

## The "Meda" Project: Creation of The Underwater Archaeological Map in Santa Marinella. Prospects for The Reconstruction of the Ancient Landscape

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**Submitted:** 27 Nov 2021; **Accepted:** 03 Dec 2021; **Published:** 11 Dec 2021

**Citation:** Magda Vuono, Martina Patusso (2021) The "Meda" Project: Creation of The Underwater Archaeological Map in Santa Marinella. Prospects for The Reconstruction of the Ancient Landscape. *J Huma Soci Scie* 4(2): 286-290.

### Abstract

The importance of studying the coasts and the seabed is already known. In any case, the submerged archaeological presences remain today an aspect not yet addressed in a completely systematic way, often remaining a rather incomplete knowledge. The cataloguing of submerged archaeological evidence, through the formation of underwater deposits maps and the study of these, through the contribution of GIS methodologies, fortuitous - to the understanding of their origins and their transformation over time.

**Keywords:** Underwater Deposits, Archaeology of The Coastal Landscape, Underwater Archaeology As a Methodological Tool.

### Introduction

The current project, subject of this writing, focuses on the creation of an underwater archaeological map and topographical analysis of the territory of the current town of Santa Marinella, in the area that in historical times extended from Pyrgi to the area occupied

by the ancient maritime colony of Castrum Novum. This territory is located in Italy, in the Lazio region and is included in the Santa Marinella and Torre Marangone tablets of the IGM map of Italy (Sheet 142 of the Map of Italy, Military Geographical Institute).

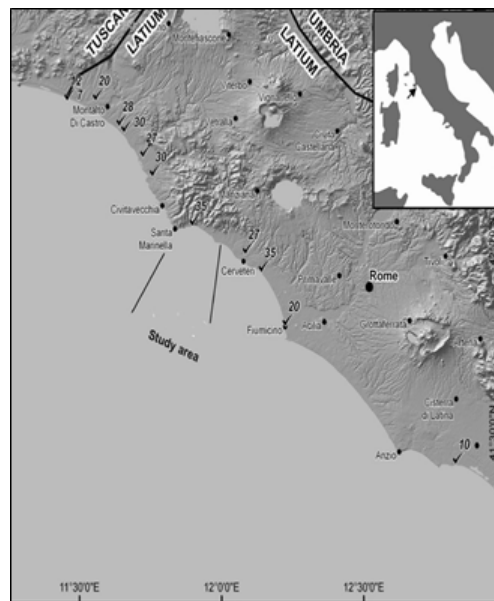


Figure 1: Area of focus

The aim of the project will be to increase knowledge of the territory by attempting to reconstruct the settlement pattern of antiquity as a whole and to interpret ancient landscapes in a long-term perspective, that does not exclude any historical phase. The main instrument of research will be intensive and systematic archaeological surveys, thanks to which a dense network of settlements can be documented and mapped using GIS. We want to create a tool for the analysis and interpretation of the archaeological context that is able to act as a continuously implementable engine for the management of the collected data, so as to bring traditional methods of investigation on a common work plan with the application of new information technology potential. The use of GIS for archaeological research guarantees completeness of documentation, diversified keys to interpretation and allows to satisfy the fundamental requirements to bring archaeology on par with other disciplines in the policy of territorial management and analysis. This type of approach will allow both the management of the different themes (archaeological, soil visibility, geological maps) and the refinement of the documentation process and the creation of spatial models useful for interpretative purposes (maps of indivisibility between sites, acclivity, slope exposure, 3D models), with the aim of contributing to the elaboration of cognitive analyses between sites.

### Methodological Approach

The area that will be examined can undoubtedly be considered of considerable historical and archaeological interest as it is rich in structures from various periods, which are currently submerged. The area that will be examined can undoubtedly be considered of significant historical and archaeological interest as it is rich in structures from various periods, which are currently submerged. The methodological framework that inspires this work is certainly global archaeology, and in particular the study of landscape archaeology. This field of research is based on the "globality of approach, overcoming disciplinary fences, integrated use of different sources, both archaeological and non-archaeological, proper use of tools, procedures and methods of the various disciplines involved, with the aim of answering a variety of historical questions" [1]. This type of approach is undoubtedly the only one applicable when the subject of the research is the coastal landscape. In fact, due to its highly variable and changing characteristics, the study of the evolution of the coastal landscape must be based on geo-archaeological, naturalistic and historical-archaeological studies. This multi-disciplinary analysis makes it possible to grasp the evolutions and transformations, considering them in their entirety. In recent years, this type of approach has, for example, been used to study Italian protected areas. The study carried out for the Torre Guaceto State Nature Reserve and Marine Protected Area in Apulia can certainly be considered a reference study [2]. Following this type of methodological approach, the structure of the project will be articulated in a first part in which the framework of the investigated context is deepened both from the geo-morphological point of view. This context will be examined in function of the importance of the reconstruction of the ancient sea level through the realisation of thematic maps based on the archaeological evidence. Among the submerged archaeological evidence, fishponds are the most reliable category of monuments for studying these variations. The study of sea level variations, as they had a very precise relationship with the tidal variations at the time of their construction, which can, moreover, be circumscribed within a very limited

