

**PA Department of Environmental Protection
Environmental Forum on Emerging Contaminants
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Bacterial Pathogen and Source Marker Occurrence in Pennsylvania Surface Water

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Abstract: The USGS Michigan Water Science Center has been conducting research into the occurrence of pathogenic Shiga-toxin producing *E. coli* (STEC) and markers of fecal sources in surface water from a 27-station water quality network in Pennsylvania using Polymerase Chain Reaction (PCR) methodology. Study results from the first year of sample collection will be presented in the context of other regional and national findings, and the relative merits of available pathogen and source detection methods will be discussed. Occurrence data will be presented in relation to indicator bacteria concentrations, contributing land use, season, and other relevant parameters.

Mr. Joseph Duris received his B.S. in Biomedical Science and his M.S. in Biological Science from Western Michigan University. He has worked for the U.S. Geological Survey at the Michigan Water Science Center in Lansing, MI for the past six years. His research interests include: understanding how anthropogenic and natural processes affect the occurrence, distribution, and fate and transport of bacterial pathogens in surface water; understanding the structure of communities of commonly measured fecal indicator bacteria; and understanding how the occurrence of pathogens relates to human risk.

Emerging Contaminants in the Tidal Delaware River: A Pilot Monitoring Survey

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Abstract: A pilot survey in the mainstem of the tidal Delaware River sampled and analyzed ambient waters for pharmaceuticals and personal care products (PPCP), and perfluorinated compounds (PFC) by liquid chromatography/tandem mass spectrometry (LC/MSMS); hormones, sterols and nonyl phenols by gas chromatography/mass spectrometry (GC/MS); and polybrominated diphenyl ethers (PBDE) by high resolution gas chromatography/mass spectrometry (HRGC/MS). Twenty-one out of fifty-four PPCP analytes were detected in ng/L concentrations. Aquatic ecotoxicity data, primarily based on individual compounds and single species tests, are readily available for only sixteen out of the twenty-one PPCP analytes detected limiting assessment of risk to aquatic life. PFC were measured in ng/L concentrations that exceed benchmarks for water quality. Nonyl phenol levels did not exceed current United States Environmental Protection Agency water quality criteria. PBDE were measured in pg/L to ng/L concentrations with homolog distributions similar to those observed in other North American locations. Natural and synthetic hormones were reported in ng/L levels. Concurrent, short-term chronic toxicity tests for survival, growth, and reproduction in the ambient water samples did not indicate toxicity for species and endpoints measured. Assessment of ecotoxicity from emerging contaminants in the tidal Delaware River would be further informed by estrogenicity screening, biomarker measurements and population (sex ratio) surveys.

Dr. Ronald MacGillivray is an Environmental Toxicologist at the Delaware River Basin Commission (<http://www.state.nj.us/drbc/>). His work includes characterizing contaminants of emerging concern, monitoring ambient toxicity, establishing water quality criteria, and developing Total Maximum Daily Loads (TMDLs) / Pollution Minimization Plans (PMPs) in the Delaware Estuary. Prior to working at the DRBC, Dr. MacGillivray taught at West Chester University and was a Project Scientist at the Fate and Effects Laboratory of Weston, Inc. Dr. MacGillivray's education consists of a Ph.D. in Environmental Sciences from the University of Massachusetts at Boston, a M.S. in Microbiology from Rutgers University and a B.S. in Biology from Northeastern University. He is the current President of the Hudson Delaware Chapter of the Society of Environmental Toxicology and Chemistry (<http://www.hdcsetac.org/>).