



## The 1908 tsunami effects along the Messina Straits (Southern Italy): a contribution for predicting inundation scenarios

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The 1908 Southern Calabria – Messina earthquake is one of the strongest seismic events of the 20th century in the Mediterranean area. Southern Calabria and North-eastern Sicily were severely damaged (maximum Intensity XI MCS), particularly along the coastal area between South Reggio Calabria and Scilla, and between South Messina and Capo Peloro. Messina and Reggio Calabria were almost completely destroyed; the victims were at least 80,000.

The seismic event was followed, few minutes later, by a Sieberg - Ambraseys Intensity 6 tsunami (Tinti et al., 2004). It produced a large inundation along the Sicilian and Calabrian coast, with run-up exceeding in many localities 10 m, and up to 13 m at Pellaro (Calabrian coast), and 11.70 m at Sant'Alessio (Sicilian coast). The maximum on-land water penetration was 600 meters at Pellaro (along La Fiumarella stream), and almost 700 meters in the Catania Plain (Sicily), at the mouth of the Simeto river.

Based on a carefully screening of contemporary documents, i.e. technical reports (Franchi, 1909; Mercalli, 1909; Novarese, 1909; Omori, 1909; Platania, 1909; Sabatini, 1909; Baratta, 1910), newspapers and other archive material, a geo-database, reporting the tsunami characteristics and effects, has been performed.

The collected data enable us to evaluate the potential impact of an analogous future tsunami event in the Messina Strait area. Particularly, run-up and flooding data have been used to construct the potential inundation maps related to 155 km of the Sicilian coast (from Peloro Cape to Brucoli village) and to 98 km of the Calabrian coast (from Bagnara village to Spartivento Cape).

The results show that a future comparable tsunami is expected to inundate an area of about 33 sq km along the Sicilian coast (8,7 sq km with water height > 3 m) and about 9,8 sq km along the Calabrian coast (5,2 sq km with water height > 3 m).

Maximum risk is located in the area between Pellaro and Lazzaro villages, south of Reggio Calabria, where high values of run up and ingressions are expected to hit an highly urbanized coastal area. For example, the population of Lazzaro village increased from 1259 inhabitants in 1901 to 3260 in 2001; it has been reflected in the almost total urbanization of coastal areas.

Even in numerous sectors of the Sicilian coast the expected inundation will impact highly urbanized areas: according to CORINE Land Cover 2000, these areas are classified primarily as "residential zones", primarily "continuous" and subordinately "discontinuous".