chronological span. The studies, starting from a careful analysis of the sources and supported by surveys carried out at sea, allowed a more stringent selection of significant markers. In fact, in relation to the structures of the fishponds, only the reference heights deduced from the walls that run inside the tanks, from the intake channels have been declared reliable. While the external perimeter walls were excluded as they were considered a source of scarcely reliable data for the ancient sea level. The historical development of the coastline will then be analysed, considering the main centres of development in both Etruscan and Roman times and their evolution in the Middle Ages. An attempt will be made to outline the settlement patterns of the area. Finally, an underwater archaeological map will be drawn up with the aim of identifying both the main geo-topographical contexts and the sporadic archaeological evidence. The Archaeological Map will be accompanied by detailed cards of the archaeological evidence, which will be used as a tool for various spatial elaborations between sites.

### Overview of The Geomorphology of Southern Etruria

As regards the area that interests us most closely here, i.e. the southern offshoot of coastal Etruria between the territories of Alsium, Caere and Castrum Novum, from a geological point of view it presents a varied formation with a rich stratigraphy including deposits that can be traced back to the Middle and Upper Pliocene [3]. The oldest recognised Pleistocene sediments, dating back to the Lower Pleistocene, were exposed by the erosion of the Mola ditch, which is the main watercourse in the explored area [4]. On the oldest tuff deposits formed by the activity of the Sabatino Complex in the middle Pleistocene (stratified tuffs), powerful ignimbrite beds have been deposited that have masked the pre-existing morphology, allowing the formation of a hydrographic network with the incision of valleys clearly delineated by red tuff walls. The coastal strip of the territory, between 0 and 5 metres above sea level, and the bottom of the main river valleys are characterised by the presence of Holocene formations, consisting of alluvial deposits, silts, rich in sandy gravels, often difficult to drain. The continuity of the Holocene alluvial deposits is interrupted by the outcrop of Pliocene calcareous rocks, sandstones, often organogenic, covered by sand and ancient Pleistocene clays. A detailed study was carried out by the Department of Earth Sciences of the University of Rome, which led to the revision of the geological map of the area. In some areas, the presence of a large area of sharp-edged pebbles belonging to the turbiditic sandstones should be noted. From the characteristic typology of these pebbles, Pietraforte can be identified as the most accredited quality. Interesting studies have been carried out in the area of Pyrgi, in correspondence with the Castle of Santa Severa. This is the 'wreck' of a rocky promontory dismantled by sea erosion, which in all probability was used as a quarry for building material during the construction of various defensive structures in Etruscan and Roman times. Finally, two important studies carried out in the Lazio region were considered for the study on sea level variation. These studies have been compared for a further comparison on the evolution of the coastline in the sea stretch of this area. The first one concerns the study of coastal erosion along the whole coastline of the Lazio region. It was conducted by means of a diachronic analysis of coastline variations. It showed that most of the beaches were unstable, to be considered as eroding. A subsequent analysis based on the comparison of the coastline between the years 2000 and 2008, in the second phase of the study, confirms a progressive effect of erosion show-

ing that eroding beaches are increasing. Another interesting study was conducted at a line of Roman villas that once dominated the Mediterranean coast south of the Tiber estuary near Ostia, central Italy. The Roman remains, which were built within a series of dune ridges, now lie up to 900 m from the current coastline as a result of the continuing evolution of the Tiber delta.

