EMS Annual Meeting Abstracts
Vol. 13, EMS2016-367, 2016
16th EMS / 11th ECAC

Synoptic climatology of heavy precipitation in an active landslide region of Romania (Curvature Carpathian-Subcarpathian region)

Dana Micu (1), Simona Andrei (2), Mihai Micu (1), Razvan Zarea (3), and Florica Toanca (2)

(1) Institute of Geography of the Romanian Academy,Bucharest, Romania (micudanamagdalena@gmail.com) , (2) National Institute of R&D for Optoelectronics, Remote Sensing Department, Magurele - Bucharest, Romania (simona.andrei@inoe.ro), (3) Romanian Waters Company, Buzau-Ialomita Basin Admnistration, Buzau, Romania

Despite their limited frequency, heavy precipitation over time-periods preceding shallow and medium-seated landslide occurrences in one of the most landslide-prone regions of Romania (the Curvature Carpathians and Subcarpathians) have been frequently assigned as a triggering or preparing factor in several case study researches. The objective of this paper is to classify typical atmospheric circulation patterns favoring the occurrence of heavy precipitation events over the year, with focus on the March-October interval, when the frequency of landslide occurrences is increased. A percentile-based threshold approach (q90, q95, q99) was used to identify the heavy precipitation events and to analyze their corresponding frequencies. The analyses are based on the daily precipitation data from 13 local rain gauges (1990-2014) and three weather stations (1961-2010) located in the study region and adjacent plain areas. The large-scale circulation patterns associated to heavy precipitation occurrences were derived from the COST733 catalogues, in order to understand the key atmospheric processes related to the spatial manifestation of these extreme precipitation events at regional scale. The occurrence of heavy precipitation events in the region were found mostly related to eastern and south-eastern cyclonic circulation types. Proximity of the Black Sea enables the transport of large amount of humid air toward the study area, while the Carpathians heights block the advance of air masses with high moisture content. The detection of the synoptic patterns explaining the occurrence of extreme precipitation events will add value to the current knowledge on precipitation-landslide relationship and will provide a valuable input for the assessment of landslide hazard in the Curvature Carpathian-Subcarpathian region.