

Efficacy of shallow water sampling to determine exposure of surfers to indicator bacteria at marine beaches

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ABSTRACT

Beach water quality monitoring in southern California is extensive, but samples are collected in shallow water (0.3 m) because breaking waves make sampling in deeper water inconvenient and potentially dangerous. To assess how well shallow water sampling characterizes conditions in deeper waters, we collected paired enterococci samples at the shallow depth where sampling typically occurs, and outside the breaking surf offshore, where surfers typically line up to catch surfable waves. Sampling was conducted at 12 beaches in the summer dry season and 9 beaches following winter rainstorms. Beaches selected for study all had a flowing freshwater creek, surfers present at the site and a history of microbial water quality standards exceedences. Seven pairs of samples at different distances from the freshwater outlets were collected at all beaches. The nearshore and offshore samples were correlated during both the wet and dry sampling periods, but the correlation was higher following rainstorms. Concentrations of enterococci were typically higher in shoreline samples than offshore samples, with the difference being nearly three-fold under dry conditions and only 25% higher under wet conditions. For only one sample pair in dry weather and three sample pairs during wet weather, constituting less than 1% of total samples, did shoreline samples meet water quality standards when a corresponding offshore sample failed the standard.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2007AnnualReport/AR07_237_244.pdf