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New Study Compares Beach Water Quality Monitoring Technologies

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UNH/NOAA Cooperative Institute for Coastal & Estuarine Environmental Technology

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DURHAM, N.H. -- Timing is everything when it comes to keeping tabs on beach water quality. Since tests used by public health officials can take 24 hours or more to process, swimming beaches polluted by disease-causing microbes sometimes remain open, while safe beaches are closed after the threat has washed away. New testing methods that provide results within a few hours are available, but are they effective?

That question was explored in a recent study, co-funded by the University of New Hampshire's Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET). A partnership of UNH and the National Oceanic and Atmospheric Administration, CICEET fosters the development of tools for clean water and healthy coasts nationwide. It was founded in 1997, with the support of Senator Judd Gregg (R-NH).

Conducted by the Southern California Coastal Water Research Project, the study compared rapid microbial testing methods with the potential to make same-day health risk warnings possible. The results have been published in a report, "Evaluation of Rapid Microbiological Methods for Measuring Recreational Water Quality," now available online:

<http://ciceet.unh.edu>.

"While this study was conducted in California, the need for timely, accurate tests to determine water quality exists for all swimming beaches, including those in New Hampshire," says Richard Langan, CICEET's UNH co-director. "The results of this study are promising to anyone who wants to ensure maximum safe access to our beaches."

The study zeroed in on three molecular methods with promising results: two Quantitative Polymerase Chain Reaction (QPCR) techniques that tag bacterial DNA with fluorescent probes, and a Transcription-Mediated Amplification (TMA) approach that tags bacterial RNA. Although the study focused primarily on *enterococci*, two of the six research groups involved also measured *E. coli*. This year, a round of beta testing at California's Orange County Sanitation District and County of Orange Public Health laboratories will confirm the accuracy of these results and the practicality of these technologies.

Because there is no "one size fits all" approach to beach water quality monitoring, CICEET has sponsored projects that focus on this issue in Florida, Georgia, California, Louisiana, North Carolina, California, and New England, including a local source tracking study conducted by Steve Jones, a UNH research associate professor of natural resources and marine science.

"This is a complex challenge that varies with state regulations, the type of contamination, and

the technical capabilities of water quality managers,” says Langan. “In the end, what we really need is a diverse toolkit. That’s why CICEET has invested in alternative approaches to detecting microbial pollution, as well as different ways to track the source of the contamination.”