18th INQUA Congress, Bern, Switzerland
(21st-27th July 2011)
Poster presentation:

Onset and Termination of the Late-glacial Climate Reversal in the Diatom Records from the Annually Laminated SG06 Core from Lake Suigetsu, Japan

A Kossler a*, P Tarasov b, T Nakagawa b, G Schlolaut c, MC Marshall d, A Brauer c, HF Lamb d, D Demske a, C Bronk Ramsey e, RA Staff e, C Bryant f, F Brock e, K Gotanda g, T Haraguchi h, Y Yokoyama i, H Yonenobu k, R Tada h, M Saito-Kato l, and Suigetsu 2006 Project Members m

a Institute of Geological Sciences, Freie Universität, Berlin, Germany.
b Department of Geography, University of Newcastle-upon-Tyne, UK.
c GeoForschungsZentrum, Potsdam, Germany.
d Institute of Geography and Earth Sciences, University of Wales Aberystwyth, UK.
e Research Laboratory for Archaeology and the History of Art, University of Oxford, UK.
f NERC Radiocarbon Facility (Environment), East Kilbride, UK.
g Faculty of Policy Informatics, Chiba University of Commerce, Japan.
h Department of Biology and Geosciences, Osaka City University, Japan.
i Department of Earth and Planetary Sciences, University of Tokyo, Japan.
j Ocean Research Institute, University of Tokyo, Japan.
k College of Education, Naruto University of Education, Japan.
m For full details see: www.suigetsu.org

* Corresponding author: kossler@zedat.fu-berlin.de

High-resolution diatom analysis of two sections from the annually laminated SG06 core from Lake Suigetsu was used to study the onset and termination of the Late-glacial climate reversal (Younger Dryas counterpart) in central Japan. Accumulation of the analysed sediments occurred in a deep and relatively cold water lake with a strong mixing regime, relatively high silica and moderate nutrient content, and meso-eutrophic conditions. Using these results, together with available pollen-based environmental reconstructions, we suggest that climate cooling, together with an intensified winter monsoon and thicker snow cover, could influence changes in regional vegetation, sedimentation processes, and trophic status of the lake during transition from the last interstadial to stadial around Lake Suigetsu. A decrease in total pollen concentration and increase in Fagus pollen percentage indicate local vegetation stress/disturbances and suggest that cooling started at least two to three decades prior to the major shift in diatom assemblages (change from Aulacoseira ambigu a to Aulacoseira subarctica dominance), which took about ten years. The transition from the last...
stadial to the Holocene again shows that vegetation in the lake catchment area reacted first to the regional climate change, namely to the weakening of the winter monsoon and decrease in winter snow accumulation. Reduced volume of surface runoff associated with the decrease in melt water supply is likely responsible for the reduced soil erosion activity, which caused the consequent decrease in the amount of nutrients brought to the lake and lowering of the water trophy. The latter process finally influenced changes in the diatom assemblages, including the return to dominance of A. subarctica. Our results demonstrate the rapid response of the Lake Suigetsu system to the global cooling and warming, and allow clear definition of the onset and termination of the Late-glacial climate reversal.