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## **Seasonal flushing of pollutant concentrations and loads in urban stormwater**

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### **ABSTRACT**

Despite broad observations of first flush within storms, the scientific understanding of seasonal flushing remains incomplete. Seasonal flushing occurs when initial storms of the season have greater concentrations or loads than storms later in the Season. The goal of this study was to census storm water concentrations and loads from an arid, urban watershed to quantify seasonal flushing. Samples were collected every 15 min during the 1997-1998 wet season from the Santa Ana River and analyzed for total suspended solids. Initial storms of the season generated event mean concentrations 3-10 times the event mean concentration of storms later in the season. Cumulative flow-weighted mean concentrations were calculated as the season progressed. Early season storms discharged only 6% of the annual volume, but influenced flow-weighted mean concentrations well past the midpoint of the wet season. Mass-based estimates also indicated a disproportionate load in the early portion of the year; over 52% of the annual load was discharged in the first 30% of the annual volume from the highly urbanized lower watershed. Other stormwater pollutants, including six trace metals (Cd, Cr, Cu, Pb, Ni, Zn), were highly correlated with total suspended solids and also exhibited a significant seasonal flush.

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