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Characterization and source identification of dry-weather metals and bacteria in Ballona Creek

Eric D. Stein and Liesl L. Tiefenthaler

ABSTRACT

Dry-season urban runoff from watersheds in arid regions can contribute substantial concentrations and loads of bacteria and metals to downstream receiving waters. Identifying the relative contribution of different sources is an important step in managing dry-season runoff that has not been completed in most of southern California's urban watersheds. The goal of this study was to identify the relative contribution of various storm drain sources to the total dry-season loading of metals and bacteria in the Ballona Creek watershed. Approximately 40 actively flowing storm drains and 12 in-river sites were sampled three times during the spring and summer of 2003 for flow, total and dissolved metals, and bacteria. These data were analyzed in terms of mean concentration and load, temporal variability, and spatial distribution of substantial inputs to the creek. In general, Ballona Creek exhibited a bimodal distribution of elevated metals and bacteria, with the highest levels occurring between 3 km and 6 km immediately upstream of the tidal portion of the creek, and between 9 km and 12 km below the portion of the watershed where Ballona Creek daylights from an underground storm drain to an exposed channel. These two portions of Ballona Creek correspond to locations where storm drains with consistently high concentrations and loads discharge to the creek. Of the 40 drains sampled, 4 account for 85% of the daily storm drain volume. Between 91% and 93% of the total daily load for metals is contributed by eight drains. Nine drains consistently have the highest concentrations of metals and bacteria. Metals concentrations may vary by five-fold and bacteria concentrations may vary by up to five orders of magnitude on an intra- and interannual basis. However, despite this variability, managing a relatively small number of storm drain inputs has the potential to result in substantial improvement in water quality in Ballona Creek.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2003_04AnnualReport/ar16-stein_pg179-191.pdf