**Spatial variability of forest floor thickness for estimation of refined carbon stocks in a tropical montane forest**

ABSTRACT

Spatial variations of forest floor thickness in tropical montane forest influences carbon stocks estimates in forest floor and soil, microbial decomposition and soil conservation. Delineation of forest floor thickness according to decomposing layers (litter, hemic, sapric) and total forest floor will provide refined measurements of forest floor carbon stocks to improve site-specific carbon management. This study was aimed at determining spatial variability of the depths of decomposing forest floor layers in a tropical montane forest at varying topography. Sampling grids (10 m × 10 m) were established along three slope positions (summit, sideslope and toeslope) with 120 quadrants and their depths measured. Forest floor samples were georeferenced using a global positioning system. Variables were first explored using univariate statistics, including normality check, non-spatial outlier detection and data transformation. Variography and kriging analyses were used to quantify spatial variability of forest floor depths. Results showed that spatial structure of test variables differed across topographic positions. The coefficient of variation for test variables ranged from 27 to 64%. Surface maps displayed distinct spatial clustering and acceptable accuracy of interpolated values. Hemic and total forest floor were highest at the toeslope where hemic constituted approximately 80% of total forest floor. Site-specific management of forest floor carbon stocks in tropical montane forest should be based on topographic delineation.

**Keyword:** Detritus material; Spatial variation; High altitudes; Topography; Management zoning