



## **Volcanic activity and human settlements from 8,000 years ago until the 16th century AD in the western part of the city of Naples (Italy)**

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The area of Naples (Italy) is characterized by abundant archaeological remains from the Neolithic period onwards and by widespread volcanic deposits derived from explosive and effusive eruptions of Vesuvius and the Campi Flegrei and Ischia volcanoes, dated at <500 ka b.p.

We present an archaeological and volcanological study of excavations conducted in the western part of the city of Napoli, near the eastern border of the Campi Flegrei caldera. The area has been investigated mainly thanks to the works for the construction of Linea 6 of the Naples Underground. The excavations have yielded many traces of settlements and land use, intercalated within volcanic products dating between 8.2 ka ago and the Late Middle Ages. Gently sloping hills and coastal plains characterized the area, that is very close to the first Greek settlement in Napoli. At least 15 deposits from explosive eruptions of the Campi Flegrei, Ischia and Vesuvius have been recognized in the defined time span, which are intercalated with reworked deposits and paleosoils containing traces of human activities. Micro-morphological analyses of soils will furnish fundamental information about modes of soil use and on the impact of ancient agricultural practices. The volcanic deposits consist of pyroclastic layers with variable grain-size (ash-to-lapilli) that are correlatable on stratigraphic, lithological and petrological bases. Pyroclastic fallout and density current sediments deposited by known eruptions and partially reworked in continental and transitional environments have been recognized. Sampled deposits have been studied using optical and electron microscopes and electron microprobe techniques. Analytical results have been used to compare the studied products with those described in the current literature for the Neapolitan volcanoes. The most interesting results are from the Chiaia excavation, where the oldest anthropological traces occur within a complex paleosoil formed between 8.2 and 4.5 ka, a period of scarce volcanism in Campania. The work has brought to light various humus-bearing levels containing many postholes and fireplaces of a Late Neolithic (Serra d'Alto facies) settlement. These traces are followed by a cultivation interface characterized by hoe-marks overlain by thin volcanic ash from an eruption previously unknown in the area. This underlies two other paleosoils containing ploughing traces (the first crossed and the second with furrows and ridges). The uppermost paleosoil is overlain by the Agnano 3 (4.5 ka) and Paleoastroni 2 (4.1 ka) tephra. Ploughing traces also affect the paleosoils formed on these two deposits, which although not datable by diagnostic archaeological finds, have been attributed to the Eneolithic, on the basis of the age of the tephra of known origin. Traces of human activity are rare in the most recent deposits, probably as consequence of the abandonment of the area due to the frequent and high intensity eruptions that occurred west of the studied site. Resettlement is evident in the uppermost sequences which contained reworked fragments dated from the Iron Age until Greek times, when the Parthenope settlement was established.

The exceptional alternation of archaeological and volcanological sequences makes it possible: i) to date exactly prehistoric and historical volcanic eruptions, ii) to determine the influence of volcanic activity on human life, iii) to study the effect of the deposition of volcanic products on the territory, and iv) to use the volcanic deposits as marker levels for dating and correlating unknown archaeological sequences. Our reconstruction reveals the high-level hazard posed to Napoli by Phlegraean and Vesuvian high-to-low intensity explosive eruptions.