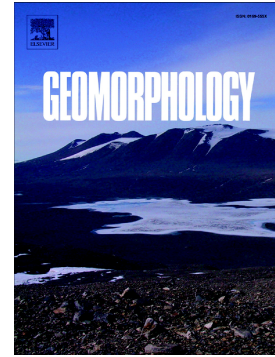


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Features caused by ground ice growth and decay in late Pleistocene fluvial deposits, Paris Basin, France

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Abstract

Last Glacial fluvial sequences in the Paris Basin show laminated lacustrine deposits OSL and radiocarbon dated to between 24.6 and 16.6 ka in one site and overlying alluvial sandy gravel. A thermokarst origin of the lakes is supported by abundant traces of ground ice, particularly ice wedge pseudomorphs beneath the lacustrine layers and synsedimentary deformation caused by thaw settlement. The features include brittle deformation (normal and reverse faults) resulting from ground subsidence owing to ice melting and ductile deformations caused by slumping of the sediments heaved by the growth of ice-cored mounds. These correspond to lithalsas (or lithalsa plateaus) and/or to open system pingos. At least two generations of thermokarst are recorded and may reflect the millennial climate variability typical of the Last Glacial. The structures studied in quarries are associated with an undulating topography visible in 5-m DEMs and a spotted pattern in aerial photographs. The search for similar patterns in the Paris Basin indicates that many other potential thermokarst sites exist in the Last Glacial terrace (Fy) of rivers located north of 48°N when they cross the lower Cretaceous sands and marls. In some sites, the presence of organic-poor, fine-grained deposits presumably of lacustrine origin was confirmed by borehole data. The site distribution coincides broadly with that already known for ice wedge pseudomorphs. This study provides

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