Distribution and Controls on Soil Organic Carbon Stores in the Pacific Northwest, USA. (S07-homann114443-Poster)

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Abstract:

Understanding the role of soil organic C in the global C cycle requires knowledge of its amount, spatial pattern, and temporal changes over broad areas. The objective of this study was to characterize the soil C in the largely forested 180,000 square-kilometer region extending from the southern Oregon state border to the northern Washington state border, and from the Pacific Ocean to the east side of the Cascade Mountains. The average soil organic C in the 0 to 20-cm depth of mineral soils differed between two approaches: 51 Mg C per ha based on the state soil geographic data base vs. 65 Mg C per ha based on 690 pedons. The two approaches were highly correlated (r = 0.78) in their representation of the spatial distribution of soil C. Soil C per ha varied by an order of magnitude across the region. It increased with temperature, precipitation, and clay content, which together explained up to 44% of the variation. Resampling of 13 second-growth forest stands at a 25-year interval indicated no detectable change in mineral soil C; in contrast forest floor C increased by 8 Mg C per ha but was still 30% less than the average of 24 Mg C per ha found in old-growth forests.

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Presentation Information:

Presentation Date: Monday, November 11, 2002
Presentation Time: 9:00-11:00 am
Poster Board Number: 1917

Keywords:

soil organic C, soil-climate relations, forest soils, carbon accretion