

## **SCCWRP Annual Report 2001-02**

### **Effects of rainfall intensity and duration on first flush of stormwater pollutants**

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#### **ABSTRACT**

The relationship between rainfall intensity and duration and its effects on the water quality of resulting surface runoff is difficult to quantify due to the inherent unpredictability and natural variability in rainfall. To overcome this variability, a rainfall simulator was constructed to mimic storm events under controlled conditions. The objective of this study was to evaluate the effect of rainfall intensity and duration on the contaminant concentrations found in runoff. Within-storm variability was quantified by subsampling simulated events of varying rainfall intensities. Among-storm variability was assessed by examining event mean concentrations from storms with: (1) similar intensities, but varying durations; (2) similar durations, but varying intensities; and (3) varying intensity and duration to achieve similar storm volumes. Within-storm variability showed that concentrations of suspended solids, total and dissolved trace metals, and polycyclic aromatic hydrocarbons (PAHs) in runoff were consistently greater (averaging 2.4-fold to 5.4-fold greater) at the beginning of simulated storm events (<10 minutes) than later in the event (10-40 minutes). Among-storm variability showed that concentrations of these constituents in runoff were inversely correlated with rainfall duration or intensities; shorter rainfall durations or lower rainfall intensities produced greater runoff concentrations. Similar storm volumes, generated from varying intensities and durations, resulted in similar runoff concentrations.

#### **Full Text**

[ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2001\\_02AnnualReport/21\\_ar40-liesl.pdf](ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2001_02AnnualReport/21_ar40-liesl.pdf)