What Sources Contribute To the Buildup of Bacteria In Conesus Lake?

Conesus Lake Watershed Project

SUNY Brockport, SUNY Geneseo, Cornell Cooperative Extension

Issue:

The contamination of Conesus Lake by coliform bacteria like *Escherischia coli*, is a well-documented problem that has periodically lead to beach closings during the summer season. High levels of *E. coli* in the water are an indication of fecal contamination and of potential risk of exposure to other fecal pathogens. The two most common sources of fecal contamination wee believed to be sewage or septic tank leaks and agricultural practices in the watershed – especially dairy cattle operations.

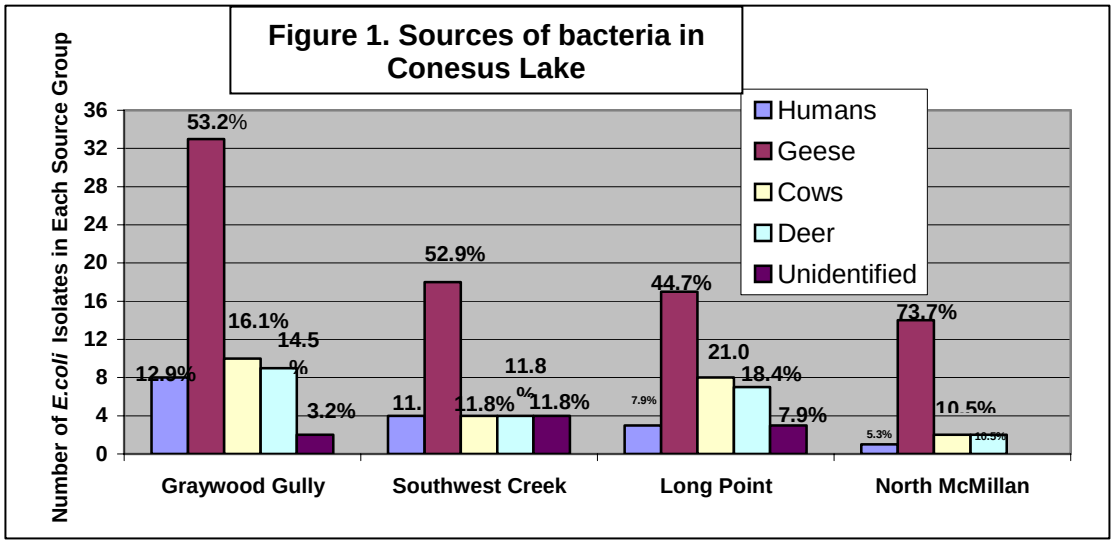
Research Implemented:

Elevated *E. coli* levels may be caused by cows, hogs, deer, geese, etc., as well as human beings. Traditional microbiological methods do not provide the ability to identify the sources of *E. coli* present in the water. Bacterial Source Tracking or BST is a modern approach that uses genetic finger printing techniques to identify the source of bacteria. We used PCR (Polymerase Chain Reaction), a genetic finger printing method, to identify the sources of *E. coli* in the waters of several streams draining watersheds heavily in agriculture. Seasonal water samples were taken over a two-year period.

Results:

Winter and spring sampling during periods of no rainfall demonstrated that geese were an important source of *E. coli* in Conesus Lake. This was a surprise as it was expected that dairy cows were the major source. NYDEC estimates from 1997 to 2001 indicate that an average of 377 (59 to 863) geese was present in Conesus Lake in January. Given an average of 200 g of droppings per individual per day, these animals could have contributed about 26 to 380 lbs of feces in one month.

Figure 1. Sources of bacteria in Conesus Lake



Background: In the Conesus Lake watershed, several research projects testing various management plans to maintain soil and nutrients on farmland and thus reduce impacts on Conesus Lake have been implemented. Funding was to the State University of New York (SUNY) at Brockport, SUNY Geneseo and Cornell Cooperative Extension from the Cooperative State Research, Education, and Extension Service of the United States Department of Agriculture. With the voluntary cooperation of several farmers within the Conesus Lake watershed, several "Best Management Practices" have been implemented since 2002. These practices include reduction of manure spreading during the winter on steep sided slopes, construction of gully plugs, nutrient reduction, etc. Results on bacteria levels, shore algae and water chemistry are available at the project's web site http://www.envsci.brockport.edu/Conesus_Project