



FORM PER PROGETTI BANDO DOTTORATO XXXIII CICLO

1. Project title

Soil moisture measurements for shallow landslide prediction

2. Proposer

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4. Key words

(Max. 5 – at least 2)

Shallow landslide, early warning, soil moisture

5. Abstract

(Max. 1.500 characters with spaces)

The PhD project aims to develop a hydrological model for shallow landslide prediction in two pilot areas of Oltrepò Pavese area (Northern Italy) exploiting remote sensing and ground observations of soil moisture. The PhD project is developed in the frame of the ANDROMEDA project, founded by the Cariplo foundation and also involving as partners hydrologists of CNR-IRPI, hydraulic and geotechnical engineers of DiCAR - University of Pavia and agronomists (Università Cattolica del Sacro Cuore of Piacenza).

Ground measures of hydrological and meteorological parameters derived from two monitoring stations installed since 2012 in the pilot areas will be collected in order to investigate soil responses to different rainy conditions and the triggering conditions of shallow failures. GPS will be also tested in order to explore the possibility of measuring soil moisture in larger areas. Soil moisture ground data will be used for the validation of satellite soil moisture (and rainfall) measures produced by CNR-IRPI. A spatially distributed soil water balance model will be produced.

Shallow landslide site specific thresholds based on soil moisture and Shallow landslide susceptibility map will be prepared at high spatial and temporal resolution (e.g., 100 m and 1 hour) and integrated in a WEB-GIS platform. Maps of landslide prone areas and soil moisture-rainfall thresholds will be used for the development of a prototypal Early Warning System for shallow landslide prediction.