



**Workshop IODP-Italia “Lo stato delle proposte di perforazione nell’area mediterranea”**  
*Scientific Drilling in the Mediterranean Sea*  
Roma, 15-16 gennaio 2018

**Abstract**

**IODP - Lo stato delle proposte di perforazione per l’area del Mediterraneo**

**Perforazione della Caldera dei Campi Flegrei - Una proposta anfibia IODP-ICDP**

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**Abstract**

Active calderas are major volcanic features of the Earth’s crust associated with shallow magma reservoirs, high geothermal gradients, and geodynamic unrests often documented through historical time. As large caldera-forming eruptions are also among the most catastrophic events that may affect the Earth’s surface, calderas are ostensibly the sites of major interest for both the scientific community and governmental institutions worldwide.

The Campi Flegrei is an active volcanic area located west of the city of Naples, largely on the continental shelf of the Eastern Tyrrhenian margin that has been characterized by dominantly explosive eruptions during the latest Quaternary. This is one among the highest volcanic risk-prone areas of the world and likely the only example in the historical record of a caldera where dramatic ground/seafloor deformation (more than 4 m of uplift between 1950 and 1984) was not followed by a volcanic eruption. This suggests some important role played by the heat and gas flow from the magma chamber and the dynamics of the shallow aquifers in the unrest episodes.

Recent research offshore the Campi Flegrei has shown that a significant part of the volcanoclastic products and sedimentary processes are still largely unknown. The structure of the hydrothermal system associated with the offshore substructure of the caldera system is poorly constrained, and even the caldera-like diagnostic characters postulated for the older phase in the evolution of the Campi Flegrei, largely based on outcrop data, are somewhat questionable. Therefore, it has become clear that only drilling both the onshore and offshore parts of the caldera much deeper than conventional coring may provide a relatively complete stratigraphic record that could not be preserved on land.

We propose 15 drill sites (1 deep drill site onland and 14 shallower drill sites offshore) that are necessary in order to reconstruct the Late Quaternary stratigraphy, structure, hydrothermal system and geodynamic evolution of the Campi Flegrei district as a component of the eastern Tyrrhenian margin.





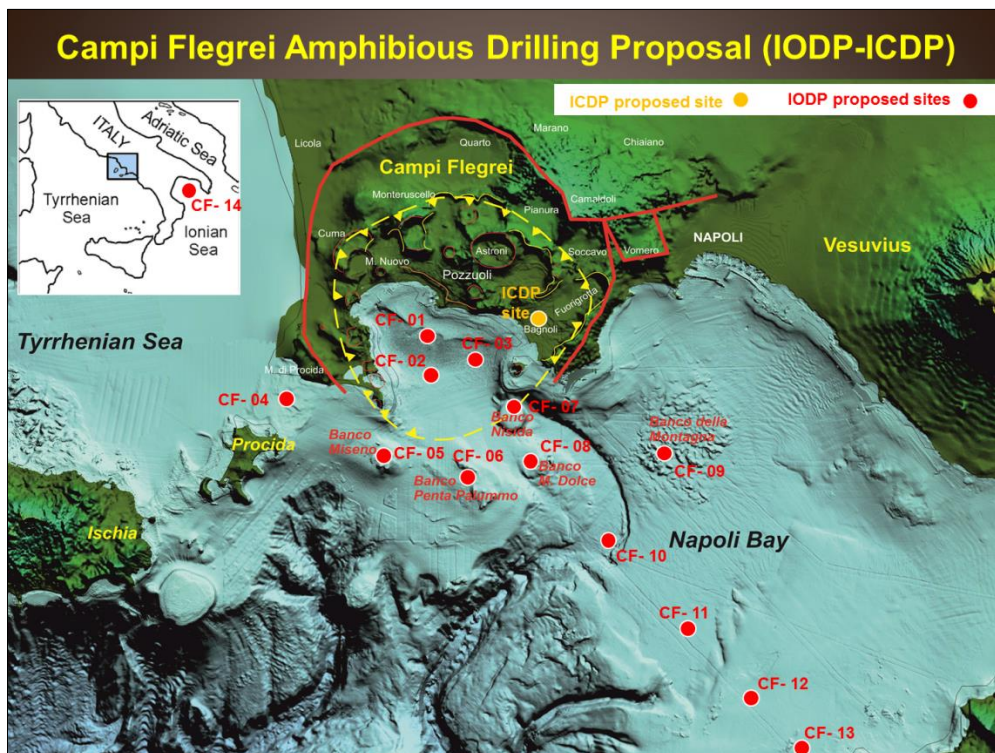
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According with the outcomes of a MagellanPlus Workshop held in Napoli in February 2017, it was suggested the Campi Flegrei Caldera Drilling Project should be jointly submitted to IODP and ICDP as an Amphibious Drilling Proposal by the end of 2018. The Workshop participant agreed on the proposition that the IODP component of the proposal should focus on integrated stratigraphy of the caldera fill and resurgent structure, as well as on petrology and architecture of shallow structural levels (0-500 m depth), whereas the ICDP component should be designed to understand the rock-fluid properties, physical-chemical processes and the geothermal system at deeper structural levels (0-3000 m depth).

Onshore drilling of a pilot hole has already been completed, enlightening many new results which shed completely new light on the volcanic history and on the extension and mechanisms of the caldera itself. The joint drilling project is hence based on solid grounds and can certainly become a key for a large step forwards in the knowledge of caldera dynamics and eruption prediction.



**Fig.1.** Working progress of the base map of the Campi Flegrei Amphibious Drilling Proposal (ADP) with location of proposed ICDP site and IODP sites.

