

Cameron Priester

Using Aquatic Snails to Measure Heavy Metals and Assess Wetland Remediation Success

Joplin and Webb City have long histories of mining for heavy metals. Decades of mining activity have contaminated soil and water throughout the region. It has been observed that aquatic snails can uptake heavy metal ions and incorporate them into their shells. These snails, along with their heavy metal ions, are eaten by other organisms and become mobile in the food chain. The goal of this research is to create a method to analyze metals in snail shells, soil, and water in order to determine if habitat restorations have been successful at reducing heavy metal toxicity to wildlife. Snails, soil, and water will be analyzed from remediated and non-remediated wetlands for comparison. For each heavy metal, including lead, zinc, cadmium, and iron, we created solutions at several concentrations and confirmed concentrations using the MPAES 4200 atomic emission spectrometer in the chemistry department of MSSU. The snail shells from various wetland sites will be pulverized and dissolved in acid to free any metal ions. This solution will be diluted to a known volume and analyzed with the spectrometer. Further calculations will determine the heavy metal ion content of the samples. Soil and water samples from the same areas as the snails will be analyzed to see if there is a correlation between the metal content in the environment and the content in the snail shells. Our comparison of heavy metals in samples from remediated and non-remediated sites has important implications for land management and conservation throughout the greater Joplin region.