

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2022-244

Anonymous Referee #2

Referee comment on "Hydrological drought forecasting under a changing environment in the Luanhe River basin" by Min Li et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2022-244-RC2>, 2022

The manuscript investigates hydrological drought forecasting in the Luanhe River Basin. A conditional distributional model incorporating an established human activity index as the exogenous variable was proposed to predict the transitional probability from meteorological drought to hydrological drought. The results of the proposed methodologies were tested and compared with the traditional ones. Overall, the results are reasonable and could support the conclusions. Some issues are listed below.

1) Throughout the results analysis section, the results are mostly focused on very detailed preliminary results, whereas insights and discussion of results are lacking. It is quite obvious that the transitional probability depends on SPI and the lead time, while the readers might be more interested in the new insights brought by this new methodology. The authors might need to rephrase some of the texts in the results analysis section to make them more logically connected.

2) Lines 4-10, page 12, the justification of 1979 as the change point (due to human activity) is not sound enough. Why the sudden change in annual runoff in 1979 is not caused by the heavy rainstorms?

3) the authors determine the change point with the Nonstationarity analysis. Do you perform the prediction based on data of each period? In this case, the sample size may be short. How to tackle this problem?

4) The authors introduce the multivariate distribution model and the conditional model for the prediction. The motivation of this method should be highlighted. For example, there are multiple prediction models out there. Why do the authors select this model? This model is closely associated with the copula mode. What is the difference or why do you select this model instead of other models?

5) Lines 9, page 15, "Transition probabilities involving HI", did you mean "Transition probabilities with involving HI as the covariate"?

6) There are some language issues in this manuscript, a thorough editorial check might be needed.