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River brenta catchment defence by controlled flooding: sensitivity study for the to uncertainty in precipitation input

M. Ferri (1) and A. M. Rossa (2)

(1) Autorità di Bacino dell'Alto Adriatico, I-30100 Venice, Italy, (2) Centro Meteorologico di Teolo, ARPA Veneto, I-35037 Teolo, Italy

The local Water Authority of North Eastern Italy, which is in charge of the planning and coordination of flood defence, water use, and protection of water resources, has developed an accurate and robust of the hydrologic response model. The model, of the geomorphologic - MonteCarlo type, reproduces stochastic and real hydrographs and thereby the return period of peak flows as well as any other feature of engineering interest, including shapes and volumes.

This model is applied to the medium-size Brenta catchment (ca. 800km2) in order to identify the maximally effective gate operations for flood mitigation using an upstream storage capacity (Corlo reservoir). In particular, a sensitivity study is conducted to quantify the catchment response to the uncertainty in precipitation input. Such a measure will be helpful in identifying for which intensities and accumulations accuracy in the precipitation estimation is particularly critical, and provide useful additional information for the decision making process when it comes to alerting procedures. Indeed, such a process would not only be based on the notification of adverse weather conditions, but also on the knowledge of the land vulnerability according to established rainfall scenarios. This study is a contribution to the COST 731 Action 'Propagation of Uncertainty in Advanced Meteo-hydrological Forecast Systems'.