

Interactive comment on “Irrigation, damming, and streamflow fluctuations of the Yellow River” by Zun Yin et al.

Anonymous Referee #1

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This paper presents a modeling study of the effects of irrigation and dams on streamflow changes in the Yellow River Basin. There are many similar attribution studies in the literature looking at various influencing factors in the study region. Authors argue that streamflow fluctuations are not well examined in previous studies. But I am not convinced that this attempt would lead to a significant advance in this field. Besides, there are several issues with the model setup and experiments, which require significant improvement and clarifications to enhance the robustness of this study. Below are my major concerns that should be addressed.

1. The main drawback of this modeling study lies in the coarse resolution of the simulations. The hydrological modeling community has advanced significantly towards hypo-resolution simulations, especially at the river basin scale. Here, authors conduct

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the simulations at a spatial resolution of 0.50x0.50 in the river basin, using global-scale products for model inputs and validations. I believe authors should utilize local data for configuring their model in this specific river basin, given the availability of various high-resolution meteorological forcing data in China and ET products as well.

2. Extensive calibrations should be performed before using the model for quantifying the anthropogenic impacts. Authors argue that streamflow fluctuations have not been well examined in previous studies. but in figure 5-6, the model shows rather poor performance in simulating the seasonality and the peak streamflow, even with consideration of irrigation and dams.

3. In the irrigation scheme, irrigation water requirement is met only by the available stream water. How is the water availability defined? How does the model perform in simulating irrigation water use, compared to census data?

4. In the abstract, “Irrigation is found to be the dominant factor leading to 63.7% reduction of the annual discharges”, Is streamflow reduction caused by anthropogenic factors only? How about the effects of changing climate? Authors need to show the relative contribution of each factor (including irrigation) to streamflow changes in the abstract and conclusion sections.

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