

MS Thesis
Department of Environmental Science and Policy
George Mason University

Candidate: Stephanie Gordon

Date: April 12, 2019

Time: 11:00 am - 2:00 pm

Location: Potomac Science Center, Room 3201

Title: Population Dynamics and Pharmaceutical Contamination in Streams and Rivers Across the United States

Thesis Director: Dr. Gregory Foster

Committee: Dr. Thomas Huff, Dr. Enrique Montaña

Abstract

Pharmaceutical contamination of surface waters across the United States has become an issue of increasing concern and study. These compounds can negatively impact the health of aquatic species and present an exposure risk to other species and humans who interact with contaminated water or use them as a source of drinking water. Pharmaceutical compounds and metabolites can enter streams from multiple sources including leaky sewer pipes, septic tanks, sewer overflow, and wastewater treatment plant effluent. Although human use is undoubtedly the main source of pharmaceutical loading to streams, stream contamination studies often focus on landscape point and non-point sources as it is difficult to geographically define populations affecting contamination in surface waters. This study develops a method to identify and define human populations contributing to environmental water contamination and additionally uses previous sampling efforts to apply this method at three scales: national, regional, and local. The method developed was also used to understand the relationships between population demographics and socioeconomic factors with type and concentration of pharmaceuticals at each scale.