



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003NY25B

**Title:** Combining an Optical Strip-Assay Biosensor with Ribotyping for Bacterial Source Tracking of *Enterococcus faecalis* in the Lower Hudson River Basin

**Project Type:** Research

**Focus Categories:** Non Point Pollution, Water Quality, Waste Water

**Keywords:** non-point source pollution, fecal contamination, water quality, pathogens, wastewater

**Start Date:** 03/01/2003

**End Date:** 02/28/2004

**Federal Funds:** \$0.00

**Matching Funds:** \$21687.00

**Congressional District:** 22

**Principal Investigators:** Thies, Janice E.

**Abstract:** Problem:

The second most reported impairment affecting tributary waters in the southern portion of the Lower Hudson River basin is runoff from urban and extensively developed suburban areas (NYSDEC 1999). Runoff can be directly attributed to the rapid population growth in the region, which in turn has caused many wastewater treatment plants to be overloaded with volumes far beyond the limits of their initial design capacities. Despite convincing scientific data, only about 1/3 of all states have adopted either *E. coli* or enterococci counts as indicators for monitoring fresh and marine waters (EPA 1999). Clearly, there is still a need for coordinated scientific studies to determine potential health risks in tributary waters and to foster consistent use of indicator species of fecal contamination.

Methods:

Grab samples will be collected during a high flow event at intervals upstream and downstream of two waste-water treatment facilities, one in a tributary to Wappinger Creek and one in Stoney Creek. Non-chlorinated sewage samples will be taken from the two waste-water treatment facilities. Wildlife feces and farms will be sampled upstream from the treatment facilities. Samples will be tested for the presence

of *E. coli* and enterococci using the IDEXX (Westbrook, ME) Colilert™ and Enterolert™ Systems, respectively.

Objectives:

The specific goals of this proposed project in the Wappinger and Stoney Creek tributaries are:

- To ribotype isolates of *Enterococcus faecalis* from water and suspected sources of contamination in order to develop a pathogen tracker database and to validate that the indicator species has a limited host range.
- To use the database to identify the source(s) of fecal contamination in the Wappinger and Stoney Creek tributaries.
- To develop a species-specific ribosomal DNA gene biosensor for rapid detection of *Enterococcus faecalis* from environmental samples (water and human feces).
- To correlate detection limits of target DNA with the number of *Enterococcus faecalis* cells/mL for use in TMDL studies in other parts of New York State.

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