



Application of infrared spectroscopy for assessing quality (chemical composition) of peatland plants, litter and soil

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In this presentation, we assess the merits of using Fourier transform infrared (FTIR) spectra to estimate the organic matter composition in different plant biomass and peat soil samples. Infrared spectroscopy has a great potential in large-scale peatland studies that require low cost and high throughput techniques, as it gives a unique “chemical overview” of a sample, with all the chemical compounds present contributing to the spectrum produced.

Our extensive sample sets include soil samples ranging from boreal to tropical peatlands, including sites under different environmental and/or land-use changes; above- and below-ground biomass of different peatland plant species; plant root mixtures.

We mainly use FTIR to estimate (1) chemical composition of the samples (e.g., total C and N, C:N ratio, holocellulose, lignin and ash content), (2) proportion of each plant species in root mixtures, and (3) respiration of surface peat.

The satisfactory results of our predictive models suggest that this experimental approach can, for example, be used as a screening tool in the evaluation of organic matter composition in peatlands during monitoring of their degradation and/or restoration success.