Ref. No.: ESSD-2022-79
Title: "HRLT: A high-resolution (1 day, 1 km) and long-term (1961–2019) gridded dataset for temperature and precipitation across China"

Dear reviewer,
We are truly grateful for the constructive comments and thoughtful suggestions you provided. Based on these comments and suggestions, we have made careful modifications to the original manuscript. We hope the revised manuscript will meet journal's standard. Below you will find our point-by-point responses to the reviewer' comments/ questions in BLUE. Please let us know if you have any questions.

Yours sincerely,

Feng Zhang

General comments: This study produced a new daily maximum temperature, minimum temperature, and precipitation dataset spanning 1961-2019 in spatial resolution of 1km in China by various machine learning and traditional methods. The observation data from meteorological stations were used to evaluate this dataset and the other three existing datasets, the result showed this dataset with high accuracy. This study involved huge computation with interpolation, and the method, which will be helpful for similar studies. Overall, the manuscript was well written and easy to follow. The method is very reliable, the dataset is solid and it will have valuable contributions in the fields of ecology, remote sensing, hydrology, and meteorological science. This manuscript and dataset have the potential to be a highly cited work in the future. In my opinion, the MS can be accepted for publication after a medium revision.

Specific comments：

1. For all reference links in the manuscript, the last access date should be added and the font color should be uniformed (blue). For the simplicity and clarity of the manuscript, it is recommended to delete the reference links of temperature, precipitation, and meteorological stations in subsection 2.1 (Lines: 88-98), and uniformly use the link: (https://data.cma.cn/, last access: date).

   Agreed, the reference links have been appended and revised.

2. There are many grammar problems (such as Line 31: Replace the "is" with "was"; Line 62: Replace the "grid" with "gridded"). Please modify these problems in the manuscript

accordingly.

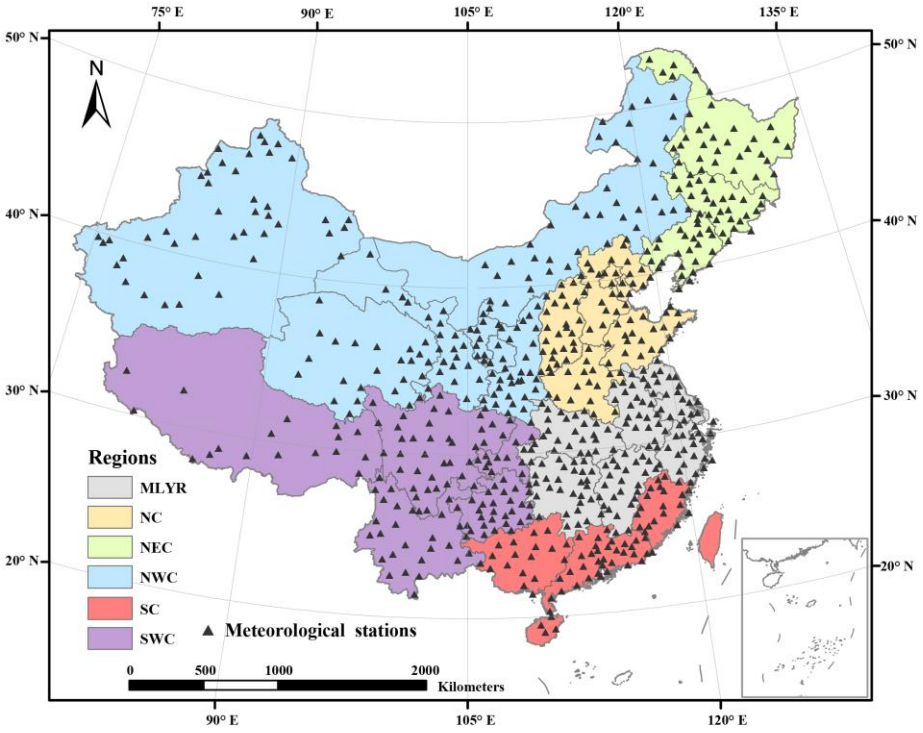
Agreed, we have fixed the grammar problems.

