



Tectonic control of the damaged areas by land subsidence: Ameca, Jalisco Mexico, a study case

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The Miocene to Quaternary Trans-Mexican Volcanic Belt (TMVB), one of the largest Mexican volcanic arcs built on the North America plate, covers about 1000 km along central Mexico from the Pacific ocean to the Gulf of Mexico. The structure of west-central Mexico is dominated by a complex assemblage of crustal blocks bounded by major tectonic structures of the TMVB. These are the NW-SE Tepic-Zacoalco, the N-S Colima, and the E-W Chapala grabens, which separate the Jalisco and Michoacan blocks from the stable North American plate. The three grabens join south of Guadalajara to form what has been long interpreted as an active triple junction. The Tepic-Zacoalco rift is composed of the eastern part of the Plan de Barrancas-Santa Rosa graben and by the Ameca and Zacoalco half-grabens.

The Ameca city is located in the Ameca half-graben. From 80's several houses and buildings (more than 300) have been affected by land subsidence for more than two decades. The damage area follows a specific pattern with NW trend which is similar to the regional faults. The land subsidence is associated with the water extraction. We suggest that the distribution of the damage area is controlled by the fault system in combination with the water extraction. Because of the Ameca half-graben has been affected by historical and present day earthquakes and considering the subsurface geology (sandstones, siltstone intercalated with conglomerates) sudden collapses can be expected.