

## ***Interactive comment on “Organic matter composition and stabilization in a polygonal tundra soil of the Lena-Delta” by S. Höfle et al.***

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Response to Review #1

Page 12346, line 10/11 (line 68): By using the word 'here', it sounds as if you are discussing the results of the current paper. Please change. Also, in this same paragraph, it is improper to say the 'active layer of the permafrost soils'. You could say active layer of permafrost regions or active layer soils of northern latitude soils. But to say permafrost soil means the actual frozen part of the soil, not the active layer.

"here" was changed into "there".

'active layer of the permafrost soils' has been changed into "active layer soils of permafrost regions".

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M&M: How many samples and what is the level of replication? If no replication and no statistical comparisons this needs to be stated and the message might need to be tempered somewhat.

The time consuming and expensive analytical methods have prevented that we investigated more than one sampling site. The aim was to test these methods in a study on soil organic matter stability. To account for soil heterogeneity we at least took a large sample (from a soil pit) and mixed this. This information was added in section 2.1 (lines 128-133).

Section 3.1. How representative is this soil of other northern latitude soils? What is the soil type? Is there cryoturbation? If not representative, please calibrate the message given in the conclusion to reflect that this is only one location.

This information was added in section 2.1 (line 115 – 119). Soil type is Gelisols (suborder: Glacic Aquiturbels, according to US Soil Taxonomy) which cover an area of about 27% at >50° northern latitude (Jones et al. 2010, Publications Office of the EU). Naming of soil horizons has been added in Table 1 and section 3.1.1. Cryoturbation of soils was low as indicated by nearly linearly decreasing 14C contents. Define pMC. pMC = percent modern carbon related to 1950. A definition is given in section 2.6 (line 197).

Page 12355, Line 7 (line 318/320). Is the change in concentrations of fatty acids significant? What is the statistical test and the statistical result?

We compared the differences in concentration between the two biomarkers, n-alkanes and n-fatty acids. The concentrations of the n-fatty acids were one order of magnitude higher than the concentrations of the n-alkanes. The sentence has been rewritten to point out this intension. Average concentrations have been added in brackets in the text (line 318 + 319).

Page 12360, line 12 (line 457). Replace 'considerable' with 'small but significant', or is it actually significant?

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Changed as suggested.

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\*Line numbers in brackets refer to lines in revised word-document.

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