

Review report

The authors present an interesting work on reassessing drought risk and impacts in Shenyang. This study unveils the characteristic of droughts by using the historical proxy data and instrumental observations. This study extended the precipitation series from 1906 to 2015, as well as reconstructed a long-term drought data series around 800 years, which may interest the readers who study on hydrology or climate variability. However, the manuscript seems lost balance when structure the result section. Pity for very few data analysis on historical data. My suggestions are as follows.

1. The manuscript presents a data-driven study, meaning the authors should be more careful about the data quality. The authors checked the data homogenization between NCAR dataset and station observations in manuscript. However, station NO. 54342 relocated many times, i.e. the year of 1970, 1976, 1989, 2006, etc. A study mentioned (Li et al, 2014. Title: Effect of data homogenization on estimate of temperature trend and urban bias in Shenyang station; The abstract in English) relocations could affect record (i.e. temperature) due to the non-uniformity during observations. Therefore, it will be good to check: Whether and how does the relocations affect the precipitation?
2. Could you discuss the reason to use SPI-12 instead of SPI-6 more specific?
3. The long-term drought series and documentary records from C.E. 1200 was a very interesting point of this study. This study period covers at least three types of government in China, including empire era, warlord era, and the current stage. Could you discuss the difference on societal impacts when a same/similar level of drought occurred during the different era/period, in particular for the pre-instrumental observation period? If possible, a further question, what's the difference on societal response when a same or similar level of drought occurred during the different period? Such as the leading group, government or local group/companies; the supporting funding, etc.
4. Is ENSO the best natural driving factors for drought in Shenyang? Did you consider about sunspots, temperature/heatwave, or volcano eruptions (normally have signal in extreme climatic events)?
5. ENSO effect precipitation was not a point to point impact (i.e. Wang et al, 2000; [https://doi.org/10.1175/1520-0442\(2000\)013<1517:PEATHD>2.0.CO;2](https://doi.org/10.1175/1520-0442(2000)013<1517:PEATHD>2.0.CO;2)). Each step need energy and time cost, thus, it may cause you hard to get high confidence on correlation if you use the ENSO series and droughts in the same season. Did you try correlated the pre-season ENSO to drought series (the level data, therefore your historical data could be included)? Such as spring drought to autumn/winter ENSO, summer drought to spring ENSO, etc.
6. A brief comment on one of your results mentioned in manuscript many times (just a view sharing, you do not need add or explain this in detail in your work): It make sense of documentary records did not have pre-drought information, and the drought records normally started from spring. The dominant economic sector in historical China was agriculture, which is normally start from spring in north/northeast China. Therefore, personal diaries and govern documents record 'extreme/abnormal/disaster events' more than 'common records'.

Minor comments

1. line 63 remove the comma between author name and the following sentence, 'Wilhite and Glantz (1985), classified droughts'. Remove the dot between 'and' and 'drought' in line 90.
2. Why you emphasis the ground water drought in line 64 to 65? And what the difference between the ground water drought and hydrological drought? According to the definition from USGS (<https://water.usgs.gov/ogw/drought/>), ground water drought is a type belonging to the hydrological drought. And in this study, you did not separate them into two types when classify drought types (line 334).
3. Line 75-76: the author list many events there. Two minor comments: a. add the season instead of year only, i.e. the spring and summer of 1975 and 1976 in Europe; b. add the special name of those events, just like you did for the USA event.
4. Line 75 and line 80: check the reference published year: Zaidman et al. According to the paper name from your reference below, this paper published in 2002 (<https://www.hydrol-earth-syst-sci.net/6/733/2002/>), not the year of 2010.
5. Line 100, I would suggest to keep number in the same format: 'four years' into '4 years'.
6. Line 116, 'a record of droughts' into 'the record of droughts'

7. Please pay attention to the abbreviations you used, they may confused your readers. i.e. Line 137, 8'M' to 8 million; Capital 'M' also appear in line 395 and line 396. If you wish to abbreviate the million into 'M', please define it at the first place it shown. Line 248 'WWII' to the Second World War.
8. Line 170, you may need show the full name of 'REACHES' (Reconstructed East Asian Climate Historical Encoded Series) to your readers, which could help them understand the data type you used.
9. Line 186: you can directly write 'Shenyang was called Shengjing' in the brackets after Shengjing Times.
10. Line 192: just need a quick check, are those NCAR data were gridded data or real station data? As you mentioned 'This dataset covers 60 relatively evenly distributed sites in China', which is, somehow, quite counter-intuitive. China has 60 stations with long term data series, but distribution were not 'evenly', at least east more than west; and from the link you attached this dataset was describe itself as 'Temporal/Geographical Coverage (each dot represents a 3° box containing one or more observations)', I'm not sure whether your 'evenly distribution' result from this. You need check it, as gridded data with spatial resolution of 3° x 3° (~300 km x 300 km) won't be a good choice for a city scale study.
11. Line 217 & 218 Could you put the period of the Han dynasty and Dong Han Dynasty?
12. Line 442: please give a percentage or number instead of the phrase 'most of'.