3. Line 30: More than one machine learning method is used in this manuscript, so it is recommended to change “machine learning” to “machine learning methods”. This also works on line 80.

   Agreed, we have replaced the “machine learning” with “machine learning methods”.

4. Figure 1: The legend representation as “Meteorological stations” is more appropriate than “Testing stations”.

   Agreed, we have replaced the “Testing stations” with “Meteorological stations”:



5. Line 106: The equation should be re-expressed on a new line, such as the equation line 238.

   The TWI is formulated as follow:

$$\mathrm{TWI} = ln(\frac{\mathrm{SCA}}{\tan(\mathrm{Slope})}) \quad (1)$$

where TWI and SCA is topographic wetness index and specific catchment area, respectively.

6. Lines 108-110: The expression is not clear, please re-write the sentence. Moreover, you should elaborate on which observed meteorological station data you used.

We used observed data from meteorological stations (Fig. 1) to evaluate our dataset and the existing three daily datasets, then the accuracy of the existing three daily datasets was compared to that of our dataset, respectively.

7. Line 134, please remove repeated “was”

   Agreed.

8. Line 142: use the abbreviation TPS for thin-plate-smoothing splines

   Agreed.

9. Line 144: Re-write the subheading (“The methods” to “The interpolation methods”)

   We have changed the “4.3 The methods” to “4.3 The interpolation methods”

10. Line 147-148: add implemented after used to.

    Agreed.

11. Line 153: Remote sensing uses low case R

    Agreed.

12. Line 160: Remove repeated “The”

    Agreed.

13. Line 324: Remove “for”

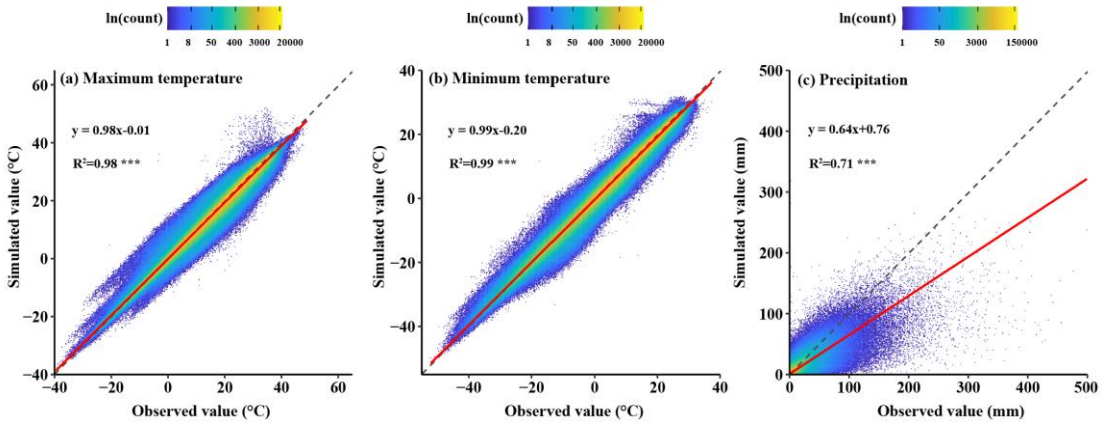
    Agreed.

