



## **On the seasonal and land use controlled variability of soil hydraulic model parameterisation**

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Soil hydraulic parameters are very often assumed to be constant over time and for a soil type. Hydrological models, for example, are mostly driven using constant soil hydraulic parameterisations. However, it is well known that soil biological activity as well as sediment relocation processes induces changes in the properties of the soil surface affecting hydrological processes such as infiltration. As soil biological activity and soil cultivation practices vary with the season and land use, in this study the seasonal and land use dependent variability of soil hydraulic and soil hydrological properties such as saturated hydraulic conductivity, unsaturated hydraulic conductivity, infiltration capacity, field capacity and bulk density of two typical northern German soils: Podzol and Stagnosol were investigated. For both soils, three areas with different land uses were identified within 'homogenous' soil mapping units corresponding with land use classes normally available for regional hydrological model applications: grassland, crops and forest. Seasonal variability of the soil hydrological characteristics was determined by four times repetition of all measurements during the year 2006 (March/April, May, July, October) for the different land uses. The study reveals that for all investigated soil hydraulic and soil hydrological properties and characteristics, seasonal as well as land use dependent variability was detected. Soil hydraulic and soil hydrological properties therefore are not constant over time as assumed in most hydrological models and should be adapted in case of land use change scenario studies. The outcome of this study encourages a further development of hydrological models and model parameterisation in order to include more process understanding in terms of natural variability in the models.