POSTER PRESENTATION

Feasibility of modest addition of organic matter and nutrients to enhance biological resilience and recovery after acid pulses in AMD-impacted streams

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Streams impaired by acid mine drainage (AMD) exhibit altered food webs with reduced diversity and abundance of fish and macroinvertebrates. Low abundances of grazers and shredders, and lower productivity of periphyton and biofilms can compromise energy flow from basal resources to intermediate trophic levels. We hypothesize that persistent low nutrient and energy availability may slow the recovery of biological communities even after water chemistry improves. If so, modest additions of nutrient (N, P) and organic carbon, in addition to alkalinity, could significantly enhance post-treatment recovery. We conducted experiments in artificial stream channels in a greenhouse to test the effect of different combinations of N, P and dissolved organic carbon (potassium citrate, molasses, leaf matter) on the survival and growth of key macroinvertebrate grazers and shredders also exposed to simulated AMD (by addition of FeSO4). We predicted that treatments with added organic matter and nutrients would exhibit enhanced biofilm production, improved nutritional value to grazers, and would be less affected by the negative effects of AMD exposures, in terms of macroinvertebrate survival and growth. In a series of 7 to 15 week experiments, we measured responses of two macroinvertebrate grazers (Heptageniid mayflies and physid snails) and 3 shredders (Tipulid craneflies, *Pycnopsyche* caddisflies, and Nemourid stoneflies) to nutrient and carbon additions. The results were not straightforward, indicating that biotic interactions among grazers and shredders and other environmental variables, such as light availability, were important determinants of the outcome of nutrient and carbon treatments.