Geophysical Research Abstracts, Vol. 7, 07282, 2005
SRef-ID: 1607-7962/gra/EGU05-A-07282

Use of Montecarlo geomorphic models on floodplain decision making: a case study

E. Alessi Celegon, G. Botter, T. Settin, A. Uccelli, G. Passadore, M. Marani, A. Rinaldo

University of Padova, Dept. IMAGE and International Center for Hydrology "D. Tonini", Padova, Italy (elisa.alessicelegon@unipd.it / Fax: +39 049 8275446 / Phone: +39 049 8275445)

In this paper a complete hydraulic and hydrologic model is applied to a complex catchment in North-Eastern Italy. Its nodal point is a complex hydraulic system including floodgates and floodways which drives the hydrologic waters across a urban agglomerate (Castelfranco Veneto). A geomorfological continuous model of the hydrologic response is applied to estimate the hydrological contributions forcing the hydraulic network; the runoff production is modelled with the physically-based Green-Ampt approach while the evapotranspiration process is described by the FAO-Penman-Monteith model. The optimal management of the hydraulic network chiefly depends on the hydraulic behaviour of the floodgates and of the floodways. The calibration and validation procedures based on continuous data measurements has allowed to estimate both the hydrologic behaviour of the catchment and the temporal evolution of the sluice-gate openings. The hydraulic and hydrologic model developed meets the requirement of reproducing the physical phenomena involved and is able of estimating both flood and droughts events providing an operational support in many catchment management activites aimed at the flood forecasting. Examples of decision making under uncertainty are related to the management of gate controls at the downstream end of the hydraulic node.