The Laboratory of Tree-Ring Research

presents a talk by

Malcolm Hughes, Regent's Professor of Dendrochronology, and Kiyomi Morino, Research Associate

(LTRR, University of Arizona)

From cell to continent: introducing our new cambial phenology project

Wednesday, November 19, 2014 - 12:00pm to 1:00pm
Room: Bannister 110

Our aim is to fill important gaps both in the scientific basis for the use of tree rings as natural archives of past climate and in the scientific understanding of the rates and patterns of carbon storage in annual growth layers in relation to seasonal to inter-annual climate variation. These gaps concern the basic natural history of the tissue that forms annual rings in wood, the vascular cambium. Vascular cambium produces wood cells by division, expansion and differentiation (xylogenesis). We are compiling data sets needed to establish when each of the three processes start each year, the rate at which each proceeds and for how long, and how daily to seasonal variations in climatic conditions relate to the timing, rate, and magnitude of each process. Although extensive work has been published in recent years for Alpine Europe and the Boreal Forest, much less information is available for the Western US. We are collecting data at four clusters of sites in Wyoming, Colorado and Arizona, all centered on flux tower facilities and including the major tree species used in dendroclimatology across this large region. We will eventually compare the xylogenesis data with air, stem and soil temperatures, water availability, solar radiation, snowpack, and other climatic and environmental factors, as well as sapflow measurements in some sites and other phenological events such as shoot extension and needle elongation in all. These data and comparisons are essential for improving forward models of the formation of conifer tree rings.

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