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Operational flash-flood forecasting chain: an application to the Hydroptimet test cases

A. C. Taramasso (1,3) , S. Gabellani (1,2) , C. Marsigli (4), A. Montani (4), T. Paccagnella (4) and A. Parodi (1)

(1) CIMA, University of Genova and University of Basilicata, Savona, Italy (2) DIAm, University of Genova, Genova, Italy (3) DIST, University of Genova, Genova, Italy (4) ARPA-SIM, Bologna, Italy.

The results of the application of an hydrometeorological forecasting chain to some test cases in the Hydroptimet european project framework are presented. This hydrometeorological chain is operatively used at CIMA (Centro di ricerca Interuniversitario in Monitoraggio Ambientale). It is especially designed for small and medium mountain catchments where social safety demands that hydrologists provide reliable prediction of ground effects at least 12-24 hours in advance. In order to accomplish this task, it is necessary to use rainfall numerical model predictions as input to rainfall-runoff models. However this coupling is characterized by several sources of uncertainties, the uncertainty at the meteorological scale per se and the uncertainty at the interface between meteorology and hydrology. In absence of a full deterministic modeling of small-scale rainfall, a stochastic downscaling procedures to generate ensemble rainfall predictions at small scales able to fill the scales gap between meteorology and hydrology is used. In this work different meteorological models have provided the rainfall fields input for the hydrometeorological chain: LAMI with horizontal resolution of 7.0 km (3 hours) and 2.8 km (1 hour), Bolam (6.5 km, 1 hours) and Moloch (2.2 km, 1 hour). A probabilistic approach has also been followed, using the rainfall field input provided by the probabilistic meteorological forecasting system COSMO-LEPS, developed by ARPA-SIM. The COSMO-LEPS ensemble is made by 5 runs of the limited-area model Lokal Modell, with horizontal resolution of 10 km (6 hours). It is shown that the probabilistic forecasting system can give a valuable contribution in addressing the uncertainty at different spatio-temporal scales involved in the flash flood forecasting problem and the sensitivity of forecasting to different LAMs used as

input has been evaluated.