Vertical motion, structural features and stratigraphic architecture of the Neapolitan Yellow Tuff (NYT) collapse caldera-resurgent dome system off the Pozzuoli Bay during the last 10 ky

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Seismic stratigraphic analysis of very high-resolution single channel reflection seismic profiles provided insights into the last ~10 ka vertical deformation pattern in the submerged part of the Campi Flegrei resurgent caldera, off the Pozzuoli Bay. The collapse of the central part of the Campi Flegrei is associated with the eruption of the Neapolitan Yellow Tuff (NYT) at ~15 ka BP, and was followed by discrete phases of intra-caldera volcanic activity and resurgence (Di Vito et al., 1999). Only in recent years the southern part of the caldera, presently submerged off the Pozzuoli Bay, has been explored using marine geophysical data (Sacchi et al., 2014; Steinmann et al., 2016). Interpretation of the high-resolution seismic reflection dataset acquired during the Cruise SEISTEC_2013, calibrated by marine gravity cores, allowed us to identify key horizons between the 1538 AD M. Nuovo and the ~3.7 ka Averno eruptions. Chronostratigraphy of the older part of the caldera fill was inferred through tentative correlation with significant eruptions known onland. Seismic stratigraphic interpretation reveals the occurrence during the last ~10 ka of at least three generations of Prograding Wedges (PW1-PW3) that were likely associated with corresponding periods of relative sea-level stands, and of minor coastal terraces. Correction of the observed depth of each sea-level indicator for the paleo-bathymetric estimate and for the glacio-hydro-isostatic sea-level change occurred since its formation, allowed to reconstruct differential relative sea-level curves for the western, central and eastern sector of the submerged part of the caldera. Preliminary results indicate that the periods of relative sea-level and accommodation space stability that allowed the onset of Prograding Wedges were attained when uplift occurred at a rate comparable to the rate of sea-level rise. These periods ostensibly correspond to known different phases of volcanic activity and unrest, suggesting that not only volcanism but also ground deformation were temporally clustered. Subsidence prevailed during periods of volcanic quiescence.

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