



The role of evapotranspiration fluxes in summertime precipitation in Central Europe: coupled groundwater-atmosphere simulations with the WRF-LEAFHYDRO system.

Sabela Regueiro Sanfiz (1), Breo Gómez (1,2), and Gonzalo Miguez Macho (1)

(1) Non-Linear Physics Group, Faculty of Physics, Universidade de Santiago de Compostela, Spain (sabela.regueiro@usc.es),

(2) Data Assimilation and Ensembles, Met Office, Exeter, UK (breogan.gomez@metoffice.gov.uk)

Because of its continental position, Central Europe summertime rainfall is largely dependent on local or regional dynamics, with precipitation water possibly also significantly dependent on local sources. We investigate here land-atmosphere feedbacks over inland Europe focusing in particular on evapotranspiration-soil moisture connections and precipitation recycling ratios. For this purpose, a set of simulations were performed with the Weather Research and Forecasting (WRF) model coupled to LEAFHYDRO soil-vegetation-hydrology model. The LEAFHYDRO Land Surface Model includes a groundwater parameterization with a dynamic water table fully coupling groundwater to the soil-vegetation and surface waters via two-way fluxes. A water tagging capability in the WRF model is used to quantify evapotranspiration contribution to precipitation over the region. Several years are considered, including summertime 2002, during which severe flooding occurred. Preliminary results from our simulations highlight the link of large areas with shallow water with high air moisture values through the summer season; and the importance of the contribution of evapotranspiration to summertime precipitation. Consequently, results show the advantages of using a fully coupled hydrology-atmospheric modeling system.