Hydrology and Earth System Sciences Discussions

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 4, 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.

1. Your comment: "There are also numerous grammatical and stylistic changes that are needed; my suggestions addressed without a need for a major revision."

Our respond: the grammar and style of this manuscript has been checked based on your handwritten suggestions. Then the authors have replaced the initial mistakes and edited the sentences carefully. Attached please find the revised manuscript.

2. Your comment: "some references are missing in the reference list"

Our respond: The missing references such as Abbaspour, K.C (2009), Lenhart et al., (2007), Kannan et al., (2007), Sohrabi et al. (2003) have been added into the reference list. Please find them in the revised manuscript.

3. Your comment: "the definition of equation 4 is not proper"

Our respond: the initial sentence has been replaced by the following definition: $Q_{mea,i}$ and $Q_{sim,i}$ are the measured and simulated values for the ith pair, Q_{mea} is the mean value of the measured values, and n is the total number of paired values. The range of the ENS value is from $-\infty$ to 1, with 1 indicating a perfect fit.

4. Your comment: "rewrite the sentences on page 8216 which were same to those on the top of page 8215"

Our respond: 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 Region (TGRA) and other similar areas.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/8/C4335/2011/hessd-8-C4335-2011-supplement.pdf

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