

**A BASELINE STUDY USING PERIPHYTON COMMUNITIES IN SHAMOKIN CREEK, AN ACID MINE IMPACTED STREAM IN NORTHUMBERLAND COUNTY, PENNSYLVANIA**

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**Abstract:**

We present the results of a three month study as part of on-going monitoring program using periphyton communities found in Shamokin Creek, a tributary of the Susquehanna River affected by acid mine drainage (AMD) in Northumberland County, Pennsylvania. We sampled five sites, three located on the main stem (Hospital, 61 Bridge, Waste Water Treatment) and two located on the upper tributaries (North, and South) for a period of three months at three week intervals. AMD originated in the upper portion of Shamokin Creek while agricultural influences also occurred in the lower reaches of the stream. Diatometers and chlorophyll samples were collected for analysis in the laboratory. Water chemistry collected included standard physical chemistry (pH, oxygen, total dissolved solids (TDS), oxidation-reduction potential (ORP), turbidity, and temperature) and chemical (ammonium, phosphate, nitrate, and hardness). Diatometers were preserved in the field and prepared for microscopic examination by the ethanol dehydration method, thus allowing dominant and common taxa in the biofilm to be classified and counted. Chlorophyll was analyzed using spectrophotometric analysis and confirmed our results of the biofilm examination. We cleaned scrapings of the biofilms from rocks, sticks, and leaves with concentrated nitric-sulfuric acids to generate slides of cleaned diatom frustules for classification and enumeration with scanning electron and differential interference contrast microscopy. Our results show the common species of diatoms present to be *Eunotia exigua*, *Navicula pupula*, *Cocconeis placentula*, *Cymbella tumida*, and *Cyclotella meneghiana*. In the coal mining region, *Frustrulia rhomboides* and *Eunotia exigua* were dominant, which is in agreement with earlier studies as key species indicating the presence of AMD. All sites had low pH (4-6) and high oxygen levels, but the turbidity, ORP, and TDS varied site to site. These results demonstrate that AMD has a significant general impact on Shamokin Creek. The diatom communities, however, are robust and seem to be identical throughout the stream and through the fall (September through November).