

## Upper Sugar Creek Watershed, Ohio: A Model Watershed for Study of Pathogen Origin, Fate and Transport

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### **Justification:**

Contamination of natural aquatic systems by human and animal wastes is a significant public health concern. Development of practical intervention strategies depends on understanding of the origin of sources of microbial pollution. The objective of the present study was to use microbial source tracking to identify sources of microbial/pathogen contamination of the headwater of the sugar creek watershed in Ohio and to facilitate development of improved management practices to limit the microbial/pathogen pollution. Using real-time quantitative PCR (qPCR) we have determined the magnitude of microbial contamination using *Bacteroidales* as an indicator bacteria. qPCR analysis of water samples collected from 21 different sites identified up to  $10^7$  *Bacteroidales*/100 ml of water with two hot spots with almost 100 fold more bacteria. In addition, PCR analysis of these water samples with host specific *Bacteroidales* primers (human and bovine) suggested frequent human-specific sources of fecal contamination of water bodies in the residential areas and bovine specific sources of fecal contamination of water bodies in the livestock dense areas. Further, qPCR analysis of water samples for specific pathogens of food safety concern revealed presence of *Salmonella*, *Campylobacter* and *E. coli* O157:H7. Our findings emphasize the usefulness of *Bacteroidales* for source tracking of pathogens load in aquatic systems and should facilitate development of improved management practices to limit microbial/pathogen contamination.

### **Objectives:**

None provided.

### **Progress to date:**

Not provided.

### **Impacts:**

Natsuko N. Merrick, Warren A. Dick and Linda K. Dick. 2008. Microbial source tracking: Library independent host-specific *Bacteroidales* 16S rRNA PCR assay in a mixed use watershed. Paper presented at the combined annual meeting of the America Society of Agronomy/Crop Science Society of America/Soil Science Society of America (ASA/CSSA/SSSA), 5-9 October, Houston, TX. Abstract #43608 published by ASA/CSSA/SSSA, Madison, WI.