Enriched Background Isotope Study (EBIS): Application of an Ecosystem-scale 14C Tracer to Soil-Carbon-Cycle Studies. (S07-hanson095634-Poster)

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Abstract:

A radiocarbon release occurred near Oak Ridge, TN in July/August 1999. Measurements of 14C in tree ring cellulose throughout the area demonstrated the extent of the release and suggested a unique opportunity for study of carbon cycling at the ecosystem scale. Six issues are being investigated: 1) the partitioning of soil respiration between autotrophic and heterotrophic sources, 2) the partitioning of heterotrophic respiration sources between above-ground litter versus below-ground root detritus decomposition, 3) the pathways leading from leaf and root detritus to long-term stabilization of soil organic matter, 4) the role of dissolved organic carbon transport in distributing carbon within the soil profile, and 5) the longevity and turnover time of fine roots. The fate and transport of 14C-labeled root and leaf litter for typic Paleudult soils is being conducted by combining enriched vs. background sites with multi-year surface additions of enriched vs. background litter to yield a factorial combination of treatments. Observations will be used to parameterize and refine existing carbon dynamics models for the quantification of the longterm fate of ecosystem carbon inputs to soils.

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