

Partitioning Behavior of Pathogen Indicator Organisms in Snowmelt

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Grant Number: 2008-35102-19215

Justification:

In agricultural regions experiencing significant amounts of snowfall, understanding the microbial fate and transport processes taking place during spring melt is crucial to developing a comprehensive watershed protection program. The mass flux of viable pathogens entering surface waters from agricultural operations during snowmelt can represent a significant proportion of the total annual flux to those waters. Thus, understanding snowmelt microbial transport processes and implementing best management practices (BMPs) specifically designed to mitigate pathogens in meltwater can help to protect rural watersheds for months after the snow has melted.

Objectives:

The project is designed to test three hypothesis related to the phase and temporal distribution of pathogen indicator microbes released from snowpack at spring melt. In order to accomplish this, a mixture of fresh manure obtained from local herds (cattle, reindeer, muskox) was placed over soil in two snow lysimeters located in Fairbanks, AK. Meltwater and particulates flowing from the lysimeters will be analyzed at spring snowmelt for Total Coliforms (TC), *E. coli* (EC), and *Enterococcus* (ENT).

Progress to date:

The lysimeters were completed and the test was initiated on October 24th, 2008 (Figure 1). Approximately 3.7kg (dry weight) of manure mixture was placed into each of the two lysimeters. Current laboratory work involves developing a centrifugal method for discerning particle-bound from free-living indicator organisms in the meltwater.



Figure 1: Snowmelt Lysimeter Under Construction (L) and at Startup (R)

Impacts:

Test results have not yet been obtained. At least one peer-reviewed publication will be prepared after the study is completed in Spring 2009.