BEYOND GREENNESS: LINKING REMOTE SENSING AND FLUX MEASUREMENTS TO STUDY COUPLED CARBON AND WATER CYCLES IN SEMI-ARID ECOSYSTEMS

SPEAKER: Mallory Barnes

2016 McGinnies Scholar

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TIME: 3:00-4:00 pm

LOCATION: ENR2, S107

ABSTRACT: William G. McGinnies and colleagues at the Carnegie Desert Botanical Laboratory laid the foundations for our ecological understanding of desert ecosystems. McGinnies' exploration of plant-water relations in led to key insights into climate impacts on plant water requirements and the effects of water limitation on plant production. My research builds on these insights, using a combination of remotely sensed and gas exchange data to explore drought impacts on plant productivity and carbon uptake in water-limited systems across spatial and temporal scales. My dissertation research addresses three key knowledge gaps: 1) relationships between leaf-level spectral and physiological properties, 2) the effects of drought timing on vegetation and ecosystem processes, and 3) impacts of drought on regional vegetation productivity and carbon uptake. In this talk I will establish a link between spectral measures of productivity and photosynthesis at the leaf level. Next, I use these techniques to investigate how the timing of drought in the Southwest influences the productivity of grasslands, shrublands, and forests and build on these findings to investigate regional patterns of drought and productivity. Collectively, my work is showing how the timing and intensity of drought impacts carbon uptake and vegetation productivity in semi-arid ecosystems. This work helps us understand linkages between the carbon and water cycles in arid and semi-arid ecosystems and informs predictions of vegetation response to future climate conditions. My research follows in the tradition of McGinnies' work in deserts, contributing to our understanding and ultimately informing management of semi-arid ecosystems.