

EGU21-15552

<https://doi.org/10.5194/egusphere-egu21-15552>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



New simplified models for earthquake-triggered landslides in large area: application to Italian case studies

Amerigo Mendicelli¹, Federico Mori¹, Gaetano Falcone¹, Edoardo Peronace¹, Massimiliano Moscatelli¹, Naso Giuseppe², and Massimiliano Alvioli³

¹CNR-IGAG Istituto di Geologia Ambientale e Geoingegneria, Area della Ricerca di Roma 1, Via Salaria km 29.300, 00015 Monterotondo Stazione, Roma, Italy

²Dipartimento della Protezione Civile (DPC), via Vitorchiano 2, 00189 Roma, Italy

³CNR-IRPI, Istituto di Ricerca per la Protezione Idrogeologica, Via Madonna Alta, 126 - 06128 Perugia, Italy

Shake maps, produced a few hours after a seismic event, represent the key input for the rapid assessment of earthquake triggered landslides scenario maps in near real time.

The IGAG20 approach (Falcone et al., 2021) improves the prediction of these by contemplating the site effects that are calculated as a function of the V_{s30} (Mori, 2020) and the intensity of the shaking.

The method originally calculates the amplification factor for some intensity measures at the surface level for the national hazard, in Italy.

Here, we present applications of the method, in terms of scenarios, for a few main shocks of past seismic events in Italy: Friuli 1976, Umbria-Marche 1997 and L'Aquila 2009. We used the OpenQuake engine (Silva et al., 2014), to produce PGV and PGA stochastic maps including amplification factors. The PGV map helped calculating landslide probability maps within the Nowicki et al. (2018) model, while the PGA map was a key input for landslide rockfall maps obtained within the STONE model (Antonini et al., 2002, Guzzetti et al., 2002; Alvioli 2020).

Results of both models were compared with available landslide records for the corresponding earthquake events, either in the form of points or polygons (Govi 1977; Guzzetti et al 2009).