



Modelling the behaviour of façade biocides in urban hydrological runoff

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ABSTRACT

Concern about biocides in surface waters is nowadays increasing because of their adverse effects on aquatic organisms. In this investigation, we developed a simulator able to predict the environmental dynamics of these contaminants and thus support protection measures. First, we constructed a conceptual hydrological transport model through the approximation of the watershed as a well-mixed reactor. Second, we upscaled an existing facade-leaching model to basin scale and coupled it to the hydrologic pollution model. The integrated model was applied to a 15-km² urban hydrosystem in Switzerland. There, we analysed the behaviour of three common facade biocides, viz. Terbutryn, Carbendazim and Diuron. The results show that the simulator reproduces well the observed flow rates and measured pollutographs. The proposed framework indicates that a parsimonious approach can be successfully employed to simulate the hydrograph and pollutograph response for biocide release from a heterogeneous urban area. The model is a flexible and easily applied tool for predicting biocide loading on aquatic ecosystems, and could be used to help design source control measures.

KEYWORDS

Parsimonious modelling, urban watershed, biocide leaching, pollutograph, transport, hydrograph