Developing Indicators of Contamination Originating from On-Site Wastewater Treatment

Talia Chalew, and Dr. Howard Weinberg
UNC-CH, School of Public Health/Dept. of Env. Sciences and Engineering

New synthetic chemicals are continuously introduced into the marketplace without adequate understanding of their environmental fate, including transport and degradation. This is a particular concern with conventional on-site wastewater treatment that was not designed to handle chemicals, such as drugs, that are resistant to biological degradation. It is likely; therefore, that many of them will be discharged into soils or accumulate in sludges, which will impact ground and surface water quality. With septic system failure, which occurs in nearly half the septic systems in North Carolina, chemical constituents are likely to reach surface and ground water. Currently, there is no means of determining this impact.

For this study, representative emerging contaminants are being targeted that are used in households, are known to survive wastewater treatment, and are thus likely to be present in septage and effluent. Methods for the detection of these compounds in various matrices have been developed and applied to both municipal and on-site wastewater effluents. Surface water near both types of wastewater treatment are being monitored for detection of these chemicals with the objective of identifying chemical tracers that can distinguish between effluent discharges from these two sources.

Development of an indicator of septic pollution in surface water will provide a valuable tool for environmental protection. Such an indicator would allow more effective use of resources for identifying sources of pollution and remediation.