Earth Syst. Sci. Data Discuss., author comment AC2
https://doi.org/10.5194/essd-2022-278-AC2, 2022

Reply on RC2

Jun Qin et al.

Author comment on "A long-term 1□km monthly near-surface air temperature dataset over the Tibetan glaciers by fusion of station and satellite observations" by Jun Qin et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-278-AC2, 2022

We would like to thank the reviewer for the comments and suggestions, which are all valuable and very helpful for improving our paper. We have made revisions and a point-to-point response is present in the following.

Summary and comments:

Qin et al. construct a 60–year (1961–2020) near-surface air temperature dataset over the glaciers of the Tibetan Plateau by fusing satellite and multi-source observations. The used ensemble learning model is described in detail and sufficient experiments are conducted to validate the reliability of constructed datasets. The manuscript is well organized, and all results are clearly presented.

Response:

We thank Referee #2 for the encouraging comments.

Comments:

Minor comments:

1) As the article is aimed at a data journal, I think it is better to include more key information on the dataset in the title of the manuscript, such as the spatial resolution (1km), temporal resolution (monthly) and used methods (data fusion or machine learning).

Response:

The authors have changed the title to "A long-term 1-km monthly near-surface air temperature dataset over the Tibetan glaciers by fusion of station and satellite observations".

Comments:

2) Section 3.2: It is necessary to present some reasons or your considerations for selecting the random forest model, by citing relevant literatures or adding concise discussions.

Response:

As the reviewer points out, there are many machine learning methods that could be selected to convert LSTs to SATs. There has already existed a study which compare a total of ten machine learning methods (including several methods mentioned by the reviewer) in converting LSTs to SATs. The result shows that Cubist and random forest rank the first two places and their difference is subtle. Moreover, the random forest has been successfully applied in many studies to convert LSTs to SATs. Therefore, the authors have added description and citation "which has been proved effective in many scenarios (Belgiu and Dragut 2016; Xu et al. 2018)" in the revised manuscript.

Comments:

3) Eq. 8: Please give more description for DISO. How should readers interpret the value? Does a larger or smaller value mean better?

Response:

The authors have added "Overall, the smaller DISO is, the better estimates are." after Equation (8) to qualitatively describe the implication of DISO in the revised manuscript.

Comments:

4) Please add legends for all scatterplots.

Response:

The authors have modified all scatter plots in the revised manuscript by adding the color bars. These newly drawn figures are displayed in the following.

Comments:

5) Whether the stations outside the TP in the Northern Hemisphere locate at glaciers? If yes, it is better to add a sub-figure in Figure 4 to show the validation results at such station.

Response:

These stations outside of the TP are not at glaciers. But we will try our best to collect records at glaciers, and we will consider more glacier stations all over the world the subsequent research.

Please also note the supplement to this comment:
https://essd.copernicus.org/preprints/essd-2022-278/essd-2022-278-AC2-supplement.pdf