



Assessing the spatial structure of the riparian zone in a Nordic boreal catchment and its influence on pools, turnover times and lateral fluxes of organic carbon

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Near stream (riparian) zones are an important link between terrestrial and aquatic ecosystems and influence a wide range of processes including solute transport or hydrologic behavior of headwater catchments. The ability to predict the spatial structure of the riparian zone including its vegetation and hydrology is, thus, a prerequisite for relating small scale processes to observations at the watershed scale. In the past, terrain attributes have commonly been used to predict the spatial distribution of certain terrestrial ecosystem properties. Applying this approach to riparian zones, however, has only recently become feasible with the availability of high-resolution digital elevation models and the new development of suitable computational methods. In this study we present links between geomorphology and riparian zone hydrology, carbon pools and fluxes of dissolved organic carbon. Terrain attributes were successfully used to predict (1) riparian groundwater levels and flow pathways, (2) the size of riparian soil carbon pools, (3) the vertical variation of dissolved organic carbon in riparian soil profiles, as well as (4) riparian carbon fluxes and turnover times.