### Overview of The Main Settlements in Southern Etruria

The archaeological evidence already known shows how the topographical layout of prehistoric and protohistoric settlements was strongly influenced by the geomorphological structure of southern coastal Etruria [5]. In fact, there is a "comb" distribution of housing complexes, with a greater concentration along the coastal strip and then moving inland along the main waterways. In reality, this distribution of the population is the result of a series of interconnected phenomena [6]. This doubtless includes the abandonment of many sites occupied in previous phases and the emptying out of large portions of the territory. Basically, there is the overcoming of the capillary distribution, characterised by small settlements, in favour of the constitution of larger complexes. It is plausible to argue that at the basis of this evolution there was a strategic selection of sites, which in the course of time led to a preference for settlements in more defensible areas, to the detriment of those in undefended areas, and thus to the formation of ever larger settlements. A new population system was thus configured, characterised by fewer but larger settlements. These new centres were established in correspondence with large orographic units, in a dominant position with respect to the surrounding territory from which they were easily defended. Preferably, territories with the availability of mineral or agricultural resources in the vicinity of watercourses or the sea were chosen. The whole phenomenon has been interpreted in terms of a real "proto-urban and pro-state turning point", i.e. as a decisive moment in the long-lasting process that determined the gradual overcoming of the proto-historical "village" organisation in favour of an organisation centred on "towns". This is the context in which the centres of Cerveteri, Tarquinia, Vulci and Veio were founded. These centres in southern coastal Etruria were founded on broad tufa plains that were clearly distinct from the surrounding landscape. All of them are characterised by their proximity to watercourses, mostly torrential in character, which are part of the hydrographic system of larger rivers, used as connection routes between the hinterland and the coast. In the cases of Cerveteri, Tarquinia and Vulci, the chosen sites are located a few kilometres from the sea and immediately behind the coastal plain, which they dominate visually. Later, in Roman times, this area was initially occupied through the construction of military camps 'castrum' located in strategic control positions. These were fortified outposts on the sea, of an almost exclusively military nature, usually manned by a contingent of about 300 men. These were soldiers, all Roman citizens *optimo iure*, enjoying all the rights guaranteed by the State, enrolled in one of the various tribes into which the Roman electoral body was divided, and commanded by special magistrates and officers of various ranks. The foundation of the castrum at Pyrgi and Castrum Novum can be dated to this period [7]. Later, once the Romans had definitively conquered the area, otium villas were built along the coast. There are luxurious villas built on small headlands. Frequently the choice of location fell on small bays and inlets suitable for mooring. These were the holiday resorts of the Roman aristocracy from the 2nd century AD. Finally, during the Middle Ages, these majestic, luxurious villas with

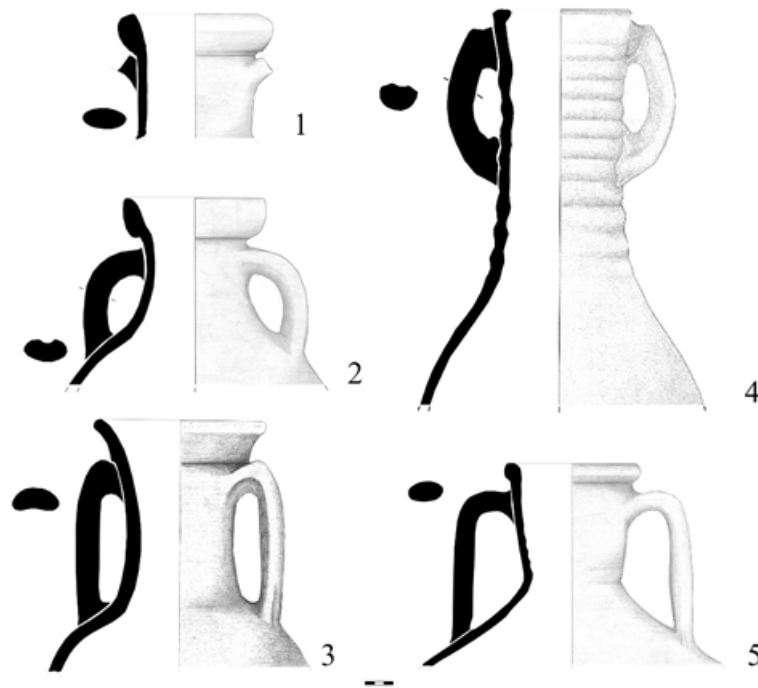
no defensive structures were abandoned in order to build small fortified settlements far from the coast. This migration of the population is evident throughout Latium, with the radical abandonment of areas near the sea in preference to areas perched inland where walls of fortifications could be built and easily defended against enemy attacks. The only case of a settlement near the coast is the Castle of Santa Severa, built exactly at the ancient landing place with a sacred area from Etruscan times, on which the castrum of Pyrgi had been built in Roman times.

