

Comparison on humus and soil geochemical baselines in Southern Finland

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Geological Survey of Finland has carried out geochemical baseline mapping using topsoil, subsoil and humus samples in Southern Finland since 2002. The geochemical baseline concentration refers to both the natural geological background concentrations and the diffuse anthropogenic input of elements in soil. Humus samples reflect the interplay between atmosphere, biosphere and lithosphere. It is also used to study how (long-range) atmospheric input of elements to ecosystem accumulates over time (Salminen et al. 2004). Concentration of elements in topsoil are mostly controlled by geology but atmospheric input can affect also geochemistry of the topmost 25 cm of the mineral soil layer.

The correlation between the element concentrations in humus and minerogenic topsoil has been evaluated first measuring the Spearman rank correlation values; in this case the total numbers of samples and the different soil parent material, were considered too. The correlation between the element and the content of organic C was taken into account as well. Then scatter plots between the element concentrations in humus and minerogenic topsoil, and between the content of the element vs. the content of organic C, were elaborated where significant Spearman values were noticed.

In general, there was no strong positive correlation between humus and minerogenic topsoil concentrations in Southern Finland. Earlier studies have shown that there is good correlation between topsoil and subsoil concentrations suggesting a geologic origin of the distribution patterns. Concentrations in humus layer reflected better the atmospheric deposition pattern estimated from moss samples (Poikolainen et al. 2004).

References:

- Poikolainen, J., Kubin, E., Piispanen, J., Karhu, J., 2004. Atmospheric heavy metal deposition in Finland during 1985-2000 using mosses as bioindicators. *The Science of the Total Environment* 318: 171-185.
- Salminen, R., Chekushin, V., Tenhola, M., et al. 2004. *Geochemical Atlas of the Eastern Barent Region*. Elsevier. 548 pp.