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Phoenix Convention Center North, Room 225 A

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[CEU Approved Sessions](#) **Audrey V Gamble**, DE - Delaware, University of Delaware, Newark, DE and Donald L Sparks, 221 Academy Street, University of Delaware, Newark, DE

Presentation Description:

Abstract:

Current methods to identify speciation (forms) of soil P rely on sequential extraction methods which are operationally-defined and can introduce artifacts during analysis. Non-invasive synchrotron-based spectroscopic techniques can overcome limitations of current methods to speciate soil P in situ. This study examines the capabilities and limitations of spatially-resolved X-ray fluorescence (XRF) and X-ray absorption near-edge spectroscopy (XANES) to speciate P in heterogeneous soil samples. Novel synchrotron tender-energy (1-5 keV) X-ray beamlines at the National Synchrotron Light Source (NSLS) and the Stanford Synchrotron Radiation Lightsource (SSRL) were used in this study to characterize P hotspots and determine forms of inorganic and organic forms of P. Soils with varying chemical properties and high (>800 ppm) P loadings were collected from within the Chesapeake Bay watershed to evaluate soil P speciation. Initial data indicate the presence of Ca phosphates, Al-sorbed P, and Fe(III)-sorbed P. Speciation varied based on soil physical and chemical properties.

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