful review, I found this manuscript has certain distance away from being able to be considered for publication on HESS. I also found this paper is novel; there are not

so many similar papers that have been published. The motivation and methodology is in general scientifically sound and attractive. However, the scientific achievement of this manuscript has not been fully presented by the authors. First, only one hydrologic station was used in the evaluation. Can't more flow data at other hydrologic stations in this watershed be used in judging model's performance? Any information on evapotranspiration available which can justify the accuracy of simulations? Second, what about the well-known equi-finality problems in hydrologic modeling? How to prove or convince that the model prediction presented here is unique, and not depending on the single parameter set chosen? The authors need to address on these related important modeling issues since they can change the conclusions significantly.

Therefore, my judgment is that the paper in its current form is somewhat below the average level compared to published HESS papers. I suggest "major revision" – in particular the authors are suggested to expand more relevant information into the manuscript. It is clear there are novel ideas in this paper, so I would like to see the final publication of this paper after very careful revisions.

The presentation of major findings in the Abstract and Conclusion was all in terms of the relative percentage of changes. Please compare by using the actual numbers and put the percentage change together within the parenthesis. Moreover, I strongly suggest that the authors has to present the overall water balances (between precipitation, evaporation and river flow)for different periods considered as one key Table.

The arrangement of the figures is too rough and leaves much room for improvement. For example, Figs 1 and 2 can be together (in fact both photos are not absolutely necessary to be presented in the paper); Figs 4 and 5 can be merged into one figure, and Figs 6 and 7 too. Further, the "95% prediction uncertainty" was plotted in almost every figure, but no explanation was offered. What is the definition? How to derive that uncertainty? What's the implication? All need to discuss.

Although the writing of the manuscript is in general understandable, at least the follow-

ing places need to be revised:

page 13493, line 14: change “Overtime” into “over the time”. page 13494, line 10: change “Xu Xiangzhou and his colleagues (Xu et al., 2002, 2004)” into “Xu et al. (2002, 2004)”. page 13496, line 5: can the unit be more clear? For example, change “t” into “ton”? page 13496, line 8: change “much cropland were” into “many croplands were” page 13496, line 9: change “for quite long period” into “for a quite long period” page 13496, line 28: only one reference was cited here. Can some more relevant references be added in the end of this line (since the authors said “from some literatures and field works”. page 13497, line 1: “Precipitation and hydrological data. . .”, please be more specific what kinds of hydrologic data you are referring to? Also the same comments can be applied to page 13496, line 14. page 13497, line 15: sometimes “long-term” was used, sometimes “long term”, please be consistent throughout the manuscript. Also, change “watershed scale model” into “watershed-scale model”. page 13498, line 13: Here, the authors have to explain what does the overbar mean in equations (1)-(3). page 13499, line 1: please mention which variable (river flow?) will be used for Eq(3) page 13499, line 6: The reason is? Land use map only available for two years? page 13500, line 13: Avoid using the word "so" in scientific papers. "Therefore" "Thus" can be much better.

page 13513, Fig. 3: The watershed shape looks not consistent at all with that in the inset of this figure. Please improve the quality and accuracy of this figure.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13491, 2012.