



Methodology for qualitative urban flooding risk assessment

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ABSTRACT

Pluvial, or surface, flooding can cause significant damage and disruption as it often affects highly urbanized areas. It is therefore essential to accurately identify consequences and assess the risks associated with such phenomenon. The aim of this study is to present and investigate the applicability of a qualitative flood risk assessment methodology in urban areas. The presented methodology benefits from the recent developments in urban flood modelling, such as the dual-drainage modelling concept, namely one-dimensional automatic overland flow network delineation tools (e.g. AOFD) and 1D/1D models that incorporate both surface and sewer drainage systems. To estimate the consequences of the flooding event, the velocities and water depth results obtained using a 1D/1D model were used. Three consequence dimensions were considered: affected public transportation services, affected properties and pedestrian safety. The methodology was tested using two rainfall events with return periods of 350 and 2 years observed in Alcântara (Lisbon, Portugal). The most affected areas in terms of flooding were easily identified; the presented methodology showed to be easy to implement and effective to assess flooding risk in urban areas, despite the common difficulties in obtaining data.

KEYWORDS

1D/1D urban drainage modelling, flood modelling, risk assessment, surface urban flooding