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Tree pits to help mitigate runoff in dense urban areas

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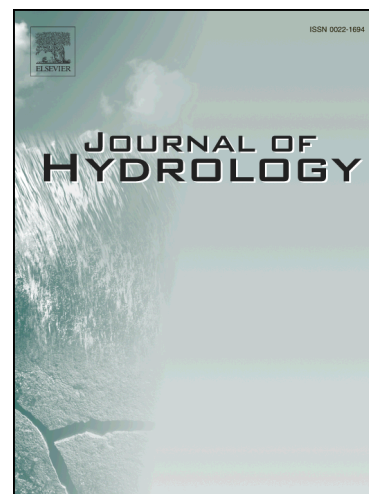
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1 **Tree pits to help mitigate runoff in dense urban areas**

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13 **Abstract**

14 Tree pits are attractive stormwater control measures (SCMs) for implementation in dense urban
15 areas because of their small footprint, their potentially low cost and the co-benefits they may bring
16 through improved street tree growth. While they provide street trees with passive irrigation, it
17 remains to be determined if tree pits may achieve meaningful reductions in stormwater runoff. We
18 undertook a streetscape experiment to quantify runoff retention of tree pits in a heavy clay soil
19 with low-rates of exfiltration. We calibrated and validated a water balance model using the field
20 experiment data to identify tree pit characteristics driving runoff retention performance. We then
21 applied the model to different implementation scenarios to ascertain how useful these tree pits may
22 be at reducing runoff to return a more natural flow regime in dense urban areas. The main drivers
23 of runoff retention were identified as exfiltration rates from the tree pits and the connected
24 impervious catchment size. Our results show that it is possible, even in dense urban streetscapes

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