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ADRION
ADRIATIC-IONIAN
EUROPEAN UNION
European Regional Development Fund - Instrument for Pre-Accession II Fund

APPRODI

ADRION, Charter routes
from antiquity to modern times

(EBOOK)

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from antiquity to modern times

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Monumenta Germaniae Historica, Scriptores, Hannoverae, 1885, XXVII.
Moryson, F. 1907. *An Itinerary Containing His Ten Yeeres Travell: Through the Twelve Dominions of Germany, Bohmerland, Sweitzerland, Netherland, Denmarke, Poland, Italy, Turky, France, England, Scotland & Ireland*. Glasgow: James MacLehose and Sons Publishers to the University.
Oldfield, P. 2014. *Sanctity and Pilgrimage in Medieval Southern Italy, 1000-1200*. Cambridge: Cambridge University Press.
Ortalli, G. 1997. "Il Mezzogiorno normanno-svevo visto da Venezia." in *Il Mezzogiorno normanno svevo visto dall'Europa e dal mondo mediterraneo*. ed. Musca, G. Bari: Il Dedalo Edizioni.
Ortona e la Repubblica di Ragusa tra il XIII e il XVII secolo. Catalogo della mostra documentaria. Ortona-Palazzo Farnese, 25 luglio-9 agosto, Ortona, Associazione Archeologica Frentana, 1987.
Pansa, G. 1920. "La leggenda di traslazione di S. Tommaso apostolo ad Ortona a Mare e la tradizione del culto cabirico." *Mélanges d'archeologie et d'histoire*. 38.
Pardo, V. F. 2002. "Le città portuali meridionali e le Crociate." in *Il Mezzogiorno normanno-svevo e le Crociate. Atti delle quattordicesime giornate normanno-sveve, Bari, 17-20 ottobre 2000*. ed. Musca, G. Bari: edizioni Dedalo.
Parks, G. B. 1954. *The English Traveller to Italy, The Middle Ages (to 1525)*. Roma: Edizioni di Storia e Letteratura.
Pellegrini, L. 2002. "I santuari d'Abruzzo e Molise." in *Per una storia dei santuari cristiani d'Italia: approcci regionali*. ed. Cracco, G. Bologna: Società Editrice il Mulino.
Pierucci, P. "Emigrazione slava nelle province abruzzesi: secoli XV-XVI," in *Italia felix. Migrazioni slave e albanesi in Occidente, Romagna, Marche, Abruzzi, secoli XIV-XVI*, ed. Anselmi, S. Quaderni di "Proposte e Ricerche", no. 3.
Pierucci, P. 2016. *L'economia dell'Abruzzo tra continuità e mutamenti (secc. XIV-XIX)*. Milano: Franco Angeli.
Polidoro, E. 1991. *Santa Maria di Costantinopoli in Ortona: monastero celestino, confraternita, beneficio, parrocchia*. Ortona editrice Soc. Coop. Iniziativa Cristiana.
Politi, A. 1982. "Documento d'archivio su S. Tommaso nella cattedrale di Ortona." *Rivista Abruzzese*, vol. XXXV, no.4: 226-231.
Poso, C. D. 2007. "Immagine e forma urbana di Otranto dai Normanni agli Angioni." in *Otranto nel Medioevo tra Bisanzio e l'Occidente*, ed. Houben, H. Galatina: Mario Congedo Editore.
Raschellà, F. D. 1985-1986. "Itinerari italiani in una miscellanea geografica islandese del XII secolo," *Annali dell'Istituto Universitario Orientale di Napoli-Filologia Germanica* 28-29: 541-584.
Schefer, C. and Cordier, H. ed. 1882. *Recueil de voyages et de documents pour servir à l'histoire de la géographie depuis le xiiie jusqu'à la fin du xvie siècle*. vol. XII. Paris: E Leroux.
Sensi, M. 1998. "Pellegrini al Santo Sepolcro tra Tre e Quattrocento." in *Militia Sancti Sepulcri. Idea e istituzioni. Atti del colloquio internazionale tenuto presso la Pontificia Università del Laterano, 10-12 Aprile 1996*, ed. Elm, K. and Fonseca, C. D. Frascati: Tipolitografia Giammarioli.
Shaw, S. 1976. *History of the Ottoman Empire and Modern Turkey*, I: *Empire of the Gazis. The Rise and Decline of the Ottoman Empire, 1280-1808*. Cambridge: Cambridge University Press.
Staffa, A. R. 1993. "L'Abruzzo fra tardoantico e altomedioevo." in *Abruzzo e Molise. Ambienti e civiltà nella storia del territorio*. ed. Costantini, M. and Felice, C. Mantova: Edizioni Centro Federico Odorici.
Stopani, R. 1988. *La via Francigena. Una strada europea nell'Italia del Medioevo*. Firenze: Le Lettere.
Stopani, R. 1991. *Le vie di pellegrinaggio del Medioevo. Gli itinerari per Roma, Gerusalemme, Compostela*. Firenze: Le Lettere.
Stopani, R. 2005. "Itinerari e problemi del pellegrinaggio meridionale," in *Tra Roma e Gerusalemme nel Medio Evo*, ed. Oldoni, M. Salerno: Laveglia Editore.
Tabula Peutingeriana: le antiche vie del mondo. ed. Prontera, F. Firenze: L.S. Olschki, 2003.
The Itinerary of Benjamin of Tudela. Critical Text, Translation, and Commentary, ed. Adler, M. N. London: Henry Frowde, Oxford University Press, 1907.
Trinchera, F. 1865. *Syllabus Graecarum membranarum, quae partim Neapoli in maiori tabulario et primaria bibliotheca, partim in Casinensi coenobio ac cavensi et in episcopali tabulario neritino iamdiu delitescentes et a doctis frustra expetitae. Nunc tandem adnitente impensius Francisco Trinchera in lucem prodeunt*. Neapoli: Typis Josephi Cataneo.
Tucci, U. 1991. *I Servizi marittimi veneziani per il pellegrinaggio in Terrasanta nel Medioevo*. Venezia: Università degli Studi di Venezia Poligrafo.
Ughelli, F. 1717. *Italia sacra*, Venetiis, Apud Sebastianum Coleti. vol.VI.
Von Falkenhausen, V. 1978. *La dominazione bizantina nell'Italia meridionale dal IX all'XI secolo*. Bari: Ecumenica Editrice.

