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Silent zone in a highly seismogenic belt crossing Calabria and eastern Sicily framed into a reviewed regional seismotectonic scenario

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A review of the seismic, geologic and geodynamic information available for the calabro-sicilian region leads us to speculate about a possible unifying view of the M7-class earthquakes which occurred in the last millennium in the same region. These earthquakes, mostly concentrated in the last 3.5 centuries and located along a narrow curved extensional belt including Western Calabria and Eastern Sicily (WCES belt), can be related to a nearly continuous north-to-south succession of east-dipping normal faults activated by WNW-ESE extension induced by residual rollback of the Ionian subduction slab. The analysis of seismic catalogs evidenced a seismically silent zone along the WCES belt, corresponding to the 23km-long Scaletta-Fiumefreddo fault segment in eastern Sicily. Because previous investigators estimated recurrence times in the order of a millennium for M7 earthquakes along different segments of the belt, and the data reported in the literature for destructive earthquakes in the 1st millennium AD are not detailed enough to allow detection of the causative faults, we cannot establish if the silent zone is a seismic gap or not. We propose the Scaletta-Fiumefreddo fault segment as an interesting zone for promoting new geophysical and geological research including off-shore seismometry and neotectonics, considering also that the seismic potential of a 23km-long normal fault going to rupture is known to correspond to an earthquake of magnitude around 6.6, a size of interest for local seismic risk mitigation projects.