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Natural catchments as sources of background levels of storm-water metals, nutrients, and solids

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ABSTRACT

A key challenge in managing water quality and meeting compliance standards is accounting for both the anthropogenic and natural contributions of a range of water quality constituents. This study quantified levels of solids, metals, and nutrients in storm-water runoff from 18 sites across 11 watersheds representing a range of natural conditions in southern California. Constituent concentration and flux were measured over the course of a variety of storms in order to investigate temporal and spatial patterns in constituent levels, and to identify the most important environmental attributes affecting background water quality. Metals and nutrient concentrations from the natural catchments were typically one to two orders of magnitude lower than those from developed catchments. In contrast, total suspended solids levels were comparable to those found in urban storm water from Los Angeles. Geologic setting had the greatest effect on constituent levels at natural sites. Unlike urban systems, natural catchments do not appear to exhibit a first flush phenomenon, with a substantial portion of the constituent load occurring later in the storm. Ratios of particulate to dissolved metals concentrations changed considerably over the course of storms suggesting that bioavailability of constituents from natural areas may vary over storm duration.

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