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Acid mine drainage, also known as acid rock drainage, is one of the major environmental complications in West Virginia. Acid mine drainage is when abandoned mines leak heavy metals into streams and rivers. Acid mine drainage also leaches into the groundwater, which in turn may have implications on plant community composition and health. An abandoned mine field site in West Virginia is being identified and all necessary permissions to conduct research at the site are being obtained. Field work will consist of laying out multiple transects radiating outwards from the abandoned mine site. Along each transect plots will be established in which all plants will be tallied and soil properties such as pH and iron levels will be measured. Measures of species composition, diversity, and richness will be calculated and modelled against soil properties. We will also measure functional traits of select acid intolerant species along the gradient to assess within species differences in performance.

We hypothesize that along a gradient of acid mine drainage contamination will decline (pH will rise, iron toxicity will decrease) with distance from mine. We hypothesize that the effects of groundwater contamination will have a negative impact on community composition, diversity, and within species performance. Community composition is predicted to shift from dominance of low pH tolerant species to less tolerant species, and within species performance is expected to rise with distance from mine. Understanding community and individual species responses to soil contamination is critical for reclamation and management efforts.