Factors Influencing Nitrogen Losses and Fixation in Fire-Maintained Pinus palustris Ecosystems. (S07-boring081540-Oral)

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Abstract:

Fire is an important influence upon the structure and function of many ecosystems, including controls on productivity, forest floor in N and P pools, N fixation and N and P availability. Fire characteristics, including seasonality and return intervals, as well as litter quality, mass and its distribution strongly regulate N losses and retention. A case study of the fire-maintained Pinus palustris ecosystem illustrates: significant combustion losses of N from a regular 2-3 year prescribed fire regime; slow decomposition and mineralization of N from dominant pyrogenic leaf litter types; rapid decomposition and mineralization of N from legume litter; large populations of diverse N-fixing legume species; variable but often high rates of symbiotic N fixation; and hypothesized long-term maintenance of soil N pools via belowground litter turnover. There were feedbacks between N combustion loss with fire, and litter immobilization of P without fire.

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