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Effects of soil depth spatial variation on runoff simulation, using the Limburg Soil Erosion Model (LISEM), a case study in Faucon catchment, France

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Soil depth is an important parameter for models of surface runoff. Commonly used models require not only accurate estimates of the parameter but also its realistic spatial distribution. The objective of this study was to use terrain and environmental variables to map soil depth, comparing different spatial prediction methods by their effect on simulated runoff hydrographs. The study area is called Faucon, and it is located in the southeast of the French Alps. An additive linear model of "land cover class" and "overland flow distance to channel network" predicted the soil depth in the best way. Regression kriging (RK) used in this model gave better accuracy than ordinary kriging (OK). The soil depth maps, including conditional simulations, were exported to the hydrologic model of LISEM, where three synthetic rainfall scenarios were used. The hydrographs produced by RK and OK were significantly different only at rainfalls of low intensity or short duration.

Keywords:

conditional simulation; Faucon; hydrograph; kriging; LISEM; soil depth

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