

Quantitative application of host-associated microbial source tracking markers to environmental samples.

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Molecular markers used for microbial source tracking are useful for presence-absence detection of fecal contamination sources in water. However, the value of this approach is partially dependent on laboratory detection limits. There are three major problems with presence-absence testing: 1) various host-associated markers are detectable in samples where contamination by the associated host is small relative to other sources; 2) host-associated markers may be detectable at contamination levels that are allowable under *E. coli*-based water-quality standards; 3) host-associated marker contributed by nontarget hosts (for example, dogs carrying ruminant marker) can result in false-positive results in contaminated environmental samples. An approach is described wherein the upper limit of *E. coli* contribution from a particular host is estimated based upon observations of *E. coli* and MST marker concentration in reference fecal material. By use of this approach, it was possible to test whether particular sources (in particular, human and ruminant) were credible major contributors of fecal contamination to quality-control samples and to environmental samples. This approach may be particularly useful to prioritize human- and dairy-waste-centered remediation efforts in contaminated watersheds.

Biographical Sketch

Don Stoeckel worked as a research microbiologist with the U. S. Geological Survey, Ohio Water Science Center from 1999 to present. He began working at the USGS after receiving his BS in Microbiology at the Ohio State University, MS in Environmental Science at University of Cincinnati, and PhD in Soil Microbiology at Auburn University. His research program at USGS focused on evaluation and application of methods for microbial source tracking of fecal contamination. During his time with USGS, he co-authored several papers on validation and application of microbial source tracking. Don recently left the USGS to pursue an alternate career path in the field of environmental microbiology.

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