

Interactive comment on “Temperature changes derived from phenological and natural evidences in South Central China from 1850 to 2008” by J. Zheng et al.

Anonymous Referee #1

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Most observational records in China start from 1950 AD. It is of great importance to extend the observations back in time as possible to put the ongoing warming trend in a long-term perspective. This study is immediate and presents a new annual temperature series in South Central China during the period from 1850 to 2008 based on different types of proxy records. It makes possible to understand decadal temperature variations and evaluate the status of the current warming in the study region. The manuscript is well organized. I expect that this paper will be of broad interest within communities with respect to the climate of the past and particularly to current climatic change issues. This paper is suitable for publication in *Climate of the Past* with minor revision.

Major comments:

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(1) It is suggested to add the comparison between the new temperature reconstruction and the regional temperature derived from CRU (Climatic Research Unit) gridded temperature data in the south central China over the period 1850–2010. The discussion on the advantages and disadvantages between them is beneficial and would strengthen the manuscript. It would be also interesting to compare the new results with the longest observational records (Shanghai, and other longer regional temperature series) in China. (2) A spatial correlation map is needed to show the spatial representation of the newly-produced regional temperature series. (3) Different types of proxy records are used in the regression equation. But the authors did not state how the proxy series were pre-treated considering their discrepancies in dimensions and length. (4) The method ‘multiple regression’ has some weaknesses. For example, there is multicollinearity and transfer function’s instability with time. It is clear that the tree ring width chronologies used are highly correlated with each other. It would be nice to give some more comments on the related parts in the text. (5) The authors detected Quasi-15-year and quasi-35-year cycles in the temperature reconstruction series, but did not do any discussion. Further insight is needed. (6) There are spelling errors in the text and tables (Table 1 and Table 2). Please check it carefully and do correction. (7) A simple section to describe how the tree-ring chronology was produced is needed. The authors should show which detrending method was used, and how the chronology was derived. Also, how the reconstruction uncertainties were estimated need clarification.

Specific comments:

In the Title, evidences should be corrected as evidence; Abstract: They wrote ‘1893 was the coldest year’. My question is that ‘Is it correct within the uncertainty range’? Page 4079, Materials should be Material; Table 1: what are the superscripts [27], [28], [29]? It is difficult to find the reference sources. Figure 1: the study area is irregular and strange. The Nanchang sub-region should be excluded. Figure caption: central China should be South Central China; There are no proxy records available in west north parts of the study region (see Figure 1). Do the proxy records collected by the

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authors have good representation for the whole study region? A spatial correlation map is needed. Page 4082, line 19, the reference could be wrong. Page 4084, lines 10-25, many sentences are related to 1892 rather than 1893, but the 1893 is considered as the coldest year. Page 4085, lines 1-14 is not relevant.

Interactive comment on *Clim. Past Discuss.*, 11, 4077, 2015.

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