

# ***Interactive comment on “Decadal variation of extreme drought and flood in North China revealed by documentary-based seasonal precipitation reconstruction for the past 300 years” by Jingyun Zheng et al.***

## **Anonymous Referee #1**

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General comments In this paper, extreme drought and flood events in North China during 1736-2000 have been identified with seasonal precipitation reconstructions of 17 sites, and then compared with ENSO episodes and large volcanic eruptions. Higher temporary and spatial resolution of precipitation reconstructions allows the authors to identify more extreme events than the previous studies and eliminate some ones that intensity may have been overestimated (as discussed in the section 3.1). This work is helpful for better understanding of the climatic extremes in the past and their driving mechanisms. Before acceptance and publication, some minor revisions are still

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necessary.

Specific comments 1. This paper contains two main parts, identification of extreme drought/flood events, and the relationship between these events and ENSO/volcanic eruptions, however, in the Introduction (Section 1), the authors just introduce the study progress of historical climate change and extreme events. The previous studies cited in the Section 3.3 (from page 6 line 26 to page 7 line 2) which are about the relationship between climatic extremes and ENSO/volcanic eruptions could be moved into the Introduction, and more relevant literature should be added. 2. In the Section 2.1, the authors introduce the seasonal precipitation reconstruction which is from their previous work (page 3 line 10-23), and more details of this work, especially the description of the quantitative precipitation records of Yu-Xue-Fen-Cun during the Qing Dynasty and the methods of reconstruction, would be helpful for better evaluation of the scientific significance of this paper. 3. In the Section 2.2 (Method), the method how the authors identify the extreme drought/flood events should be described more clearly. For example, what does the phrase "these years" (in page 4 line 9-10) mean, all the years in 1736-2000, or just the 10 extreme years in 1951-2000 mentioned in the last sentence? The methods used for comparing the extreme drought/flood events with the ENSO chronology and the large volcanic eruption chronology also need some supplements. 4. In the Section 3.3, the authors give the probabilities of the occurrences of extreme events with ENSO events and large volcanic eruptions, however, no driving mechanism. Further discussion on how ENSO and volcanic eruption impact the climate change and extreme events might be necessary for this paper. What are the opinions in the previous studies, and why the results of this paper are different?

Technical corrections 1. This paper might need to be read and corrected by a native English speaker. 2. In page 4 line 10, the sentence "35% (35%) and 29% (24%) for severe and extreme drought (flood) respectively" should be checked, because according to the Fig.2, 35% (35%) is probably the criteria to identify the extreme drought (flood) events, but not severe ones. 3. For the Fig.3 (page 13), a legend might be necessary



to describe the symbols appearing on the figure.

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