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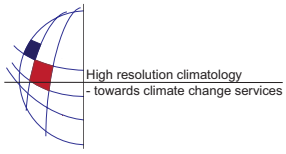

Coupling WRF with LEAFHYDRO: introducing groundwater and a fully dynamic water table in regional climate simulations

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Here we present a soil-vegetation-hydrology model, LEAFHYDRO coupled with the WRF model. LEAFHYDRO includes a groundwater parameterization with a dynamic water table and river routing and it can be run at a finer resolution than the atmosphere within WRF. Offline multiyear simulations over the Iberian Peninsula at 2.5 km resolution with the LEAFHYDRO model with and without groundwater indicate that introducing the water table parameterization has a significant impact on soil moisture amounts, soil moisture persistence and evapotranspiration fluxes. This is particularly true over the semiarid flat plateaus of the Iberian interior, where the atmospheric source of precipitation is scarce and the water table is naturally shallow due to slow drainage and lateral flow convergence from the surrounding mountains. Climatic simulations with the coupled WRF-HYDRO system suggest that the memory induced in the soil by the water table significantly impact the simulated precipitation, especially in the spring, when the land-surface atmospheric coupling is strong and rainfall amounts have their annual peak inland Iberia.