EMS Annual Meeting Abstracts
Vol. 13, EMS2016-148, 2016
16th EMS / 11th ECAC

Setup and first evaluation of the coupled hydro-meteorological MESCAN-SURFEX-TRIP modelling system over Europe

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This study is being conducted in the framework of the UERRA (Uncertainties in Ensembles of Regional Reanalyses) project, which aims to develop an ensemble system of regional reanalysis over Europe for the period 1960-2010. The European high resolution MESCAN reanalysis, produced by the project, is used to force the French land surface model SURFEX whose drainage and surface runoff are then used to drive the hydrological model TRIP (Total Runoff Integrating Pathway) to produce river discharges at a half a degree resolution. The preliminary purpose of this work is to implement and evaluate the coupled MESCAN-SURFEX-TRIP modelling system by using available in situ observations.

The simulations are first evaluated over the 2007-2010 period, for which MESCAN reanalysis are already available. The evaluation consists first in comparing the daily and monthly river discharges simulated by TRIP to the Global Runoff Data Center (GRDC) dataset at hundreds of stations over Europe. This evaluation is then complemented by comparing (1) measured heat fluxes (latent and sensible) from FLUXNET network stations to SURFEX simulations and (2) snow depth in situ observations from the synoptic data network of Météo-France to the snow depth simulated by SURFEX.