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Weather factors sensitivity in shallow landslide hazard statistical model

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The intense rainfall events and their effects on the ground are one of the distinctive elements related to the climate change. Over recent decades increase in terms of intensity and frequency of deep convective storms in areas where they find favourable conditions (e.g.proximity of sea basins), triggered a great number of shallow landslides.
Aim of this work is to test an effective set of shallow landslide susceptivity predictors by using different informative sources as topographic, geological, landuse, climatological layers re-sampled to an operative spatial resolution (30 meters).
Also aim is to perform an evaluation, in a real-time event analysis, of the added value provided by weather data obtained from meteorological LAM (local area models) to determine local shallow landsliding hazard.
Common shallow landslides predisposing factors (predictors) considered in susceptibility analysis may be morphology-related, hydrology-related, geology-related, climate-related, landuse-related and in case of real-time assessment (hazard), weather-related (in this case data derive from direct measures or from numerical weather model simulations). Some of predictors chosen for this work are the most widely accepted as important landslides susceptibility factors, while effectiveness of others is still debated.
A study have been conducted over two intense events (Lunigiana, 25-10-2011 and Arezzo area, 11-03-2013) occurred in Tuscany considering both the rainfall data (predicted and measured) and the triggered landslides. Limited-area numerical model (WRF) simulations have been tested in this study using different spatial resolution, and verified against observed data. Also predictions on soil moisture and soil temperature in 4 layers below ground, coming from the model are taken into account.
To characterize landslides susceptibility, statistical modelling of spatial landslide occurrence was carried out, testing different geological, geomorphologic and predictors by using Random Forest classifiers.
Also data coming from meteorological model are taken into account in statistical model of landslide occurrences, in order to evaluate their importance vs the other predictors.
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