

Energy and Resources Group Spring 2008 Colloquium Series (ER295)

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The Significance of Soil Erosion for Terrestrial Carbon Sequestration

110 Barrows Hall – 4:00 p.m.

Understanding soil carbon dynamics in eroding landscapes is complicated by the effects of soil redistribution on both net primary productivity and decomposition. Recent studies arrive at contradictory results as to whether soil erosion constitutes a net source or sink of/for atmospheric carbon dioxide. In this presentation, I will discuss why and how soil erosion can constitute a carbon dioxide sink by: (a) defining the criterion necessary for erosion to constitute a carbon sink; (b) comparing the rates of soil organic matter decomposition at eroding and depositional settings; and, (c) identifying the potential for soils to provide protective surfaces (physical and chemical stabilization mechanisms) and the inherent biochemical stability of soil organic matter in eroding versus depositional settings. Although soil erosion has serious environmental impacts, the annual erosion-induced C sink can potentially offset up to 10% of the global fossil-fuel emissions of carbon dioxide.