Soil Carbon Stocks of a Temperate Deciduous Forest: Influence of Microclimatic, Edaphic, and Biotic Factors. (S05-castellanos083637-Oral)

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Abstract:

Soils are widely recognized as an important component of the global carbon cycle. To understand better the potential role of soils as sources or sinks of carbon, it is necessary to evaluate the organic carbon content of soils and its relation to other variables in the soil environment. We collected detailed soil data from 66 soil pits excavated in ten forest stands in the Hoosier National Forest in southern Indiana. Our objective was to examine the effects of vegetation age and microclimate (soil moisture and temperature) variation due to slope aspect on the soil organic carbon (SOC) content (kg m-2). The overall SOC content of these soils (to 1 m) was 5.67 +- 0.40 kg m-2 for the mineral portion and 0.88 +- 0.09 kg m-2 for the organic horizons. One half of the mineral SOC was found in the top 20 cm. There was a significant aspect effect on the SOC content. The NE-facing slopes with cooler and more humid conditions showed an average of 0.75 kg m-2 more carbon than the SW-facing sites. Soil water content was the microclimatic-related variable best correlated with carbon content. The mean annual topsoil temperature was not significantly related to SOC content.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 2:30 pm

Keywords:

Soil Organic Carbon, Forest Soils, Microclimatic effects, Carbon sequestration