# The submerged structure and stratal architecture of the Neapolitan Yellow Tuff (NYT) caldera, offshore the Campi Flegrei, (Eastern Tyrrhenian Margin): new insights from high resolution seismics and gravity core data

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The Campi Flegrei is an active volcanic area defined by a quasi-circular depression that covers some 200 km$^2$ of the coastal zone of SW Italy, a large part of which develops off the Naples (Pozzuoli) Bay (Fig. 1). The area has been active at least since 60 ka BP ( Pappalardo et al., 1999), and is structurally dominated by a caldera, 6 km in diameter, associated with the eruption of the Neapolitan Yellow Tuff (NYT), a 40 km$^3$ Dense Rock Equivalent (DRE) ignimbrite (Scarpati et al., 1993) dated at ca 15 ka BP (Deino et al., 2004), that covered the district now occupied by the city of Naples, the Campi Flegrei and a large area of the continental shelf off the Pozzuoli Bay.

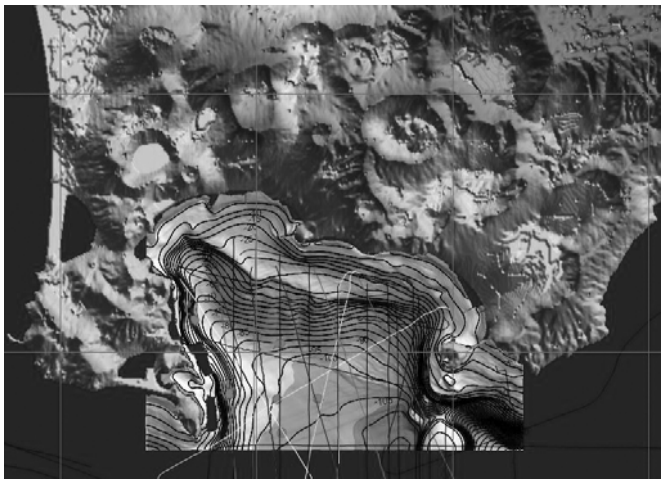

*Fig. 1* – Map of the Campi Flegrei active volcanic area and location of seismic profiles and gravity core data

The volcanological evolution of the NYT caldera as been long described on the basis of outcrop and subsurface studies onland (Rosi & Sbrana, 1987; Orsi et al., 1996, 2004 and references therein; Di Vito et al., 1999; Perrotta et al., 2006; Fedele et al., 2011), but its offshore morphology, detailed structure and recent stratigraphic setting are still poorly understood.

In this study we integrate geological and geophysical data of different resolution/penetration obtained from high-resolution reflection seismic profiles (Sparker and Chirp source) with gravity core and swath bathymetry to better constrain the shallow structure, stratigraphic architecture and latest Quaternary to Holocene evolution of the submerged sector of the NYT caldera off the Pozzuoli Bay.

Our data clearly image, for the first time, the offshore geometry of the NYT caldera ring-fault zone, as well as the style and timing of volcano-tectonic deformation associated with the late stage evolution of the NYT inner caldera resurgence. Our interpretation suggests that since 15 ka the offshore sector of NYT inner caldera underwent significant deformation and uplift (with minor subsidence episodes) that occurred at almost the same rate as the post-glacial sea-level rise. Particularly, the inner Pozzuoli Bay started to deform soon after 15 ka BP, when sea-level rise was initially faster than uplift. This caused a general increase of the accommodation space that was progressively filled up by volcaniclastic sediments. Since ca. 8 ka BP, along with the mid Holocene decrease in the rate of the sea-level rise, the early NYT resurgent structure was then uplifted up to the sea-level or even to partial subaerial exposure. From ca. 8 to 5 ka BP two distinct layers of volcaniclastic resediments, mostly represented by gravity flow deposits, formed throughout the Bay. A significant post-Roman (post 2 ka BP) subsidence phase of ca 10 m is then recorded offshore Pozzuoli by the drowning of the infralittoral prograding wedge below the present-day fair-weather wave base.

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