



Possible changes in the frequency of flood occurrences in the Po and Rhone valleys

A. Lombardi (1), B. Tomassetti (1), V. Colaiuda (1), E. Cerasani (1), M. Verdecchia (1,2)

(1) University of L'Aquila, CETEMPS, Department of Physics, L'Aquila, Italy (annalina.lombardi@aquila.infn.it), (2) University of L'Aquila, Department of Physics, L'Aquila, Italy

It has been long recognized that one of the most evident effect of climate changes is the increase of extreme events and the expected consequences on hydrological cycle can be summarized as an increase of dry period and an increment of major discharge peaks. Beyond the trend of average hydrological cycle, it appear interesting to quantitatively evaluate the possible increase of the frequency of flood occurrences. Within the framework of ACQWA project funded by the 7th Framework Programme of the European Union, different climatic scenarios simulated with two Regional Climate Model have been used to evaluate the expected changes in the hydrological cycle for the Po and Rhone catchments, to this aim the output of climate models have been used to force CHyM distributed hydrological model. The output of hydrological simulations, provided at hourly time steps for the years 1960-2050, have then been analyzed using two different alarm indices, implemented by CHyM model and calibrated for operational flood alert mapping activities. The results show that a significant increase of flood alarm occurrences have to be expected in the next 30 years for both the simulated basins and that the Padana plain is the area where the probability of flood risk appear greater. Detailed description of the alarm indices and their validation will be given and emphasis will be placed on the possibility to use the proposed approach to map flood risks for the future scenarios in the whole Europe.