

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2  
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## **Comment on nhess-2021-218**

Anonymous Referee #2

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Referee comment on "Spatiotemporal evolution and meteorological triggering conditions of hydrological drought in the Hun River basin, NE China" by Shupeng Yue et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-218-RC2>, 2021

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### General comment

The manuscript investigates the effects of large reservoirs on drought occurrence in the Hun River basin (China), by implementing a procedure accounting for meteorological and hydrological drought occurrence, through drought propagation within the system, included reservoirs. The manuscript is generally well written and interesting to read. Notwithstanding this, there are some minor to moderate issues that should be addressed by the Authors before the manuscript can be considered for publication. In summary, the Authors should improve the presentation of their work, especially the methodology section, in order to highlight the innovative contribution to the literature provide by their work, help readers understand results and possibly replicate the analysis for other case studies. My concerns are listed in the following; I hope that they will be helpful for manuscript improvement.

### Specific comments

#### Abstract

The description of the work in the abstract should be improved; in fact, while reading the abstract, the work appears to be only a case study application. On the contrary, I believe that the Authors are proposing a methodological framework to evaluate the impact of meteorological droughts in regulated river systems.

#### Methodology

- (5) should be better explained, e.g. by adding a sketch. If this equation was previously used for the same scope, a reference should be added. I would also add a sketch describing depicting the general framework adopted here. A better description of the framework could help the reader understand the rationale behind the specific statistical tools implemented here.
- The CPD is used as condition to explain the occurrence of severity and duration of hydrological droughts; why using CPD and not meteorological drought characteristics estimated based on SPI (e.g. intensity, severity and durations of meteorological droughts)? This point is not very clear to me, and the same could be for a potential reader. Further, why using the 0.95 CPD quantile as a threshold for hydrological drought? Does it result from data analysis or from the hydrological response of the catchment?

## Results

- What about drought frequency? It is mentioned at line 17 of page 9, yet not defined or investigated.
- Section 4.2. What do you mean by “periodicity”? Do you mean frequency or probability?
- At SY and XJWP stations, the correlation is very high for a large variety of SPI time scales; this makes the identification of PTMH values highly uncertain. This affects the conclusions drawn from figure 8; to overcome this issue I suggest to include in figure 8 the PTMH uncertainty bounds. This is the only major issue that should be addressed by the Authors.
- For clarity, in Figure 9 I suggest to use the same x-axis range for all D or S panels.

There are some typos in the text; I warmly suggest to revise the English language.