Impact of Sampling Frequency on Soil CO2 Flux Estimation. (S03-parkin131349-Poster)

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Abstract:

Carbon dioxide flux from soil is a key indicator of soil organic C decomposition, and field estimates of CO2 fluxes are a critical component in soil C budget calculations. Often cumulative CO2-C flux is computed from weekly or biweekly measurements; however the consequences of this procedure, specifically with regard to under-sampling in time, are generally unknown. This paper examines the temporal variation of soil CO2 flux at several scales. Automated chambers were used to measure CO2 fluxes at hourly intervals to quantify diurnal variations. From these measurements daily and seasonal CO2-C fluxes were calculated. A jacknifing procedure was used to compute the sampling frequency-dependant variabilities associated with the seasonal CO2 flux estimates. Our results indicate that the uncertainties associated with estimates of cumulative CO2-C flux increased with decreasing sampling frequency, and were approximately 7%, 20%, 30% and 50% when fluxes were measured at 2, 5, 10, and 20 day intervals, respectively. Strategies are presented for improving interpolation between sampling times to obtain better estimates of cumulative CO2-C loss.

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