



## Searching for storm water inflows in foul sewers using fibre-optic distributed temperature sensing

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### ABSTRACT

A major drawback of separate sewer systems is the occurrence of illicit connections: unintended sewer cross-connections that connect foul water outlets from residential or industrial premises to the storm water system and/or storm water outlets to the foul sewer system. The amount of unwanted storm water in foul sewer systems can be significant resulting in a number of detrimental effects on the performance of the wastewater system. Efficient removal of storm water inflows into foul sewers requires knowledge on the exact locations of the inflows. This paper presents a monitoring technique that can be used to localize illicit storm water inflows into foul sewer systems: Distributed Temperature Sensing (DTS).

Data results from two monitoring campaigns in foul sewer systems in the Netherlands and Germany show the level of detail with which in-sewer processes can be studied. Storm water inflow can be detected as long as the temperature of this inflow differs from the in-sewer temperatures prior to the event. Also, the in-sewer propagation of storm water can be monitored, enabling a detailed view on advection-dispersion and mixing processes.

### KEYWORDS

DTS, foul sewers, storm water inflows, temperature monitoring