NRESI RESEARCH COLLOQUIUM SERIES

FRIDAY

Mar. 2, 2007

3:30 - 4:30 pm

LECTURE THEATRE

7-158

LIGHT REFRESHMENTS SERVED AT 3:20 PM

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Dr. James H. Speer

Asst. Prof., Geography & Geology
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Indiana State University
More. From day one.

Applications of tree-ring analysis to understanding forest insect dynamics

Dendrochronology is a technique that provides a natural way to record environmental processes and human behavior. Because the tree becomes the instrument for environmental monitoring, it provides a long-term record that extends for the lifetime of the trees. Dendrochronology can provide records of past temperature, rainfall, fire, insect outbreaks, landslides, hurricanes, and ice storms to name a few applications. Trees record any environmental factor that directly or indirectly limits a process that affects the growth of the tree. It has broad applications in ecology and I will specifically be talking about its use in recording insect outbreaks and determining the effect of insects on tree growth in general. The first example that I will present will be a 1571-year reconstruction of pandora moth outbreaks, a defoliating insect, from ponderosa pine trees growing in Oregon. The second example will be examining the effects of periodical cicadas, a root parasite, on tree growth in the Eastern Deciduous Forest. By comparing multiple tree ring records I have been able to determine that pandora moth outbreaks seem to reduce fire occurrence, have a 20 and 40 year cycle of outbreaks, and are likely triggered by drought, but maintained by moist years. Cicadas have little overall effect on tree growth, but they do effect sites with heavy insect loads and may be significant in nutrient cycling.