NEW JERSEY'S APPLICATION OF MICROBIAL SOURCE TRACKING TECHNIQUES

Eric Feerst, Section Chief
New Jersey Department of Environmental Protection
Water Monitoring & Standards
Bureau of Marine Water Monitoring
PO Box 405 - Stoney Hill Road
Leeds Point, New Jersey 08220

ABSTRACT

Microbial Source Tracking (MST) methods have recently been applied to help identify sources responsible for the microbial contamination of fresh and marine waters in New Jersey. The NJDEP's Water Monitoring & Standards program has several on-going projects designed to track down sources of water quality impairments that are affecting shellfish areas and recreational bathing beaches.

New Jersey uses a tiered approach to microbial source tracking. This approach includes the following;

1.) Evaluate long-term bacteria monitoring data to clearly identify the impacted areas.
2.) Perform sanitary surveys including GIS land use coverage, hydrographic studies, and inventories of actual and potential pollution sources.
3.) Perform stormwater monitoring to delineate the major sources
4.) In addition to conventional microbial indicators, use specialized tests (F+RNA coliphage and Multiple Antibiotic Resistance (MAR) to identify sources as human, animal, or wildlife.

Data resulting from the above process are compiled for both spatial and temporal analysis. Patterns of traditional indicators in the water in relation to physical factors such as tide or rainfall show patterns that provide information on pollution sources. Additional work with specialized tests provides further information about the sources (e.g. human or animal origin). This results in an assessment of the principal sources of microbial pollution relating to a water quality impairment and an ability to prioritize those sources as to their degree of public health concern.

The presentation will describe two case studies using MST methods in impaired coastal waters. One of these describes application of source tracking methods to waters impaired for bathing at Spring Lake and Sea Girt, NJ. The second case study involves waters impaired for shellfish harvesting in New Jersey's Navesink River. Laboratory methods used to distinguish sources of fecal contamination will also be discussed.

KEYWORDS

Microbial Source Tracking (MST), Stormwater Monitoring, F+RNA coliphage, Multiple Antibiotic Resistance (MAR), sanitary surveys, water quality impairments