

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

Anonymous Referee #1

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The authors downscaled the monthly CRU temperature and precipitation data in 30' grids into 0.5' and compared against 745 weather station observations over China. They concluded that the down scaled dataset is closer to the observations than the original CRU dataset. The analysis and presentation are very clear, but their motivation of the analysis and the liability of the downscaled data are questionable. Their study is more like an analysis and comparison of the CRU dataset rather than an original creation of a new data set. Therefore I am not in favor of publishing their analysis in the ESSD data journal.

Major comments:

(1) It is not clear what temperature it is in their analysis. Is it land surface air temperature at 2m or surface temperature over land (0m)? Given current observation capability,

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how is it possible to generate 1km TMP and PRE datasets?

(2) How is the WorldClim data in 0.5' created and what observations are used? What is its reliability, how many station data is used over China (at most 745 stations)? As shown in Figure 2 (assuming the same color scale is used), the climatology of PRE (and TMP as shown later in Figures 6–8) in CRU is very different from WorldClim. I am wondering CRU data may have systematic climatological drift, the large difference between CRU and observations may mostly arise from its climatological drift. If this is the case, the downscaling may not help reduce the error as authors concluded. My suggestion is to include an additional analysis of using 30' WorldClim without downscaling and compare it with that downscaled at 0.5'. If this not the case, the downscaled data is indeed better than the CRU data, authors should address the reasons why it is better.

(3) As shown in Table 2, the uncertainty (\pm values) are very large, which is much larger than the differences between observed and downscaled mean values. Therefore, it is very likely that the difference between observations and downscaled data is statistically insignificant unless the authors can prove that is indeed the case.

(4) As shown in Table 3, the authors focused on the statistical significance of the trends, but they ignored the more important question whether the differences among CRU, downscaled data, and observations are statistically significant. I suggest the authors using uncertainty (\pm values) instead of “***” marking.

(5) Figure 4 and its discussion in the main text: Left and Right columns should be explained in the figure caption. I am wondering whether the correlations are mostly associated with climatologies. It should be more convincing if anomalies are used in the diagrams.

Minor comments

P3L25, Delta downscaling, a reference is needed and a brief description is helpful.

P3L28–30, The calculation of TMP anomaly is conventional, but why PRE anomaly

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is defined by ratio? What happens if the difference is defined for PRE?

P4L10, NSE needs a reference.

P4L16, “raw” data, CRU data can never be called “raw”. How many station data are used in CRU over China? If all 745 station data are used in CRU, the comparison in Section 4.1 is not independent!

P5, Section 4.2, first paragraph, it is not clear whether the description is for the down-scaled data of 0.5’. I also suggest use the same color scale for the TMPs in Figure 3. Second paragraph, see the major comments (2).

P6L5, “downward” trend, check and verify it.

Figure 5 (and Figure 3), the focus should be the difference between CRU and down-scaled data rather than the trend (and climatology) itself.

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