EGU22-2507, updated on 31 Aug 2022
https://doi.org/10.5194/egusphere-egu22-2507
EGU General Assembly 2022

Impact of multi-temporal landslide inventories on landslide hazard assessment: a case study in the province of Belluno (Veneto Region, NE Italy)

Silvia Puliero[1], Sansar Raj Meena[1,2], Filippo Catani[1], and Mario Floris[1]
[1]Machine Intelligence and Slope Stability Laboratory, Department of Geosciences, University of Padova, Padova, Italy (silvia.puliero@phd.unipd.it)
[2]Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente, Enschede, Netherlands

Frequent and extreme meteorological events can lead to an increase in landslide hazard. A multi-temporal inventory plays an essential role in monitoring slope processes over time and forecasting future evolution. In recent years, the province of Belluno (Veneto Region, NE Italy) was affected by two relevant and intense meteorological phenomena that occurred on October 27-30, 2018 (i.e. windstorm Vaia) and on December 4-6, 2020. Both events were characterized by heavy rainfall of up to 600 mm in 72 hours, triggering widespread landslides throughout the area. The analyses conducted on some local rain gauges in the sectors most affected by each storm show very high return periods (over 100 years) for both events, even though they occurred in a two-year time frame. This study aims to evaluate whether these strong meteorological phenomena are characterized by an increase in their frequency in the province of Belluno and to see what influence they have on slope instabilities, which are important for assessing landslide risk. The rainfall data available since 1950 have been investigated through statistical analysis to achieve these goals. The spatial and temporal evolution of slope instabilities has been examined through remote sensing techniques to compare landslides triggered in 2018 and 2020 with past instability phenomena in the same area. The results show the importance of multi-temporal databases for landslide hazard assessment after extreme meteorological events at the regional scale.