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S08.01b -1

ESTIMATION OF SOIL HYDRAULIC PROPERTIES EVOLUTION IN AN E&BT HORIZON

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To predict soil evolution induced by human activities at the century scale, we need to be able to model this evolution on such a time scale. For that purpose, coupled water-geochemistry modelling approaches are one possibility. If it is well recognized that soil hydraulic properties evolve in space, their temporal change are rarely taken into account. On the one hand, models hardly support the temporal variability of soil hydraulic properties that must be constant parameters all along the simulation and, on the other hand, the temporal evolution of soil hydraulic properties is often not known. Few experimental data concern the temporal variability of soil properties in the surface horizon at the annual scale, due to agricultural practices, for example. We propose here to investigate deeper horizons. We have performed an experiment to estimate the impact of sixteen years of subsurface drainage on the hydraulic properties of an Albeluvisol. We have focused our analysis on the heterogeneous E&Bt horizon, composed by two elementary pedological volumes (EPV) organised in a complex 3D structure. The analysis of serial sections demonstrated that the proportion and spatial arrangement of the EPVs evolved with time. Based on 3D reconstructions of the structure of the two EPVs and on the knowledge of their hydraulic properties, we have quantified the evolution of the hydraulic properties at the horizon scale, by using a 3D water transfer model. An application of this work will consist in including the temporal evolution of soil hydraulic into a model of soil evolution.