



Structural and morphological characterization of active intermontane basins: a case of the Gubbio captured basin (Umbria Pre-Apennines, Italy)

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Intermontane basins characterize many orogenic chains, where they are originated either by crustal stretching or gravitational collapse of the axial zones of the chain. Extensional and/or transtensional mechanisms generate structures with geometries controlled by fault-bounded depressed areas, which in some cases are seismogenic. The western sector of the Northern Apennines in Central Italy is characterized by several intermontane basins filled by continental Plio-Pleistocene sediments. At present, a few of these basins are depressed endorheic areas, whereas most of them have been captured by river upstream erosion. The morphotectonic characterization at both regional and local scale of these structures is crucial considering the associated geological hazards due to clustered seismicity and seismic-related slope-instability along the basin-margins.

This work presents a multi-disciplinary approach based on new and existing data to define the structural geometries, landforms and processes related to the genesis and the morphoevolution of the intermountain valleys/captured-basins in Central Italy.

Quantitative geomorphological analyses from Digital Terrain Models (DTMs) are compared with geological and structural data and with geophysical investigations of active and sismogenic faults bordering the Gubbio valley in the Umbria Pre-Apennines in central Italy. This 4 km-wide valley extends for ca. 20 km in NW-SE direction and is bounded along the NE margin by a SW-dipping listric normal fault with an offset of 1500 m. The area locates along one of the main seismogenic portion of the Apennine chain and recorded historical (i.e. April 29, 1984: Ms 5.3) and many instrumental earthquakes. In this study, new data on the slope-instability along the basin-margins and the influence of active tectonics and gravitational phenomena on the streams incision and aggradation are also provided.