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The 1783 Scilla tsunami: evidences of a submarine landslide as a possible (con?)cause

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On February 6th 1783, a span of coast of some 165.000 m^2 near the small town of Scilla (Tyrrhenian Calabria, Southern Italy) collapsed to the sea, following two main seismic events (estimated 7.3 and 5.8 Magnitudo). According to historical witnesses and tsunami catalogues, a huge amount of rock debris entered the sea producing a tsunami that killed some 1.500 inhabitants camped on the beach.

This event is, beside Vajont 1966, the only historic recent tsunami in Italy generated by a subaerial landslide entering in a water body. Two marine surveys have been carried out on December 2005 and January 2006 in the marine area immediately offshore the slide, by using shallow and deep water multibeam systems.

First results indicated a morphological continuum between the subaerial and submarine slope, the latter making up the right flank of the Scilla valley, a shore parallel feature that connects the Messina Strait with the Tyrrhenian abyssal plain. There strong currents are active, generated by the out-of-phase tidal movement on the Ionian and Tyrrhenian Seas. On this valley flank, dipping some 20-25°, a submarine steep slope approximately 1000x500 m in size is present, exactly offshore the subaerial one. The average depression respect to the surrounding seafloor is 10-20m and a rough estimation of the submarine lost volume is of some 3 Mm^3. Actually the scar is well-evident below 100-150m whilst it is almost undetectable in shallow water, either because of the primary geometry, and because of the presence of a stream deposit in the very neighbouring. Just at the foothill of the scar, a depositional bulge with hummocky morphology is present with an estimated thickness of max 10-12 m. Within the bulge large blocks are present, each one accounting for a volume between 100 and 200.000 m^3. The total volume of the deposit has been estimated something less than 2.8 Mm3. The deposit shows clear evidence of reworking by bottom currents.

Preliminary results on the relationship between the subaerial and submarine scar, the lack of scar in shallow water and the difference in volume between scars and deposit will be discussed.