

Micro CSI: A Microbial Citizen Science Initiative in Urban Watersheds

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Across the Nation, a number of citizen science efforts have been conducted to monitor water quality. Efforts have included monitoring of bacteriological parameters (*E. coli*, enterococci, and fecal coliforms) and/or physicochemical parameters (temperature, turbidity, pH, conductivity, etc.). Although these efforts are extremely useful to identify a problem area, they can be limiting in scope due to resource availability, human manpower, or even sampling logistics. Likewise, monitoring efforts conducted by county, city, and state governments to identify water quality issues are often limited due to funding and/or lack of available personnel. The aim of our program is to engage volunteers or citizen scientists to collect water samples and perform basic water quality and microbial analysis from a variety of urban locations. Information gathered by citizen scientists on microbial water quality will be collected in a central location and used to adapt a statistical modeling tool already used in recreational beaches (Virtual Beach (VB)) to predict microbial contamination in urban streams. VB will facilitate identification of stream locations prone to impairment due to fecal bacteria. The tool will also be able to identify the environmental conditions that produce such impairments. The effort will include application of microbial source identification at the DNA molecular level to better inform mitigation practices. The objectives of the study are to: (1) facilitate water quality monitoring efforts by citizen scientists and encourage community participation in activities promoting environmental awareness; (2) develop a robust set of information suitable to test and implement the use of VB for the rapid assessment of impairments in urban watersheds; (3) integrate microbial source tracking techniques to assess the most important sources of contamination impacting urban hotspots.

Laboratory data and environmental parameter information will be compiled in an EPA server to be processed for model development and testing. In addition, the data will be posted in the NGO's website to make it readily available to the public. We will ensure that sampling and FIB analysis are conducted according to EPA protocols and procedures. The information from this study will also be used for the development of a web-based version of VB.