12 - Biogeochemical transformation of Fe- and Mn- along a redox gradient: Implications for carbon sequestration within the Christina River Basin Critical Zone Observatory

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Organic carbon (C)-mineral complexation mechanism is crucial in C sequestration. It is a function of geomorphologic, hydrologic, and microbiological processes. Soil horizons with abundant Fe and Mn oxides/hydroxides have high mineral surface area and thus a high capacity to complex C, reducing its susceptibility to microbial degradation.[p]At the Christina River Basin-Critical Zone Observatory, located in the Piedmont region of southeastern Pennsylvania and northern Delaware, we investigate how Fe- and Mn-redox transformations affect the C cycle under varying redox conditions across a wide range of landscape uses, such as floodplain forest, upland forest, and agriculture.[p]This multidisciplinary field study will demonstrate the combined results for the chemical composition of soil-pore water, bulk soil, and molecular analysis on microbial communities coupled with an advanced sensor network for real-time monitoring of hydrological and biogeochemical parameters. These sensors can be widely installed at low cost using open-source hardware and software platforms.

Sunday, March 25, 2012 10:40 AM
Redox Transformations of Metals in Sediments at Molecular to Pore Scales (08:30 AM - 12:20 PM)
Location: San Diego Marriott Marquis & Marina
Room: Miramar

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