Geophysical Research Abstracts
Vol. 14, EGU2012-155-1, 2012
EGU General Assembly 2012

Short-term climate changes in the Holsteinian Interglacial - EGU2012-132

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Oxygen and carbon stable isotopes from fossil lake sediments of the Holsteinian age (eastern Poland) give evidence for the abrupt climate shifts in this interglacial that coincide with the changes in vegetation inferred from palaeobotanical data. Especially changes of the stable isotope ratios as well as decrease in the carbonate content in the deposits and increase in silicate redeposited from the area around the lake are synchronous with the short-term climatic deteriorations within the interglacial pollen flora.
Two distinct climate shifts are recorded in the Holsteinian. The first one is marked by the very characteristic pine-birch cold phase after the yew (Taxus) domination that is reported from numerous pollen diagrams from Central Europe. This distinct cooling resembles a phenomenon known as 8.2 ka event in the Holocene, when waters of the Agassiz Lake in North America drained into the Atlantic Ocean (Koutsodendris et al. 2010). Enormous volumes of freshwater from melting of the Laurentian ice-sheet caused disturbances in the Gulf Stream and as a result some decrease in regional temperatures. The second distinct cooling of a lower rank took place within the younger part of the climatic optimum of the Holsteinian. It is relatively less known, because most often pollen records lack sufficient temporal resolution needed to identify this event. A well documented cooling in the Holsteinian deposits from Dethlingen, northern Germany (Koutsodendris et al. 2010) and from the Ossówka, eastern Poland (Nitychoruk et al. 2005) are exceptional. In the sequence from Dethlingen, a distinct increase in the percentage of pioneer trees is accompanied by a lower content of temperate taxa. At Ossówka, the shift of climate is noted as the rise of ratio of oxygen and carbon isotopes. According to Nitychoruk (2000) the cold event is coincident with volcanic eruptions evidenced by volcanic ash found in the lake deposits at that time.

Literature

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