



Forecasting skills of the ensemble hydro-meteorological system for the Po river floods

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The Po basin is the largest and most economically important river-basin in Italy. Extreme hydrological events, including floods, flash floods and droughts, are expected to become more severe in the next future due to climate change, and related ground effects are linked both with environmental and social resilience. A Warning Operational Center (WOC) for hydrological event management was created in Emilia Romagna region. In the last years, the WOC faced challenges in legislation, organization, technology and economics, achieving improvements in forecasting skill and information dissemination. Since 2005, an operational forecasting and modelling system for flood modelling and forecasting has been implemented, aimed at supporting and coordinating flood control and emergency management on the whole Po basin. This system, referred to as FEWSPo, has also taken care of environmental aspects of flood forecast. The FEWSPo system has reached a very high level of complexity, due to the combination of three different hydrological-hydraulic chains (HEC-HMS/RAS – MIKE11 NAM/HD, Topkapi/Sobek), with several meteorological inputs (forecasted - COSMOI2, COSMOI7, COSMO-LEPS among others - and observed). In this hydrological and meteorological ensemble the management of the relative predictive uncertainties, which have to be established and communicated to decision makers, is a debated scientific and social challenge. Real time activities face professional, modelling and technological aspects but are also strongly interrelated with organization and human aspects. The authors will report a case study using the operational flood forecast hydro-meteorological ensemble, provided by the MIKE11 chain fed by COSMO_LEPS EQPF. The basic aim of the proposed approach is to analyse limits and opportunities of the long term forecast (with a lead time ranging from 3 to 5 days), for the implementation of low cost actions, also looking for a well informed decision making and the improvement of flood preparedness and crisis management for basins greater than 1.000 km².