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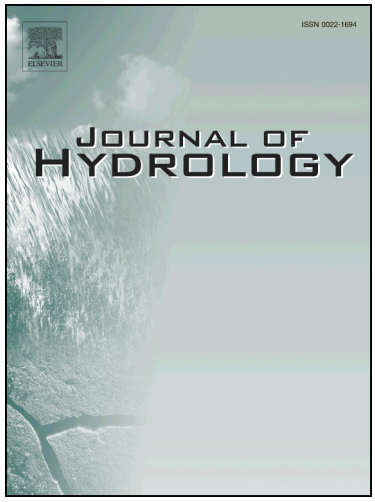

Research papers

Identifying the best locations to install flow control devices in sewer networks to enable in-sewer storage

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ACCEPTED MANUSCRIPT

Identifying the best locations to install flow control devices in sewer networks to enable in-sewer storage

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Abstract

The activation of available in-sewer storage volume has been suggested as a low-cost flood and combined sewer overflow mitigation measure. However, it is currently unknown what the attributes for suitable objective functions to identify the best location for flow control devices are and the impact of those attributes on the results. In this study, we present a novel location model and efficient algorithm to identify the best location(s) to install flow limiters. The model is a screening tool that does not require hydraulic simulations but rather considers steady state instead of simplistic static flow conditions. It also maximises in-sewer storage according to different reward functions that also considers the potential impact of flow control device failure. We demonstrate its usefulness on two real sewer networks, for which an in-sewer storage potential of approximately 2,000 m^3 and 500 m^3 was estimated with five flow control devices installed.

Keywords: in-sewer storage, flow control device location, storm water management, best management practice, urban floods

1. Introduction

Urban pluvial floods have received a considerable amount of attention in recent years due to the negative impacts they can have on society. This type of flood event is caused by intense rainfall associated with the limited hydraulic capacity of drainage systems. Their

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