Geophysical Research Abstracts,
Vol. 11, EGU2009-9046, 2009
EGU General Assembly 2009

Reconstructing Climate Using non de-trended Stable Carbon Isotope Ratios From Pine Trees in Northern Finland

M. Gagen (1), D McCarroll (1), N J Loader (1), I Robertson (1), R Jalkanen (2), and P Narhi (2)

(1) Dept. of Geography, Swansea University, Swansea, United Kingdom (m.h.gagen@swansea.ac.uk), (2) METLA, The Finnish Forest Research Institute, Rovaniemi Research Station, P.O.Box 16, Rovaniemi, FIN-96301, Finland

In a 2007 paper (Gagen et al., 2007) we presented a stable carbon isotope tree ring archive covering the period AD 1640-2002. The stable carbon isotope series was constructed using trunk cellulose from the annual rings of Pinus sylvestris trees sampled from close to the northern limit for the species, in Finnish Lapland. This chronology was used to develop a reconstruction of summer temperatures, based on the correlation between the carbon isotope series and July/August mean temperatures (r = 0.72). In Gagen et al., (2007) we tested the hypothesis that stable carbon isotope series from tree rings might not contain any long-term age-related trends and thus require no statistical de-trending and we used a non- detrended stable carbon isotope series to reconstruct summer temperatures since AD 1640. However, we concluded that the sample replication in the proxy series was probably too low to capture lower frequency variability. Here we present an extension to that study via an AD 1150-2006 chronology, developed near to the original site, using sub-fossil trees extracted from lakes. We describe a novel sampling method which was used to rapidly process more than ninety individual trees for stable carbon isotope dendroclimatology with the aim of retaining both high and lower frequency climatic variability