

Quantifiable Water Chemistry Trends in Streams Degraded by Acid Mine Drainage

David Graebe and James Wood

Abstract

Surface coal mining has been a major economic force in the Appalachian region for hundreds of years. Surface coal mining leads to runoff known as acid mine drainage (AMD) which infiltrates and severely degrades freshwater streams. Acid mine drainage impacted streams often see a marked decrease in biodiversity especially Ephemeroptera, Plecoptera, and Trichoptera (EPT taxa) which are intolerant to pollution. We researched the water quality in four streams. Two downstream mines were impacted by AMD while the other two served as control or unimpaired sites. Water chemistry of all four streams was measured including sulfate, iron, and magnesium using a YSI 9500 photometer. The pH of each stream was measured using a YSI Quatro meter. We found elevated levels of sulfate and iron in the impaired streams while magnesium levels varied across sites. The pH tended to be lower in the impaired streams but remained fairly alkaline (pH > 5). These data are useful for understanding the chemistry of impaired streams and how freshwater macroinvertebrates may respond to these chemical parameters. Additionally these data aid in remediation efforts which may be dependent on specific water chemistry.