Evaluation of rapid methods and novel indicators for assessing microbiological beach water quality

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ABSTRACT

A broad suite of new measurement methods and indicators based on molecular measurement technology have been developed to assess beach water quality, but they have generally been subjected to limited testing outside of the laboratory in which they were developed. This study evaluated 29 assays targeting a variety of bacterial and viral analytes by providing the method developers with twelve blind samples consisting of samples spiked with known concentration of sewage or gull guano and negative controls. Each method was evaluated with respect to its ability to detect the target organism, absence of signal in the negative controls and repeatability among replicates. Only 6 of the 30 methods detected their targets in at least 75% of the samples while consistently determining the absence of the target in the negative controls. Among quantitative methods, QPCR for *Bacteroides thetaiotamicron* and *Enterococcus* detected by Luminex reliably identified all but one sample containing human fecal material and produced no false positive results. Among non-quantitative methods, the *Enterococcus esp* gene, the *Bacteroidales* human specific marker and culture based coliphage were the most reliable for identifying human fecal material. The study also found that investigator-specific variations of methods targeting the same organism often produced different results.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2009AnnualReport/AR09_223_233.pdf