

EGU2020-21648

<https://doi.org/10.5194/egusphere-egu2020-21648>

EGU General Assembly 2020

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



Comparison of the performance of different Territorial Landslide Early Warning Systems

Jose Cepeda^{1,4}, **Piciullo Luca**¹, Tirante Davide², Pecoraro Gaetano³, and Calvello Michele³

¹Norwegian Geotechnical Institute - NGI, Oslo, Norway (jmc@ngi.no, lpi@ngi.no)

²Department of Natural and Environmental Risks, Regional Agency for Environmental Protection of Piemonte, Italy (davide.tiranti@arpa.piemonte.it)

³Department of Civil Engineering, University of Salerno, Italy (gaetanopecoraro84@gmail.com, michele.calvello@gmail.com)

⁴Department of Geosciences, University of Tromsø, Tromsø, Norway

Landslide early warning systems (LEWS) can be categorized into two groups: territorial and local systems. Territorial landslide early warning systems (Te-LEWS) deal with the occurrence of several landslides in wide areas: at municipal/regional/national scale. The aim for such systems is to forecast the increased probability of landslides occurrence in a given warning zone. Nowadays, there are around 30 Te-LEWS operational worldwide. The performance evaluation of such systems is often overlooked, and a standardized procedure is still missing. Often, a contingency matrix 2x2, usually employed for rainfall thresholds validation purposes, is used. Recently an original method has been proposed by Calvello and Piciullo, 2016: the EDuMaP.

This paper describes the new excel user-friendly tool for the application of the method. Moreover, a description of different indicators used for the performance evaluation of different Te-LEWS is provided. Subsequently, the most useful ones have been selected and implemented into the tool. The EDuMaP tool has been used for the performance evaluation of the SMART warning model operating in Piemonte region, Italy. The analysis highlights the warning zones with the highest performance and the ones that need thresholds refinement. The SMART performance has been evaluated with both the EDuMaP and a 2x2 contingency table for comparison purposes. The result highlights that the latter approach can lead to an imprecise and not detailed analysis, because it cannot differentiate among the levels of warning and the variable number of landslides that may occur in a time interval. Moreover, a comparison of the performance of different Te-LEWS with the SMART model has been carried out highlighting critical issues and positive aspects. Finally, the weakness aspects and the future developments of the SMART warning model are described.

This paper has been conceived in the context of the research-based innovation project Klima 2050 - "Risk reduction through climate adaptation of buildings and infrastructure" <http://www.klima2050.no/>.