

Interactive comment on “Winter temperature variations over middle and lower reaches of the Yangtze River during the past three centuries” by Z.-X. Hao et al.

Anonymous Referee #3

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General comments:

The paper has a potential to be published in *Climate of the Past*, but it has to be significantly revised. I see as particularly important following comments:

- a) Page 104: Introduction should be completed by paragraph giving some overview about reconstructions based on documentary data, i.e. put this article more into international context what is done in historical climatology. For example, many such papers exist also outside of China. Great reconstruction effort concerns, for example, of Europe and some important papers should be mentioned here.
- b) Page 108: Description of reconstruction method is very short with hints on some
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published papers, i.e. reader is not able to understand how it was really done. More detail description of homogenisation methods is necessary. Moreover, there is not clear, if calibration and verification periods to find corresponding transfer function have been used. If yes, there should be mentioned some standard verification statistics used which should show the quality of reconstruction. Generally, the reconstruction methodology has to be described much better than it is.

- c) Discussion of results: it should be broader, please concentrate also on possible reasons of the fluctuations you found. See e.g. point 16 below.
- d) Page 111, Conclusions: it needs to be re-worked. On lines 20-26 you only repeat what you have mentioned in the second paragraph on page 109.
- e) For some clarification of the text, the manuscript should be checked by native speaker.

Other comments:

- 1) Title: You mention three centuries, but your reconstruction covers shorter period (1736–2007). Change it as “in AD 1736” instead of “during the past three centuries”.
- 2) Page 104, lines 3-4, 24: please express more exactly longitude, not only “east of”.
- 3) Page 104, line 5: I recommend “days from historical documents of Yu-Xue-Fen-Cun archive in Qing . . .”
- 4) Page 104, line 11: not clear formulation: “is 0.25°C higher than that of climatology” – what climatology?
- 5) Page 104, lines 12-13: What causes?
- 6) Page 106, line 4: I do not like expression “daily weather type” in this context.
- 7) Page 106, lines 15-16: Did you homogenise temperature series? What you mean “by quality insurance check”?

- 8) Page 106, line 17-18: how did you find that five stations “catch 50–90% variance of regional ...” – what method was used?
- 9) Page 106, line 20-22: did you limit the use of linear regression by any value of correlation coefficients (between given station and its neighbour)?
- 10) Page 106, line 26: What is “rain infiltration depth”?
- 11) Page 107, line 3: What kind of “quantitative and qualitative” information you have in mind?
- 12) Page 108, lines 20-21: There is not clear, how you came to values of the explained variance.
- 13) Section 4, title: Results and discussion has to be clearly separated into two sections.
- 14) Page 109, line 11: The winter 1865 is those of 1864/1865? The same concerns of 1809 – please clarify (see also line 16).
- 15) Page 109, line 20: 30-year or decadal trends?
- 16) Page 109, lines 26-27: May you discuss why the trend in 1862–1961 is much stronger than in the 20th century? Non-homogeneous data or other reasons?
- 17) Page 112, line 2: Please add any quotations of related Chinese papers (behind this first sentence).
- 18) Page 112, Appendix A: Information explaining time or days has to be in square brackets, e.g. [12–21 Dec. 1739]. Please do not use numbers 1, ..., 12 for identification of months. What do you mean by “Solar calendar” – is this in any relation to Julian or Gregorian calendar? Expression in the Gregorian style would be the best.
- 19) Pages 113-114: References were not checked for completeness and correctness. But they should be extended for quotations of some papers working with documentary-

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based reconstructions, e.g. in Europe.

- 20) Table 2A: Columns K, b0 and p are not necessary, I recommend to skip them. Note: “explained variation” or “explained variance”? Instead “Observation” I recommend “Period”.
- 21) Fig. 1: Graphical scale is missing to have an idea about the size of the territory studied. Please give a better formulation of the first sentence in the figure caption. Not fully clear is distinguishing between “total records and quantitative records” – see also my comments to page 107.
- 22) Fig. 2: please use “10-yr running mean” in the figure caption. You have to indicate reference period if you use “anomalies”.
- 23) Fig. 3: How is calculated “Temperature standardised index”? r is a correlation coefficient? – if yes, only two places behind comma are enough (i.e. 0.56 instead of 0.5623). r is correlation between corresponding series and “our reconstruction”? WT, ..., CC has to be explained not only in section 4 (page 110), but also in figure captions.
- 24) Other corrections I put directly into the manuscript and sent to the editor.

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