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## Carbon fluxes in soil: long-term sequestration in deeper soil horizons

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Terrestrial ecosystems represent the second largest carbon reservoir, and the C balance in terrestrial ecosystems can be directly impacted by human activities such as agricultural management practices and land-use changes. This paper focuses on the C-sequestration in soil. Although many studies showed that the concentration of SOC is much higher in the shallow soils (0-30 cm), the deeper horizons represent a much greater mass of soil and represent a huge C-storage pool. The process of preferential retention of more strongly adsorbing components, along with competitive displacement of weakly binding components are the key processes that enhance the movement of organic carbon to deeper soil horizons. DOC represents the most dynamic part of organic carbon in soils, and thus can be used as a timely indicator of the short-term change of C-sequestration. Long-term experiments have demonstrated that higher SOC levels in shallow soils would lead to increased fluxes of DOC to deeper horizons, but more data on a wider range of soils and treatment strategies are needed to fully evaluate the linkages between changes in SOC in shallow soil, vertical fluxes of DOC to deeper soil horizons, and enhanced C-inventories in deeper, slow-turnover SOC pools.

Paper (PDF)

**关键词:** carbon flux; SOC; DOC; land use and management doi: 10.1360/gso50203