

Abandoned Mined Land Impacts on Water and Sediment Quality, and Invertebrate Assemblages in Two Virginia Watersheds. J.L. Yeager, J. R. Bidwell, D. S. Cherry and C. E. Zipper. The constituents of abandoned mined land (AML) discharges (acidic pH, metals, dissolved solids, total suspended solids) can be toxic to aquatic life. Studies were undertaken to determine environmental impacts of acid mine drainage (AMD), a component of AML, in the Black Creek and Ely Creek watersheds, Wise and Lee Counties, Virginia. Conductivity and pH in the stream were measured to survey the magnitude of AMD discharge within each system. Water, sediment and water/sediment mixtures that simulate storm events were analyzed for metal content (Al, Fe, Mn, Zn, Cu, Mg). Benthic macroinvertebrates were collected seasonally using D-framed nets to determine AMD effects on relative abundance and taxon richness. Acidic pH ranged from 2.15-3.30 at three AMD-influenced seeps and varied from 6.40-8.00 at reference stations. Conductivity ($\mu\text{mhos/cm}$) ranged from 32-278 at reference sites and from 245 to >6000 at AMD-impact sites. Benthic macroinvertebrate abundance and taxon richness were notably lower in the seeps having only 1-3 taxa totalling < 10 organisms as compared to reference areas where richness values were 12-17 and comprised 300-977 organisms. Sediments from selected areas within Black Creek caused significant reductions in Daphnia magna reproduction relative to reference site sediments in 10 day chronic toxicity test. Concentrations of Fe, Al, Mg, Cu, and Zn were highest in the AMD influenced stations with low pH and high conductivity.

Additional Key Words: Acid Mine Drainage, Metals