



Pleistocene Frost-Fissure Polygons on the Waasland Plateau in Flanders (Belgium)

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Complex polygonal networks of sand wedges have been observed on a low-lying plateau in Flanders. The polygonal network comprises small-scale and large-scale polygonal cells, with diameters of $\sim 0.2 - 10$ m. The wedge structures, $\sim 0.02 - 1.5$ m wide at the top, $\sim 0.2 - >2.5$ m deep extend from a gravel bed overlain by a ~ 2.5 m - thick layer of fluvio-aeolian/aeolian sand and silt deposits, into glauconiferous clayey sand and sandy materials.

The wedge structures are interpreted a composite-wedge pseudomorphs showing evidence of both a primary and secondary infilling. The structures suggest formation in a permafrost environment as result of thermal contraction cracking, possibly combined with summer desiccation. Superimposition of networks indicates a complex growth history involving phases of wedge activity, wedge inactivity and wedge casting. Variations in the proportions of primary versus secondary infilling features within the network probably points to variations in sand/ice proportions and distribution within the original frost-fissure system, likely reflecting temporal and spatial variations in environmental conditions. Composite fillings indicate relatively dry and sparsely vegetated ground surfaces during wedge growth.

The structures were most likely formed during the coldest phases of the Late-Pleistocene, although an older age for the oldest generations is not excluded.