

## Research Institute for Geo-Hydrological Protection

in the Department of Earth System Sciences and Environmental Technology

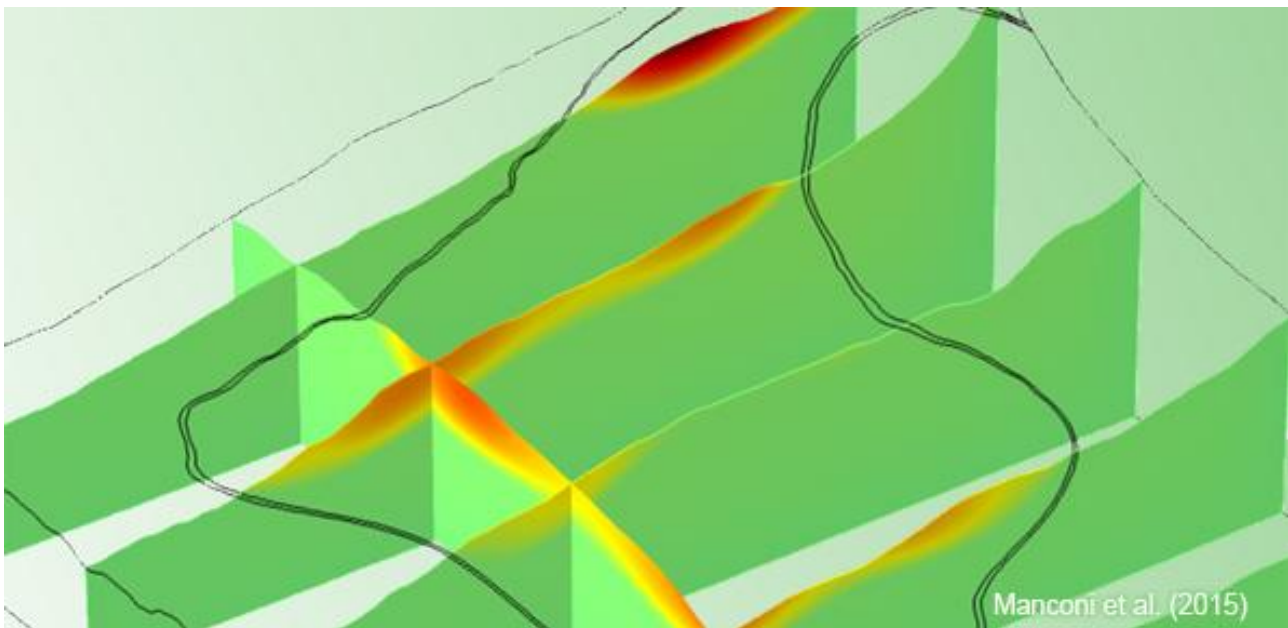
an Institute of the Italian National Research Council (CNR)

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# Kinematics of slow-moving active landslides

3D Finite element modelling optimized through inverse analysis technique for the analysis of the kinematics of slow-moving active landslides

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We experiment the application of 3D numerical modelling techniques for the analysis of the kinematics of slow-moving active landslides. The activity assesses the hazards posed by slow-moving landslides, determines the factors controlling the slope processes, investigates the potential evolution of the active slopes, and helps selecting appropriate slope mitigation strategies.

We exploit modern numerical modelling techniques based on finite element methods, using two-dimensional (PLAXIS-2D) and three-dimensional (PLAXIS-3D, COMSOL

Multiphysics) commercial software. We calibrate and optimize our numerical models using landslide-monitoring data acquired using traditional and new techniques, on the ground, from the air, and from space.

The numerical models can be used to predict the kinematical evolution of the landslides.

## Results

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The numerical models that we have developed for a number of large landslides in Italy and Spain allowed us to identify the sectors of the slopes affected by large deformations and deformation velocities, to detect the direction and the components (EW, NS) of movements, and to outline subsiding and rising areas.

The models have also allowed us to detect areas subject to shear deformation, where damage to structures and infrastructure is to be expected.

The numerical models allow us to make hypotheses on the evolution of the landslides we have studied.

## Granting institutions

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- EC FP7 LAMPRE Project

## To know more

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