Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
https://doi.org/10.5194/hess-2022-196-RC2, 2022

Comment on hess-2022-196

Anonymous Referee #2

Referee comment on "Attributing trend in naturalized streamflow to temporally explicit vegetation change and climate variation in the Yellow River basin of China" by Zhihui Wang et al., Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2022-196-RC2, 2022

Based on the Variable Infiltration Capacity (VIC) model prescribed with continuously dynamic leaf area index (LAI) and land cover, this study attributed the trend of naturalized streamflow to temporally explicit vegetation change and climate variation over the Yellow River Basin of China. They found that the effect of climate variation on streamflow is slight, while the change of underlying surface has imposed a substantial trend on naturalized streamflow. This research is of significance for understanding the underlying mechanisms of natural streamflow reduction, which can provide guidelines for local water resources management. Here are a few comments below:

1. Equation 7: In scenario S3 (f (Cinter, Pintra)), all climate variables and intra-annual temporal pattern of monthly precipitation vary according to observation records, while in scenario S2 (f (Cinter)), only specific climate variable varied according to observation records, why the intra-annual temporal pattern of precipitation on the annual streamflow trend (QPintra) can be calculated with equation 7? Maybe you should add a scenario (S2-1), in which all the interannual change of climate variables vary according to observation records while other variables vary according to control conditions in the S1. With this scenario, you can also check whether climate variables affect each other.
2. It seems that the VIC simulations don't match well with the observations, and the Nash–Sutcliffe efficiency (NSE) of monthly streamflow is only 0.44 and 0.46 over TNH-TDG and LM-HYK during validation periods (Fig. 8). To ensure the accuracy of this research, it may be necessary to recalibrate the model parameters.
3. Why only the results over TDG-LM and LM-HYK are shown in Fig. 12, and what's the streamflow trend over other regions?
4. To reduce the uncertainty of this research, it's better to show the multi-years average evapotranspiration and soil moisture in Fig. 13, rather than a specific year. In addition, please explain the meaning of these line charts in the manuscript.

Minor Comments

5. Line 29: "the effect climate variation on streamflow" should be changed to "the effect of climate variation on streamflow".
6. Line 129: "hman" should be changed to "human".
7. Line 267: "HKY" should be changed to "HYK".
8. Fig. 4a: The label of the colorbar is incorrect. "-6" should be changed to "6".

9. Are the trends in Fig. 7, 10, and 12 significant? It’s better to add the confidence interval in the figures.
10. Fig. 12: “LM-TDG” should be changed to “LM-HYK” in the figure caption.