

Earth Syst. Sci. Data Discuss., author comment AC1  
<https://doi.org/10.5194/essd-2021-454-AC1>, 2022  
© Author(s) 2022. This work is distributed under  
the Creative Commons Attribution 4.0 License.

## Reply on RC1

Hongru Sun et al.

---

Author comment on "A compiled soil respiration dataset at different time scales for forest ecosystems across China from 2000 to 2018" by Hongru Sun et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-454-AC1>, 2022

---

### Dear Prof. Referee #1:

Thank you very much for your kind consideration and help to our manuscript! According to your suggestions, we revised our manuscript. All the modifications were listed as follows.

**Comment:** Soil respiration is an important indicator for a wide range of applications, especially those related to evaluating carbon cycle regionally or globally. The authors did a great job for collecting a total of 10288 monthly and 634 annual soil respiration data from 568 publications. I enjoyed reading this well-reasoned and well written study. In a certain extent, it is helpful for building robustness of this dataset for comparison between that from reference and software. However, it still requires substantive effort for the following reason:

- Authors mentioned Yu et al. (2010) established a geostatistical model with 390 monthly data and Jian et al. (2020) analyzed the spatial patterns and temporal trends with 1782 monthly data. The authors need to justify the importance of their research in comparison with these researches. For example, using any quantitative method to address advantage of their dataset. It just looks like a supplement for the research mentioned above right now.

**Response:** The importance of the dataset was discussed in the section "**4.3 Improvements of the dataset**" in Lines 260-290, mainly including the following four aspects: 1) the large increase of samples in annual Rs (N=634) and monthly mean Rs (N=5003), 2) the concurrently measured Rs & T<sub>5</sub> (N=6341) and Rs & T<sub>10</sub> (N=2878), which were extracted from the figures in the original papers with the digital software (WEBPLOTDIGITIZER) and not supplied in the previous datasets, 3) the consistency of the selected measurement methods (Li-6400, Li-8100, Li-8150 and gas chromatography), 4) Bamboo forests included, which were seldom considered in the previous datasets.

**Comment:** 2. What is the difference of soil respiration among different equipment and method? How does these affect the robustness of the dataset?

**Response:** "The common measurement methods were selected, including Li-6400, Li-8100, Li-8150 and gas chromatography, which had been proved to be consistent" **was revised to** "Rs measurements were mainly from Li-8100 (47%) and Li-6400 (33%), secondary from gas chromatography (18%), and Li-8150 only accounted for 2%. The

differences of the four common measurement methods had been proved to be small ( $\sim 10\%$ )" in Lines 261-263.

**Comment:** 3. Authors need to add more information for 'cross-checked'. It will be helpful to add one table or figure to address the different sources.

**Response:** There are some data from the same authors and different sources (e.g. master or Ph. D. dissertation and journal article). Here, "cross-checked" means the data from different sources was checked. To avoid to misunderstand, "Moreover, the data has been carefully cross-checked by the authors and from different sources." **was revised to** "Moreover, the data from the same authors and different sources (e.g. master or Ph. D. dissertation and journal article) has been carefully cross-checked and supplemented." in Lines 106-108.

**Comment:** 4. In Table 1, it is confused that the number of latitude and longitude are more than Study site. I only found 251, 122 and 180 different values for latitude, MAT and MAP, respectively. It needs more clarification for this table.

**Response:** Thanks for your reminder. In Table 1, we showed the number of the different study sites, but the numbers of the latitude, longitude, altitude, MAT and MAP were all. Thus, to keep the consistency, the numbers of the different latitude, longitude, altitude, MAT and MAP were listed in Table 1, i.e. 208, 218, 329, 122 and 180, respectively.

**Comment:** 5. What are the patterns for soil respiration along MAT and MAP?

**Response:** The patterns for annual soil respiration along MAT and MAP **were supplemented** in Figure S3.

**Comment:** 6. I strongly recommend that the authors rasterize this dataset to about 10 km resolution. You can exclude the Northwest and Southwest part of China which did not covered with much forests. Then, it would be more compatible to do analysis with spatial climate data.

**Response:** Thank you for your suggestion. This is a good advice. We rasterized this dataset to 1 km resolution, see the supplement. Yet compared with the large forest area of China ( $188 \times 10^4 \text{ km}^2$ ), the small samples ( $N=634$ ) and their unbalanced distributions would increase the uncertainties. Data coverage is a challenge for larger-scale extrapolation, and the simple interpolation analysis based on this data may be inaccurate. In order to make a more precisely map, in the future study, we are going to use more reasonable methods like machine learning, and have climate and soil variables included as predictors.

Thanks again for the reviewer and the editor for your kind consideration and help!

Best regards

Sincerely yours,

Hongru Sun, Zhenzhu Xu, Bingrui Jia

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2021-454/essd-2021-454-AC1-supplement.pdf>