Geophysical Research Abstracts,
Vol. 11, EGU2009-8262, 2009
EGU General Assembly 2009

Seasonal flood layer distribution of the last 450 years in annually laminated sediment from Lake Ammersee (Southern Germany)

M. Czymzik (1), A. Brauer (1), P. Dulski (1), B. Plessen (1), R. Naumann (2), J. Zimmermann (1), and U. von Grafenstein (3)

(1) German Research Centre for Geosciences (GFZ), Section 5.2 Climate Dynamics and Landscape Evolution, Telegrafenberg, 14473 Potsdam, Germany, (2) German Research Centre for Geosciences (GFZ), Section 4.2 Inorganic and Isotope Geochemistry, Telegrafenberg, 14473 Potsdam, Germany, (3) LSCE Orme, point courier 129, CEA-Orme les Mersiers, 91191 Gif sur Ivette, France

Lakes can be utilized as long-term natural observatories of environmental and climate change in the human habitat because they act as ideal sediment traps accumulating continuous sediment records reaching far back in time. Especially from annually laminated lake sediment records detailed seasonal information can be obtained. Such long time series of high-resolution data ideally complement multi-scale observational data in order to achieve a comprehensive mechanistic understanding of climate and environmental variability.

For this case study two short annually laminated sediment cores from Lake Ammersee (Southern Germany) have been studied using a combination of micro-facies analyses, high resolution element scanning (μ-XRF) and stable isotope (δ^{13}C, δ^{18}O) data. Our results provide a precise and independent chronology established by counting of calcite varves using a petrographic microscope and the identification of short-term fluxes of detrital matter into the lake. The seasonal occurrence of these detrital layers was determined by their micro-stratigraphic position within a varve. The record of detrital layers within the last 73 years is in good agreement with observed runoff data from the main tributary river (Ammer) and local precipitation data. This leads in combination with a proximal-distal pattern of detrital layer thicknesses to an interpretation as flood layers. Our data indicate maxima of spring and summer flood layers during solar minima in the Little Ice Age triggered by intensified snowmelt events and atmospheric circulation changes.