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Subject Area	Energy and Environment

Modelling of Mecoprop Pollution in Urban Stormwater Runoff

Coupling COMLEAM Software with SWMM Software

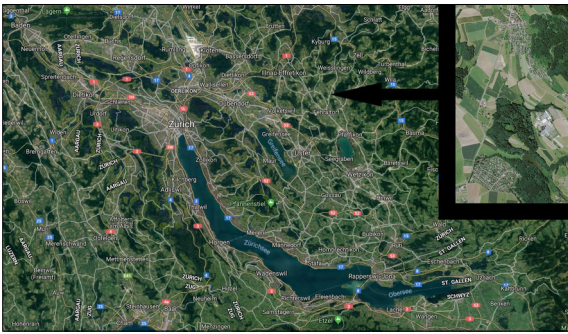


Figure 1: Investigated municipalities Rumlikon and Fehraltorf in the area of Zürcher Oberland.

Introduction: In Switzerland, infiltration of non-polluted stormwater is required by the Federal Act for the Protection Water. The runoff from buildings is generally classified as non-polluted. However, runoff water from buildings might contain problematic substances, but monitoring a sewer system is costly. Alternatively, the pollution can be assessed by modelling.

The goal is to combine the dynamic building wash-off using the software COMLEAM with the urban drainage model software SWMM and compare this approach with a simplistic pollution source description.

The simulation was validated with measured data. The studied sewer system is located in Zürcher Oberland and contains the municipality Rumlikon and a part of Fehraltorf (Figure 1).

Procedure / Result: The focus is set on the organic substance Mecoprop used as a root protection agent in bituminous membranes of green roofs which is often present in surface waters. For the COMLEAM model the geometries of flat roofs in the catchment and rainfall data were prepared. The output of COMLEAM is linked to SWMM with an application programming interface (API) which has been created. The API controls both models and allows to run parameter iterations automatically. The sensitivity of the Q_{cum} representing the cumulated release (Figure 2) is crucial. The concentrations in the roof runoff by leaching is significantly higher compared to the concentration in the sewer system. It can be concluded that the dynamic pollution input improves the peak accuracy. As shown in Figure 3, a difference in the pattern of measured and modeled flow and concentrations are observed. However, the peak concentration in this model deviates only by less than 30% whereas in the simplistic description by more than 50%.

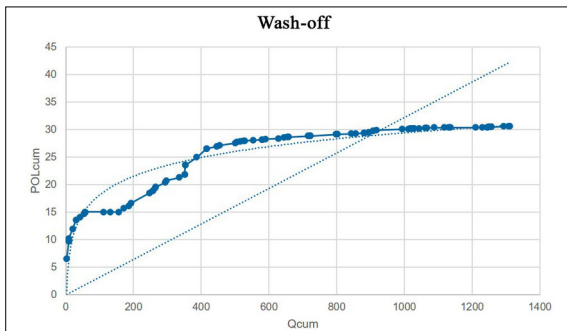


Figure 2: Linear, logarithmic and measured wash-off characteristics of a rooftop containing Mecoprop.

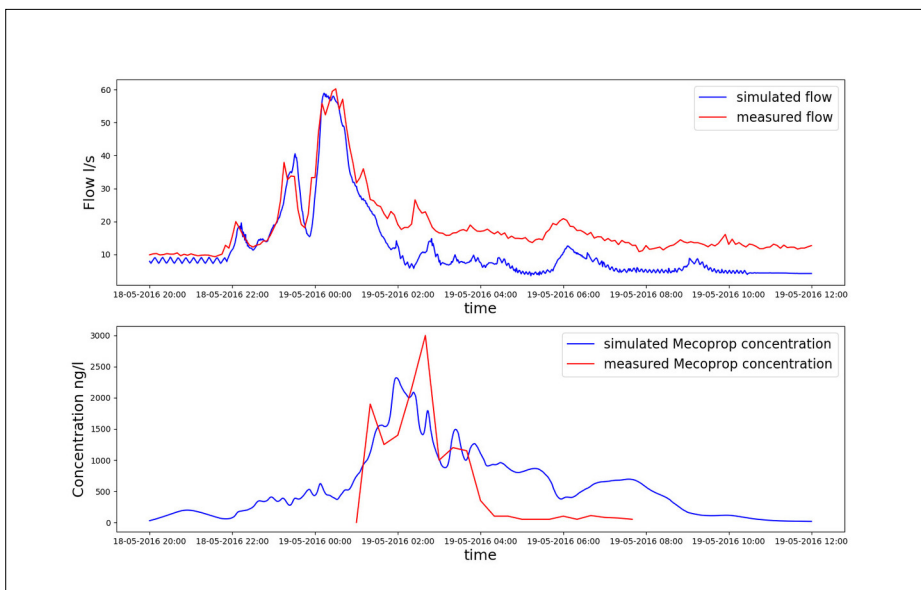


Figure 3: Modeled and measured single event of flow and pollution concentration in the studied sewer system.