

Earth Syst. Sci. Data Discuss., author comment AC1
<https://doi.org/10.5194/essd-2022-161-AC1>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Reply on RC1

Yutian Ke et al.

Author comment on "MOdern River archivEs of Particulate Organic Carbon: MOREPOC" by
Yutian Ke et al., Earth Syst. Sci. Data Discuss.,
<https://doi.org/10.5194/essd-2022-161-AC1>, 2022

Dear Reviewer 1,

Thanks for the detailed comments, which really helped to improve the MOREPOC dataset
and the manuscript. Please check our reply to the comments below:

▪ Dataset

We have made several modifications to MOREPOC v1.0, and now version 1.1 is available
on Zenodo. Each data entry is an individually collected sample unless several size fractions
were reported in the original study.

To summarize:

MOREPOC V1.1

- Renamed field header. The names of some fields were changed to make them more intuitive, e.g., "riv_na" was changed to "bas-id" to refer to the sampled drainage basin and "bas_na" was changed to "riv_id" to refer the name of the sampled river. "RCA" was changed to "age_14C", and "cn_mar" and "as_mar" were changed to "cn_ratio" and "alsi_ratio", respectively.
- Added extra fields. The "country" column was created to separate it from "riv_id"; "perc_poc_1sd", "d13C_1sd", and "D14C_1sd" columns were added to provide analytical uncertainties for POC content, $\delta^{13}\text{C}$ and $\Delta^{14}\text{C}$ data, respectively.
- Corrections made. There were some wrong entries about the country where samples were collected in the "country" column, which has been corrected. The content of the "time_m" column was changed from strings to numeric. In addition, we removed brackets, points, commas or empty spaces in the data fields. Coordinates were carefully checked through, and wrong entries were corrected. The reversed latitude and longitude of the one sample (Amazon River at Obidos, 2005) were corrected. Only the average is now presented in Figure 1 if several samples exist from a given location.
- Added data. We incorporated data from some recently published or missed articles, e.g., Menges et al., 2020 and Holmes et al., 2022. Besides, we looked through all references from MOREPOC v1.1 to add analytical uncertainties if available. However, most papers do not report uncertainties. We also added more sampling date information, such as those from Bouchez et al., (2014). Now there are only 3 samples without associated dates. However, some data entries only have the sampling date

information as a period (year) because there is no specific date reported for each data entry, such as for a large amount of data from Taiwan rivers (Hilton et al., 2010).

MOREPOC V1.1_RM

- Reorganized references. References not cited in MOREPOC v1.1 were removed, and newly incorporated references were added.
- Added extra fields. The "para_m" and "para_c" columns were added to clarify the sources of parameters in MOREPOC v1.1. Data entries of some parameters were directly taken from the cited references, while some were obtained through later calculations and conversions.
- Completed information. Some missing information in "filter" and "Note" were added.

Besides, a Readme.txt was provided with the MOREPOC v1.1 dataset, also available on Zenodo.

▪ **Manuscript text**

Line 7-8: Rephrased.

Line 31: Corrected.

Line 45: We agree that SOC in permafrost has a dynamical turnover time subjected to varying climate conditions, especially the current elevation of ambient temperature will accelerate the thawing of permafrost. In the manuscript, we now explain the term "turnover time" following Eglinton et al. (2021), which is the ratio of soil carbon stock to input flux, to make it more proper to discuss the relative long SOC turnover time in permafrost regions.

Line 47: Carvalhais et al. (2014) was removed from the Introduction.

Line 53: Replaced.

Line 66: Rephrased.

Line 81: We agree that "carbonate removal" is more appropriate and is now used to replace "decarbonization" in the manuscript. "acid adopted" means the type of acid used for removing carbonate - this is clarified now.

Lines 134-136: Time is in units of hours and temperature is in units of Celsius degrees. We added this information in the manuscript to explain the parameter in MOREPOC v1.1_RM.

Line 142: Rephrased.

Line 146: Corrected.

Lines 142-154: We agree that the definition of $F^{14}C$ should be included in the manuscript - the equation was added.

Line 170: Corrected.

Line 259: Good suggestion, we rephrased the expression to "MOREPOC will benefit the scientific community carrying out research on riverine POC sources, transport, and fate, furthermore, helping inform and validate Earth system models to improve the ability to model and understand the global carbon cycle."

