

Interactive comment on “Analysis of parameter uncertainty in hydrological modeling using GLUE method: a case study of SWAT model applied to Three Gorges Reservoir Region, China” by Z. Y. Shen et al.

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Thank you very much for your comment of Oct 16, 2011, informing us of valuable suggestions to improve our manuscript ‘Analysis of parameter uncertainty in hydrological modeling using GLUE method: A case study of SWAT model applied to Three Gorges Reservoir Region, China’ (hess-2011-263). Our point-by-point responses are as follows.

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1. Your comment: “Generally, the English writing is good in this manuscript. However, there are a number of grammar mistakes. There is no need for a major revision but the authors should spend some time to polish English.”

Our respond: the grammar and style of this manuscript has been checked by all the authors. Then the authors have replaced the initial mistakes and edited the sentences carefully. Attached please find the revised manuscript.

2. Your comment: ‘Title: use “hydrological and sediment modeling” than “hydrological modeling”

Our respond: the main objective of this study was to identify the degree of uncertainty and uncertainty parameters for prediction of stream flow and sediment in TRGA. Therefore, the title is replaced by ‘Analysis of parameter uncertainty in hydrological and sediment modeling using GLUE method: a case study of SWAT model applied to Three Gorges Reservoir Region, China’.

3. Your comment: “Keywords: use “Three Gorges Reservoir Area” rather than “TGRA”

Our respond: TGRA is the abbreviation of “Three Gorges Reservoir Area”. In the paper, we have replaced “Three Gorges Reservoir Area” by “TGRA”.

4. Your comment: ‘Methods: The procedures for sensitivity analysis, calibration and validation of input parameter are missing in the manuscript. Need to add.’

Our respond: Previously we had conducted a parameter uncertainty analysis for non-point source pollution modeling in this region. In the present study, a further study was developed in hydrological modeling and related uncertainty. More details about the procedures for sensitivity analysis, calibration and validation of input parameter can be found in the study of Shen et al. (2008) and Gong et al. (2011). Thus, a short description of parameter calibration was introduced in this paper due to the limited length of this article.

5. Your comment: “Conclusion: A number of sentences are similar with those in the

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“Results” section. Rewrite the conclusion section.”

Our respond: We agree. The conclusion has been refined as follows: The results indicate that only a few parameters were sensitive and had a great impact on the stream flow and sediment simulation. CANMX, ALPHA_BNK and SOL_K were identified as identifiable parameters. The values of these parameters could be obtained by calibration process without much difficulties. Conversely, there were multiple possible values for CN2 and ESCO. This indicates that calibration of these parameters might be infeasible. These non-identifiability parameters even led to equifinality in hydrologic and NPS modeling in the TGRA. It was anticipated that the parameter uncertainty are systematically correlated to the non-identifiability parameters. Under such cases, a user should check if any information related to the watershed characteristics and its underlying hydrologic processes could be used to provide a more precise range for model parameter. It is anticipated that this study would provide some useful information for hydrological modeling related to policy development in the Three Gorges Reservoir Area(TGRA) and other similar areas.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/8/C4545/2011/hessd-8-C4545-2011-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 8203, 2011.