

Second American Dendrochronology Conference



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Late Holocene paleotemperatures from bristlecone pine tree rings and treeline elevation change

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Content :

High elevation tree-ring widths from Great Basin bristlecone pine (*Pinus longaeva*) are a particularly useful proxy to infer temperatures prior to the instrumental record in that the tree-rings are annually dated and extend for millennia. We have created a very long (4500+ years) annually resolved record of ring width, and an estimate of past treeline elevation for the Great Basin, USA. These records are integrated and used to infer decadal- to millennial-scale regional temperature variability over the past 4,500 years. We find that late 20th century treeline advances are probably greater than in at least 4,000 years. There is also considerable covariation between a regional high elevation tree-ring chronology and regional temperature estimates from an atmosphere-ocean general circulation model (GCM) over much of the last millennium. A long-term temperature decline of $\sim -1.1^\circ\text{C}$ since the mid-Holocene underlies substantial volcanic forcing of climate in the preindustrial record.

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