



Are "postglacial" fault scarps really postglacial?

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Larger earthquakes leave their imprint in the landscape. The threshold for ground rupture and fault scarp development is usually regarded MS higher than 5.5. The slipped area of the fault plane often extends to the Earth's surface and tears the land apart to produce ground breaks along the fault line or the active segment and leave a distinctive, step-like expression in the landscape named fault scarps. Therefore, fault scarps are dislocations of the ground surface and are the primary geomorphic expression of active faulting. Paleoseismologists and tectonic geomorphologists use these features to identify active faults and to parameterize paleoearthquakes.

Depending on the lithology short-living topographic features in non-consolidated sediments develop, which are subject immediately to erosion and lichen development. On the other side, long-lasting bedrock fault scarps result of differential erosion of foot- and hanging walls of faults. These linear features form often coseismically during the earthquake, leaving "ribbons" of hard rock scarps. Bedrock or hard rock fault scarps are long-lived expression of repeated surface faulting in tectonically active regions, especially in the high deformation rate settings of the Mediterranean or semiarid areas, where it is supposed that erosion cannot outpace the fault slip.

Post-glacial (or Late Pleistocene) hard rock scarps, especially those made up of Mesozoic limestones and displaced against Quaternary sediments, are quite frequent in the Mediterranean region (e.g., mainland Greece, Crete, Italy, southern Spain, FYROM (Macedonia) and Albania). We present examples from these active faults. They demonstrate fault activity and are usually very easy to recognize, because they offset mountain slopes, which have been regularized by intense Late Pleistocene weathering and cryogenetic processes. Preservation of several meter-high, coseismic fault scarps is a function of reduced production and mobility of sediments along the slope, persistent climatic conditions (i.e. since 15-10 ka), and cumulative earthquake events along the same fault (tectonic slip rate > erosion rate). The common theory is: during glacial conditions enhanced sediment mobility was faster than fault slip movement; no scarps developed. This is partly confirmed by cosmogenic dating of fault scarps in Greece (Sparta Fault, Peloponnesus; Kaparelli Fault, Greece) and Italy (Magnola Fault, Apennines), where oldest exposure ages of around 20-13 ka have been found for the exhumation of limestone fault scarps. However, calculated "post-glacial" slip rates on some of these faults are significantly too high, therefore age of the scarps and slip mechanisms are critically addressed in the presentation.