



Moisture pulse and soil respiration dynamics of a Bishop pine forest in a Mediterranean type climate

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This presentation will focus on the importance of the amount, frequency, and timing of moisture pulses to soil respiration dynamics. The study was conducted in a Bishop pine forest Mediterranean ecosystem on the California Channel Islands, USA. The ecosystem is unique in that summertime moisture inputs are derived exclusively from many small fog-drip events, where as winter inputs are dominated by fewer, larger rain events. Results will include: (1) soil respiration fluxes measured by automated chambers and soil CO₂ profiles; (2) plant and microbial contributions to soil respiration separated by radiocarbon source partitioning techniques; and (3) microbial dynamics using field and laboratory measurements. We show that microbial decomposition responded immediately to summer- and winter-time moisture pulses. Root respiration responded to large rain events, but more gradually over seasonal timescales. Laboratory manipulations revealed differing microbial capacities to respond to moisture pulses depending on antecedent soil moisture conditions. Thus, alterations to the amount, frequency, and seasonality of moisture pulses have very different implications for plant and microbial respiration sources, and the total carbon respired in these ecosystems.