### Development of the Underwater Archaeological Map

For the realisation of the Map of Archaeological Evidence, in order to achieve an overall view of the area, it was decided to examine both the archaeological remains that are currently submerged and those that are in the immediate vicinity of the coast, which are inextricably linked to it. In order to catalogue the data that are being collected as a result of the research activity, it was decided to proceed with an accurate classification of the contexts: wreck, hypothetical wreck, area of fictile fragments, isolated find, structures [8]. These five types of contexts vary from one another and have certain characteristics that identify them; a "wreck" type context, for example, means a specific submerged archaeological site in which entire portions of the hull or conspicuous remains of cargo have been found that make it possible to state unequivocally that we are dealing with the shipwreck of an ancient vessel. On the contrary, a 'hypothetical wreck' indicates a context in which it is not possible to identify with certainty a shipwreck episode. Indicators of a hypothetical wreck can also be the presence of remains of the boat's cargo, the association of clay fragments belonging to the cargo with wooden fragments belonging to the hull. As for the evidence "on land", it is also possible to include the "areas of clay fragments" among the submerged evidence. These are contexts of concentration or dispersion of materials, sometimes in a secondary position, referable to frequentation activities, port dumping, occasional anchorages. For this type of context, a scale of values has been determined in order to subdivide the areas of fragments into three classification micro-contexts. The dataset also includes the "isolated find" type, in which the most disparate materials found individually, without their original context, are grouped together; this category includes decontextualized anchors, isolated amphorae, clay fragments, stone dead bodies, net weights, anchor logs, etc. Before beginning the systematic survey at sea, it was decided to focus on three centres along the coast of particular interest: the site of Pyrgi, the site of Grottaacce and the site of Castrum Novum. In correspondence with these nerve centres, systematic reconnaissance is being carried out both along the coastline and in the portions of sea in front of these archaeological sites. As far as Castrum Novum and Pyrgi are concerned, it must be emphasised that both are Etruscan settlements that were transformed into maritime colonies by the Romans during the third century BC. Moreover, in both cases, the reconnaissance made it possible to collect data testifying to the existence of inhabited areas close to the sea to which a landing place must certainly have been connected, to be located on the ancient coastline, now submerged, around the mouth of the primitive course of the Fosso delle Guardiole. The stratigraphy documented in the erosion section reveals traces of a coastal settlement that was certainly active in the Middle Bronze Age and perhaps also in the Recent Bronze Age. The continuous recovery of ancient material after sea storms testifies to the intense maritime activity of the site, especially in relation to the numerous amphora

fragments. With reference to the site of Grottace, research has been directed towards the presence of the remains of the maritime villa built overlooking the sea. An important quantity of finds, both sporadic and within the inhabited settlement, are being discovered and catalogued in this area. It is important to emphasise the presence of fishponds in all three contexts that have been investigated so far. As mentioned earlier, this type of fish-farming structure was used to breed fish. Also, these types of fish-breeding structures are the most reliable category of monuments for studying variations in ancient sea level. In fact, the water level played a fundamental role in this type of construction. The studies, starting from a careful analysis of the sources and supported by investigations carried out at sea, have allowed a more rigorous selection of significant markers. In fact, in relation to the structures of the fishponds, only the reference heights deduced from the walls that run inside the tanks and from the intake channels were declared reliable, while the external perimeter walls were excluded as they were consid-

ered a source of scarcely reliable data for the ancient sea level. The archaeological importance of the evidence from the sea, however, does not end with the study and analysis of the fishponds. In fact, objects of considerable interest have been recovered from the seabed in front of the sites under study. Certainly, the most consistent part is made up of amphorae. But the presence of bronze nails with wood fragments suggests the presence of one or more wrecks of ships used for commercial traffic that were wrecked in the harbour roadstead in front of the settlements. In addition, bronze or sealed ceramic objects or even common pottery enrich the significance of these finds. Among these, of particular interest for the site of Castrum Novum was the discovery of a votive statuette depicting the Greek goddess Hera, which opened up important reflections on trade contacts with the ancient colony of Paestum, from which it probably came. In addition, the Castrum Novum site is currently being investigated with regard to the findings of the ceramic class of amphorae.



**Figure 2:** Amphorae From The Capo Linaro Seabed: 1. Africana iia; 2. Massaliota type 2; 3. Dressel 9/10; 4. Egloff 172; 5. Dressel 2/4.

This has made it possible to reveal the trade contacts of Castrum Novum and its evolution over time. At the same time, it is possible to observe how relations between the Romans and the surrounding populations changed over time. These classes of artefacts are undoubtedly among the best indicators for reconstructing the process of globalisation of the Mediterranean as a function of the Roman conquest. The amphorae found on the beach at Capo Linaro are of different provenance and period. Some refer to Italic (Greek-Italic) production (fig.2), others from Spain, like Dressel 20, and one specimen of particular interest, the Egloff 172 type amphora found at a depth of about 2 metres, of Egyptian production.

### Developments and Prospects

The ongoing research will eventually lead to a systematic knowledge and recording of archaeological data located both along the coast and at sea. All the evidence recorded will contribute to the creation of spatial models useful for interpretative purposes (inter visibility maps between sites, acclivity, slope exposure, 3D models), with the aim of leading to the elaboration of cognitive analyses between sites. It will also be possible to focus on how and to what extent the places chosen for settlements are linked to the resources available at the time of reference. An attempt will be made to create networks of functional links to control the territory, and

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to recognise a system of relations between sites of different rank. For example, an analysis of the inter visibility between settlements will be carried out using the line of sight and view shed functions of the ESRI software. This processing will make it possible to ascertain the presence or absence of a hierarchical system between the various settlements.

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