Geophysical Research Abstracts, Vol. 9, 08050, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08050

High resolution reconstruction of wetness dynamics in a southern boreal raised bog during the late Holocene

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

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

In order to quantify historical changes in mire water table, Generalized Additive Modelling (GAM) were used to investigate the current relationships between surface plant species and water-table-depth in a southern boreal bog. Modern water-table-measurements and survey of associated plant communities along four moisture gradients provided data for GAM-analyses. Then, because the plant species showed unimodal distributions with apparent optima and narrow tolerances along the water table gradient, a transfer function was created by calibrating fossil plant macrofossil records against the modern vegetation/water table relationship using weighted averaging partial least squares (WA-PLS) regression method. A very high-resolution plant macrofossil analysis was applied to investigate past wetness dynamics in the same bog covering the last 5000 years. A particularly good chronological control and the age-depth model were based on 40 radiocarbon dates. The quantitative water table reconstruction for the late Holocene showed that the water table depth had varied between 38 and 2.5 cm, the root mean square error of prediction being about 3 cm. The detected historical wet and dry shifts were compared with other similar kind of data derived form nearby locations, and from Western Europe. Despite of some similarities, especially during the last c. 1000 years, the noticeable differences in timing and duration of vegetation changes suggest that these may not have been mainly driven by climate, but by local, autogenic, factors and very often also by fires.