Geophysical Research Abstracts
Vol. 16, EGU2014-14705, 2014
EGU General Assembly 2014

Large deep-seated gravitational slide off Ischia volcanic island, Eastern Tyrrhenian sea (Italy)

Crescenzo Violante (1), Giovanni de Alteriis (1), and Fabrizio Pepe (2)

(1) National Research Council - CNR, Institute for Marine Coastal Areas - IAMC, Napoli, Italy (crescenzo.violante@iamc.cnr.it, +39 081 542 3888), (2) Department of Earth and Sea Science, Palermo University, Italy

Ischia island develops at the edge of the shelf area and represents the sub-aerial section of a larger, E-W trending volcanic ridge including others submerged or buried volcanic edifices. In the past decade the island's offshore has been the object of extensive hydrographic and marine geophysical surveys that have shown the structural complexity of the undersea sections and have overall shown the importance of gravity failures in island's evolution. In this paper we report a previously unreported deep-seated slump structure and associated surficial mass wasting phenomena which occur off Ischia south-western flank. Recently acquired hydrological and geophysical data lead to identify the morphological features and the internal organization of the failed sediments which spread along the continental slope. The extent of this deep-seated deformations and the deep structural levels involved lead to investigate on the influence played by volcanic processes and regional tectonics on slope failure.

The Ischia southern slope was explored through a multibeam survey and a single-channel seismic survey. Acquisition was carried out from aboard the R/V Urania at depths between 400 and 1200 m. The bathymetric data were collected using a hull mounted Reson 8160 multibeam sonar. Resolution resulted in a 20x20 m implemented with 50x50 gridded size provided by a previously collected data. Seismic survey consisted of 6 seismic lines run along the slope spaced 1 km between them and 5 cross lines. The acoustic source used was a 1Kjoule high-energy power supply system with a multi-tips (400) sparker array, fired at 2s time interval.

The collected data show that a wide submerged area of 350 km2, between 400 to 1200 m depths is undergoing slow-moving deformation and associated secondary mass wasting phenomena. Morphological features include trenches, counterscarps, bulging and both extensional and contractional features while internal deformations show typical landward dipping reflectors with strong evidence of synsedimentary faulting and asymmetric anticlines.

Deformation processes operate at various scales generating folds with wavelength ranging from hundreds meters to kilometers. Extensional and rotational rupture surfaces sole out at various low-angle detachment planes located at depths from few hundreds meters to 1 kilometer in subsurface.