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A geo-archeological approach applied to the Ortona coast (central Adriatic)

Abstract

In the frame of the APPRODI ADRION project, the study area corresponding to the administrative limit of Ortona city has been analysed to develop an archive of archeological and geological data based on a GIS environment which includes aerial/satellite images, digital elevation model as well as historical maps.

Ortona is mentioned in the V Geography book of Strabone as epineion (military harbor) of Frentani, a pre-Roman population, established from the 6th century BC along the Abruzzo coast and in the internal territory of the Valle del Sangro. Afterward, it was a fortified settlement (castrum) with a military port and an arsenal to defend the promontory and the population. The city is organized in two ancient quarters: Terravecchia and Terranova, formed by a complex Middle Age internal district. In such a diverse territory, the interest in the past history of the town has been strong over time, but not systemic. The main objective of this work was to collect the available information on the historical, archaeological and geological settings on the evolution of the coastal area within the Ortona administrative limit.

This interdisciplinary geo-archaeological approach highlights the strong importance of combining the different information to correctly assess the historical and environmental evolution which appears not well exploited for this area while it has been successfully applied in other adriatic coastal sites.

There are still many open questions on the use and presence of ports in this western side of the central Adriatic sea during greek and roman period which deserve further study and investigations and this work is a first step for a more detailed work in the future.

Keywords: *geo-archaeology, adriatic ancient ports, Ortona*

Introduction

Geoscience and archaeology can largely support each other in deciphering the most recent history of our planet (Pollard 1999). In the last decades these disciplines have shared technical expertise and approach to better understand the Quaternary rock records and climatic settings which constrain the human evolution. We used this interdisciplinary geoarchaeological approach as first attempt to reconstruct the evolution of the ancient port of Ortona in the framework of the Approdi - Adrion Interreg project.

Ortona, in the province of Chieti, is a town of about 24000 inhabitants and stands on a sandstone promontory, ~70 meters above sea level. It was defined "la Pizzuta" from local historian De Lectis[1] for its morphology and position towards the Adriatic Sea.

