



Combining stable isotopes in tree rings with other palaeoclimate proxies: an example from northern Fennoscandia

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The stable isotopes of carbon, oxygen and hydrogen measured in perfectly dated tree rings provide a powerful tool for reconstructing the climate of the past. However, we must concede that none of these isotopes are really thermometers; nor are they rain gauges or hygrometers. Like all other proxy sources of evidence for past climate, they must be interpreted with great care, relying on a sound understanding of the mechanisms that control isotopic fractionation as well as on the statistical relationships observed during the instrumental calibration period. By combining the isotopic records with other natural proxies, from trees and other natural archives in the same region, we can greatly strengthen the accuracy and precision of climate reconstructions. The coherence, or otherwise, of the different records through time can be used to test hypotheses about changes in synoptic climatology. In this paper we collate isotopic and other proxies from pine trees at several sites in northern Fennoscandia and compare them with proxies obtained from peat and lake sediment archives in the same region. Most of the data were produced within the EU-funded 'Millennium' project. The results suggest significant changes in the synoptic climatology of the area over the last millennium, reinforcing the importance of a multi-proxy approach to palaeoclimate reconstruction and of parameters other than temperature.