



Towards high resolution soil property maps for Austria

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Soil hydraulic properties, such as soil texture, soil water retention characteristics, hydraulic conductivity, or soil depth are important inputs for hydrologic catchment modelling. However, the availability of such data in Austria is often insufficient to fulfill requirements of well-established hydrological models. Either, soil data is available in sufficient spatial resolution but only covers a small extent of the considered area, or the data is comprehensive but rather coarse in its spatial resolution. Furthermore, the level of detail and quality of the data differs between the available data sets.

In order to generate a comprehensive soil data set for whole Austria that includes main soil physical properties, as well as soil depth and organic carbon content in a high spatial resolution (10x10 to 100x100m²) several available soil data bases are merged and harmonized. Starting point is a high resolution soil texture map that only covers agricultural areas and is available due to Austrian land appraisal. Soil physical properties for those areas are derived by applying pedotransfer functions (e.g. Saxton and Rawls, 2006) resulting in expectation values and quantiles of the respective property for each soil texture class. For agricultural areas where no texture information is available, the most likely soil texture is assigned applying a Bayesian network approach incorporating information such as elevation, soil slope, soil type, or hydro-geology at different spatial scales. Soil data for forested areas, that cover a large extent of the state territory, are rather sparse in Austria. For such areas a similar approach as for agricultural areas is applied by using a Bayesian network for prediction of the soil texture. Additionally, information to various soil parameters taken from literature is incorporated. For areas that are covered by land use different to agriculture or forestry, such as bare rock surfaces, or wetland areas, solely literature information is used to assign soil physical parameters to the soil data set. Soil depth is only available in a very coarse spatial resolution. By correlating this information with altitude and slope steepness, soil depth data is refined. An evaluation of the Bayesian network predictions will be performed within a cross-validation framework.