



# The natural and cultural landscape of Naples (southern Italy) during the Graeco-Roman and Late Antique periods



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## ABSTRACT

The landscape around the Graeco-Roman town of *Neapolis* was reconstructed through morphostratigraphic methods and pollen analysis of the sediments filling the bay hosting the ancient harbor. This was discovered in 2004 thanks to excavations for two new lines of the Naples metro network; the harbor's sedimentary record spans the period between the late 4th century BC and the 6th century AD. The main changes occurring in the marine and terrestrial landscape surrounding the ancient town are highlighted through the reconstruction of a detailed geological cross section and four 3D palaeogeographic models. Pollen analysis suggested the presence of mixed oak woods on the slopes surrounding the town and of vegetable gardens around the harbor area. The tree crops mainly consisted of walnut, and to a lesser extent chestnut and grapevines. The horticultural varieties were dominated by Brassicaceae, most likely representing cabbage cultivation which was rather common in Roman times. Comparison with reference pollen material reinforces this hypothesis. During the 3rd century AD a drastic decrease in horticultural activity, in concurrence with an increase in wild vegetation and tree crops, suggest reduced maintenance due to a phase of abandonment. Historical data imply for the same period a phase of economic and social decline which involved the whole Empire. From the end of the 3rd century AD, the growth of a spit bar at the port entrance gave rise to the establishment of a lagoon and then to the final closure of the bay.

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## 1. Introduction

Reconstructing past landscapes is a challenging task, especially when dealing with regions that have witnessed the presence of man since prehistoric times (Leveau et al., 1999; Mercuri et al., 2010a, 2010b; Sadori et al., 2010a; Marinova et al., 2012). In such areas the natural evolution of environments, driven by climatic and/or endogenous factors, is intimately modified by continuous land use and management by man (Kosmas et al., 1997; Walling, 2001; Redman et al., 2004; Butzer, 2005). On this assumption, it has become clear that any attempt at landscape reconstruction in archaeological contexts has to rely on the systematic integration of archaeology, geomorphology and other scientific disciplines.

The present contribution deals with the reconstruction of the landscape around the Graeco-Roman town of *Neapolis* (Fig. 1) through morphostratigraphic methods and pollen analysis of the

ancient harbor sediments. These data enrich the geomorphological, stratigraphic, archaeological and archaeobotanical reconstructions already obtained for this site (Giampaola et al., 2006; Irollo, 2005; Ruello, 2008; Amato et al., 2009; Carsana et al., 2009; Allevato et al., 2009, 2010; Cinque et al., 2011).

*Neapolis* harbor was discovered in 2004 thanks to excavation work on two new lines of the Naples underground. Its sedimentary record has been shown to cover a time interval between the late 4th century BC and the 6th century AD (Giampaola et al., 2006). The excavations brought to light vast amounts of stratigraphic data from excavations and boreholes which were analyzed by a multi-disciplinary team comprising archaeologists and geologists. Taken together, the geological and archaeological data cover the coastal strip of the modern town. The latter spreads at the bottom of the Pendino terrace (Fig. 2), where *Neapolis* rose in the late 6th century BC (D'Agostino and Giampaola, 2005), bordered westward by Mt. Echia, the hill where the more ancient town of *Parthenope* was settled in the mid 7th century BC (Giampaola, 2011).

Despite the extraordinary abundance of archaeological sites of Graeco-Roman age in Campania, there have been few integrated studies devoted to reconstructing the landscape in this period.

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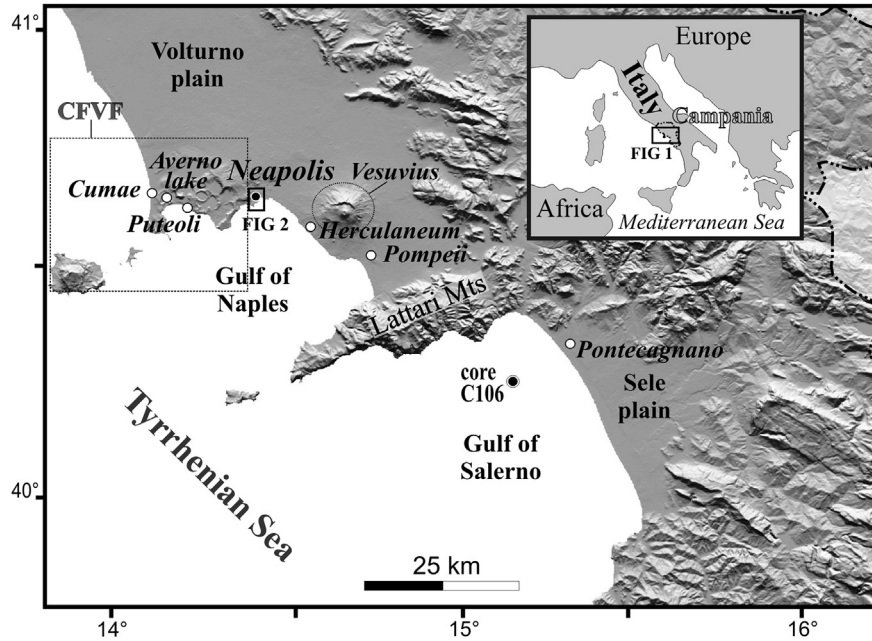


Fig. 1. Geographical location of the study area and of the sites cited in the text. CFVF: Campi Flegrei volcanic field.