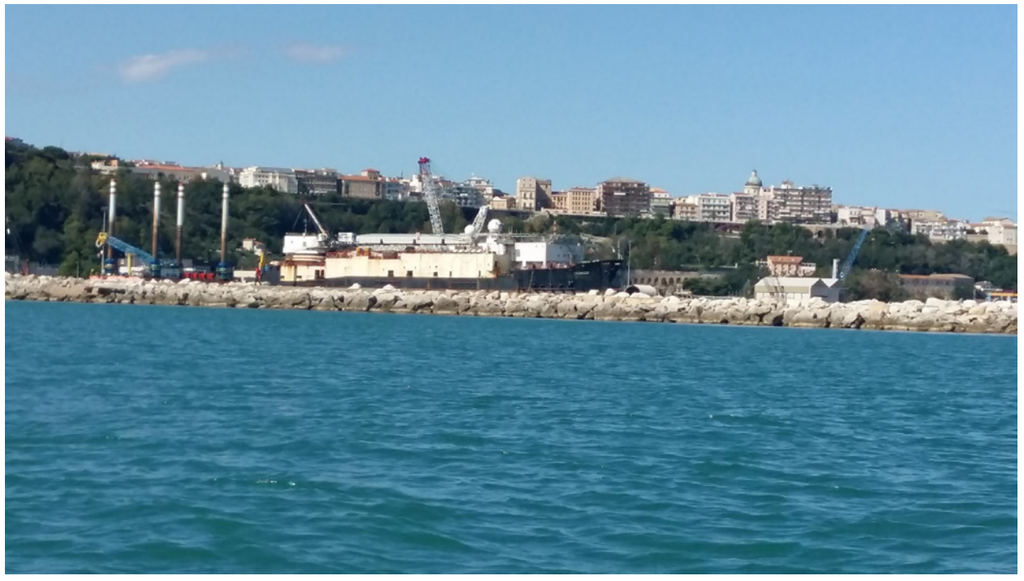

Figure 1. View of the Ortona town from the modern harbour.[2]

The history of the city was characterized by the close relationship with the sea, which favored the trade, the birth of the shipyards and the commercial exchanges in the Adriatic, both with Venice, Dubrovnik (republic of Ragusa) and with other Croatian and Illyrian cities.

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The relics of the Apostle Thomas arrived by sea on 6th September 1258 from the Island of Chios in the Aegean Sea, signing the city, from the religious and human point of view. Ortona is mentioned in the V Geography book of Strabone, which defines *epineion* (military harbor) of Frentani, a pre-Roman population, established from the 6th century BC along the Abruzzo coast and in the internal territory of the Valle del Sangro (Romanelli 1996).

It was a fortified village with a military port and an arsenal to defend the promontory and the population. The city is organized in two ancient quarters, Terravecchia and Terranova, on a complex series of internal districts, formed in the Middle Ages and mostly dedicated to agriculture as they were linked to St. Thomas monastic order. In such a diverse territory, the interest in the past history of the town has been strong over time, but not systemic: since the 19th century, numerous scholars ed archaeologists have carried out surveys in areas of interest, reporting various archaeological remnants of the town and the structure of the complex ancient port system (Orlandi 1999; Staffa 2002, 359; Fossataro et al. 2005; Orlandi et al. 2016).

Figure 2. The Ortona administrative boundaries (image Google).

In the frame of the APPRODI ADRION project, the study area corresponding to the administrative limit of Ortona (Figure 2) has been considered to build an archive of archeological and geological data to propose touristic tour. We built a digital archive in GIS environment with different type of data including aerial and satellite images, digital elevation model as well as historical maps.

History of Ortona and ancient Adriatic routes

The Adriatic is a narrow sea and so finding land was not so difficult for sailors; it was indeed difficult to approach it and to land due to the natural morphology of the coasts. One had to be a very skillful sailor, with good knowledge of coasts, rocks, reefs, winds, and currents, and of signs that can help in predicting weather conditions. That knowledge could not have been acquired without regular connections among Adriatic communities throughout prehistory and history, before the invention of navigation instruments.

