



Real time flood forecasting of Tiber river in Rome

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Warning of incoming flood events allows the activation of non structural flood protection systems with sufficient advance. The warning system consists in three fundamental elements: monitoring network, forecasting model, decision maker. Apart from the structure of the model, decision making process is based on flood forecasting results; if forecasting values are incorrect, false warning could be issued or missed flood could occur with fairly probable heavy consequences. The aim of present work is to investigate the real applicability of real time model of flood forecasting in Tiber river in Rome in order to assess if the lead time is compatible with civil protection actions. The catchment area of Tiber river at Ripetta gauging station, in Rome, is more than 16000 km². In the upper part of the watershed is located Corbara dam, a reservoir encompassing an active storage of 165 hm³. The catchment area at the Corbara dam is 6075 km². The discharges released by Carbara dam and the contribution of Paglia river, the main Tiber tributary immediately downstream Corbara lake, constitute the main precursors of floods in Rome. The travel time of the flood wave from the inlet of Paglia in Tiber river to Rome is about 24-30 hours. Two different models were applied: a classic linear model and a physically based model performing rainfall-runoff analysis (TEVERE model). This model was developed to evaluate the probability of inundation of Rome using a Monte Carlo analysis. It is constituted by both hydrologic and hydraulic modules: the hydrologic one was slightly modified in order to perform flood forecasting in Rome. The models are applied to simulate the forecasting of three historical floods. The computations show the possibility to develop a flood forecast model with a lead time of 12 hours, which is useful for civil protection actions.