

Interactive comment on “Multi-proxy reconstructions of precipitation field in China over the past 500 years” by Feng Shi et al.

Anonymous Referee #2

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This is an interesting paper which introduces a newly generated annual warm season precipitation reconstruction over China. The reconstruction is based on the point-to-point regression-based method and a dense data network including 489 tree-ring width data, 2 tree-ring isotope data, 108 drought/flood index, and 1 long-term instrumental data. The verification results show good agreements between the reconstruction and instrumental data over eastern China. The paper is in itself interesting, but its structure and language needs to be improved. Since the methodologies have been commented by another reviewer, here I mainly add some comments about the proxy records.

1. “Each record is required to be significantly correlated with one or more instrumental precipitation record at the 90% ($p < 0.1$) confidence level during the overlap period, based on both raw data and linearly detrended data. “

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How did you do the correlation analysis? How many nearby instrumental grid cells did you compare the proxy data with? It is surprising that all 489 tree-ring proxy records are “sensitive precipitation proxy records“.

2. The quality of DWI before the instrumental period needs to be discussed.

3. As you mentioned the precipitation/ PDSI reconstructions over East Asia from Cook et al. (2010) and Feng et al. (2013), have you compared this reconstruction with theirs?

4. “ A total of 242 of 491 tree-ring chronologies were extrapolated. The maximum and mean extrapolation lengths of the 242 chronologies were 24 years and 10.5 years, respectively. The extrapolation bias was ignored because of the short extrapolation length.“

As you mentioned “all tree-ring records were extrapolated to AD 2000“, that means lots of infilling data are between 1981-2000CE, which overlaps with the calibration period (1981-2000CE). Have you considered using a longer calibration period and leave out the last ten years?

5. The second and third leading EOF patterns, the south-north dipole and the sandwich triple pattern, are indeed found in instrumental period. And they are closely related to the movement and intensity of the western pacific subtropical high (WPSH). The sea surface temperature can influence the rainfall through WPSH, but correlation maps between ENSO and summer precipitation are often noisy (Wu and Wang 2002). So, why would the signal of ENSO in rainfall be so strong in the reconstructions if it is noisy in instrumental rainfall data?

6. In Figure 9, which method did you use for the correlation analysis? How does it look using winter temperature in the Nino 3.4 region?

Reference:

Wu, R., & Wang, B. (2002). A contrast of the East Asian summer monsoon–ENSO relationship between 1962–77 and 1978–93. *Journal of Climate*, 15(22), 3266-3279.

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