



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

Rob Shepard

(University of Arizona)

*An exploratory study in wood anatomy, crossdating,
climate-growth relationships, life history, and
above-ground productivity*

Tuesday, December 8, 2015 - 4:00pm to 5:00pm

Room: Bannister 110

Velvet mesquite (*Prosopis velutina* Woot.) is a common tree in semi-arid, southwestern U.S. savanna ecosystems. While there are studies that examine some of the physiological and ecological aspects of this tree (response to fire, net ecosystem exchange, encroachment into grasslands, yearly growth through dendrometer bands, etc...), the wood anatomical features of a growth ring, suitability for dendrochronological research, life history, and above-ground productivity through time are knowledge gaps that can be filled. The purpose of this study was to examine these gaps in order to better understand the role of velvet mesquite in these ecosystems. Wood anatomical analysis showed that velvet mesquite has a semi-ring porous structure and termination of the growth ring is indicated by a small band of parenchyma. Visual crossdating of velvet mesquite was successful but a complex growth habit, with both eccentric and lobate growth, combined with ecological pressures hampered statistical validation of the chronology. Seasonal climate-growth analysis of dated rings showed a strong positive correlation to previous year September and October precipitation and a strong positive partial correlation to previous year September and August mean temperature. Life history through growth curve analysis showed no age related growth trend (either s-shaped or reverse-j) indicating the maximum age of velvet mesquite stems sampled (128 years old) can become much older with many releases few suppressions. Above-ground productivity of these trees are low compared to higher elevation forest productivity, but similar to other savanna ecosystems of the southwest. The use of velvet mesquite in dendrochronological research would greatly benefit from a complete analysis of wood anatomy, and addition of more samples from various locations to verify dates and begin building more reliable chronologies for this species across its range. These additions would allow for a greater understanding of stand and tree level responses through suppressions and releases, and understand the biomass accumulated above-ground through time.