



Crossing of investigation and methods to define the internal geometry of a coastal landslide in Normandy

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The coastal slopes of the Pays d'Auge plateau (Calvados, Normandy, France) are regularly affected by landslides. The study area between Trouville and Honfleur is approximately 8 hectares. The landslides of the 'Cirque des Graves' and the 'Fosses du Macre' are active rotational and translational slides subjected to slow continuous displacements (5-10 cm.yr⁻¹) since several centuries. This low velocity pattern is perturbated by episodes of acceleration with metric displacements and the development of large cracks and scarps. Four major events have occurred (March 1982, February 1988, January 1995 and March 2001).

The result of this complex velocity pattern is a composite morphology representative of multiple rotational landslides with a succession of horsts and grabens, counter slopes, and scarps of different sizes.

The objective of this work is to define the actual morphology and the internal structure of the slopes by crossing information acquired with different methods (geomorphological observations, geotechnical and geophysical surveys, airborne laser scanning datasets).

The initial phase of the study is the morphological interpretation of the landslide supported by remote- (airborne LiDAR) and ground-based surveys (differential GPS measurements, field mapping). Geophysical surveys (Electrical Resistivity Tomography –ERT–, Ground Penetrating Radar –GPR–) are used to image the structure of the slopes at several spatial scales and combined to geotechnical information acquired in boreholes to obtain a 3D image of the subsurface formations. Then, the SLBL (sloping local base level) method is used to infer the landslide geometry and estimate the volume of displaced material.