

Earth Syst. Sci. Data Discuss., author comment AC4  
<https://doi.org/10.5194/essd-2021-454-AC4>, 2022  
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## Reply on RC4

Hongru Sun et al.

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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-AC4>, 2022

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### Dear Prof. Referee #4:

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:** Understanding soil respiration in large forest such as in China is of utmost importance, and compiling a database with available data regarding this topic highly relevant for the scientific community and stakeholders. Thus, the topic is worth of publication. However, clarifications should be provided before publication.

In the Introduction, the aims of the paper must be clarified. It seems this will be a review paper but latter the reader find there is data analysis also.

**Response:** Thanks a lot for your comments. "and analyze temperature sensitivity ( $Q_{10}$ ), monthly and annual  $R_s$  in cold-temperate, temperate, subtropical and tropical zones." **was added** in Lines 61-63.

**Comment:** In section 2.1, why was the search focused on publications performed 2018?

**Response:** We started from 2019 to collect the related literatures published up to December 31, 2018, it took three years (2019-2021) to established the soil respiration dataset.

**Comment:** L83: it is not clear what you meant. Should this be provided in section 2.3?

**Response:** "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.", and moved to section 2.3 in Lines 106-108.

**Comment:** In section 2.3 it is not clear why you used WEBPLOTDIGITIZER. It seems you used it to extrapolate published data. Please, better explain. How much of your database is based on published data and your estimations? Why the selection of 5cm and 10 cm soil depth? Was it linked with data availability?

**Response:** About 82% of the  $R_s$  data were extracted from monthly figures with

WEBPLOTDIGITIZER, others (e.g., minimum, maximum) were directly given in the original papers (see in Lines 99-101.). Yes, most studies measured soil temperature at 5 cm depth and/or 10 cm depth. "Soil temperature as a main influencing factor, was usually concurrently measured with Rs. Monthly dynamics of Rs and soil temperature at 5 cm depth ( $T_5$ ) and/or 10 cm depth ( $T_{10}$ ) were shown with figures in many literatures." **was supplemented** in Lines 97-99.

**Comment:** L103: I guess there may be other equipment models to perform these measurements, so I suggest to use the name of the equipment (e.g. infrared gas analysers)

**Response:** "Long-term continuous Rs could be monitored with Li-8100 or Li-8150" **was revised to** "Long-term continuous Rs could be monitored with infrared gas analyzers (e.g., Li-8100, Li-8150)" in Lines 110-111.

**Comment:** L105: "The typical days" – does it mean that you did not compile all the available data? (the reader needs to know the aim of the study)

**Response:** No, all the available data were collected and compiled in the database. Soil respiration was usually measured in the typical days with no rain in the original papers. To avoid to misunderstand, " The typical days were usually selected to calculate mean monthly Rs" **was deleted**.

**Comment:** The methodology used for data analysis must be clarified. Did you consider different climatic zones in the analysis? If so, which ones? The methodology used to calculate temperature sensitivity must be explained in section 2.

**Response:** "Monthly and annual Rs were averaged arithmetically in cold-temperate, temperate, subtropical and tropical zones." **was added** in Lines 123-124.

"Temperature sensitivity ( $Q_{10}$ ) is defined as the factor by which Rs is multiplied when temperature increases by 10 °C (Davidson and Janssens, 2006; Lloyd and Taylor, 1994), which is usually calculated with the van't Hoff equation ( $Rs=ae^{BT}$  &  $Q_{10}=e^{10B}$ ), where Rs is soil respiration rate ( $\mu\text{mol m}^{-2} \text{s}^{-1}$ ), T is temperature (°C)." **was added** in Lines 127-130.

**Comment:** L114: how did you estimated this value? Based on a weighted average between emissions and the extent of each climate zone? Please, explain in the methodology.

**Response:** Monthly Rs and annual soil carbon efflux were collected from the original papers, not the estimated values. Monthly Rs and annual soil carbon efflux with other units in some studies were converted to the common unit of  $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$  and  $\text{g C m}^{-2} \text{ year}^{-1}$ , respectively. "Monthly and annual Rs were averaged arithmetically in cold-temperate, temperate, subtropical and tropical zones." **was added** in Lines 123-124.

**Comment:** L158: how did you assess the significance of the differences? Please, explain it in the methodology

**Response:** With your suggestions, we have added the description of the method in the section "**2.5 Statistical analysis**", "Independent-Samples T Tests (2 groups) and One-Way ANOVA ( $\geq 3$  groups) at the  $P = 0.05$  significance level were used to test the differences among different forest types in the same climate zone and among the same forest type in different climate zones." **was added** in Lines 124-127.

**Comment:** L160: what is the meaning of EBF, ENF and DNF?

**Response:** " EBF, ENF and DNF" **was revised to** "evergreen broadleaf forest (EBF), evergreen needleleaf forest (ENF) and deciduous needleleaf forest (DNF)" in Lines 183-184.

**Comment:** L162: Meaning of MF?

**Response:** "MF" **was revised to** "Broadleaf and needleleaf mixed forest" in Lines 187-188.

**Comment:** L165: so the analysis was also performed based on ecosystem type? Please, explain it in the methodology

**Response:** "Independent-Samples T Tests (2 groups) and One-Way ANOVA ( $\geq 3$  groups) at the  $P = 0.05$  significance level were used to test the differences among different forest types in the same climate zone and among the same forest type in different climate zones." **was supplemented** in Lines 124-127.

**Comment:** Section 5: you don't need a separate section to provide this information. You can include it in the Conclusions

**Response:** "Data availability" need to be given as a separate section in Earth system science data.

**Comment:** Fig.1: it will be interesting to show also the climate zones and if possible the main ecosystem types

**Response:** Forest types were displayed as a background map in Figure 1, including evergreen broadleaf forest, deciduous broadleaf forest, evergreen needleleaf forest, deciduous needleleaf forest, broadleaf and needleleaf mixed forest and Bamboo forest.

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

Best regards

Sincerely yours,

Hongru Sun, Zhenzhu Xu, Bingrui Jia