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Tracking Sources of Bacterial Contamination in Stormwater Discharges to Mission Bay, California

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ABSTRACT

Sources of the indicator bacteria total coliform, fecal coliform, and enterococcus were investigated in stormwater flows discharging to Mission Bay, a heavily used aquatic park in San Diego, California. Stormwater flows were targeted because long-term receiving water monitoring of the bay indicated that wet weather discharges were the predominant source of bacterial contamination. Exceedences in water quality objectives for body contact recreation established by the State of California most often occurred in the east bay, where the least amount of circulation and largest quantities of stormwater discharges occur. Unlike the wet weather results, almost all of the 89 storm drains that discharge to the bay either did not have flowing fresh water or did not contain exceedingly high bacteria densities during dry weather. Upstream tracking during multiple storm events on two of the largest watersheds draining to the bay showed that sources of indicator bacteria were diffuse and widespread. Densities were as high at the head of each watershed as they were at the mouth, where both discharged to the bay. Every reach in each creek exceeded State of California water quality objectives and had densities similar to surface flows measured before they entered the separate municipal storm sewer system from urban land uses, such as residential, commercial, and industrial, as well as open lands.

Keywords: indicator bacteria, stormwater, water quality objectives, land-use effects

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