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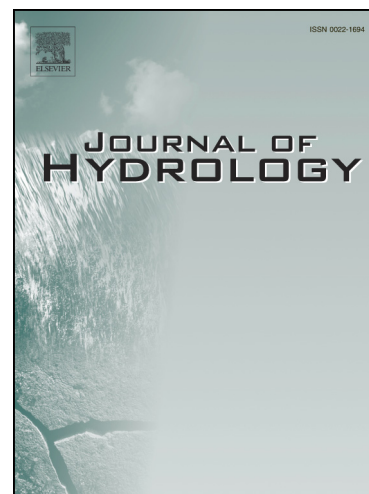
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Underground structures increasing the intrinsic vulnerability of urban groundwater:
sensitivity analysis and development of an empirical law based on a groundwater age
modelling approach

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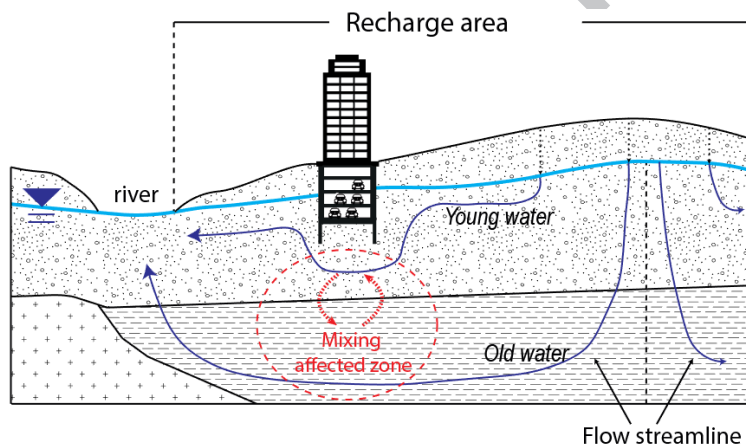
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Graphical abstract



Abstract

In a previous paper published in Journal of Hydrology, it was shown that underground structures are responsible for a mixing process between shallow and deep groundwater that can favour the spreading of urban contamination. In this paper, the impact of underground structures on the intrinsic vulnerability of urban aquifers was investigated. A sensitivity analysis was performed using a 2D deterministic modelling approach based on the reservoir theory generalized to hydrodispersive systems to better understand this phenomenon and the mixing affected zone (MAZ) caused by underground structures. It was shown that the maximal extent of the MAZ caused by an underground structure is reached approximately 20 years after construction. Consequently,

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