



Marine climate variability during the last millennium: the Loch Sunart record, Scotland, UK.

Alix Cage and William E.N. Austin

School of Geography & Geosciences, University of St Andrews, St Andrews, Fife, United Kingdom
(alixcage@googlemail.com, 01334 463949)

The first decadal-scale reconstruction of British coastal temperature anomalies spanning the last millennium is presented from a sea-loch (fjord) basin, Loch Sunart, NW Scotland. Based on modern observation and the results of previous numerical modelling of fjord circulation, benthic foraminiferal oxygen isotope records are interpreted as a record of summer temperature. A significant climate transition, apparently driven by large-scale reorganization of northern Hemisphere atmospheric circulation, occurs in the record at AD 1400. An abrupt, but relatively short-lived climate warming occurs between AD 1580 to 1650, when the bottom water temperature anomalies are 1.1°C above the long-term average, which is warmer than most of the 20th century and the late Medieval Warm Period. A long-term cooling occurs throughout the Little Ice Age culminating in the coldest recorded temperature anomalies between the late 1940s and 1960s. The warmest reconstructed temperatures of the past millennium occurred in the last 5 years of the record, which ends in 2006. A replicated post-AD 1900 shift in benthic foraminiferal $\delta^{13}\text{C}$ of ca. -0.6‰ provides evidence of the Oceanic $\delta^{13}\text{C}$ Suess Effect; this feature provides an independent test of the age-model and demonstrates the value of benthic foraminifera as palaeo-proxies in the Loch Sunart record.