Geophysical Research Abstracts
Vol. 13, EGU2011-9382, 2011
EGU General Assembly 2011

Linkage between erosion and sediment deposition and soil carbon storage within terrestrial ecosystems.

Greg McCarty
USDA ARS, Beltsville, United States (greg.mccarty@ars.usda.gov)

Landscape processes are important drivers of soil biogeochemistry. But existing biogeochemical models for soil organic carbon (SOM) have been calibrated/validated largely using data from plot studies largely isolated from topographically driven processes. Soil erosion and deposition through tillage and water transport are important in agricultural ecosystems and can greatly influence production and fate of soil organic carbon. The use of radioisotope tracers such as natural 210Pb and 14C as well as bomb produced 137Cs are useful for discerning linkages between soil redistribution and carbon storage in agricultural landscapes. Analyses of patterns of soil redistribution and soil carbon content in context of high resolution digital elevation models (DEM) provide strong indication of topographic controls on both redistribution and biogeochemistry. They also provide evidence for an ordered redistribution of soil carbon resources across biogeochemical gradients in landscapes which can significantly drive changes in carbon sequestration and storage. A better understanding of the role of landscape processes in soil carbon dynamics will improve understanding of impacts of agriculture on the terrestrial carbon cycle.