Soil Parameters and Vegetation Types in a SVAT Scheme, and their relative Importance for modelling Water Balance Terms in Weather Forecast Models

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SVAT schemes define the lower boundary condition in meso- and global scale weather forecast models. Interaction between stored soil moisture and the atmosphere and the prediction of soil moisture content is relevant both for weather forecasting and climate change scenarios, especially when considering runoff and flood forecasting.

Using a stand-alone SVAT we execute a simulation experiment with a number of factors. Factors in the experiment are root development and root density profiles, leaf area dynamics, soil physical properties including stoniness, soil texture, and the reduction of evapotranspiration with decreasing moisture conditions. In addition different bottom boundary conditions (groundwater change vs. free drainage), vegetation types, and weather data for different European climate zones will be imposed. When solving the soil moisture transport equation, differences in discretization of the soil profile (number of layers) and in parameterization of the soil physical characteristics may have an important effect on the results. The simulation experiment will allow us to determine the relative importance of the effect of these different factors on the water balance terms, such as soil evaporation, transpiration of the vegetation and groundwater recharge. This will subsequently allow us to set priorities in parameter and data acquisition.