Geophysical Research Abstracts
Vol. 12, EGU2010-11052-1, 2010
EGU General Assembly 2010

High resolution seismic reflection survey in the Gulf of Pozzuoli, Naples, Italy. An example of preliminary interpretation of seismic profiles.

Elena D'Aniello (1), Vincenzo Di Fiore (2), Marco Sacchi (2), and Antonio Rapolla (1)

(1) Department of Earth Science, University of Naples "Federico II", Naples, Italy. (elena.daniello@unina.it) , (2) Institute for Coastal Marine Environment - National Research Council, Naples, Italy

During the cruise CAFE_07 – Leg 3 conducted in the Gulf of Naples and Pozzuoli in January 2008, on board of the R/V URANIA of the CNR it was carried out the acquisition of a grid of ca. 800 km of high-resolution multichannel reflection seismic profiles (Sacchi et al., 2009; Di Fiore et al., 2009).
The aim of the cruise was the understanding of the stratigraphic-structural setting of the Pozzuoli Bay area, with specific reference to the major offshore volcanic features, such as Nisida Bank, Pentapalummo Bank, M.Dolce-Pampano Bank and Miseno Bank and others.
The Gulf of Pozzuoli is placed in the Volcanic district of Campi Flegrei, an area of active volcanism located at North West of Naples city, along the Tyrrhenian margin, in an extensional collapsed area called Campanian Plain, filled by siliciclastic, epiclastic and volcaniclastic sediments, deposited during Late Pliocene and Quaternary.
Several studies present in literature suggest a relation between volcanic system of Campi Flegrei and faults system; in particular, at the Gulf of Pozzuoli we can observe some volcanic banks and submarine volcanic edifices, as Pentapalummo, Nisida and Miseno Banks, are aligned along the NE-SW trending Magnaghi-Sebeto fault line, that separates the Bay of Naples into two sectors: the first, at NW of the Bay, characterized by volcanism activity and magnetic anomalies and the second, at SE of the bay, involved only by sedimentary activity, with the exceptions of the circular anomalies in the offshore of Torre del Greco city (Bruno et al., 2003; Secomandi et al., 2003); other volcanic hights are instead positioned along NW-SE structural discontinuities (Bruno, 2004).
The magnetic and gravimetric analysis of the Bay of Naples confirms the tectonic control of the Campanian volcanism: we can observe a good correspondence of high magnetic anomalies with the main volcanic structures at the North-Western side of the bay, just the Gulf of Pozzuoli, where both NE-SW and NW-SE normal faults were recognized. The correspondence between magnetic structures, interpreted as volcanic bodies, and the faults NE-SW and NW-SE trending, supports the hypothesis that the magma rises along normal faults cutting the carbonate platform.
We here present two significant seismic profiles: their interpretation reveals a complex stratigraphic and structural setting, dominated by the occurrence of volcanic bodies and siliciclastic depositional units, mostly deriving from the dismantling of the adjacent vents and volcaniclastic units. The results of this preliminary research include the recognition of volcanic features and structures not yet described in the literature that may represent a relevant contribute to the understanding of the Late Quaternary evolution of the Campi Flegrei area.

References:

Bruno P.P., Rapolla A., Di Fiore V., 2003. Structural setting of the Bay of Naples (Italy) seismic reflection data: implications for Campanian volcanism. Tectonophysics, 372, 193-213.
Bruno P.P., 2004. Structure and evolution of the Bay of Pozzuoli (Italy) using marine seismic reflection data: implication for collapse of the Campi Flegrei caldera. Bull. Volcanol., 66, 342-355.
Di Fiore V., D'Aniello E., Rapolla A., Sacchi M., Secomandi M., Spiess V., 2009. Multichannel seismic survey in coastal Campania area by two different resolution sources. EGU General Assembly 2009, vol.11.
Sacchi M., Alessio G., Aquino I., Esposito E., Molisso F., Nappi R., Porfido S., Violante C., 2008. Risultati preliminari della campagna oceanografica CAFE_07 – Leg 3 nei Golfi di Napoli e Pozzuoli, Mar Tirreno Orientale. Quaderni di Geofisica, n. 64.
Secomandi M., Paoletti V., Aiello G., Fedi M., Marsella E., Ruggieri S., D'Argenio B., Rapolla A., 2003. Analysis of the magnetic anomaly field of the volcanic district of the Bay of Naples, Italy. Marine Geophysical Researches.

24: 207-221.