The study of ancient sources highlighted that several authors, both Greek and Latin, indicate the presence of "ports" in the Abruzzo region, but often in very controversial ways. For example, two opposite pictures of Livy (X,2-4)[3], attesting that the coasts of this region are unsuitable lands for

1 Giovan Battista De Lectis, local hystorian and ecclesiastic of Ortona, XVI century

2 Picture from L. Marinangeli

3 Tito Livio. *Ab urbe condita Libro X.*

ports, and, on the other hand, Strabone,[4] testifying the existence of '*epineia*', (Fig.4) the ancient Greek term for ports of non maritime centres, which were generally located not far apart (between 5 and 10 Km). The term '*epineion*', however, does not necessarily imply that they were small outlet; for example, considering that ports like the Pireus and Ostia were considered *epineia* respectively of Athens and Rome, but specifically pointing out the distant location of the main town and the probable status of 'non-town' for the settlement born around the port.

μετὰ δὲ
Ἄτερνον Ὄρτων, ἐπίνειον Φρεντανῶν, καὶ Βοῦκα,
καὶ αὐτὴ[1] Φρεντανῶν, ὅμορος Τεάνῳ τῷ Ἀπούλῳ.
Ὀρτώνιον[2] ἐστιν ἐν τοῖς Φρεντάνοις, πέτραι
λῃστρικῶν ἀνθρώπων, οἷς αἱ οἰκήσεις ἀπὸ τῶν
ναυαγίων πήγνυνται· καὶ τἆλλα θηριώδεις εἶναι
λέγονται.[3] μεταξὺ δὲ Ὄρτωνος καὶ Ἀτέρνου ὁ
Σάγρος ποταμὸς

Figure 3. The first time that Ortona is mentioned by Strabone.[5]

Regarding the geographical conditions of the area, certainly, there are not adverse streams which do not allow a proper navigation along the Adriatic coast (see also Berlinghieri 2003, 17-26, 157-162).

Generally, there are three kinds of currents:

1) one very deep going from Greece to Italy trough Venice,
2) another one following the same direction of the first but with stronger intensity and causing troubles for navigation in certain short period of the years, and
3) a stream, but the most important for our study, directly influenced by the winds.

The combinations of the streams and the result is a cyclic stream who changes its direction from season to season favouring the navigation from Greece to Italy trough Venice during summer and *vice-versa* during the winter (Fossataro 2005).

The hypothesis that the western Adriatic coast was used for maritime trade since the Greek period, finds a certain consensus among specialists of Adriatic hystory. The discovery of attic pottery in several sites on the Adriatic coast south of Conero promontory (Ancona) supports this hypothesis.

The western coast was also offering shelters for the cabotage routes thanks to the estuaries of the rivers from the Potenza river to Termoli. If topographic continuity alone cannot prove the existence of an archaic maritime route, the discoveries of attic ceramics in this area suggests that a western road leading from the Otranto Canal to the north of the Adriatic had to coexist with the eastern route. These western coastal sites would have even had a role of "redistributors" of attic products inward, thanks to the exploitation of the internal valleys of the rivers.

Alternatively, Kirigin et al. proposed the "open sea" route to sail the Adriatic from Corfù with Palagruža island as intermediate stop (Figure 4).[6]

[4] Strabone. O*pera Geografia, Libro V.* "...After Aterno is Ortona the maritime arsenal of the Frentani, and then Buca which also belongs to the Frentani, its territory borders on Teano Apulo. Ortona is a stony place in the Frentani area inhabited by robbers, who build their homes with the relics of the castaways, and live bestially in all the rest. Between Ortona and Aterno flows the Sagro that divides the Frentani from the Peligni: and the navigation from the Picentino to the Apuli that the Hellenes call Daunii, is about four hundred and fifty stadiums."

[5] Ibid.

[6] Kirigin, Johnston, Vučetić and Lušić 2009.

The above brief discussion highlights the lack of knowledge about the ancient sailing routes and the importance of further investigate the archaeological reconstruction of ancient ports and their connections across the Adriatic Sea. An attempt to collect the available data on the archaeological sites of the Adriatic Sea, has been done by a network of research institutes (Adriaticum Mare association) to built a web-based atlas.[7]

