



Impact of rainfall data resolution in time and space on the urban flooding evaluation

Vincenza Notaro¹, Chiara Maria Fontanazza², Gabriele Freni¹, Goffredo La Loggia² and Valeria Puleo²

¹ University of Enna “Kore”, Italy, vincenza.notaro@unikore.it

² University of Palermo, Italy, fontanazza@idra.unipa.it

¹ University of Enna “Kore”, Italy, gabriele.freni@unikore.it

² University of Palermo, Italy, glal@idra.unipa.it

² University of Palermo, Italy, puleo@idra.unipa.it

ABSTRACT

Climate change and the modification of urban environment increase the frequency and the impact of flooding rising, the interest of researchers and practitioners on this topic. Usually flood frequency analysis in urban areas is indirectly carried out by adopting advanced hydraulic models to simulate long historical rainfall series or design storms. However, their results are affected by a grade of uncertainty which has been extensively investigated in recent years. Major source of uncertainty inherent to hydraulic model results is linked to the imperfect knowledge of the rainfall input data both in time and space. Several studies show that hydrological modelling in urban area requires rainfall data with fine resolution in time and space. The present paper analysed the effect of rainfall knowledge on urban flood modelling results. A mathematical model of urban flooding propagation was applied to a real case study and the maximum efficiency conditions for the model and the uncertainty affecting the results were evaluated by means of GLUE analysis. The added value provided by the adoption of finer temporal and spatial resolution of the rainfall was assessed.

KEYWORDS

Rainfall resolution, rainfall-runoff transformation, urban drainage modelling