



Atmospheric circulation changes evidenced by cyclic dust deposition in the US Great plains (Nebraska, USA) during the last deglaciation

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The Peoria Loess unit is a well-defined stratigraphical unit in the Upper Pleistocene of the North American Quaternary. Deposited between 30 - 25 ka and about 12 ka ago. It has been indicated that this unit shows the highest ever-worldwide depositional rate for eolian deposits, as its thickness varies, near the source area, between 19 m and 46 m, extreme values that are not even recorded in the Chinese sequences. The results of our present investigation indicate that this particular unit is not homogenous. It shows different subunits where lithological variation can be observed through the occurrence of embryonic gley horizons alternating with laminated loess. Furthermore the analysis of the grain size shows cycles corresponding to variations in the eolian dynamics responsible of the dust transport and deposition. A grain size index interpreted as characterizing the eolian dynamics (higher values corresponding to stronger wind conditions) shows higher values than those observed in Europe. A comparison of this index is proposed with the Greenland dust and $\delta^{18}\text{O}$ records. It shows that the main climatic history, as corresponding to events occurring mainly in North Atlantic domain, is recorded in the Peoria Loess deposits. However, the variation in the

magnitude of the eolian events indicates a different behavior than in European loess sequences. The strong North Atlantic coolings as expressed by the Heinrich events, recorded in Europe by the coarser deposits, are not discriminated in the sequence by coarser material in the studied sequence, and so better follow observations obtained off California for the north East Pacific domain.