



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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Higher temperatures negatively affect tree growth at multiple spatial scales in the western United States

Monday, April 14, 2014 - 12:00pm to 1:00pm

Room: Bannister 110

Annual tree growth is tightly regulated by climate. As air temperature increases, evaporative demand also increases, changing the dynamics of water availability in forest ecosystems. By correlating tree growth with precipitation, temperature, climatic water deficit, and vapor pressure deficit, we show that higher temperatures decrease tree growth across all spatial scales and regions. We use a novel dataset of Douglas-fir chronologies from 122 sites distributed throughout all mountain regions and a broad range of climate regimes in the western United States. By sampling throughout “climate space” at the continental scale, these data account for a large percentage of variability in growing environments for Douglas-fir. Results for the period 1916-2006 (encompassing historical climate records) indicate that temperature exerts a top-down control on tree growth, regardless of the magnitude of precipitation. As temperature continues to increase in future decades, we can expect growth of Douglas-fir to decrease throughout its range.