Decomposing Root Systems-A Source of Error in Estimating Soil Carbon. (S07-vanlear150303-Oral)

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Abstract:

Sampling procedures to estimate soil carbon on forest sites typically avoid stumps and root systems of trees previously harvested. When sample points fall on stumps of harvested trees, the typical procedure is to offset 1 m to avoid woody root tissue which is not defined as soil. These procedures exclude a large pool of carbon that should be considered part of soil carbon. For example, just after harvest of mature pine stands on Typic Kanhapludults in the Piedmont of South Carolina, stumps and root systems contain about 28% of the below-ground carbon in the upper m of soil. Sixty percent of root system carbon is within 1 m of the stump, the area usually not sampled and which comprises 17% of below-ground carbon. Roots continued to be important deeper in the soil (50 to 100- cm depth) where root tissue comprised 25% of soil carbon at that depth. As root decay proceeds, carbon content of decomposing root systems declines. After 16 years, decomposing coarse roots within 1 m of the stump contain about 6 % of below-ground carbon. To accurately quantify carbon in forest soils, stumps (which gradually decay into the soil) and roots of harvested trees and their decomposition rates should be taken into account.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 1:00 pm

Keywords:
soil sampling, soil carbon