



Evaluation of moisture sources for the Central European summer flood of May/June 2013 based on regional climate model simulations

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Heavy precipitation affected Central Europe in May/June 2013, triggering damaging floods both on the Danube and the Elbe rivers. A modelling approach with COSMO-CLM is used for a detailed analysis of the evolution of the event. Moisture flux, backward trajectories, evaporation and cyclone track analysis are evaluated for the relevant time period 30 May to 2 June 2013. The aim is to identify potential moisture sources and to quantify their contribution to the flood event in the Danube basin. Control simulations with undisturbed ERA-Interim boundary conditions and sensitivity experiments with modified evaporation characteristics are performed to estimate the role of moisture evaporated from different marine and land areas. The simulated cyclone tracks and upper level flow are compared against reanalysis. Simulated precipitation amounts are validated against E-OBS precipitation data. Two relevant cyclones are identified, which moved counterclockwise in a retrograde path from Southeastern Europe over Eastern Europe towards the northern slopes of the Alps. The control simulations represent the cyclone characteristics and tracks reasonably well. The evolution of the precipitation event in the simulations shows some minor differences to the Reanalysis in terms of its spatial and temporal characteristics. Our sensitivity experiment results provide evidence that the two main sources contributing to the event were the continental evapotranspiration (moisture recycling) and the North Atlantic Ocean. The Mediterranean Sea played only a minor role as a moisture source. This study confirms the importance of continental moisture recycling for heavy precipitation events over Central Europe during the summer half year.