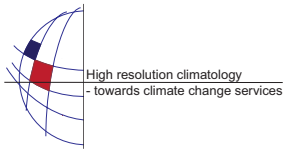
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-413, 2010
10th EMS / 8th ECAC



Meteo-hydrological predictions: testing different ensemble approaches

S. Davolio (2), T Diomede (1), C. Marsigli (1), M. M. Miglietta (3), A. Montani (1), and A. Morgillo (1)

(1) ARPA-SIMC, Hydro-Meteo-Climate Regional Service, Bologna, Italy (amontani@arpa.emr.it, fax: +39 051 6497501), (2) ISAC – CNR, Via Gobetti, 101 - 40129 Bologna, Italy (s.davolio@isac.cnr.it), (3) ISAC – CNR, Corso Stati Uniti, 4 - 35127 Padova, Italy (m.miglietta@isac.cnr.it)

For medium-sized catchments, characterized by short response times, hydrological predictions have to rely on quantitative precipitation forecasts (QPFs) issued by meteorological models. Although meteorological predictions are becoming more and more accurate, QPFs are still affected by errors which can be relevant at the scales of interest for hydrological purposes. In order to represent the uncertainty inherent to QPFs, the ensemble forecasting approach is becoming a common practice for operational hydrological predictions. This approach provides multiple precipitation scenarios to be used as the input for a hydrological model. The hydrological model propagates the uncertainty in the flood forecasts, providing a more informative and probabilistic hydrological prediction.
In the present study, two different ensemble approaches are tested in a real-time configuration:
1) a multi-model forecasting system based on four mesoscale models run (BOLAM, COSMO, MOLOCH and WRF), implemented at different horizontal resolutions, ranging between 8 and 2.5 km:
2) the COSMO-LEPS (Limited-area Ensemble Prediction System) ensemble, an operational limited-area forecasting system based on the COSMO model, run at 10 km resolution and driven by selected members from the ECMWF Ensemble Prediction System.
The forecast precipitation fields are then used to drive the distributed rainfall-runoff model TOPKAPI.
Preliminary results concerning a recent high-impact episode affecting the Reno river basin, located in Northern Italy (Apennines), are analyzed and compared in terms of precipitation and discharge predictions.