Erlangen, 24 August 2022

Dear Editorial Team of Biogeosciences, dear Reviewers,

thank you for the handling of the manuscript and for providing us your comments. We did our best to address the constructive criticisms.

Please find our answers in the table on the next pages. For the final submission, we will upload a new version of the manuscript with tracked changes and another one with all tracked changes removed for further processing.

With kind regards and on behalf of all co-authors

Marlene Dordoni (PhD student)

Reviewer´s suggestion	Authors´ answer
Reviewer #1	
Overall, this is well-organized and clearly written manuscript. The data, discussion and conclusion are intuitive for the most part. That said, I do have some minor to moderate comments and suggestions that I think will improve the manuscript. I outline these below, with line numbers where appropriate. Once these changes have been made, I fully support publication of the manuscript in Biogeosciences.	We thank the reviewer.
L12-13: It may be better to use "phases" instead of "sources" here. Some abbreviation seem to make me confusing, e.g., POC and ExtPOC. Could the authors just use "auto-POC" and "allo-POC" to name these two differently-sourced POC.	Done.
L14-16: I am confused about which is the "this purpose". Does it refer to the first sentence of the Abstract? Could the authors change it to "For eliminating the influence of atmospheric exchange, we ……." ? Also, the Abstract could be improved to be more concise and logically clearer.	We modified the text accordingly.
L32: In the introduction part, a description of characterization of metalimnion and hypolimnion seems missing, because CO_2 exchanges from atmosphere and soil are also important sources of DIC.	We improved this part of the Introduction.
L110: The description of d13C could be simplified, as it is a basic parameter to the audience in this field.	Done.
L130: Instead, the isotope mass model could be explained in more details, e.g., how the equation (2) was deducedï¼ŸThe variations of d13CDOC and d13CPOC should be plotted in the main text, as they are important for the manuscript.	We deepened the details regarding equation (2) in the supplementary material to avoid an interruption of the flow of the main text. The graph with variations of $\delta^{13}C_{DOC}$ and $\delta^{13}C_{POC}$ was inserted into the main text.
L175: The Results part looks very discrete with 6 paragraphs, even some paragraphs are only composed of 3-4 sentences. Please revise the part to be more simplified and concise.	We merged Results and Discussion and divided the new section into more coherent paragraphs.
L231: Please add several sub-titles to discussion part to make it more readable.	The Discussion is now divided into subsections with headings.

Reviewer´s suggestion	Authors´ answer
Reviewer #2	
I think while this study is interesting the paper could do with restructure. The results are almost like bulletpoints and could be merged with the discussion to give it logic and context.	Results and Discussion are now merged into a single section with subsections that have individual headings.
I also am not convinced by the mass balance end-members. 13C isotopes vary so widely in freshwater that they overlap with terrestrial values. While the data show that there is differences between POC and DOC, there is enough overlap to reduce the conclusions that the authors state. I don't know if the endmembers the authors used for the calculations are right, and therefore, I'm not sure that the interpretation is correct. If the end-member is correct (the authors should jusitify this) and the descrition of the isotope methods was made clearer the paper could be accepted with minor revisions. If not, calculations should be revised and reconsidered after major revisions.	In our manuscript, we used endmembers that were already published (doi:10.1080/10256016.2017.1282478). At current, no further data more suitable for our study venue are available as input. The endmembers for allochthonous POC and sedimentary POC are still in the range for C3 plants that are expected as starting material for organic matter input. The reason why the allochthonous POC and its related sedimentary POC range around – 31 ‰ (at the lower end spectrum of C3 plants) could be related to inputs from peaty material from a hardrock terrain that makes up the Rappbode Catchment. These relationships were explained at more detail in the Results and Discussion section. Carbon isotope compositions for autochthonous and allochthonous POC overlap only for some metalimnetic samples between March and May. This might be an additional reason why we were not able to constrain a definite OM source for DIC pool in the metalimnion. For the remaining data in the database, isotope compositions for autochthonous and allochthonous POC differed enough to differentiate these sources. If the reviewer's concerns are directed at the data collected, we have reported the standard deviation of the relative instruments in our manuscript. We agree with the reviewer that the POC and DOC correlations are similar for the metalimnion, and we further addressed this topic in the Results and Discussion.
I would prefer if the isotopes were plotted on their own with permil axis rather than the way they are plotted - it is hard to see the real scatter/overlap.	We agree that it is difficult to follow the manuscript with only the isotope results being used as input in figures 3 and 4 (now, figures 4 and 5). Also based on a request by Reviewer 1, in the new version we added contour plots of $\delta^{13}C_{DOC}$ and $\delta^{13}C_{POC}$ to the main text (new figure 3).
I also think that the terms that the authors use should be explained as they are not used in all countries. I have made comments in the attached pdf and hopefully these will help.	These comments were unfortunately unavailable to us and if possible we are happy to incorporate them at a later point.
Overall, I think the premise is good but I'm not convinced that the data shows what the authors conclude. some parts should be simplified and others should be explained properly. I think that the tables in the supp. information should actually be in the main article or isotopes plotted by their own.	We have modified the structure of the manuscript and given more space to the concepts reported.