


# 102070 Impacts of a Shifting Redox Potential on Arsenic Sorption to Goethite.

**Poster Number**

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***Joshua Sanchez***[1], *Jason Stuckey*[1] *and Donald L Sparks*[2], *(1)University of Delaware, Newark, DE (2)221 Academy Street, University of Delaware, Newark, DE*

**Presentation Description:**

**Abstract:**
Climate change and subsequent sea level rise (SLR) are increasingly important global issues, especially as mean sea levels are expected to rise approximately 1 m by the year 2100. Along coastal zones throughout the world, industrial activity has left a history of legacy contaminants, such as arsenic (As), that will be affected by changing redox conditions. This study aims to investigate the impact of shifting redox conditions on arsenate, As(V), and arsenite, As(III), sorption onto goethite in the presence of fresh water or seawater, which is directly tied to As mobility. Although previous studies have observed the fate of As in decisively reduced or oxic conditions, limited research exists on the effect of incrementally changing redox conditions on As mobility in model fresh water and seawater environments. To begin probing this knowledge gap, As(V/III) sorption isotherms will be conducted to elucidate arsenic loading extent to goethite. X-ray adsorption spectroscopy (XAS) will later be performed to determine mineral structure and As binding mechanisms. After a myriad of characterization experiments, As-bearing goethite samples will be reacted with synthetic fresh or sea water at redox windows ranging from -200 mV to +300 mV in advanced automated biogeochemical microcosms. Arsenic oxidation state and concentration will be quantified to determine the degree of As mobilization at differing redox potentials whereas XAS will be utilized to determine As bonding environments in the solid phase. Variations in results between the fresh water and seawater systems will be monitored to identify differences in As mobility. These results will give insight into the environmental fate and cycling of As along coastal zones, which have positive applications to human health.

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