

1. SYNTHESIS REPORT ABSTRACT

Watershed managers require regional data to develop biomonitoring tools and contextualize local assessments. However, they often rely on data generated by programs with a more local emphasis, such as studies mandated by pollution discharge permits. These programs typically study only specific sites or stream reaches. The goal of this study was to compile individual data sets from site-specific programs to see if they could be merged into a regional-scale program. We evaluated if the merged data could be used to a) perform a regional assessment of streams in southern California, and b) identify potential stressors to aquatic life in these streams. Water quality, toxicity, physical habitat, and benthic macroinvertebrate samples were collected from over 100 sites in coastal watersheds in San Diego, Riverside, and Orange counties by six different programs.

The data indicated widespread impacts to many water chemistry constituents, with some, like ammonia-N and specific conductivity, exceeded aquatic life thresholds in more than 60% of samples. More than 50% of water and sediment samples were toxic to at least one indicator species (*Ceriodaphnia dubia*, *Hyallela azteca* or *Selenastrum capricornutum*). Of the 708 bioassessment samples included in the study, 80% were in poor condition (i.e., index of biotic integrity < 40). Impacts for all indicators were most severe in urban areas along the coast. Nonmetric multidimensional scaling of benthic macroinvertebrate communities identified two stressor gradients: a strong gradient associated with toxic contaminants in the water (e.g., metals, high specific conductivity, and organics) and a weaker gradient related to eutrophication (e.g., dissolved oxygen and nitrate). The toxic contaminant gradient was strongly associated with development in the watershed, and watersheds with more than 10% developed area were invariably in poor biological health.

In conclusion, combined data sets produced potentially biased regional assessments because of their sampling designs, which emphasized evaluations of known impacts. In contrast, such data are more useful for stressor identification, as they effectively capture important gradients in the region. Integration of local programs may prove useful if they are designed in coordination to meet regional as well as local goals.