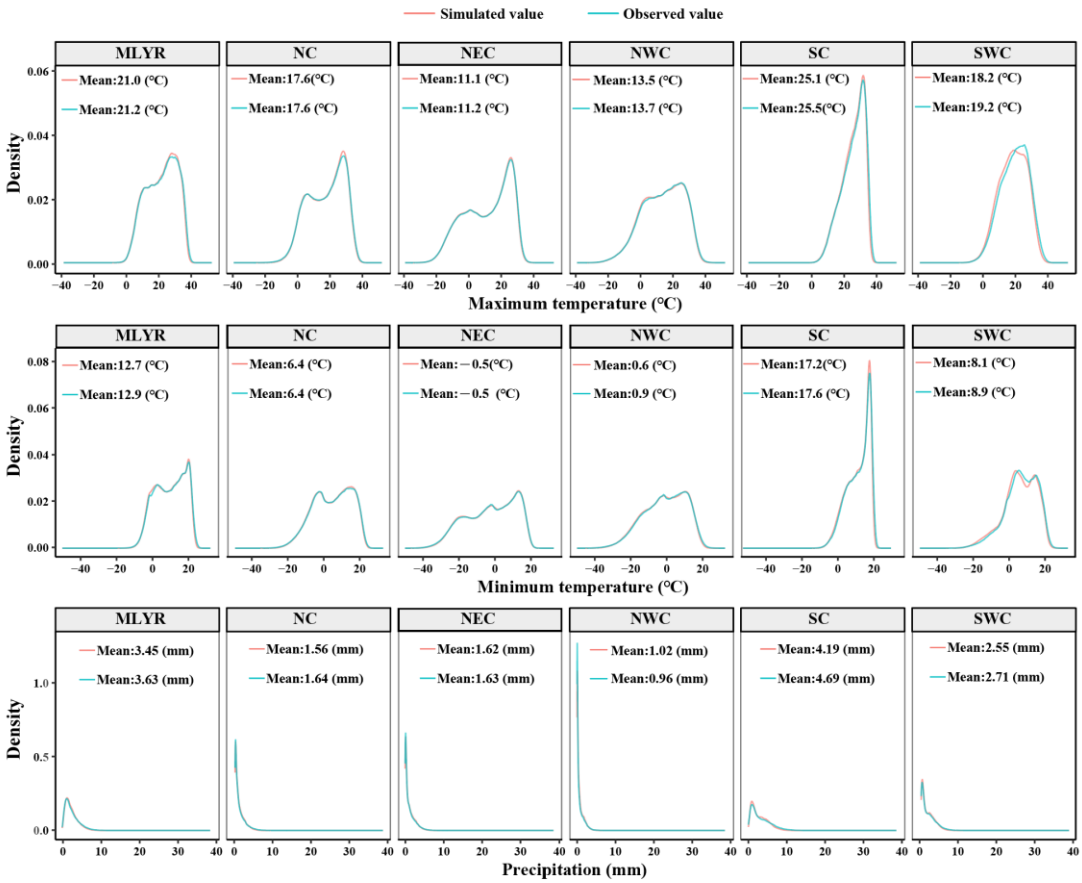
14. Figure 2: Please add the full spelling of TWI in the figure comments.

    The TWI is topographic wetness index and it has been added in figure 2 comments

15. Figure 3&5: The values (R^2/Mean) appear to be incomplete. please regenerate these figures.

    We have regenerated these figures:





16. Lines 265-268: please try to add reference.

    The reference (Qin, et al., 2022) of different regions has been supplemented:

    Qin, R., F. Zhang, C. Yu, Q. Zhang, J. Qi, and F.-m. Li: Contributions made by rain-fed potato with mulching to food security in China, European Journal of Agronomy, 133, 126435, https://doi.org/10.1016/j.eja.2021.126435, 2022.

17. Figure 5&6: Please add the explain of Min, Max and Mean in the figure comments.

    Agreed, they have been added in figure 5&6 comments.

18. Figure 8b5: There seems to be an extra vertical white line, please delete it.

    This may be due to discontinuous data distribution.

19. Lines 419-420: Reference missing page number, please add.

    Friedman, J. H. and Roosen, C. B.: An introduction to multivariate adaptive regression splines, 3,192-217, https://doi.org/10.1177/096228029500400303, 1995.

20. Lines 476-480: The year of reference is incorrect. Please modify it

    Merino, A., Guerrero-Higueras, A. M., López, L., Gascón, E., Sánchez, J. L., Lorente, J. M., Marcos, J. L., Matía, P., Ortiz de Galisteo, J. P., Nafría, D., Fernández-González, S.,

Weigand, R., Hermida, L., and García-Ortega, E.: Development of tools for evaluating rainfall estimation models in real- time using the Integrated Meteorological Observation Network in Castilla y León (Spain), 2014.