Geophysical Research Abstracts,
Vol. 10, EGU2008-A-03940, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-03940
EGU General Assembly 2008

Last-millennium moisture and temperature variations in northern Europe based on proxy data

A. Korhola (1), M. Väliranta (1,2), L. Holmström (3), H. Seppä (2), E-S. Tuittila (4), J. Laine (5), J.Alm (6)

(1) Dept. of Biological and Environmental Sciences, University of Helsinki, Finland, (2) Dept. of Geology, University of Helsinki, Finland, (3) Dept. of Mathematics, University of Oulu, Finland, (4) Dept. of Forest Ecology, University of Helsinki, Finland, (5) Finnish Forest Research Institute, Parkano Research Unit, Finland, (6) Finnish Forest Research Institute, Joensuu Research Unit, Finland (atte.korhola@helsinki.fi / +358-40-5360357)

A quantitative, high-resolution record of the last-millennium moisture variability was obtained from a southern boreal raised bog in Finland. The record was based on a transfer function created by calibrating fossil plant macrofossil records against the modern vegetation/water table relationship using weighted averaging partial least squares (WA-PLS) regression method. In addition, testate amoebae, peat humification and pollen were analysed from the same subsamples. The reconstruction showed that the mire water table depth varied between 38 and 2.5 cm during the late-Holocene. Statistically significant features, i.e. trends as well ups and downs, in the produced time series were analysed using BSiZer, a Bayesian version of SiZer (Significant Zero crossings of the derivatives). The bog clearly shows effective moisture increases during the Little Ice Age (LIA) between 1500-1800 AD and during the 20^{th} century, from 1920 onwards, whereas drier conditions prevailed during the Medieval Warm Period 800-1200 AD and during the latter part of the LIA, i.e. 1800-1920 AD. This latter dry phase in the 19^{th} century is particularly interesting, as it clearly demonstrates that LIA was not wet throughout the northern Europe. Inferred wetter conditions during the 20^{th} century agree with the observed intensification of the global water cycle and the predicted increase of precipitation in northern Europe. The detected historical wet and dry shifts were compared with other similar kind of data derived from nearby locations, and from northern Europe, and also contrasted against known temperature

records from the North Atlantic regime.