



Mineralization of soil carbon stored by forest trees during exposure to elevated atmospheric carbon dioxide

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Large scale Free Air Carbon Enrichment experiments have shown that generally there is a substantial increase in forest tree productivity when trees are exposed to elevated atmospheric CO₂. It is often assumed that this increase in productivity will result in increased C storage in the soil, thus partially mitigating the rise in atmospheric CO₂. We measured C mineralization rates in soils taken from forest plots exposed to either: ambient conditions, elevated CO₂, elevated ozone, or elevated CO₂ plus ozone for 12 years. Soils were incubated for one year and the rate of C mineralization was measured. C isotope ratios were also measured in the respired CO₂ to detect the fate of the added CO₂ used during fumigation. The percentage of soil C mineralized during the incubation was significantly greater in soils from CO₂ enriched plots, but it was not enough to account for the fate of the increased production in CO₂ enriched plots. A substantial amount of C from the CO₂ enrichment remained in the refractory fraction of soil C.