



Erosion effects on water and DOC/DIC fluxes in soils from a hummocky ground moraine landscape

Marcus Herbrich (1), Horst H. Gerke (1), Michael Sommer (1,2)

(1) Leibniz-Centre for Agricultural Landscape Research (ZALF), Institute of Soil Landscape Research, Müncheberg, Germany (Marcus.Herbrich@zalf.de), (2) Institute of Earth and Environmental Science, University of Potsdam (UP), Potsdam, Germany

In the arable hummocky ground moraine soil landscape, an erosion-induced spatial differentiation of soil types can be observed. Unknown is how the water flow and solute transport is affected by soil-crop interactions depending on properties of differently-developed soil horizons. The objective was to analyze these interactions and by comparing lysimeter-based measured water and solute balances for Luvisol soil monoliths extracted from differently-eroded slope locations. For a 3-years measurement period, differences in cumulative seepage water drainage of more than 76 % were observed between most and least eroded Luvisol. Although the soil types were identical, these data indicated characteristic erosion-induced spatial differentiation in the water balance of the landscape. Because the concentrations of dissolved organic carbon (DOC) and of dissolved inorganic carbon (DIC) were relatively similar for all lysimeters at the bottom (1.4 m soil depth), the DOC/DIC leaching was dominated by differences in water fluxes in this observation period (04/2011-04/2014). Results suggest that water and solute balances are depending on the degree of erosion-induced soil profile modifications. Hence for the landscape scale analysis of the landscape water and solute balances, not only the distributed soil types but also erosion-induced modifications with a single soil type should be considered.