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News Release

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Note to reporters: This news release can be viewed online at http://oh.water.usgs.gov/newsreleases/PortageMST.pdf

New Technology Being Tested to Identify Waste Sources in Portage River Watershed, Ohio

Fecal contamination of the Nation's water supplies by human and other animal waste is a growing concern in agricultural watersheds, such as the Portage River Watershed in northwestern Ohio. The U.S. Geological Survey (USGS) is testing a new technology, called microbial source tracking (MST), to identify potential sources of fecal contamination. Partners in this effort are Bowling Green State University and the Wood County Health Department.

"Possible sources of fecal bacteria in typical agricultural watersheds are discharges from home septic systems and small wastewater treatment plants, runoff from livestock operations, and pet and wildlife feces," said Christopher Kephart, USGS microbiologist and project leader. "The purpose of this study is to evaluate the utility of microbial source tracking techniques which may be able to track these waste sources in the Portage Watershed."

Bacteria that inhabit the intestines of warm-blooded animals can have DNA sequences or "markers" that are unique to the animal species. One kind of MST technique uses those unique DNA markers to trace the bacteria found in animal waste shed into the environment back to the original source.

"First we have to establish that DNA markers, identified by various researchers, can be found in waste sources in the Portage Watershed. We do that by collecting samples from potential fecal contamination sources such as septic waste, cattle manure, and wastewater plants," said Kephart. "Then, we analyze those samples to determine the presence or absence of these unique DNA markers. If the unique markers are present, we can then collect samples from streams and ditches draining known waste sources to verify that sources of waste can be differentiated."

In this study, researchers will not be attempting a comprehensive identification of all waste sources and their contributions to the watershed; instead, the focus will be on testing the usefulness of the MST technologies in this local setting. If the MST markers can successfully distinguish between sources, they could then be used later in a larger scale study in the Portage Watershed. Similar MST studies are being conducted in other parts of the country.

Brad Espen, Director of Environmental Health at Wood County Health Department, noted that "This USGS research project will establish baseline knowledge about existing waste contamination sources and water quality in the watershed now and will help us determine if watershed protection steps need to be initiated."

Bowling Green State University is a collaborator on the study. Dr. Robert Midden, associate professor in the Department of Chemistry at BGSU has experience monitoring for contaminants in the Portage Watershed. "We have been collecting and analyzing water samples in the Portage Watershed, and this study with the USGS will open up more opportunities and new avenues of research to address the environmental concerns."

Additionally, Dr. Midden will be providing a hands-on opportunity for some BGSU students as they will be trained by USGS researchers to collect samples and analyze them for concentrations of the fecal-indicator bacteria *E. coli*. "I am excited that my students are getting hands-on experience working on this real-world problem," said Dr. Midden.

Researchers currently do not have a standard method to identify sources of fecal contamination. Understanding sources of fecal contamination helps protect the quality of our waters for beneficial uses such as drinking water and recreation. It also identifies the contributions of contaminants from the Portage River into Lake Erie.

Funding for the study is provided by the Ohio Lake Erie Commission and the U.S. Geological Survey.
More information about microbial source tracking is available on the web at http://oh.water.usgs.gov/micro_sourcetracking.htm .

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