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Assessment of spatio-temporal patterns and variability of DOC export from riparian soils in the boreal Krycklan Catchment, Northern Sweden

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Dissolved organic carbon is a key component of the biogeochemical cycle and exerts a major control on other components including transport and solubility of heavy metals, pH or nutrient availability. In boreal regions, wetlands and riparian soils are the main sources of DOC. If hydrologically connected to streams, the spatio-temporal variations in soil water DOC and flow pathways should be reflected in the variations of stream DOC concentrations. However, until today only little is known about DOC-related processes and exports from different types of riparian soils.

In this study we present data from the Krycklan riparian observatory. The observatory is a unique experimental design strategy for monitoring the interaction between soil and stream water chemistry based on 13 riparian plots located in 4 different landscape elements. At each plot monthly soil water samples were collected from lysimeters installed at 5 soil depths. More than 600 samples were analyzed and related to automatically recorded groundwater tables and stream discharge. Preliminary results indicated strong seasonal changes of DOC concentrations in the soil water profiles at relatively humid locations. No seasonal changes were observed at more well drained, dry plots. Combining the DOC measurements with hydrometric observations allowed estimation of seasonal DOC export rates from the 13 plots. We found very distinct patterns of seasonal DOC export rates for the plots at the different landscape elements.