Geophysical Research Abstracts
Vol. 15, EGU2013-12739, 2013
EGU General Assembly 2013


# An erosional unconformity over whole Europe? - New insights into Late Pleistocene loess paleosol sequences from Saxony (Germany)

Dominik Faust (1), Sascha Meszner (1,2), Sebastian Kreutzer (3), and Markus Fuchs (3)

(1) Institute of Geography, Dresden University of Technology, Germany, (3) Department of Geography, Justus-Liebig-Universität Gießen, Germany, (2) s.meszner@gmail.com

The Saxonian loess region is located in the transition zone between the Central German Uplands (here Erzgebirge) and the Northern European Lowland. A loess layer on average of 6 m thickness sedimented mainly during Weichselian glaciation causes a characteristically smooth landscape of gently rolling hills.
Since 2008 this area is focused for paleoenvironmental research on loess paleosol sequences (Meszner et al. 2011 and Meszner et al. 2012) with the aim to establish a new, high resoluted stratigraphical stack of all units found in the Weichselian loess sequences. The authors subdivide this new standard profile in five units. Unit IV and V represent pre-Eemian and Early Weichselian sediments with intercalated Eemian soil complex. The following unit III is build of several redeposited week interstadial Cambisol-like and trunda gley soils of a period form 30/35 ka to 28 ka. Above, unit II composed of barren and pure Upper Pleniglacial loess follows and reaches a maximum thickness of 7 m (at site Gleina). It is subdivided by several tundra gley soils and shows a stratified loess facies in the lower and non-stratified loess facies in the upper part. The surface near the margin (max 2.5 m thick) of decalcified material within the Holocene/Late Pleistocene interglacial soil is classified as unit I.
A conspicuous complex of a reddish-brown substrate from top of unit IV and its overlaid bright grey Gleysol as lowermost part of unit III is called Gleina Complex. Lieberoth (1963) defined it as in important interstadial soil development of younger Middle Weichselian and called it 'Gleina soil development'.
New luminescence age estimations indicate a hiatus inside of this complex. Between the brown substrate (lower part), with an OLS-age estimation of app. 60 ka and the upper part (strong Gleysol), with and an age estimation of app. 30-35 ka, an unconformity spanning app. 30 ka is identified. This hiatus, roughly spanning MIS 3, could found in all investigated loess sequences in Saxony!
Furthermore, it seems that this complex is not a regional phenomenon only. Also in the central German loess region close to the Saale river, in Lower Silesia loess region near Wrocław (Poland) and in Sandomierz loess region (Poland) this complex could also be found.
First of all, on the base of our results we suppose that the preservation of MIS 3 loess and paleosols in central and east Germany was very rare. The processes forming this hiatus are discussed recently. One possibility is that there was not enough dust sedimentation for profile growing. However, in this case there might be even one site with a weak sedimentation which accounts the preservation. But there is no site including a sequence spanning this timeframe yet. Another possibility is that during a period of strong reworking, all sediments of MIS 3 were eroded. This seems to be more likely due to the fact that the hiatus is clearly visible. This abrupt step of OSL-ages follows the clear boundary between the described layers.
Generally, the recent study clearly illustrates the inhomogeneity of preservation in loess paleosol sequences. In loess, as an terrestrial archive for landscape evolution, there are sequences of high resolution (e.g. Upper Pleniglacial) close to huge hiatuses at the same site.