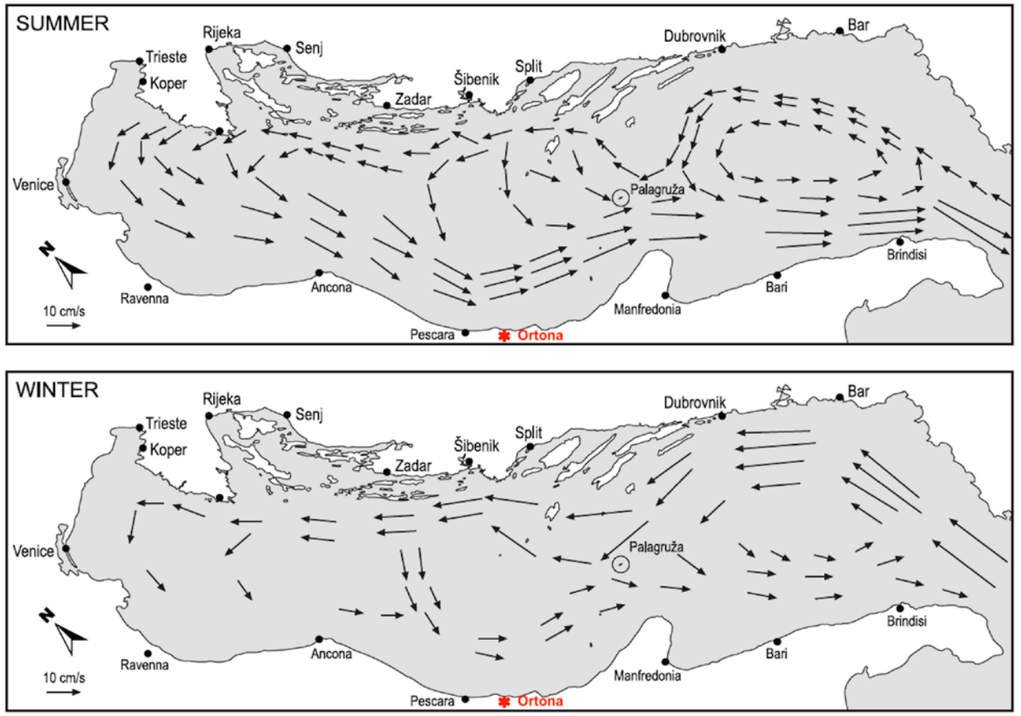


Figure 4: Surface currents in the Adriatic during summer and winter (modified from), (Kirigin, Johnston, Vučetić and Lušić 2009).

From an historical point of view, Ortona may have been an important maritime town although not comparable with some others in the Adriatic Sea, such as Venice (Figura 5). As the historian Antonio Falcone wrote in his book *Storia di Ortona* (Falcone 2004): "*...the most characterizing element of the historical course of Ortona is in the fact that it was a maritime town and an harbour town.... The connection with the sea was fundamental for the main facts involving the town, from immigrations to the wine trade, which in turn determined the grapevine growing in the most of its land, to the social, cultural, and commercial relationships with the rest of the Adriatic Sea coastline*".

[7] Adriaticum Mare association web-based atlas. The website *Adriaticum Mare* is focused on developing the historic and archeological research throughout the Adriatic region, from the Protohistoric to the Middle Ages. Its main activity is *AdriAtlas, a* digital Atlas of the ancient Adriatic, accessible on line to the scientific community and as well as to the larger public.

Fossataro noted that the Latin sources following a 'Livian Tradition', attest the absolute lack of ports in contrasts with Greek sources that reported some *epineia* in Abruzzo, in particular near the ancient Hortona (modern Ortona), in the area actually called 'Scalo'. Regarding the place-name 'Scalo', mentioned above, is very important as name-reference because in Italian means 'maritime outlet', attesting the commercial relevance of the area. However, even among the Latin sources there is not an homogeneous view: Pliny (*Nat.Hist.*, III, 106) described a different situation from Livy, calling even "*portuosus*" part of the region, in direct and probably deliberate contrast with the Livian '*importuositas*'. This apparent discordance has not to be interpreted as a negative feature of the region, but as a use of the coast which had a sort of discontinuity during time, and therefore, the sources testify different situations in different periods, according to the age of the sources and to the political situation of the area (Fossataro, 2005).

