

**DETERMINING SOURCES OF FECAL CONTAMINATION IN TWO RIVERS  
OF NORTHUMBERLAND COUNTY, VIRGINIA**

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(ABSTRACT)

The goal of monitoring the water quality of shellfish beds is to provide protection against transmission of water-borne infectious diseases. The Coan River and the Little Wicomico River contain shellfish beds that are closed to harvest due to contamination with fecal bacteria. These two rivers are located in Northumberland County, Virginia, and empty into the lower Potomac River and the Chesapeake Bay.

Bacterial source tracking (antibiotic resistance analysis of *Escherichia coli*) was used to determine the sources of fecal contamination that have caused shellfish harvest closures in these two rivers.

A total of 1,248 *Escherichia coli* isolates were collected from known sources to build a regional library for the rivers. The Virginia Department of Shellfish Sanitation (DSS) and project cooperators collected known source samples from August 2001 to September 2002.

The Average Rate of Correct Classification for the known source library was 71.9%, with a total of 930 isolates correctly classified. The categories (and rates of correct classification) were Birds (84.7%), Humans (74.8%), Livestock (72.4%), Pets (62.0%), and Wildlife (65.7%). The library was used to identify the sources of *Escherichia*

*coli* isolated from DSS sampling stations along the Coan and Little Wicomico Rivers from August 2001 to September 2002. Some stations contained a substantial human signature, while wildlife and birds are also major contributors. The results will be used to decide the necessary changes that need to be addressed if the shellfish harvesting beds are to be reopened.