

*Review article: Terrestrial dissolved organic carbon in northern permafrost*

*Liam Heffernan, Dolly N. Kothawala, Lars J. Tranvik*

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### *General Comments*

*I thank the authors for their reply to my comments and concerns about the manuscript. The changes made in response to all reviewers comments have improved the manuscript. I've noted a few typos and minor changes that could be made below, but on the whole, I think it is a good paper that will add to the body of evidence on DOC concentrations. I also think it is important to highlight the data gaps found by compiling this database. The lack of mobilisation measurements and data show a clear gap in the C cycle of northern peatlands.*

We thank the reviewer for taking the time to provide us with this follow up review of the manuscript. We are happy that you are satisfied with our response to theirs, and the other reviews, concerns and comments. Below we have addressed their detailed comments.

### *Specific Comments*

#### *Abstract*

*The DOC concentrations in lines 36 to 40 are confusing: Are these maximum concentrations? "DOC concentrations were greatest in the sporadic permafrost zone (101 mg L<sup>-1</sup>) while lower concentrations were found in the discontinuous (60 mg L<sup>-1</sup>) and continuous (59 mg L<sup>-1</sup>) permafrost zones."*

*Then reporting median values as 'highest medians'? These values are smaller than those in the previous sentence.*

*"The highest median DOC concentrations of 66 mg L<sup>-1</sup> and 63 mg L<sup>-1</sup> were found in coastal tundra and permafrost bog ecosystems, respectively. Coastal tundra (130 mg L<sup>-1</sup>), permafrost bogs (78 mg L<sup>-1</sup>), and permafrost wetlands (57 mg L<sup>-1</sup>) had the highest DOC concentrations in the permafrost lens, representing a potentially long-term store of DOC."*

We have added text in the abstract to clear this up. Now we state that across permafrost zones the highest median concentration of DOC is found in the sporadic, but across a[permafrost zones there is variability in each ecosystem. Then we say that across ecosystem type the highest median DOC were found in coastal tundra and permafrost bog sites. Hopefully this clears things up

#### *Introduction*

*Paragraph 1 makes the purpose of the paper really clear*

We thanks the reviewer for this comment

*Line 77 typo 'concentrations'*

Changed

#### *Method*

*The literature search method is mostly clear. I'm still not sure why the search on Google Scholar is mentioned twice in section 2.1 though. Could Tables 1 and 2 could be combined into one table, reducing repetition?*

We have removed the second mention of using Google Scholar

We understand that there is repetition between the two tables but would rather to keep them separate. Table 1 is the criteria used when searching for papers on the electronic databases. Table 2 is the criteria used once these potentially relevant papers were identified. They are two very different but important steps in the process and we do not want to confuse them by combining.

*Was the carbon:nitrogen ratio (mentioned in line 207) a ratio of DOC:DON, or soil C content:soil N content?*

This is the soil carbon:nitrogen ratio, we have added soil to the text to clarify this

*Line 212: "Ratios in C:N have been shown..." do you mean decomposition rate, or potential? Or how decomposed the soil already is?*

We have added that this indicates that decomposition has previously occurred

*Line 220 – 269: Could some of the site, ecosystem and soil info be put into a table? The list in prose is quite hard to follow as it contains so much information. I appreciate some of this text was added in response to a query in my first review.*

We have added a table to the supplementary that includes all categorical variables included in analysis of the database

*Results*

*I appreciate the addition of section 3.4 to the results, and the change in the way median and interquartile ranges are reported.*

Thanks, we think that this new way to report them is much clearer and appreciate prior input

*Line 489 typo: acro*

This has been removed

*Line 505 typo: in in*

Second "in" has been removed

*Discussion*

*Line 798 typo: assessed..*

Changed