THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

Brewster Malevich

(University of Arizona)

Reconstructing Klamath River Flow with Uncertain Instrumental Records: a Mathematical Tale of Passion, Deception, and Desire

Wednesday, December 3, 2014 - 12:00pm to 1:00pm
Room: Bannister 110

Tree-ring based reconstructions of streamflow variability are useful to water resource management. A challenge when developing reconstructions is assessing multiple uncertainties and how these uncertainties impact use in resource management. The skill of tree-ring reconstructions greatly depends on the quality and availability of tree-ring data and the instrument records used for reconstruction training and testing. This presentation will touch on the impact of potential uncertainty in instrumental records with an emphasis on streamflow reconstructions in the Upper Klamath River basin. Several instrumental records are available in the Klamath River basin. Unfortunately some of these records have limiting uncertainties. Complex basin hydrology and a long history of water use has made it difficult to estimate the river's natural flow. This presentation will explore a preliminary approach to tree-ring reconstructions which captures uncertainty from the instrumental record. This is, for the moment, a stubbornly crude Monte Carlo method. This method attempts to tackle complex interactions between variability in instrumental records and the resulting design of statistical models used for tree-ring reconstructions. Results give probability distributions for past streamflow events. These can be used to calculate exceedance probabilities for single and multiple-year moving average droughts relative to instrument-record drought events. The colorful characteristics of the computer-generated dendrochronological models used to reach solutions is also of interest.

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