Multi-century humidity reconstructions from the southeastern TibetanPlateau inferred from tree-ring δ^{18}O

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Multi-century humidity reconstructions from the southeastern Tibetan Plateau inferred from tree-ring δ^{18}O

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Abstract

We present two new multi-century long tree-ring δ^{18}O chronologies from the southeastern Tibetan plateau. The longer chronology dates back to AD 1353, representing the longest annually resolved δ^{18}O chronology in the region, covering 660 years (AD 1353-2012). Both chronologies show strong relations to summer season precipitation, relative humidity, and temperature. We applied linear transfer functions and developed a summer season precipitation and a summer season relative humidity reconstruction. Moisture conditions during the past six centuries were characterized by a more humid period during AD 1700-1850 and a drying trend since the mid-19th century. Spatial correlations between the δ^{18}O chronologies and gridded reanalysis data (ERA-20C) revealed strong regional and remote associations to west central Asian, northeastern Europe, and to the western equatorial Pacific. These findings imply a potential influence of (i) atmospheric wave trains emanating from the North Atlantic and (ii) equatorial Pacific sea surface temperatures on the moisture variability over southeastern Tibet.

Keywords: Tree-ring δ^{18}O, Little Ice Age, Southeastern Tibetan Plateau, Teleconnections

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