



Experimental investigations of the effects of soil erosion and deposition on soil organic matter dynamics

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We present preliminary results from an ongoing project in which the overall aim is to quantify the effects of soil erosion and deposition on soil organic matter (SOM) dynamics using a range of experimental approaches. We use a series of controlled rainfall-simulation erosion experiments on the University of Bristol's TRACE facility which is a dual axis soil slope measuring 6 m long \times 2.5 m wide \times 0.3 m deep accompanied by a nozzle-type rainfall simulator. In particular, the effects of hillslope gradient, rainfall rate and surface type (e.g. vegetated, bare soil) are being investigated on patterns of soil erosion and deposition and the resultant patterns of composition of sediment-bound organic matter compounds in eroded and deposited sediment. The effect of preferential transport of fines on forms of SOM transport is assessed by determining the distribution of key compound classes (e.g. inorganic and organic forms of nitrogen) within different particle size fractions. A suite of organic SOM-derived biomarker compounds are being used to determine: (a) SOM sources, (b) selectivity, (c) transport processes, and (d) mineralization, as affected by erosion and deposition. This information will be used to answer questions concerning how particular components of SOM behave under specific erosion/deposition conditions and determine how this relates to carbon-cycling in soils.