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The influence of inlet drainage in modelling flow interactions between storm sewer system and overland surface

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Abstract

In coupled sewer and surface flood modelling approaches, the flow process in gullies is often ignored although the overland flow is drained to sewer network via inlets and gullies. Therefore, the flow entering inlets is transferred to the sewer network immediately, which may lead to a different flood estimation than the reality. In this paper, we compared two modelling approach with and without considering the flow processes in gullies in the coupled sewer and surface modelling. Three historical flood events were adopted for model calibration and validation. The results showed that the inclusion of flow process in gullies can further improve the accuracy of urban flood modelling.

Keywords: Coupled 1D/2D flood model; Dynamic flow interaction; Model comparison; Overland flow; Roof drainage; Storm sewer flow.

1 Introduction

Flooding is a major hazard in many urban areas that leads to significant damage to properties and disruption of services. Hydraulic modelling is the key for better understanding of flood dynamic such that enhanced adaptation measures can be applied for disaster risk reduction (DRR). For most modern cities, storm sewer networks are built to manage surface water caused by local rainfall. However, the cost for the construction and maintenance of drainage networks is expensive such

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