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Title: **Assistant Professor**

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Education:

PhD: 2005, University of Arkansas MS: 1999, University of Arizona BS: 1996, University of Utah

General Areas of Expertise:

Biogeochemistry, Soil Ecology, Climate Change, Coupled Carbon and Nitrogen Cycles, Stable Isotopes

Short Bio:

Dr. Schaeffer is a soil biogeochemist in the Department of Biosystems Engineering and Soil Science with research interests in the coupled cycling of carbon and nitrogen and how they respond to active management and climate change. Research interests include microbial carbon cycling under drought, carbon and nitrogen cycling in Arctic ecosystems, and soil nutrient cycling and retention in agroecosystems.

Five Representative Publications:

An, T, SM Schaeffer, S Li, S Fu, J Pei, H Li, J Zhuang, M Radosevich, and J Wang. 2015. Carbon fluxes from plants to soil and dynamics of microbial immobilization under plastic film mulching and fertilizer application using 13C pulse-labeling. Soil Biology and Biochemistry, 80:53-60

Mbuthia, LW, V Acosta-Martinez, JM Debryun, SM Schaeffer, D Tyler, E Odoi, M Mpheshea, F Walker, N Eash (2015). Long term tillage, cover crop, and fertilization effects on microbial community structure, activity: Implications for soil quality. Soil Biology and Biochemistry, 89:24-34

An, T, SM Schaeffer, J Zhuang, M Radosevich, S Li, H Li, J Pei, J Wang (2015). Dynamics and distribution of 13C-labeled straw carbon by microorganisms as affected by soil fertility levels in the Black Soil region of Northeast China. Biology and Fertility of Soils, 51:605-613

Manzoni, S, SM Schaeffer, G Katul, A Porporato, and JP Schimel (2014). A theoretical analysis of microbial eco-physiological and diffusion limitations to carbon cycling in drying soils. Soil Biology and Biochemistry, 73:69-83

Schimel, JP, SM Schaeffer (2012) Microbial community composition and carbon cycling in soil. Frontiers in Terrestrial Microbiology, 3:348. doi:10.3389/fmicb.2012.00348

FEWSTERN Symposium 2017 Presentation Title and Abstract:

Sustainable soil management practices are a key factor at the nexus of food, energy and water systems. Soils are arguably the most biodiverse habitat on earth, home to an astounding abundance and diversity microbes. Collectively, these organisms provide a vast array of ecosystem services that sustain life on Earth. These essential processes include biogeochemical cycling of carbon (C) and nutrients that can provide for soil formation and stabilization, production of food, fiber, and bioenergy products, as well as sequestration and breakdown of contaminants that affect water quality. Though the interactions are complex, identifying the key determining factors and feedbacks controlling the composition and turnover times of soil organic matter pools will improve our estimates of C sequestration and nutrient use efficiency as well as their change with management actions and the climate. While these fine-scale mechanistic explanations are useful, we must also find a way to link them to their large-scale manifestations. Integrating these fine-scale mechanistic processes requires crossing traditional disciplinary boundaries and approaching research questions using a cross-fertilization of knowledge, skills and abilities.