

## **ANALYSIS AND NUMERICAL MODELLING OF A COMPOUND LANDSLIDE IN LACUSTRINE DEPOSITS**

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A landslide occurred on the 30th of December 1998, about 20 km east of Florence in Italy, following a period of prolonged precipitation. The landslide affected slopes cut in a lacustrine sequence of clays, silts and sands of Plio-Quaternary age and was a reactivation of a pre-existing dormant slide, the first activation of which was probably linked to the extinction of a lake in the Pleistocene. The geometry of the slip surface is controlled by the presence of a sub-horizontal layer of peat which gives it the typical characteristics of a “compound” slide. The landslide caused serious damages to an aqueduct crossing the slope crest, and threatened the stability of an industrial settlement, located at the slope toe, and of the High Speed railway line. This note presents some applications of global limit equilibrium analysis, used for the back-analysis of the failure and for the assessment of preparatory and triggering causes. A more sophisticated finite-difference numerical analysis was required to simulate the development of internal shears in the sliding mass, necessary to produce a kinematically admissible mechanism along a compound slide. Finally a parametric limit equilibrium analysis was performed aimed at assessing the effectiveness of some first remedial measures, such as cut and fill and drainage.