

Geomorphic signature of active tectonics in the southern Abruzzi Periadriatic hilly belt (Central Italy)

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The geo-structural setting of the southern Abruzzi hilly belt that stretches from the northeastern front of the Maiella Massif to the Adriatic coast is characterized by deep-seated northeast verging thrusts masked by a thick cover of Late Pliocene-Middle Pleistocene marine deposits. Most authors consider this area tectonically inactive while only few of them support the hypothesis of its recent activity from the analysis of the river network pattern. Geological and geomorphological investigations carried out in the area have clearly shown the occurrence of surface deformations resulting from the continued activity of compressive tectonics up to recent times. The analysis of the study area by a 10 m resolution DTM (using the open-source QGIS software) confirmed and supplemented field observations. Particularly significant in this context is the topographic setting of the alluvial strath terraces in the river valleys that develop transversally to the buried thrusts. In correspondence of these structures, topographic highs have grown up displacing the middle-Pleistocene planation surface developed on top of the hilly belt, from the Maiella piedmont to the coastal zone, and diverting laterally the river courses uphill. In the same places, as along the Alento and Foro rivers that cross by antecedence the grown up topographic highs, the long profiles of terraces bend eastward and the height difference between the terrace orders, essentially related all around the area to the Quaternary regional uplift, strongly increases. In some cases, surficial faults have lowered the terraces into graben troughs or have displaced them until assuming an uphill trend. This recent tectonic activity should be taken in account in assessing the seismic hazard of the study area.