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Watershed and land use-based sources of trace metals in urban stormwater

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ABSTRACT

Trace metal contributions in urban storm water are of concern to environmental managers because of their potential impacts to ambient receiving waters. However, the mechanisms and processes that influence temporal and spatial patterns of trace metal loading in urban storm water are not well understood. The goals of the present study were to quantify trace metal event mean concentration (EMC), flux, and mass loading associated with storm water runoff from representative land uses; compare EMC, flux, and mass loading associated with storm water runoff from urban (developed) and non urban (undeveloped) watersheds; and to investigate within-storm and within-season factors that affect trace metal concentration and flux. To achieve these goals, trace metal concentrations were measured in 315 samples over 11 storm events in five southern California, USA watersheds representing eight different land use types during the 2000 through2005 storm seasons. In addition, 377 runoff samples were collected from 12 mass emission sites (end of watershed) during 15 different storm events. Mean flux at land use sites ranged from 24 to 1238, 0.1 to1272, and 6 to 33,189 g/km^2 for total copper, total lead, and total zinc, respectively. Storm water run off from industrial land use sites contained higher EMC sand generated greater flux of trace metals than other land use types. For all storms sampled, the highest metal concentrations occurred during the early phases of storm water runoff with peak concentrations usually preceding peak flow. Early season storms produced significantly higher metal flux than late season storm sat both mass emission and land use sites.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2007AnnualReport/AR07_013_030.pdf