



Oxygen isotopes in tree rings as atmospheric moisture proxy

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Climate models project a marked increase in heat waves and droughts even in high rainfall areas of Europe for the 21st century. Such projections, however, still contain huge uncertainties, and empiric proxy data are required to reduce model uncertainties. Besides insight into the trees' physiological response to climate change is of high relevance for predicting how tree growth and thus the terrestrial carbon and water cycle will respond to future environmental conditions. Oxygen isotopes in tree rings can provide valuable insight into the water uptake by trees and their physiological response to hydroclimatic variation. This holds particularly in temperate, low elevation regions where traditional tree ring parameters such as tree-ring width or maximum late wood density are limited in recording strong climatic signals. In this talk I will present an integrative mechanistic and paleoclimatic perspective on recent studies that convincingly demonstrate the applicability of oxygen isotopes in tree-rings as recorders of hydroclimatic, and particularly atmospheric moisture variability. Examples range from seasonal, local scales to multi-century continental scales.