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Water dynamics in an infiltration trench in an urban centre in Brazil

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Infiltration trenches are compensatory techniques that have been settled up for decades. These aim to store the stormwater previously collected and infiltrate water into its banks. The objectives of the proposed study consist of modeling the water dynamics in an infiltration trench in order to evaluate its hydraulic performance. The studied trench is installed in the city of Recife (Pernambuco-Brazil, Brazil). We analyzed the response time of the infiltration system, the percentage of the infiltrated volume, and the dynamics of water storage processes for an extensive series of several rainfall events. We used the PULS method to model the events and quantify the contributions of each compartment to the water budget (infiltration, evaporation, etc.). Both observations and modeling demonstrated that the infiltration trench had a positive effect, with high performance, allowing the infiltrating of a large part of the drained volume. The infiltration trench achieved its objective of decreasing the volume drained on the surface. In this research, we also question the changes in the soil characteristics with time (in particular clogging of the banks) and the potential occurrence of preferential flow.