

Interactive comment on “The Influence of a Prolonged Meteorological Drought on the Catchment Water Storage Capacity: A Hydrological Model Perspective” by Zhengke Pan et al.

Anonymous Referee #1

Received and published: 17 March 2020

This paper represents an interesting huge work, the main objective of this paper is to detect the possible changes in catchment water storage capacity induced by a prolonged meteorological drought. It will also help improve our ability to simulate the hydrological system. Meanwhile, the structure is clear and analyses and conclusions in this paper are reasonable and logical. Overall, it is a nice paper with proper methodology and complete discussion on the main findings. A minor modification should be considered before publication.

General comments: First, the results indicated that 12 catchments had a significant

C1

downward shift in the CWSC. My first principal doubts come from there: are 12 sufficient to be able to analyze regularity about catchments with a significant downward shift. Second: Formulating conclusions is similar to drawing up an abstract. I mean that the emphases of the abstract and conclusions are different.

Detailed comments: * Is there a mistake in the inconsistency between the Abstract (L37-L38) and Conclusion (L613-615). * Previous study (Yan et al., 2015) has indicated that the sensitivity of the parameters in the GR4J model has different performance in different parts of the same basin. Therefore, you should cite more citations or do some researches in the study area to support the sentence in the L224-L226. * L503-517: You should cut out much of the repetition with the Section 4. * In the Section 4.4 you had better discuss the factors for the direction first and then the magnitude of shifts in the CWSC. * Why not analyze the reasons for conclusion 2 in the Section 5.1? (Catchments with larger elevation and slope, lower forest coverage of Evergreen Broad leaf Forest are more likely to have an increase in the CWSC during a chronic drought while smaller catchments with lower elevation, lower coverage of the Evergreen Broad leaf Forest are more likely to have a decrease in the CWSC.) * The conclusion should be concise and coherent. It is suggested that only the key and definitive conclusions of this paper should be stated. If you cannot confirm your conclusion, these results may only be used in the Discussion, such as L610-611 and L622-631, etc. * It's better to add latitude and longitude to the location map of the study catchments (Figure 1). * Table 3 should add the results about the fourth criteria. * Figure 4 can be improved. The figure should show the change directions and magnitudes of the CWSC at the same time. It is better for readers to understand the shifts of the CWSC in the adjacent catchments. * Is the supplementary material missing?

Reference Yan, X. et al., 2015. Application of GR4J Rainfall-runoff Model to Typical Catchments in the Yellow River Basin. Proceedings of the 5th International Yellow River Forum on Ensuring Water Right of the River's Demand and Healthy River Basin Maintenance, Vol V, 191-198 pp.

C2

