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Investigating the role of soil moisture-atmosphere coupling for temperature and precipitation variability in Europe

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In a recent study (Seneviratne et al. 2006, Nature), we investigated the role of land-atmosphere coupling for European summer temperature variability in present and future climate, using regional climate simulations with either interactive or prescribed (climatological) soil moisture. In this contribution, we first provide a brief overview of the main results of this study, and then discuss more recent experiments of two types: 1) regional climate simulations investigating the impact of land-atmosphere coupling for intraannual variability in addition to interannual variability; 2) global climate model experiments with the ECHAM5 GCM, carried out in the context of the Dutch/German/Swiss ESSENCE project. In addition to analyses of the impact of soil moisture-atmosphere coupling for summer temperature variability, we will also discuss here the extent to which soil moisture-atmosphere coupling is relevant for precipitation variability and heavy precipitation events

Reference:
Seneviratne, S.I., D. Lüthi, M. Litschi, and C. Schär, 2006: Land-atmosphere coupling and climate change in Europe. Nature, 443, 205-209.