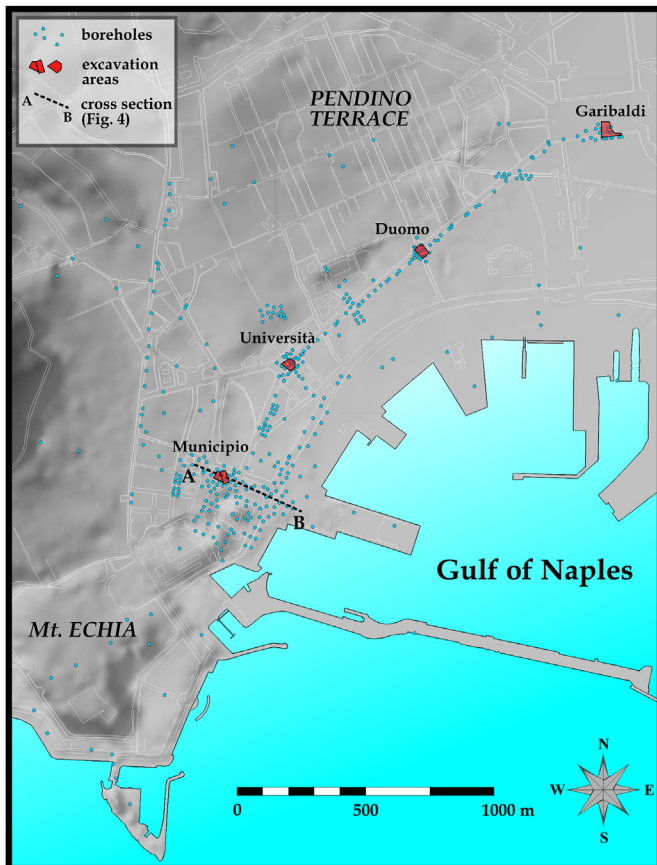


Fig. 2. Coastal strip of Naples with position of investigated boreholes and excavation areas. For location of this sketch see Fig. 1.

Most such studies concern the sites buried by the AD 79 eruption (Jashemski, 1979; Ricciardi and Aprile, 1988; Meyer, 1988; Ciaraldi, 2000; Mariotti Lippi, 2000; Jashemski and Meyer, 2002; Robinson, 2002; Mariotti Lippi and Bellini, 2006). These works mainly concern analysis of pollen and macroremains in restricted contexts, apart from the study on the sediments of Lake Avernus (Grüger and Thulin, 1998; Grüger et al., 2002) and the Cumae lagoon (Morhange et al., 2002) northwest of Naples (Fig. 1).

This study aims to contribute to filling this gap by giving insight into the physical landscape around a large town, during the Graeco-Roman and Late Antique periods. In particular, geomorphological analysis and morphostratigraphic correlations provide a detailed reconstruction of the ancient coastline of *Neapolis* and its evolution during a time period covering the entire life of the Graeco-Roman harbor. Pollen analysis has highlighted the floral composition of the landscape around the port area, seeking to distinguish the natural and anthropogenic components of vegetation.

## 2. The study site

The modern city of Naples is located within the graben structure of the Campania plain, which developed between the western sector of the Apennine Chain and the eastern margin of the Tyrrhenian Sea (Fig. 1). The geomorphological setting of the area is characterized by favorable conditions that have facilitated human settlements since Neolithic times: cliffed promontories alternating with narrow coastal plains offered natural resources and, at the same time, protected landing places. This landscape was constructed by the activity of the Campi Flegrei volcanic field (CFVF, Fig. 1) and especially by Neapolitan Yellow Tuff (NYT) emplacement (15 ka, Deino et al., 2004; De Vivo et al., 2010) and by the subsequent monogenic tuff cone and ring formation (from 10 to 3.8 ka BP; Di Vito et al., 1999). The city of Naples, in particular the coastal area in question, is located at the eastern boundary of the CFVF along the rim of the NYT caldera (Di Vito et al., 1999; Orsi et al., 1999). Moving to the east, the urban landscape is almost flat, with a gradual transition to the Sebeto river plain and the Vesuvius

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