Biogeosciences

Discussions

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Interactive
comment

Interactive comment on "A revised northern soil Hg pool, based on western Siberia permafrost peat Hg and carbon observations" *by* Artem G. Lim et al.

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Received and published: 9 April 2020

In order to further address the comment No 3 of Reviewer 2, we compared our unpublished data on elementary composition of peat with those of Raudina et al. (2019) and Stepanova et al. (2015) for the same key areas. We used a non-parametric Mann-Whitney U test for paired data at a significance level of 0.05 to assess the difference between sites (micro-landscapes) for each key area. The overwhelming majority of elements do not exhibit statistically significant differences between different peat cores. Thus, in the middle taiga region (Mukhrino), only Gd and Tb were sizably different. In Khanymey, only Mg showed statistically significant difference between different peat

cores. In the forest tundra of Pangody, only Na, Ti, As, Cd, Tl, Pb exhibited sizable differences. Finally, various peat cores from southern tundra (Tazovsky) differed only in the concentration of Ca, Ni, Cu, Mo and Hf.

Taken together, we believe that one single core is sufficiently representative for the purpose of assessment of both elementary composition and overall stock of elements (including Hg).

Table R1. Comparison of concentrations of major and trace elements in peat cores from different microlandscapes (mound, depression) of WSL peatbogs studied in this work (and our unpublished data) with results of Raudina et al. (2019); Stepanova et al. (2015). Only the elements exhibiting statistically significant differences are presented. See attachement.

References:

Raudina, T. V. and Loiko, S. V.: Properties and major element concentrations in peat profiles of the polygonal frozen bog in Western Siberia, in: IOP Conference Series: Earth and Environmental Science (Vol. 400, No. 1, p. 012009). IOP Publishing. (2019, November).

Stepanova, V. A., Pokrovsky, O. S., Viers, J., Mironycheva-Tokareva, N. P., Kosykh, N. P., and Vishnyakova, E. K.: Elemental composition of peat profiles in western Siberia: Effect of the micro-landscape, latitude position and permafrost coverage, Appl. Geochemistry, 53, 53–70, doi:10.1016/j.apgeochem.2014.12.004, 2015.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2019-483, 2020.

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Elements	U	Z	p-value
Stepanova et al., 2015 Mukhrino, Middle taiga			
Gd	6	-3.3	0.001
Tb	0	3.5	0.000
Our unpublished data Khanymey, Northern taiga			
Mg	19	2.6	0.009
Stepanova et al., 2015 Pangody, Forest tundra			
Na	0	2.4	0.016
Ti	2	-2.0	0.042
As	1	-2.2	0.027
Cd	0	-2.4	0.016
Tl	1	-2.2	0.027
Pb	2	-2.0	0.042
Raudina et al., 2019			
Ca	20	2.4	0.017
Ni	2	3.7	0.000
Cu	22	2.2	0.025
Mo	17	2.6	0.009
Hf	16	2.7	0.008

Fig. 1. Table R1. Comparison of concentrations of major and trace elements in peat cores from different microlandscapes (mound, depression) of WSL peatbogs