



Effect of land use in runoff water quality from peatland areas

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ABSTRACT

Two peatland drainage networks at different land use areas were intensively monitored for stable isotopes of water and water quality between March 2012 and October 2012. Sampling was done at a peat extraction area from upstream of water protection structures and at a peatland forestry area with a strong groundwater presence. Our aim was to use bidaily sampling during snowmelt period and daily sampling period during the rest of study time to see if there are differences in flow paths and water quality caused by the land use.

Most obvious difference between the areas can be seen in the behaviour of water quality parameters. At the peatland forestry area the variability in water quality parameters are explained by changes in hydrology. Whereas at the peat extraction area the measured water quality parameters do not clearly follow the changes in discharge quantity. Clear difference is also visible in the timing of the loading. For example, cumulative suspended solids load from the peatland forestry area during the measurement period is 836 kg / ha of which 41 % is accumulated during the snow melt period. Contrary, total accumulation during the same period for the peat extraction area is 134 kg / ha of which 16 % is accounted for snow melt period. The difference of the share of the snow melt period is smaller for dissolved organic carbon (DOC). At the peatland forestry area approximately 50 % of the total recorded DOC is accumulated during the snow melt period, whereas at the peat extraction area snow melt period accounts for 39 % of the total measured quantity of DOC. The data set is further analysed for detailed processes occurring in low flow and high flow periods.

Our data set shows the need of long term monitoring for better understanding of the effect of land use on the forming of loading on peat soils. It also implies that different land use types require different water treatment solutions in case there is a need to treat them. Further studies are needed also for other peatland uses e.g. undisturbed and agricultural sites for better understanding the overall processes and load transport to water courses.