



## **Determining organic carbon distributions in soil particle size fractions as a precondition of lateral carbon transport modeling at large scales**

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The erosional transport of organic carbon has an effect on the global carbon budget, however, it is uncertain, whether erosion is a sink or a source for carbon in the atmosphere.

Continuous erosion leads to a massive loss of top soils including the loss of organic carbon historically accumulated in the soil humus fraction. The colluvial organic carbon could be protected from further degradation depending on the depth of the colluvial cover and local decomposing conditions. Another part of eroded soils and organic carbon will enter surface water bodies and might be transported over long distances.

The selective nature of soil erosion results in a preferential transport of fine particles while less carbonic larger particles remain on site. Consequently organic carbon is enriched in the eroded sediment compared to the origin soil. As a precondition of process based lateral carbon flux modeling, carbon distribution on soil particle size fractions has to be known. In this regard the present study refers to the determination of organic carbon contents on soil particle size separates by a combined sieve-sedimentation method for different tropical and temperate soils. Our results suggest high influences of parent material and climatic conditions on carbon distribution on soil particle separates. By applying these results in erosion modeling a test slope was simulated with the EROSION 2D simulation software covering certain land use and soil management scenarios referring to different rainfall events. These simulations allow first insights on carbon loss and depletion on sediment delivery areas as well as carbon gains and enrichments on deposition areas on the landscape scale and could be used as a step forward in landscape scaled carbon redistribution modeling.