Using vegetation attributes to represent soil structure effects in pedotransfer functions

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The representation of land-surface processes in hydrologic and climatic models requires soil hydraulic properties often derived from auxiliary and easy-to-measure soil attributes such as soil texture using pedotransfer functions (PTF). Present PTFs are deduced from measurements of small samples from arable land that omit soil structure found in forests and natural land. We capitalize on the strong links between vegetation cover and soil biological activity to propose a method for considering soil structural attributes to augment the PTFs. The study focuses on remotely sensed primary productivity (GPP) and leaf area index (LAI) to modify soil hydraulic parameters considering soil type and climatic regions. Tentative relationships between soil structure and hydraulic properties are developed and test procedures have been devised to assess soil structural effects on hydrological and climatic processes. We expect site specific covariations of soil properties and vegetation to play an important role in the resulting hydrologic response and thus we explore generic and spatially referenced parameterization of soil structure effect.