


B31A-0524: Effects of Forest Management on Productivity and Carbon Sequestration: A Review and Hypothesis

Wednesday, 16 December 2015

08:00 - 12:20

 Moscone South - Poster Hall



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Forests hold more carbon than other terrestrial ecosystems and are seen as a key element in mitigating anthropogenic CO₂ emissions. However, the viability of this assumption is not certain as our understanding of carbon dynamics in the soil is incomplete. Furthermore, as the world's forests are increasingly affected by human activities, and a growing fraction are actively managed, the differences in forest structure and function must be considered when projecting their role in global biogeochemical cycling. Our recent analysis found that managed forests were, on average, 50-years younger and had 2-fold lower C pools. The genetic selection process and cultivation practices (notably fertilization, competition control, and disturbance) also alter allocation patterns that, in combination with the structural differences mentioned above, may affect carbon inputs and outputs from the soil. As the role of managed forests on the landscape increases, distinguishing them from the natural forests becomes increasingly important. The current study demonstrates the importance of accounting for management effects, and proposes a simple technique for tracking soil balance. Our analysis of two global databases found that a large fraction of forest soils lose more C through heterotrophic respiration than they gain through non-harvest fresh litter inputs annually, and that the deficit is greater in managed than unmanaged forests.

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