SWES Colloquium Series 2013-2014

Department of Soil, Water and Environmental Science

Woody plant encroachment: Influence of landscape change on soil carbon fluxes, weathering, and ecosystem function

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Biosphere 2

The structure, integrity, and function of water-limited systems are highly sensitive to the amount and timing of precipitation, disturbance, and landcover change. Over the last century, many regions around the world have seen extensive landcover change by way of a transition in the vegetative composition of the ecosystem. This is particularly true within our own semiarid Southwest, which is undergoing a simultaneous shift in landcover and projected climate. The expansion of woody plants into grasslands shifts community composition, structure, and function due to differential phenology, physiological responses, and microhabitat modification. Woody encroachment can also influence hydrologic processes due to altered vertical root depth distribution and micro-scale energy balance changes associated with attenuation of incoming solar radiation, both of which impact water and carbon cycles.

Many have worked to identify the causes of the observed woody plant encroachment. Our research group is focused on identifying the consequences of this large-scale landscape change on leaf-, soil patch-, and ecosystem-scale carbon and water pools and fluxes. We use a combination of field and controlled environment facilities (Biosphere 2) to tackle some of the big questions in regional plant-atmosphere-soil interactions through interdisciplinary science. In this presentation, I'll highlight our latest findings related to (*i*) lags in linkages between aboveground function and belowground dynamics, (*ii*) the impacts of changing precipitation schemes on soil formation, weathering, and carbon efflux, and (*iii*) describe how these and other efforts can enhance our ability to improve semiarid terrestrial ecosystem process representation in land surface models.

Monday, November 18, 2013 -- 3:00pm

Marley 230

Refreshments at 2:45

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