The Effects of Wildfire and Post-fire N Fixation on the C and N Budgets of a Sierran Forest. (S07-johnson170022-Oral)

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Abstract:

We estimated carbon (C) and nitrogen (N) losses due to a wildfire and post-fire salvage logging and the gains due to regrowth and N fixation during a 16-year period following wildfire in a Jeffrey pine(Pinus jeffreyii) site in the eastern Sierra Nevada mountains of Nevada. The fire caused a minimum loss of 16,600 kg ha-1 of C and 340 kg ha-1 of N (about 10% of the total capital of each), assuming that all foliage and litter were consumed and that soil C and N were unaffected. Salvage logging removed about ten times as much C and an equivalent amount of N from the site as the fire. During the16 years that followed, the site was dominated by snowbush (Ceanothus velutinus Dougl.) and manzanita (Arcostaphylos patula Greene), which appeared to have added back as much C to the system in biomass and litter as was lost to fire but much less than was removed salvage logging. Nitrogen accretion in vegetation and litter at least equaled that lost to fire and logging. The benefits of allowing post-fire N fixation to replenish and even exceed lost N due to fire and logging must be weighed against the severe competition such vegetation creates for regenerating forests.

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Presentation Information:

Presentation Date: Monday, November 11, 2002
Presentation Time: 4:15 pm

Keywords:
Fire, Nitrogen, Carbon, N-fixation