

Referee #1 (Anonymous)

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«Needs to expand on some data, otherwise a fine paper.»

Specific Comments:

(1) I want to know more about the C-13 and D stable isotopes in the lakes. Figure 7 only shows 6 lake samples simply labeled as "lake". From my own research I have seen large differences in these isotopes based on where they were collected in an Arctic lake. Samples collected from the perimeter and the surface tended to show more AM influence while samples collected from the surface interior and even more so at depth in the lake showed more HM influence.

In Figure 4 I see 5 lake samples that show large differences in age based on their location, which is interesting. It would be nice if the data of Figure 7 was similarly labeled with the location, allowing for more of a direct comparison between the two figures of these data points.

As suggested by the Referee, we added location labels for lake samples in Figure 7, as in Figure 4 ('edge', 'center', and 'undiff.' [undifferentiated]). See the new Fig. 7 for details. Indeed, the isotopic signature of the center lies towards the HM region (grey background area) even though it still clearly remains in the AM region. We also added a sentence in the discussion to acknowledge this observation. As the Referee remained anonymous, we have to assume that this result has not been yet published (at least not to our knowledge). We also assume that when the Referee says that the signature tended to show more HM "at depth", it means the signature was obtained from diffusive gas samples. Contrastingly, all of our samples for stable isotope analysis were collected from an ebullition funnel.

(2) Despite of this paper's great attributes, it is a dense read. There are a lot of long paragraphs and long sentences, which make all of the information difficult to digest and the paper difficult to read. I think the paper would appeal to a broader biogeochemical group of scientists if the authors broke up some of the long paragraphs and sentences to shorter versions. This is a suggestion, but I think it would benefit the paper in the long run greatly.

We made an effort to shorten the text wherever possible, especially in the Study area section and in the Discussion. As suggested by the Referee, we shortened the text or broke up some of the longest sentences.

(3) The presences of the nutrient data confuses me. There is one table and one paragraph describing the nutrient data. The nutrient data adds nothing to the discussion, yet it is present in the results. Either the nutrient data should be expanded on or cut.

If the authors chose to keep the nutrient data in the paper they should discuss specific nutrient species (TN vs NO₃, etc.) rather than all grouped together (how it is currently presented). Also lacking are statistics on the nutrient data. Are there real statistical differences in TN, Fe, Mn, etc., between the lakes or all they the same? A simple ANOVA analysis would answer that question.

I think the nutrient data could help the readers understand the differing biological regimes of the lakes and ponds better (like why there are algal mats in some), but it needs to actually be discussed in the text not just shown in a table.

The nutrient data are presented here as baseline limnological information to help characterizing the studied ponds and lakes for people who want to compare with their systems, considering

the large variability in Arctic aquatic systems. On the other hand, we agree that it is relevant to discuss more about them and exploit their value. As suggested by the Referee, we ran an ANOVA analysis for all nutrients. We added the statistical results in a new supplement file (Table S1), and added a new paragraph in the Results. The analysis suggests that only DOC differed significantly between the water bodies.