Advances in Carbon Measurement with Laser-Induced Breakdown Spectroscopy: High Resolution Data from Intact Soil Cores. (S05-ebinger175222-Poster)

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Abstract:

Effective land management that results in sequestering carbon in soils depends on accurate, precise, and cost-effective measurement of total soil carbon. Currently, accurate and precise measurements are based on time-intensive laboratory analysis of soil samples. With the advent of new spectroscopic methods, however, analysis of soil samples can be reduced from days to minutes. Further, the potential to use laser-induced breakdown spectroscopy (LIBS) in the field to quantify total soil carbon allows for nearly immediate feedback of carbon concentrations and spatial variability to investigators. Recent advances make possible collection of soil carbon data along each 1 mm to 1 cm from intact soil cores up to 1 m in depth in about 15 minutes from extraction. These high-resolution data show the variability of carbon with soil depth in much more detail than was previously available. Calibration of LIBS data with dry combustion data remains somewhat problematic, but new developments to resolve matrix effects show promise. After calibration issues are addressed, carbon measurement from intact soil core will be a valuable tool in estimating carbon storage in soils.

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