

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2022-196

Dengfeng Liu (Referee)

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.,
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General comments:

The manuscript assessed the effects from temporally explicit changes of climate variables and underlying surfaces on the streamflow trend using Variable Infiltration Capacity (VIC) model prescribed with continuously dynamic leaf area index (LAI) and land cover in Yellow River Basin. This study suggests that change in underlying surface has imposed a substantial trend on naturalized streamflow in Yellow River Basin. This topic is interesting and important for the water resources management in Yellow River Basin, especially for soil and water conservation measures and ecological restoration projects.

Specific comments:

Line 156-159, the two-steps method was designed to consider time variant LAI in the VIC model simulation. Is it possible to use interannual change of LAI and land use in VIC model? In many hydrological models, the dynamical LAI and land use data are used. The version of the VIC model should be introduced.

Line 189, The monthly streamflow is evaluated by NSE, Bias and RMSE, which should be stated here, and calibration period and validation period, too.

Line 281, the vegetation degradation in the source region and urbanization in the middle reaches. It's better to cite reference or data to support this attribution.

Line 315, the grey frames in Figure 7 are not necessary.

Line 342, add Table 3.

Line 335-346, a table that summarizes the value of NSE, RMSE and Bias at different gauges in different period is helpful.

Line 338, maybe the calibrated values of 6 soil parameters mentioned in Line 185 should be presented here.

Line 353, "For the HYK station, the contributions of all climate variables to the streamflow trend were positive excepting temperature, while larger negative effects from underlying surface change offset the slight positive effects of climate change on the streamflow trend (Figure 9).", it's better to move this sentence to Line 361 after the simulation result.

Line 352-380, a table is needed to summarize the value of impacts and relative impacts rates shown in Figure 9.

Line 500, the slope land changes into the flat terraces could dramatically decrease the surface runoff generation and should not be ignored. It will also induce the change of intra-annual temporal pattern of LAI as shown in Figure 11(d).

Line 519, Was the degradation of permafrost simulated in VIC model in this study? How about the setting? Please explain it.