Hydrol. Earth Syst. Sci. Discuss., 7, C3179–C3180, 2010
www.hydrol-earth-syst-sci-discuss.net/7/C3179/2010/

Hydrology and Earth System Sciences Discussions

Interactive comment on "

Quantifying uncertainty in the impacts of climate change on river discharge in sub-catchments of the River Yangtze and Yellow Basins, China" *by* H. Xu et al.

Anonymous Referee #2

Received and published: 26 October 2010

Climate change and uncertainty are currently important issues in hydrological science. The author tries to quantify the uncertainty in the impacts of climate change on river discharge, which is an interesting work. Taking two sub-catchments, which are located in Yangtze River and Yellow River, as example, the major work of authors is to establish SWAT model, and assessment impact of climate change on river discharge with different GCMs' projections. Uncertainty analysis is mainly based on the differences

of projected river discharges. I do have some suggestions to strengthen the paper. 1. Issues of SWAT model. Huangfuchuan River is located in semi-arid climatic zone, and mechanism of runoff yielding is infiltration excess, but SWAT model is based on saturation excess. No matter how good performance the model does for historical discharge simulation, it's doubtful for the final analysis. Therefore, I suggest author to do this work with another hydrological model which can reflect real runoff yield mechanism. 2. Huangfuchuan river basin has been highly regulated by many soil and water conservation measures since 1970s. Observed discharge can not reflect natural runoff generation. Therefore, author should analyze consistency of observed discharge data series before model calibration and validation. Otherwise, although model performs well for calibration period, it's still hard to get satisfied result for validation period. I suggest author to calibrate and validate hydrological model with naturalized discharge instead. 3. Rainfall information plays an important role in discharge simulation. Model performance for Huangfuchuan river basins is just acceptable, but not very good; and model performance for Xiangxi River seems not acceptable. One reason is model itself issue, another reasons should be data issue. In this study, how many raingauges used for each of catchments? If there were not enough rainfall data available, it's hard to get satisfied result. 4. Uncertainty in assessment is not only from climate scenario, but also from hydrological model. In the paper, author just analyzes uncertainty induced by climate scenario. Uncertainty induced by hydrological model should also be included in the study.

Recommendation: The authors work on an important issue. I would like to recommend this paper for publication subject to the changes listed above.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6823, 2010.