Erlangen, 29 September 2022

Dear Sebastian Naeher and Editorial Team of Biogeosciences, dear Reviewers,

thank you again for the handling of the manuscript and for providing us with more precise comments. We did our best to address these constructive criticisms.

Please find our answers in the table on the next pages. The first round of comments to the reviewers was already uploaded on BG Discussion (https://bg.copernicus.org/preprints/bg-2022-154/#discussion). We also uploaded 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
Associate Editor	
In addition to the suggestions of the reviewers, I would like to see inclusion of more general information like maximum lake depth, lake mixing/overturn frequency and timing of mixing, productivity peaks, oxygen content (average in epi-/hypolimnion for different seasons?), potential methane ebullition from the sediments in the reservoir, etc. Such factors should be discussed, because they may impact (by how much?) the abundance and d13C composition of the organic matter in the lake and therefore influence the parameters that you investigated.	We have added a this information at the beginning of the Methods section including mixing turnover and productivity peaks as well as oxygen behaviour (Dordoni et al., 2022). The mentioned factors are important, however we point out that this study focuses only on one single point with detailed depth profiles at high frequency. We therefore suggest in the conclusions future studies that should inquire spatial and lateral heterogeneities.
Like reviewer 2, I am also not completely convinced about the determination of the end member composition. Especially using single values of d13C values of SED and extPOC from the literature (even if determined in the same reservoir) does not seem to be sufficient. Taken together with the limited discussion of above noted influencing factors, the high variability and potential large overlap of d13C in the reservoir and catchment is likely insufficiently captured. Therefore, more justification is needed to demonstrate the end members used are correct.	We searched the literature again and found three manuscripts that published data on $\delta^{13}C_{POC}$. One for sedimentary material (10.1007/s10533-022-00930-y) with a value of -31.1 ‰, and two on $\delta^{13}C_{POC}$ of allochtonous origin (10.1080/10256016.2017.1282478 and 10.1038/s41598-019-52288-1). Additionally, we inquired $\delta^{13}C_{POC}$ of allochtonous input in the studied catchment via personal communications. These $\delta^{13}C_{POC}$ data of river input were measured only sporadically and values were made available by the Helmholtz Centre for Environmental research (UFZ). They ranged between -28.7 ‰ and -32.5 ‰ and their average was -30.6 ‰. These data were added to the supplementary material. We used averages and most extreme values of these sources to show the variance of the inputs (new Fig.4 with green bands). This yields some overlap with results of $\delta^{13}C_{POC}$ of autochthonous material. However, when using average values we still obtain good separations. Note that this study did neither investigate sedimentary POC nor allochthonous POC at the same frequency we were sampling the reservoir with its depth profiles. Therefore, we have to rely on literature values and the ranges presented therein.

Reviewer 2	
When I said that the terms were not universal, I meant metalimnion/limnion and more details on the stratification terms. I wasn't clear, I meant that some of the stratification process and terms need to be explained as the process of the lake stratification for this lake is important and more details are needed. The authors speak about epi/meta/hypo but do not say anything about benthic/pelagic/littoral habitats, which also affects the isotopes, so this needs to be included too – horizonal spatial effects as well as vertical effects are also important for variations in 13C isotopes. I think the variability of the freshwater isotopes and the end-member they use from the lit. may not be correct – if they give more detail this may be enough to deal with this, but I'm not fully convinced.	As already answered to the Editor, we have added more information the manuscript that describes these points. We also referred to the supplementary material where we present a detailed plot of temperature distribution over time. This nicely shows one of the strongest controls of the reservoir turnover. This reservoir has a very small littoral zone and therefore its influence can be assumed as to be negligible. In terms of lateral heterogeneities, we have to admit that this work only investigated one profile at high temporal frequency. For this study we chose the best representative spot for studying the water column that was chosen also by other studies (10.1016/j.watres.2018.10.047, 10.1016/j.scitotenv.2022.156541, 10.1016/j.watres.2020.115701). In the conclusions, we recommend further testing of the lateral heterogeneities of the reservoir with isotope parameters.