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## Near-Coastal Water Quality at Reference Sites Following Storm Events

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### ABSTRACT

Stormwater is one of the more challenging sources of coastal pollution to abate, partly because stormwater also involves complex natural processes and differentiating these natural processes from anthropogenic excesses is difficult. The goal of this study was to identify what are the natural concentrations of stormwater constituents along the 1,377 km coastline of California, USA. Twenty-eight ocean reference sites, *a priori* defined by lack of human disturbance within its adjacent watershed, were sampled between 2008 and 2014. Samples were collected directly in front of flowing runoff following 78 site-events (combination of sampling sites and storm events), then measured for 57 constituents and toxicity to three endemic marine organisms. Results indicated a complete lack of toxicity and undetectable levels of anthropogenic constituents (i.e., current use pesticides) at ocean reference sites. The range of concentrations in ocean receiving waters adjacent to these undeveloped watersheds for naturally-occurring constituents (i.e., total suspended solids, nutrients, trace metals) typically ranged three to four orders of magnitude. With few exceptions, concentration ranges were comparable for different regions of the state, which vary in geology, rainfall, and oceanic currents. Storm characteristics (i.e., rainfall quantity, intensity, duration) did not explain these variations in concentration. The reference site information is now being used to establish targets for marine protected areas subject to runoff from developed watersheds.

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