Multilayer soil scheme and interactive vegetation in regional climate models – A case study for Mainland Southeast Asia using REMO

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This study is part of the CLIENT II-project Drought-ADAPT which investigates droughts in Mainland Southeast Asia (MSEA) with a focus on the Central Highlands of Vietnam and under recent and future climate conditions. For these purposes, we use the regional climate model REMO (v2015). This version, as it is used in recent CORDEX-simulations like CORDEX-SEA and CORDEX-CORE, considers a single-layer soil and static vegetation scheme.

Soil hydrology and vegetation play a key role for mass and energy fluxes between the land surface and the atmosphere. Thus, their adequate representation by schemes is very important to simulate the fluxes. Hence, we replace the single-layer soil scheme by a multilayer one which allows a vertical water movement in the soil. Its application in Central Europe led to improved land surface-atmosphere fluxes. Additionally, the static vegetation is replaced by an interactive vegetation module, called iMOVE, which solely was implemented in REMO2009. It allows the interaction of various plant characteristics with environmental conditions, like a decrease of LAI during dry conditions, while the former static version prescribes monthly static values independent of the prevailing conditions. We'll show results of the effects both individual changes have on the mentioned fluxes and related variables in the study area of MSEA. Additionally, we'll present first results of the promising combination of both individual schemes.