Geophysical Research Abstracts, Vol. 9, 03483, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-03483


# Soil organic carbon as a function of soil type, land use and topography in tropical soils.

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Soils are a very important component of the carbon cycle. They capture more carbon from the atmosphere than the standing vegetation. Soil organic carbon (SOC) inventories at the local and the global scale are therefore paramount to understanding carbon balances and climate change.

Many site-specific factors can play a role in the distribution of organic carbon in a soil. How some of these factors affect soil organic carbon storage and fluxes is not clear yet. Even though climate is determinant for organic matter retention, the management that people give to a specific soil can enlarge or reduce its natural carbon fixing capacity. Thus, tropical soils have been considered vulnerable, deforestation and erosion due to poor management practices seem to be common problems in these regions.

In this study, the influence of three factors in organic carbon distribution of tropical soils is evaluated: soil type, land use and position in the landscape. Soil organic carbon contents of three different soils (two Inceptisols and one Ultisol) were measured on 124 sites around the towns of Turrialba and Siquirres in Costa Rica. Samples were taken for four different land uses (coffee, sugar cane, grassland and forest) at three different positions on the slope. For every profile, carbon was measured at every 10cm of depth, down to a maximum depth of one meter. Walkley and Black's method, which uses chromic acid to measure oxidizable organic carbon in the soil, was used to measure the amount of organic carbon in each sample. In general, a correction factor of 1.33 is used independently of the soil type to deal with incomplete carbon oxidation. Nevertheless, in this study the W&B method was calibrated with the dry combustion method in order to determine a specific carbon correction factor more adapted to each soil. The first results suggest that the correction factor could vary within different soils.

The results presented in this document will be part of an attempt at accounting car-

bon stocks in Costa Rica. Existing carbon estimations, combined with data measured directly will be used to create a soil distribution map using GIS-tools.

This kind of map could have an impact on the design of active soil management strategies and could help improve the assessment of carbon stocks locally and globally.