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INTRODUCTION

The aim of this study is to characterize the internal structure of the Laval landslide and to identify its controlling factors. The methodology consists in combining photo-interpretation techniques, geomorphological observations and measurements, geotechnical measurements and seismic surveying. The objective of this work is to propose a qualitative model defining the landslide geometry and characterizing the influence of the morpho-structural features of the rocky massif on the triggering conditions.

GENERAL CONTEXT

The calcaire-oxfordian black marls of Dren (Alpes-de-Haute-Provence) are known for their susceptibility to weathering and erosion, and show many examples of active structural landslides. The Laval landslide occurred in January 1999 (Fig. 1 & 2). The studied area extends around 4000 m² from 875 m to 935 m in elevation. A water infiltration experiment has been conducted in October 2007 (Grandjean et al, in press). The motivation of this work is to define the landslide geometry (volume, layering, position and shape of the paleo-topography) and the triggering conditions.

METHODOLOGY

The acquisition of geophysical and geotechnical data in the accumulation zone allows to identify the boundary between the reworked soils and the in-situ bedrock. A qualitative model is proposed according to geomorphological observations (comparison of georeferenced photographs taken before and after the landslide event, fig. 3 & 4).

RESULTS

In the accumulation zone, the soil thickness is variable from ca. 1 to 6 m. The paleotopography overlay is in accordance with the observations made on the aerial photographs taken before the landslide. The limit between the accumulation and ablation zones is clearly established.

CONCLUSION

This conceptual model has shown its interest for the characterization of the landslide processes observed in black marls. The shape and displacement pattern of the landslide is controlled by the structure of the rocky massif. An hydromechanical modelling should be able to validate these results.