



Large ice-wedge networks and tundra gley horizons in Northern France Upper Pleistocene loess: evidences of extreme cold events and cyclic millennial changes

Pierre ANTOINE (1), Olivier MOINE (1), and Gilles GUERIN (2)

(1) CNRS, Laboratoire de Géographie Physique, Environnements quaternaires et actuels, Meudon, France
(pierre.antoine@cnr-bellevue.fr), (2) GEOTRAC / LSCE, Bât. 12, avenue de la Terrasse, 91198 Gif-sur-Yvette, France

Northern France loess-palaeosol sequences from the last interglacial-glacial cycle (Eemian-Weichselian) have been intensely studied during the last 20 years (about 100 individual sequences). Despite thickness variations of the different stratigraphic units, the sequences from the last interglacial-glacial cycle exhibit a particularly constant pedosedimentary pattern, including well-identified pedological and periglacial marker horizons that can be followed north- and eastward in Belgium and Germany. Within this system, new field investigations and luminescence (OSL) datings put in evidence at least four generations of large ice-wedge networks (10-14 m) preserved by loess deposits between ca. 50 and 20 ka. The best- and most systematically preserved network is presently dated at about 31-32 ka according to the OSL ages from its loess infilling. This main ice-wedge cast horizon systematically occurs at the boundary between Middle Pleniglacial brown soil complexes and the base of the Upper Pleniglacial typical loess cover. Consequently, it represents a major stratigraphic marker for correlations in Western Europe. According to recent OSL dating results, the first thick typical loess unit of the Upper Pleniglacial, covering the main ice-wedge cast horizon, has been deposited shortly after GIS-5 interstadial and could be contemporaneous of H3 event in deep-sea cores. In addition, it is shown that all the large ice wedge casts are developed from the surface of a tundra gley horizon (0.3 to 0.5 m in thickness). As it has been previously demonstrated that tundra gley layers were mainly formed during short interstadial events (malacology, sedimentology), a model linking tundra gley horizons, and ice wedges network regarding to DO stadial-interstadial cycles during the last glacial is proposed.