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The COSMO-LEPS system as tool to drive a real-time flood forecasting chain

T. Diomede (1,2), C. Marsigli (1), A. Montani (1), T. Paccagnella (1)

(1) ARPA-SIM Servizio IdroMeteorologico dell'Emilia-Romagna, Bologna, Italy, (2) Centro Interuniversitario di Ricerca in Monitoraggio Ambientale (CIMA), Università degli studi di Genova e della Basilicata, Savona, Italy

A Limited-area Ensemble Prediction System based on the non-hydrostatic limited-area model COSMO (COSMO-LEPS) is evaluated in the present study as a tool to provide quantitative precipitation forecasts driving a real-time flood forecasting chain. The COSMO-LEPS methodology is designed to combine the advantages of a global-ensemble prediction system with the ability typical of Limited Area Models to detail atmospheric phenomena on more local scales, particularly in those regions dominated by the effects of complex orography. The system has been developed for the time range "late-short-range (48h) - early-medium-range (120h)". The river hydrograph simulations are performed by means of the distributed rainfall-runoff model TOPKAPI. The performance of the proposed meteo-hydrological coupled system is evaluated for some small/medium-sized catchments located in the Emilia-Romagna Region, northern Italy. In particular, streamflow forecasts are simulated for the autumn and spring seasons of the period 2003-2007. Results are investigated by statistical analyses, especially with respect to the verification of warnings and alarms.