



Real time Measurement of Nitrate in Stream Water for a Paired Basin Study within the Choptank River Watershed, Maryland, USA.

Greg McCarty

USDA ARS, Beltsville, United States (greg.mccarty@ars.usda.gov)

For this study, a robust water quality monitoring system was designed to measure nitrate and sediment using a commercially available UV-Vis spectrometer probe. To increase reliability for monitoring highly dynamic small streams and reduce susceptibility to vandalism in public place installations, an innovative monitoring system was implemented around the use of a flow cell attachment for the probe with automated stream water sample delivery using a peristaltic pump. This permitted all instrumentation and electronics to be housed in secure enclosures with maximum flexibility in sampling location in the dynamic stream cross section. Monitoring systems were successfully deployed at two USGS stream gauge stations located at public parks near the towns of Ruthsburg and Greensboro within the Choptank Watershed which established a paired basin comparison of water quality. Both basins have a mixed land use of cropland in largely corn - soybean rotation and forests containing extensive wetland complexes. The basins have very similar amounts of cropland area but the Greensboro basin contains more wetlands and cropland formed from wetland drainage. Monitoring data has shown that the Ruthsburg basin exports about 25% more nitrate per area of cropland than the Greensboro basin. These results are indicative of greater landscape processing of nitrate in the Greensboro basin due to greater prevalence of wetlands and poorly drained soils in crop production.