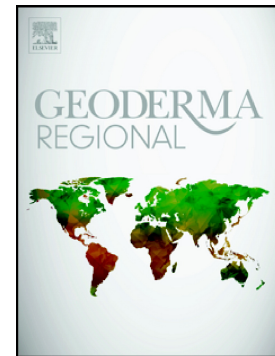


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Assessing stock and thresholds detection of soil organic carbon and nitrogen along an altitude gradient in an east Africa mountain ecosystem

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Abstract

It is well established altitude driven agro-ecological factors play a key role to influence soil organic carbon (SOC) and total nitrogen (TN) stocks in tropical mountain ecosystems. Land cover transformation is chiefly responsible for soil nutrient stock changes, with the magnitude of stock changes being a crucial concern for most of east African mountain ecosystems. With biophysical heterogeneity defined by localized micro-climates, spatial soil nutrient stocks patterns and their detection thresholds remain poorly understood. This study describes SOC and TN stocks within a research transect in the Taita hills, Southeast Kenya, using three forms of stratification: altitude, soil types and land cover categories. Results show a linear and positive relationship between altitude and either carbon ($R^2 = 0.30$; p -value < 0.05) or nitrogen ($R^2 = 0.35$; p -value < 0.05) stocks, but varied within land cover and altitude gradations. Cambisols had 30 % higher average SOC stock relative to Ferrasols and contained about half the stock observed for forest dominated Umbrisols. Average total nitrogen stocks in Cambisols and Ferrasols were

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