

Revision notes for “Attribution of climate change and human activities to streamflow variations with a posterior distribution of hydrological simulations”

(hess-2021-528)

We would like to thank the editors and reviewers for the constructive feedback again. We appreciate the valuable and thoughtful comments, which have certainly helped to improve the presentation and quality of our manuscript. We read the manuscript carefully and answered to two comments made by the Anonymous referee #2. Finally, we also checked the grammar and some expressions in the manuscript in detail, and made revisions throughout the text. All revised have been marked in red.

Answers to the reviewers in blue.

Modifications of the manuscript in orange.

To Report #1 (Anonymous referee #2):

General Comments:

The authors have addressed all what my concern, especially for the deep analysis on “equifinality for different parameters” of hydrological simulations. however, there are two additional minor revision requiring the authors to answer:

Responses to comments one by one:

1. 1) The authors have conducted a longer simulation from 1961 to 2015 to analyze the CR of CC and HA; however, first I only see the results from 1961 to 2004, whether the rest results should be described more clearly. 2) In addition, how to deal with land use change in the simulations, which was suggested to be clarified in the revised manuscript. It seems not to be found. As for section 5.2, at least there are four types (1980, 2000, 2010, 2015), how to distribute them to each year’s simulation?

Response: Thanks very much for your comments.

1) In fact, in this study, we only calibrated and validated the hydrological model from 1961-2004 (the natural period). As described in Section 3.4.1, we firstly divided the series into natural period and impacted period according to the break point test results of hydrological time series, assuming that the impact of human activities on runoff changes in the natural period is negligible, and then used the natural period data to calibrate and validate the model. Therefore, in other words, we only use the hydrological data during the impacted period to calculate the contribution rate of

climate change and human activities to the runoff change, and did not conduct hydrological simulations during the impacted period.

2) Land use change is often considered to be one of the important factors affecting the hydrological process, therefore, we analyze the land use change process in the LR basin during the historical period in Section 5.2. From the results of Section 5.2, it can be seen that the changes of Permanent glaciers and City are more significant, but they only account for 0.17% and 0.27% of the area of the LR basin, respectively. While the areas of forest and grassland (accounting for 38.4% and 47.2% of the study area, respectively) did not change significantly. Therefore, in the hydrological simulation of this study, the possible impacts of land use change in the study area were not considered. We also provide a supplementary description of the use of LUCC data in the revised manuscript. The added content (Page 6, Line 163 to 164) is as follows:

It should be pointed out that this study only used the land use information in 2010 to construct the SWAT hydrological model, and did not consider the dynamic changes of land use information in the hydrological simulation.

2. There may be a mistake. In lines 611-613, it describes the comparison between the impacted period (from 2005 to 2015) and the natural period (from 1961 to 2004); however, in Fig.14, the caption is about from 1970 to 2010.

Response: Thank you very much for your comments. We have corrected this typo in the revised manuscript.

To Report #2 (Anonymous referee #1):

Thank you again for all your suggestions and comments on the publication of this paper.