Nitrogen dynamics along a fire chronosequence in the Ponderosa pine/Douglas-fir forests of western Montana. (S07-mackenzie104204-Oral)

Authors:

- M.D.MacKenzie* School of Forestry, The University of Montana
- T.H.DeLuca School of Forestry, The University of Montana
- A.Sala DBS, The University of Montana

Abstract:

Low elevation Ponderosa pine forests of western Montana have historically been maintained by frequent low intensity wildfires, resulting in open, uneven aged stands, with grass understory. Fire exclusion over the last 100 years has caused a shift in forest structure to include Douglas-fir and shade tolerant shrubs. To date it is not clear how this change in fire frequency has influenced long-term ecosystem function. The objective of this study was to determine how fire exclusion shapes forest structure and understory composition and how these changes alter soil N dynamics. A chronosequence approach was adopted in which 14 paired sites were selected to represent change over a 130 year period. Each site was assessed for stand level and understory vegetation characteristics, and O horizon depth. Biochemical properties of the O horizon were also measured. Results demonstrate an increase in basal area, forest floor depth, Ericaceae species, total C, total N and total phenols with time since fire. Total phenolic concentrations were well correlated with forest floor depth suggesting that phenolic compounds accumulate and reduce decomposition with increasing time since fire.

Corresponding Author Information:

M. Derek MacKenzie The University of Montana School of forestry Missoula, MT 59812 phone: (406) 243-5326 e-mail: dmack@selway.umt.edu

Presentation Information:

Presentation Date: Monday, November 11, 2002 Presentation Time: 2:45 pm

Keywords:

Fire chronosequence, Nitrogen cycling, Decomposition, Phenolic compounds