☒ **Talk** ☐ **Poster**

Redox and Phase Transformations of Metal(loid)s in Wildland Urban Interface Fir Ash and Heated Soils

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The increase in fires at the wildland-urban interface (WUI) has raised concerns about the potential environmental and human health impacts of fire emissions as well as the mobilization of metal(loid)s from WUI fire ash and heated sediments and soils to groun and surface waters. Metal(loid)s in WUI fuel, sediments, and soils undergo dynamic redox and phase transformations during WUI fires as a result of heating and combustion of organic matter which releases reducing gases (*e.g.,* CO, CH_4, and H_2)[1-3]. These reducing gases together with carbon has been shown to induce metal(loid) reduction. However, the consumption of organic matter and thus reducing gases could lead to re-oxidation of the newly-reduced metal(loid)s. Therefore, the objective of this work is to improve the fundamental understanding of the dynamic transformations of metal(loid)s as a result of fuel heating in WUI fires. To this end, this presentation will discuss **1)** the speciation of metal(loid)s such as As, Cr, Fe, Mn, and Ti in field-collected WUI fire ash as a function of combustion completeness indicated by the color of the ash, and **2)** the dynamic transformations of As in As-rich native sediments during sediment heating at temperatures relevant to sediment and soil heating during wildfires. This speciation of metal(loid)s in bulk ash were determined using bulk X-ray Near Edge Structure (XANES) spectroscopy. The dynamic transformations of As in native sediments were determined using in-situe time-resolved XANES. Additionally, μ-XRF and μ-XANES results were used to identify end-member model compound for linear combination fit of the bulk XANES data.

References

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