

SCCWRP Annual Report 2011

Challenges in implementing new technology for beach water quality monitoring: Lessons from a California demonstration project

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ABSTRACT

Beach water quality is currently monitored using culture methods that require 24 hours, but quantitative polymerase chain reaction (qPCR) can be performed in two hours. Efforts to date have focused on technology development, with less attention to practical challenges of method implementation. Here we present a demonstration project in which qPCR was used to make health protection decisions at nine beaches. Project goals were to assess success in technology transfer, consistency of results between culture-based and qPCR methods and success in implementing health protection decisions the same day the samples were collected. Technology transfer went smoothly, as laboratories routinely produced amplification efficiencies >90%, a high degree of repeatability between replicates, and results comparable to that of an experienced reference laboratory. qPCR methods slightly overestimated levels of *Enterococcus* compared to culture-based methods and some samples were rejected due to PCR inhibition. However, a stakeholder task force did not consider these an impediment to method adoption, because they were outweighed by the value of providing same-day results. Providing warnings by noon was challenging, but achieved by limiting the number of sites and using electronic means for communicating warnings. The task force concluded that capital and training costs were a smaller impediment to method adoption than the expectation for more monitoring, as there is no benefit to rapidity if a result is extrapolated across a week. Cost and temporal logistics are likely to limit initial use of rapid methods primarily at beaches that are heavily used and/or have the most variable water quality.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2011AnnualReport/ar11_177_186.pdf