Abstract

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Title: LBNL Terrestrial Ecosystem Science SFA: Belowground carbon cycling

TEXT: In LBNL's Terrestrial Ecosystem Science SFA on soil carbon cycling, we conduct basic research on soil carbon turnover, storage, and loss. Our goal is to improve process-level understanding of biogeochemical dynamics and develop next-generation predictive capacity in global models of soils' role in ecosystem-climate interactions. Recent research demonstrates that environmental and biological controls are as important as soil organic matter (SOM) structure for SOM dynamics. To improve predictions of SOM response to climate change, this SFA aims to integrate this emerging understanding into soil carbon models by conducting strategically designed experiments and using observations to test and develop new model structures and parameters.

This poster will feature results from the whole-profile soil warming experiment. Over half of global soil organic carbon (SOC) is stored in subsurface soils >30 cm deep. While most climate experiments have only warmed surface soils, we are warming (+4°C) a coniferous forest soil *in situ* to 1 m. Warming began in October 2013. It has increased surface soil respiration by 40% relative to the control and increased concentrations of dissolved organic carbon as well. In addition to these biogeochemistry results, we are also applying a combination of field and laboratory experiments, microbial ecology, advanced imaging, and numerical simulation modeling in tasks on, for example, microbial carbon use efficiency, SOM stabilization via organo-mineral interactions; and soil biogeochemical modeling.