

US EPA ARCHIVE DOCUMENT

Fact Sheet
Rapid Beach Water Quality Screening Technologies
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Researchers in the EPA's Environmental Technology Verification (ETV) Program's Advanced Monitoring Systems (AMS) Center through a cooperative agreement with Battelle Memorial Institute, plan to assess the performance of rapid monitoring technologies for the detection of pathogen indicator organisms in recreational waters. These technologies should be able to produce same day results. A first step is to develop a generic testing protocol that can be reviewed and used by all those interested (technology developers and vendors, regulators, purchasers) to evaluate the performance of rapid beach water quality screening technologies.

Background

Frequent water quality monitoring of recreational waters is necessary to ensure the public's safety. Current water quality criteria require that *Enterococci* and *E.coli*, which are pathogen indicator organisms, are below specific action levels for marine and freshwater locations. Results generated no earlier than 24 hours after sample collection are currently being used by beach managers to determine if public health warnings should be posted and/or beaches closed for recreational use. Rapid monitoring technologies that claim to produce same-day results for indicator organism in recreational waters have emerged on the commercial market. Independent performance testing of such technologies is imperative to demonstrate to the EPA, state/local regulators, and coastal managers the potential applicability of these technologies to beach monitoring.

This Project

With the help of a stakeholder group, the AMS Center is preparing a generic protocol for the testing of beach/recreational water quality screening technologies. The protocol will evaluate the performance of technologies using both laboratory-prepared and real-world environmental samples. The protocol will address screening technologies that provide quantitative, semi-quantitative, or a presence/absence response compared to a defined limit. The indicator bacteria suggested for testing are: *Enterococci*, total coliforms, and *E. coli* or other appropriate pathogen-indicating bacteria that are part of beach monitoring programs at the time of the testing. The mechanism of action of these technologies may vary; however, a key factor is the technology's ability to generate data on water quality on the same day as sample collection (i.e. in 8 hours or less).

The draft protocol includes a laboratory-testing phase in which the technology is challenged with specific pathogen indicators in various matrices to evaluate performance parameters such as accuracy, precision, sensitivity, comparability of technology results relative to accepted laboratory-based methods. False positive/false negative rates around critical action levels,

frequency of technology reporting, and other operational features of each technology are also tested. The technologies are also challenged with environmental samples at recreational water sites, likely including both marine and freshwater. The number, type, and geographic location of the test site(s) proposed for the verification test will be determined during development of the protocol-based, specific test/QA plan once technology vendors have expressed interest and contracted to be tested.

The Goal

The goal of this project is to prepare a testing protocol that, when employed for testing, will demonstrate the performance of rapid beach monitoring technologies.

Expected Outcomes

The protocol will be posted on the ETV Internet website for public distribution. The purpose of publishing a protocol is that interested technology vendors can use it to test their technologies to see how well they perform under the test protocol conditions. Developers/vendors can use the results to make improvements to their technologies. Vendors may also contract with the ETV AMS Center to have third party testing performed. In such cases, AMS will prepare a test plan, conduct testing, and publish a report and summary statement. During the process EPA will provide technical and quality assurance reviews and sign off on the final verification. Vendors may use the ETV verification as credible data to help sell their technologies. Regulators responsible for monitoring public beaches, often local health departments, may use the information from ETV technology performance reporting to inform their purchase decisions. Ultimately, if technologies are implemented that can successfully determine within the same day of testing whether beaches are safe, the public health will be better protected than the current situation in which beach monitoring results take 24 hours or longer, allowing continued use during unsafe conditions.

Status

At present this protocol is in peer-review. The protocol, when available, will be found at <http://www.epa.gov/etv/verifications/protocols-index.html#ams>. It is expected to be finalized and available for use by Sept 30, 2007.

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