



Do stable oxygen isotope series from *Pinus sylvestris* growing in Scotland retain information on precipitation dynamics?

Ewan Woodley (1), Neil Loader (1), Danny McCarroll (1), Iain Robertson (1), and Timothy Heaton (2)

(1) Department of Geography, Swansea University, UK, (2) N.E.R.C. Isotope Geosciences Laboratory, Keyworth, Nottingham, UK

In order to better constrain climate predictions it is essential to reduce error in climate reconstructions and understand how climate behaves at different temporal frequencies. Few high-resolution climate reconstructions exist for Britain, despite the strong influence of the North Atlantic on this temperate maritime zone. Annually-resolved stable oxygen isotope series from *Pinus sylvestris* L. growing at Southern Glens (western Highlands of Scotland) may provide information on precipitation dynamics in northern Britain. A significant correlation ($r = 0.68$; $P < 0.01$) exists between $\delta^{18}\text{O}$ cellulose (Southern Glens) and mean June-July $\delta^{18}\text{O}$ precipitation (Global Network of Isotopes in Precipitation GNIP) from Wallingford, Oxfordshire (AD 1982-2003). Whilst acknowledging the limited length of the GNIP dataset, the strength of the correlation suggests that between AD 1982 and 2003 both Southern Glens and Wallingford were subjected to the same June-July low pressure systems (depressions) as they passed over Britain from west to east. These data indicate that despite evaporative enrichment in the leaf, a significant proportion of variance in $\delta^{18}\text{O}$ precipitation ($R^2 = 0.45$) may be retained in the cellulose of *Pinus sylvestris* growing at Southern Glens. Such a relationship demonstrates the potential for reconstructing the $\delta^{18}\text{O}$ of precipitation at this site, possibly providing information on past variability in air mass dominance and precipitation dynamics in the region.