



Soil data parametrisation for rainfall-runoff modelling (model SWIM) in the Labe river basin

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Formation of the soil parameters included in the hydrological and water quality model SWIM (Soil and Water Integrated Model) is described. Its hydrological module is based on the water balance equation, taking into account precipitation, evapotranspiration, percolation, surface runoff and subsurface runoff for the soil column subdivided into several layers. Significantly detailed soil data is therefore required. It means: textural data (amount of clay, silt and sand), bulk density, porosity, available water capacity, field capacity, saturated conductivity, organic carbon and nitrogen content, erodibility factor for each layer of each soil type. The case study is focused on the Labe watershed (52 000 km²) modelling. The soil map of scale 1:200 000 was chosen as the model input describing the soil conditions in the basin. The set of parameters for each soil type was derived from a data base of 1 000 analysed soil samples. Nineteen main soil types are defined in the national classification based on features of diagnostic horizons. This fact causes high variability of texture within the frame of single soil type. Therefore it was necessary to divide existing soil types into subtypes in such cases. The subtypes were created for eight soil types by multivariate statistical analysis (cluster analysis) based prevalingly on the textural data. Consequently there was determined thirty five unique soil subtypes as the inputs to the model. This resulted in a reformulation of the soil map using GIS software. Sensitivity test of the hydrological model to soil data both for the Labe river basin and for selected partial catchments (e.g. Malse 490 km², Zelivka 1190km²) represents the next development stage. The results obtained will determine whether the parameters derived for the Labe river basin can be used for modelling in a mesoscale river basin or it is necessary to involve additional information concerning e. g. geological and geomorphological data about the basins into the soil parametrisation. Acknowledgement: The study was supported by the research grant GA AS CR KJB300600602 and the Institutional Research Plan AV0Z20600510.