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Summer-temperature trends during the last 2000 years in northern Fennoscandia and the Kola Peninsula

Heikki Seppä (1), H. John B. Birks (2,3,4), and Anne E. Bjune (4)

(1) Department of Geosciences and Geography, University of Helsinki, Helsinki, Finland (heikki.seppa@helsinki.fi), (2) Department of Biology, University of Bergen, Bergen, Norway, (3) Environmental Change Research Centre, University College London, London WC1E 6BT, UK, (4) Bjerknes Centre for Climate Research, c/o Department of Biology, University of Bergen, 5007 Bergen, Norway.

Palaeoclimatological records are often noisy and arguments about past climate changes are realiable only if they are based on reproducible features in several reliably well-dated datasets. Here we focus on the temperature history of the last 2000 years in northern Fennsocandia and the Kola Peninsula, summarize the results of 11 quantitative pollen-based temperature July mean temperature (Tjul) reconstructions, and compare them with a high-resolution, summary chironomid-based temperature record and other independent palaeoclimate records. The most obvious feature in the inferred temperatures from all sites is the generally decreasing Tjul trend in the last 2000 years. Tjul values 0.3 - 0.2 °C higher than present are inferred between AD 0 and AD 1100 (2000-850 cal yr BP) and temperatures 0.3 – 0.15 °C below the present-day are inferred between AD 1100 and AD 1900 (850-50 cal yr BP). No particular peak is observed in our data at the time of the Medieval Warm Period, ca. AD 900-1200 (1100–750 cal yr BP), but the cooler period between AD 1100 and AD 1900 (900-100 cal yr BP) corresponds in general with the 'Little Ice Age' (LIA). Consistently with independent stable isotopic data, the record suggests that the coldest periods of the LIA date to AD 1500 – 1600 (450-350 cal yr BP) and AD 1800 – 1850 (150–100 cal yr BP). An abrupt warming takes place at about AD 1900 and the 20th century is the warmest century since about AD 1000 (950 cal yr BP).