

Interactive comment on “Assessing the impact of climate variability and human activities on streamflow variation” by J. Chang et al.

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Thanks for reviewing the manuscript and giving valuable comments and suggestions. Those comments are all valuable and very helpful for revising and improving our paper. We have studied comments carefully and have made correction which we hope meet with approval. The main corrections in the paper and the responds to the reviewer's comments are as following:

(1) It is assumed that all the model (TOPMODEL and VIC) parameters will not change under climate change only. This assumption should be stated clearly and discussed, and the calibration method, calibrated results and relevant parameter values should be provided and analyzed. Response: The aim of this assumption is to keep the effect of

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human activities unchanged on streamflow variation in the impacted period compared with the baseline period. Hence, the simulated streamflow in the impacted period only reflects the influence of climate change. Then, the impact of human activities can be separated based on the equation (2) in the manuscript. Some studies (Bao, Z. et al., 2012; Ma H et al., 2010) also used this assumption to conduct similar investigation about this topic. Bao, Z., Zhang, J., Wang, G., Fu, G., He, R., Yan, X., Jin, J., Liu, Y., and Zhang, A.: Attribution for decreasing streamflow of the Haihe River basin, northern China: Climate variability or human activities, *J. Hydrol.*, 460–461, 117–129, 2012. Ma H, Yang D, Tan SK, Gao B, and Fu Q.: Impact of climate variability and human activity on streamflow decrease in the Miyun Reservoir catchment, *J. Hydro.*, 389: 317-324, 2010. The parameters of TOPMODEL and VIC model were regulated by artificial means, and the results in calibration period (1960-1966) and validation period (1967-1969) of two hydrological models were shown in Fig.6 and Fig.7. We divided the JRB into 25 sub-basins and 17 sub-grids in TOPMODEL and VIC model, respectively. The parameters of each sub-basin for TOPMODEL are different, also the parameters of each sub-grid for VIC model are different too. The following is parameter values of 17 sub-grids of VIC model. Table The parameters of VIC model

Sub-grid	B	Ds	Dm	Ws	d2	d3
1	0.58	0.66	2	0.55	1.80	0.73
2	0.63	0.75	2	0.52	1.75	0.75
3	0.61	0.68	2	0.64	1.62	0.70
4	0.68	0.72	2	0.59	1.82	0.68
5	0.64	0.73	2	0.62	1.66	0.65
6	0.59	0.66	2	0.68	1.75	0.71
7	0.57	0.64	2	0.59	1.73	0.75
8	0.63	0.78	2	0.65	1.69	0.78
9	0.68	0.69	2	0.58	1.52	0.69
10	0.70	0.67	2	0.63	1.54	0.63
11	0.72	0.77	2	0.55	1.48	0.75
12	0.73	0.78	2	0.55	1.65	0.76
13	0.69	0.68	2	0.62	1.78	0.82
14	0.59	0.64	2	0.69	1.65	0.74
15	0.56	0.59	2	0.76	1.50	0.65
16	0.64	0.58	2	0.78	1.54	0.79
17	0.71	0.63	2	0.74	1.65	0.78

(2) Line 8 on page 12750: change “soil and a water conservation project” to “soil and water conservation projects”. Response: Corrected. (3) Lines 27-28 on page 12570: check the sentence. Response: We have changed into “Sect.3 is devoted to introduce the research methods; Sect. 4 provides the results about the methods of elasticity model and two hydrological models;” (4) Line 9 on page 12571: delete “areal”. Response: Corrected. (5) Line 10 on page 12571: “variability”

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to “variabilities”. Response: Corrected. (6) Lines 12-13 on page 12571: check the sentence. Response: According to the comment, we have changed the sentence into “Zhangjiashan station is the downstream hydrometric station on the main stream of the Jinghe River.” (7) Lines 1-2 on page 12572: check the sentence. Response: We have changed the sentence into “The monthly and annual precipitation was then established from the collected data, and the annual maximum, annual minimum, and multi-annual mean air temperature values were then calculated according to the daily data.” (8) Lines 13 on page 12572: check the sentence. Response: Corrected. We have changed it into “The historic streamflow series can be split into two subseries according to the streamflow break year, and before the year human activities were negligible.” (9) Line 9 on page 12574: delete “the equilibrium”. Response: Corrected. (10) Lines 8-17 on page 12755: check the sentence, and different scenarios are presented in tables better. Response: We didn’t set scenarios in the paper, and there’s no page of 12755.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/12/C6984/2016/hessd-12-C6984-2016-supplement.pdf>

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