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Improving understanding of the underlying physical process of sediment wash-off from urban road surfaces

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Abstract

Among the urban aquatic pollutants, the most common is sediment which also acts as a transport medium for many contaminants. Hence there is an increasing interest in being able to better predict the sediment washoff from urban surfaces. The exponential wash-off model is the most widely used method to predict the sediment wash-off. Although a number of studies proposed various modifications to the original exponential wash-off equation, these studies mostly looked into one parameter in isolation. This parameter is often the rainfall intensity thereby ignoring the interactions of other parameters corresponding to catchment and sediment characteristics. Hence in this study we aim (a) to investigate the effect of rainfall intensity, surface slope and initial load on wash-off load in an integrated and systematic way and (b) to subsequently improve the exponential wash-off equation focusing on the effect of the aforementioned three parameters. A series of laboratory experiments were carried out in a full scale setup, comprising of a rainfall simulator, a 1 m² bituminous road surface, and a

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