



Environmental Science Graduate Program Student Seminar Series

Investigating the Modifying Effects of Soil Properties on Heavy Metal Bioavailability

● **Loryssa Lake**

Smith 3150 | 11/1/19 | 2:00 - 3:00 pm

Abstract:

The human and ecological health risks associated with contaminated soils cannot be underscored. Depending on the heavy metal, contaminant concentrations do not have to be high to cause negative impacts on plant growth, microbial and soil fauna populations, and human health. Policy makers are particularly interested in heavy metal exposures to children, of which, the primary exposure route is through hand-to-mouth activity (ingestion). Therefore, models that predict the human health risk of exposure often depend on how much is absorbed from the gastrointestinal tract. The fraction of the ingested contaminant absorbed into the body is termed the bioavailable fraction. The bioavailability of a contaminant is dependent on its solubility, speciation, and the presence of modifying soil properties that can result in the production of insoluble solid phase compounds. Consequently, many risk assessors overestimate the human health risk from soil contamination as their assessments are based on total concentrations, fractions of which are often inaccessible. Modifying soil properties include soil pH, Fe/Al oxide content, clay content, presence of soil organic matter (SOM), and cation exchange capacity (CEC). The purpose of this research is to investigate the impact these modifying properties have on heavy metal bioavailability. We examined 19 different soil types, of varying properties, for their ability to dampen heavy metal bioavailability towards human and ecological receptors. From this research, we hope to better predict the risk associated with heavy metal soil contamination.

