

Review comments on cp-2021-43 “Reconstruction and analysis of extreme drought and flood events in the Hanjiang River basin since 1426”

Hanjiang River is one of the most important tributaries of the Yangtze River and the basin is well-known for its geographical attribute and cultural heritage in history. This paper thus presents the merit to study the important topic building flood and drought chronologies for the region. Given so, there were already several previous studies researching extreme flood and drought in the region. Although the authors declared that those papers were proxy-based, low-resolution, focusing on upper stream or short time period (line 121-124), to my knowledge, this was not totally true because Chinese scholars have utilized historical documents to study the extreme events and their socioeconomic impacts (e.g. Yin et al. 2015, Ren et al. 2013). It's a pity that the authors did not make further connections with the earlier studies for example to compare the trends and consistencies of the timing and zoning of the extreme events. I therefore urge them to make a comprehensive review and benefits of integrating knowledge from previous and present papers.

Despite from the above point, I have had some hesitations and inquires for the manuscript. Firstly, there are many place names in the paper, and most of the places are not shown on the map (figure 1) so it adds a lot of difficulties to follow and understand where and why the authors are referring to the locations. Also, topography information should be added in Figure 1. Secondly, method part is unclear. Now the way the authors presented the data and method looks like they were building the flood and drought index series by themselves. But to my knowledge those index series were built by the CMB (1981). So, it's more appropriate and fairer that the authors directly refer to CMB (1981) for the data source (5 geographical sites), and 3 new sites were added by themselves by using the same criteria. CMB sites and new sites can be marked on the map along with the number of records to improve the clarity. Table 1 needs to be referred to CMB, and also some info needs to be checked: criteria for modern precipitation for the grades is not consistent, is it $R \pm 1.7\sigma$ or $R \pm 1.17\sigma$? Also, it needs some explanation of why 0.33σ and 1.17σ is adopted in theory or practice? In addition to historical data, the authors also used instrumental data (lin177-182) but no context were provided to explain the time range used in the analysis and how the two very different types of data, i.e. historical and instrumental, can be merged for analysis. Line 238-250 writes that using Yang and Han (2014) method to evaluate the non-uniformity of the number of records and then 1812 and 1951 were regarded as time nodes of discontinuity. This paragraph seems important but the method and contribution to

the study is unclear. This also brings to another point; the authors used a lot of Chinese papers in the reference (some marked with in Chinese, some not). While this can be understandable in the context, it inevitably raises justification issues. It's important that authors review papers from more diversified sources including a rich quantity of paper in English related to monsoon, ENSO, and volcanic forces on climates.

Thirdly, the result part which identifies extreme flood and drought in history is fine, although it would be even better if the authors can compare the results with previous studies in the Hanjiang River watershed instead of comparing to the whole Yangtze River or Northern China. Also, many places mentioned in the section are very hard to be understood because of the lack of locational identification on the map. For the section 3.2, I appreciate the authors' endeavor trying to examine the extreme flood and drought trends with other important factors like monsoon index, ENSO and volcanic eruptions. However, I also found the interpretation can be arbitrary and sometimes not convincing. For example, in line 355-360, it says '15th-17th century, the monsoon was generally weak, and extreme drought events were relatively more likely to occurred. And 18th-19th century, the monsoon gradually strengthened, and there were more extreme flood events than extreme drought events.' I couldn't agree with that for Table 1 showing, among all, most importantly only 2 extreme floods in the 18th century and 10 times each for the 16th, 17th, and 19th centuries. The correlations between extreme events and ENSO and volcanic eruption are not robust or statistically significant. Also, it is important to notify that ENSO, monsoon, and volcanic eruption represent multi-annual scale variations, so it can fall into scale mismatch when authors trying to explain the correlations at multi-decadal or centennial scale. Overall, I suggest authors to further clarify the scientific contribution of the paper by improving the data and method section, and comprehensively reframing the results, discussions, conclusion parts.