



# Identifying Sources of Disease-Producing Pollution

Detecting and measuring markers can help in the battle for global public health

## Environmental and health concerns addressed onsite and in the lab

Biosolids removed during the treatment of municipal wastewater are commonly applied to land, a practice that could lead to water contamination and human exposures. Neighbors of land application sites, often situated near low income communities, worry that exposure to contaminants can cause illness. Microbial source-tracking (MST), funded by the Gillings Gift, will assess the source of potential harm to rural populations with the goal of averting disease brought on by contact with these contaminants. Rigorous epidemiological and medical investigation into the origins of these potentially dangerous waste materials is a challenge, but examining the unique molecular signatures of these biosolids may determine whether the source is local animal waste or municipal application of human waste.

### • **Pyrosequencing**

High-throughput gene sequencing will be used to examine the microbial communities present in biosolids and to identify dominant and unique genetic targets in treating biosolid material. Using this tool, the fate and transport of biosolids can be tracked and assessed in aquatic systems and other environments where treated waste has been applied. Land areas where waste products have been applied then can be examined for these genetic markers. Waste-disposal practices can be reevaluated with a view toward safest policies and optimum public health outcomes.

### • **Sensitivity and specificity**

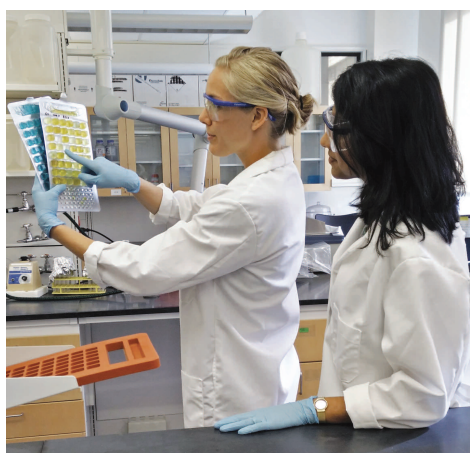
Biosolids from partner utilities will be evaluated to identify markers with the highest *sensitivity* (ability to detect a source when it is present) and *specificity* (ability to correctly identify when a source is *not* present). Markers with the highest sensitivity and specificity will be selected for further study.

## Leadership



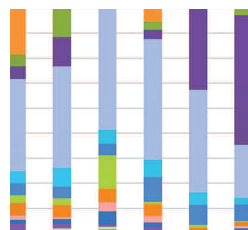
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## IMPACT!

Tracking and assaying sources of pollution can impact management decisions and affect choices for improving public health, both locally and globally. Improved practices and regulations are particularly important to address potential health inequities associated with land application of biosolids.



### GOAL

To identify unique microbial source-tracking indicators of biosolids that can be used to trace the fate of biosolid waste materials following land application. This can be done through laboratory and field studies to improve water quality and reduce public health risks associated with fecal contamination.

### PARTNERS

Public Utilities

