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Hydro-meteorological hazards associated with extreme precipitation events in a geomorphological-active area of Europe: Vrancea-Buzau Seismic Region

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When a high incidence of hydro-meteorological hazards characterizes a region where its coping capacity is poorly developed, the elements at risk vulnerability may notable increase. This is the case of Vrancea-Buzau Seismic Region, located in the Curvature Carpathians and Subcarpathians of Romania. This region is one of Europe's most landslide-prone areas, which also experiences propitious conditions for flash-floods, and is at the same time, the most active cub-crustal province of Europe. This paper aims at presenting the meteorological framework of heavy rain events occurrence, highlighting their role in the region's hydrology and geomorphology. The paper outlines some typical synoptic conditions favourable for triggering severe flash-flood and multiple-landslides events (e.g. Mediterranean fronts, retrograde Cyclones or trans-Carpathian air mass advections). By selecting several case studies (i.e. 1975 and 2005, considered the wettest years from the observational data in the region), characterizing both the Carpathian mountains and the Subcarpathian hills and depressions, a preliminary inventory of damages caused by such processes was undertaken, as a basis for a future vulnerability assessment in the region. The presence of numerous elements at risk (e.g. a dense and sometimes continuous network of villages or scattered households) overlaps one of Europe's most reduced income/family areas. Consequently, an increase of the potential losses value was observed in the last decades due to heavy rain episodes. The paper offers important results for the assessment of the flash-flood and landslide hazard at regional level (FP7 MC-ITN CHANGES Project), as a necessary input for the local strategies of risk reduction, by determining the potential recurrence intervals for certain thresholds of one of the most important triggering factors such as precipitation.