

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 #2

Received and published: 19 May 2018

Dear editor and authors of the manuscript “Decadal variation of extreme drought and flood in North China revealed by documentary-based seasonal precipitation reconstruction for the past 300 years”. To the best of my knowledge, the Yu-Xue-Fen-Cun record is the best proxy data in Eastern China with seasonal resolution and significant relationship to the instrumental precipitation variability. This work chooses the study area at the margin of the Eastern Asian summer monsoon, which will have a critical implication to understand the monsoon variability over the past several hundred years. The idea to definite and identify the extreme drought/flood events during the

[Printer-friendly version](#)

[Discussion paper](#)



different centuries is novel in paleoclimate reconstruction community. The results are completely supported by the data analysis. Thus, I suggest that the manuscript should be accepted for publication after a minor revision.

Main comments:

1. The explanation of the features of the extreme drought/flood events in North China could be further inferred. e.g. 1) The higher probability of the extreme drought events mostly followed the El Niño activity, which implied that the El Niño' may triggered the drought event in North China. 2) The precipitation variability in summer and autumn is stronger than other seasons, the reason may be that the precipitation during the flood season accounts for a large proportion of annual precipitation. 3) Some events have not mentioned in the previous studies, which indicates that the Yu-Xue-Fen-Cun has more accurate than other proxy record, e.g. the drought/flood grads, or the definition of the drought/flood events in this study is different from the other studies.

2. The phrase 'decadal variation' usually means that the record is smoothed by the 7 or 9 years low-pass filter to show the decadal variability. Here, the inter-annual events are analyzed during the different centuries. Thus, the phrase 'decadal variation' may not be a best choice.

3. The reason for selecting the study area should be further emphasized in climate research, e.g. the North China is located at the margin of the Eastern Asian summer monsoon, which is more sensitive to the global climate change.

Specific Comments:

1. Page 1, The seasonal features of the drought/flood events should be added in the abstract to emphasize the advantage of the Yu-Xue-Fen-Cun record.

2. Page 2, line 14. Is the 'larger precipitation anomaly percentage' more suitable? The reason is that the precipitation in south China is larger than one in North China.

3. Page 2, lines 16-35. The definition of drought/flood events should be added since

[Printer-friendly version](#)[Discussion paper](#)

the different definition will obtain the different classifications. e.g. Zhang (2005) points out that there are only 15 events in North China over the past 1000 years in Page 2, lines 18-19, but there are five events during some centuries in this study.

4. Page 3, lines 1-3. The Yu-Xue-Fen-Cun record is not firstly used in this study, thus, this sentence is inappropriate.

5. Page 3, line 13. Here, the longitude should be a range from 108°E to another longitude (120°E?).

6. Page 3, lines 23-24. Please explain the reason for selecting Gergis and Fowler's ENSO index, because there are some other ENSO index reconstructions in the past millennium (Braganza et al. 2009; Cook et al. 2008; Li et al. 2011; Li et al. 2013; McGregor et al. 2010; Stahle et al. 1998; Wilson et al. 2010).

7. Page 3, lines 27-28. Regarding to the volcanic eruption index, a new reconstruction is encouraged to use (Sigl et al. 2015). Moreover, it would be interesting that the other degrees of eruptions are assessed, or the Southern Hemisphere eruptions are excluded.

8. Page 5, line 11. There is an extra period '.

9. Please change 'El Nino' with 'El Niño'.

10. If the Yu-Xue-Fen-Cun record is archived in a published repository, which will be a huge contribution for the paleoclimate integration community.

References:

1. Braganza K, Gergis JL, Power SB, Risbey JS, Fowler AM (2009) A multiproxy index of the El Niño–Southern Oscillation, A.D. 1525–1982. *J Geophys Res-Atmos* 114. doi:10.1029/2008JD010896

2. Cook ER, D'Arrigo RD, Anchukaitis KJ, Diaz HF (2008) ENSO reconstructions from long tree-ring chronologies: Unifying the differences. In: Talk presented at a special

[Printer-friendly version](#)

[Discussion paper](#)



workshop on Reconciling ENSO Chronologies for the Past.

3. Li J, Xie S-P, Cook ER, Huang G, D'Arrigo R, Liu F, Ma J, Zheng X-T (2011) Inter-decadal modulation of El Nino amplitude during the past millennium. *Nat Clim Change* 1:114-118. doi:10.1038/nclimate1086
4. Li J, Xie S-P, Cook ER, Morales MS, Christie DA, Johnson NC, Chen F, D'Arrigo R et al. (2013) El Nino modulations over the past seven centuries. *Nat Clim Change* 3:822-826. doi:10.1038/nclimate1936
5. McGregor S, Timmermann A, Timm O (2010) A unified proxy for ENSO and PDO variability since 1650. *Climate of the Past* 6:1-17. doi:10.5194/cp-6-1-2010
6. Sigl M, Winstrup M, McConnell JR, Welten KC, Plunkett G, Ludlow F, Buntgen U, Caffee M et al. (2015) Timing and climate forcing of volcanic eruptions for the past 2,500 years. *Nature* 523:543-549. doi:10.1038/nature14565
7. Stahle DW, Cleaveland MK, Therrell MD, Gay DA, D'Arrigo RD, Krusic PJ, Cook ER, Allan RJ et al. (1998) Experimental Dendroclimatic Reconstruction of the Southern Oscillation. *B Am Meteorol Soc* 79:2137-2152. doi:10.1175/1520-0477(1998)079<2137:edrots>2.0.co;2
8. Wilson R, Cook E, D'Arrigo R, Riedwyl N, Evans MN, Tudhope A, Allan R (2010) Reconstructing ENSO: the influence of method, proxy data, climate forcing and teleconnections. *J Quaternary Sci* 25:62-78. doi:10.1002/jqs.1297

Interactive comment on *Clim. Past Discuss.*, <https://doi.org/10.5194/cp-2018-45>, 2018.

CPD

Interactive
comment

Printer-friendly version

Discussion paper

