Geophysical Research Abstracts
Vol. 12, EGU2010-4498, 2010
EGU General Assembly 2010

Analysis of a large deep-seated landslide occurring in a sedimentary context at the front of the sub-alpine meridional chains (Maritime-Alps, France).

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The "La Marbrière" slope (Maritime-Alps, Southeast France) corresponds to the meridional front of the sub-alpine chains (external Alps) characterised by a significant structural heritage. The geological framework is quite complex and is associated with a thick substratum made of Triassic series (clays and gypsum) overlying by highly fractured and faulted Jurassic calcareous (involving a mechanical contrast between the layers). As a consequence of this frontal position and its geological structure, the entire slope is affected by several deep-seated deformations involving 110.106 m3 of rock material associated with high disturbance in the morphology and many typical gravitational morpho-structures such as scarps, counter-slope scarps and trenches. These DSL occurs on the same slope, but they are being analyzed independently because of their different stages of evolution which include: an earlier stage, an active stage and an old mature one.
A geomorphological mapping (at 1:1000 scale) coupled with geophysical survey revealed an important passive control of the inherited brittle tectonic deformations on the overall deep seated landslide. This control relies (at both surface and depth (deepest than 200m)) on spatial and geometrical relations between the fault networks and the gravitational morpho-structures. A specific spatial organisation of the morpho-structures according to their typologies allows us to propose a consistent interpretation for the overall structure and the kinematic of the gravitational processes. Moreover this interpretation is supported by a comparison between the three areas associated with various stages of the evolution of the 'La Marbrière" deep-seated deformation. The results confirm that the passive tectonic structures (persistent faults) and the soft substratum represent the predisposing factors for the "La Marbrière" landslide and also suggest a possible catastrophic rock collapse evolution for the DSL.