

Editor comments on the revised manuscript BG-2022-183-AT1 “Particulate organic matter in the Lena River and its Delta: From the permafrost catchment to the Arctic Ocean.

I would like to thank the authors for carefully responding to the three reviews and revising the earlier version of their manuscript accordingly.

While cross comparing the Reviewers’ comments, the responses, and the corresponding revisions, I still have more requests for revisions. If these required revisions are satisfactory, I could accept it for publication.

L.74: I would like the authors to specify the sampling frequency, rather than simply mentioning “approximately 5–6 samples per year are collected”

L.75: Explain why samples were taken directly from the river’s main stems rather than from their deltas and estuaries. The rationale here is not clear.

Overall, I would suggest that Lines 75–87 be rephrased in the logic and details. Here are few examples of suggestions, but I am sure while you consider these, you’ll understand how to rephrase it:

- Remove “Thus” at L.75.
- Start a new sentence with “For example...”.
- Replace “of the” at L.79 with from the sampling site..
- Replace “and to characterize” with “by characterizing”
- The new addition at L. 76–77 need to be written as an independent sentence, and please add a reference after “one of the world’s biggest deltas”

L.98: rephrase as “more than 94% of which is frozen”

L101: remove “and includes”. Instead, start with a new sentence “the region is covered by...”

L106: Please use proper reference instead of a link. You could cite this link in the list of references and indicate when it was last accessed.

Also while reading your responses to reviewers, you replied that you defined the boundaries using the hydrosheds classification, and this classification is the most recent. I looked at the suggested ref. in that page and it is 2013, can you explain why you say so? [as Kutscher et al., 2017 is more recent?]

L106: “was defined” instead of “was made”

L120: Please add a reference at the end.

Figure 1:

- I would recommend being consistent with the entire manuscript by using Stolb, rather than Stolb i.
- For the sampling station in the legend and symbols within the map, please remove the red diamond symbol at the sampling station (avoid too many unnecessary colors]. Replace the legend with this as follow (you can fill the markers with black color]:

**Sampling stations:**

□ main stem

◇ Stolb

○ Delta

L131–132: remove “as mentioned above”

L135–137: Please simplify this sentence. It is too wordy

L150: explain why the samples were frozen

L155–156: the word group o the parenthesis is awkward, please rephrase.

L166: How about the river samples? I fact, I did not clearly see any report on how the river samples were analyzed, were they analyzed differently

L177: Typo for HCl

L178: Please add ref. for the tin boats along with dimensions

L178-9: How do you know? I think that a description of this step is skipped here

L182: shouldn't it be reported vs. VPDB?

L184: please add the values for these refs.

L185: and the concentrations were .....

L194: Blank sample was determined...

Also in this paragraph, was pMC–percent modern carbon– included in your analyses? Wouldn't adding it strengthen your data interpretation

L196: add a ref after “for determining OM age”

L197: “ $\Delta^{14}\text{C}$ -depleted” is not grammatically correct. A ratio cannot be depleted

L215: rewrite as Figures 2–5, also Table with T

L223: These are not described in the methods, nor the tools that were used to measure these. Otherwise, please rephrase as “Previous measurements of .... [then add ref]”

L227: remove “In contrast to our surface water samples” and add “instead” after “samples are”  
For the newly added text in there, I suggest removing it and keep it for discussion

L233: Since you report this here, this definitely requires you to describe how river water samples were sampled and analyzed in the methods. Please make sure to include that.

L247-8: I agree with this, but you could also emphasize that ArcticGRO database has greater TSM range than yours [if I interpret you figure properly]

Figure 2: It is better to put the ArcticGRO datapoints behind your datapoints so it is easy to assess where your samples plot vs. ArcticGRO points.

L255: again, reporting river data without method description makes reader doubt about the research, please ensure to add methods pertaining to rivers.

L259: WL19-02 with a value of ..... respectively [also remove the extra “.” before the coma

L261: Space forgotten before “The”, also please rephrase as “The samples with high TSM...”

L264: why reporting two highest values? Are you referring to a reference threshold?

L270: I believe one of the reviewers commented on this “disembogue”. I double checked and it is not a noun. Please use proper noun, e.g., outlet? discharge?]

L280: a value translated to 2236....

L284: Font looks a bit different

L289: rephrase as “values than what we found”, then remove “for the ArcticGRO dataset”

L291–2: remove this last sentence, it is redundant

L294: Rephrase as “a strong difference was note don the  $\delta^{13}\text{C}$  of POC. In the Main Stem,  $\delta^{13}\text{C}$  values were....”

L298: The  $\delta^{13}\text{C}$  values of POC.....

L305: The TSM and POC

L317-8: Please indicate ref.

L320: I think “assessed” or “evaluated”? is a better word choice than “analysed”

While I look at Figure 3, the age estimation provided earlier in the manuscript is confusing as there is no more discussion about age I the remaining part of the paper, or I may miss an important information

L.512: “-288 to -122 per mil” if this is so, and while referring to your age estimation above, why not referring to age here?

L525: There was a part similar to this that I suggested to remove earlier, so I suggest keeping this and removing that.

L529: Please avoid as much as possible “etc.” when you write scientific paper. Do not let your readers guess. That’s a rules of thumb

Figure 4: My question here may be very stupid, but I ask anyway. Do you think that converting ‰ values for the  $\Delta^{14}\text{C}$  is really age appropriate? What is the proportion contribution between Holocene soils and modern OC?

Endmember: This technical term is bothering me. Can you please define what do you really mean by endmembers? In mineralogy, for example, we use endmember as Ca-rich mineral [e.g., anorthite] and Na-rich mineral [e.g., albite], i.e., with a clear geochemical composition, and with a possible predictable mineral with varying Ca an Na composition.

L544. “less depleted in  $\delta^{13}\text{C}$ ”—this is an incorrect expression, see similar comment above

L548: Please list these first so it is easy to follow.

L571: this is the reason why I asked earlier if you have pMC data

L581: I don’t think that “endmember” is the proper vocabulary here. May be “category”?

L603: replace “;” with “.” then start with new sentence “This..”