

## ***Interactive comment on “High-spatial-resolution monthly temperature and precipitation dataset for China for 1901–2017” by Shouzhang Peng et al.***

### **Anonymous Referee #2**

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This study by Peng et al. developed a high-resolution and long-term climate dataset over China. The CRU data was downscaled to 1km using the Delta downscaling framework. The topic is interesting, and the product would be useful in climate-related studies for the nation. However, I think the paper needs some improvement and further discussion before it can be published.

My major concerns include:

1. The Delta downscaling improves the spatial representation of temperature/precipitation climatology using high-resolution WorldClim as the reference climatology. However, it is hard to understand how this downscaling method improves temporal variability (or trend), because the temporal change is simply based on the interpolated anomalies from low-resolution CRU. This limitation should be at least explained

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and discussed in the manuscript.

2. The downscaled dataset is developed based on the WorldClim reference climatology from 1970 to 2000, and the data evaluation is performed for the period 1951-2016. Can the authors first evaluate the reference data (WorldClim) at different resolutions? Also, because there is an overlapping period for data training and evaluation, is it possible to use two separate periods, in which one is for downscaling and the other one is for data evaluation?

3. The authors need to discuss the possible reasons why CRU temperatures have systematic cold biases.

4. The dataset covers from 1901 to 2017, but most of the evaluations and discussion are about post-1950. Data quality or uncertainties before 1950 need more discussion.

Specific Comments:

1. P3, L10-L15: Can we get the information about how many stations in China were used for CRU TS and WorldClim? How different are they? Are they comparable to the 745 weather stations used in this study?

2. P4, L17-19: I assume the final product is generated using the bilinear interpolation method? This should be mentioned in conclusion and abstract as well.

3. P5, section 4.3: Trend is one aspect of the temporal variations. It would be better to also calculate the correlation of the time series.

4. Table 1: These metrics are applied to the climatology of TMP and PRE for 1951-2016? Or applied to time series of monthly TMP and PRE, then averaged over the 745 stations? Or any other way? This should be clarified in the main text or table caption. Same issue for Table S1.

5. Figure 4: Because the climatology is “corrected” using high-resolution reference data, it is not surprising that the downscaled data outperformed the CRU data in terms

of the climatology. As suggested in Comment #3, it would be better to have a similar figure to show the time series (or anomalies).

6. Figures 6-9: These figures are not quite informative. It would be better to add the trends as text on the figures. For figure 9, it is really hard to distinguish those three lines.

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