Geophysical Research Abstracts, Vol. 9, 07971, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-07971

Diatom-inferred summer temperatures of the past eight centuries in northern Fennoscandia

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Establishing natural climate variability becomes particularly important in remote Polar regions in anticipation of higher than average warming. We present a high-resolution record of temperature variability of the past 800 years based on sedimentary diatoms from a treeline lake in northwestern Finnish Lapland. BSiZer multiscale smoothing technique is applied to the data to identify significant features in the record at different temporal levels. The overall reconstruction shows a relatively large multi-centennial temperature variability with a total range of about 0.6-0.8ºC. At a millennial perspective the temperatures exhibit a statistically significant long-term cooling trend prior to industrialisation (∂T = -0.03ºC/century). At a centennial time scale three warm intervals were identified around AD 1200-1300 (terminal phase of the Medieval Warm Period), AD 1380-1550 and from AD 1920 until the present. Pronounced coolness occurred between AD 1600 and 1920, indicative of the Little Ice Age. At a decadal level certain shorter-term climate excursions were revealed. The warmest $\sim$10-30 year, non-overlapping periods occurred in AD 1220-1250, 1470-1500 and 1970-2000, respectively. The classic events of Medieval Warm Period (MVP) and Little Ice Age (LIA) are evident in our record, as is also the 20^{th} century warming.