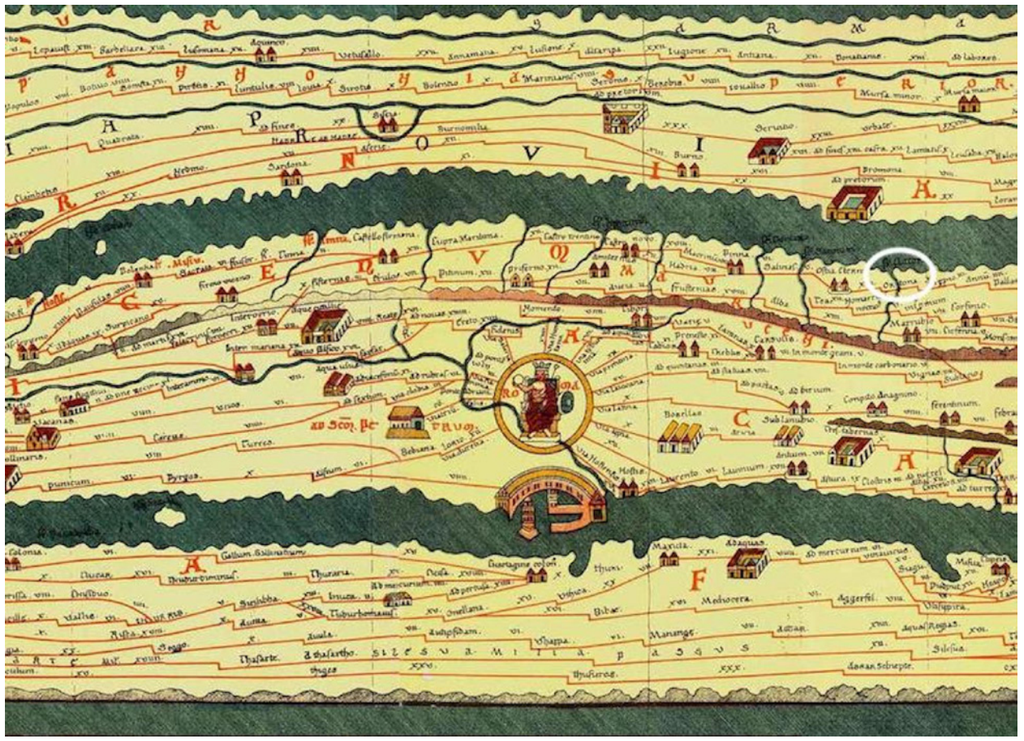


Figure 5. The Poutinger Map (XII-XII century)[8] based on an ancient roman map with the indication of Ortona (white circle)

The oldest remains within the Ortona town were found during the restoration work of the Aragonese Castle. They came from the Bronze Age (from XV to XIII century B.C.) and allowed to point out the presence of a settlement in the area.

Indo-European populations from the Balkans, mostly Illyrians from Bosnia, arrived by sea and occupied the hills around Ortona during the 4th century BC. They were mainly warriors, shepherds, seamen, fishermen and pirates who from nomads become sedentary.

During the V century B.C. a group of Sanniti reached down the coast, coming from an area which were probably located at the modern boundaries between Campania and Molise regions. Those people renamed themselves as Frentani, as the name of the river Frentum (Fortore today), and established along the coast, between Ortona to the N, and Termoli to the S.

Later in the V century B.C., the Frentani population came to war with the Romans and then they became *cives romani*. Later on, several commercial relationships were established between Rome and the Adriatic coast, especially through the Tiburtina-Valeria-Claudia road, which connected Rome with Ostia Aterni (the present Pescara). At that time, the main economical activities in Ortona were certainly addressed to the sea and in particular to the commercial routes toward the Eastern Adriatic coasts and the Greek islands, as well. The trading activities were probably increased in frequency and number under the Roman government and the protection against the pirates. These favourable conditions allow us to speculate that many goods from Rome were delivered through the harbour of Ortona[9]. Strabone also documented the ability of the Frentani to build docks and ships and thus accomplish maritime activities.

After the fall of the Roman Empire, the N-S route became the most relevant for the commerce and the military affairs as well. The bridging position of Ortona (Figure 5) also allowed the cultural contamination and it is visible today in the art and literature. During this time, the "route crossing Abruzzi" were strategically relevant for the interior of Abruzzo, due to the several connections between Naples and Florence and toward the Northern Italy and the rest of the Europe. Ortona passed from the dukedom of Benevento to the dukedom of Chieti, and its role in the maritime traffics became much more relevant.

The maritime traffics of Ortona strongly developed since the Suevians. A commercial league was founded between Ortona and Lanciano, in order to create maritime companies in the Mediterranean area. This league was so important that in 1196 Arrigo VI issued a naval law, in order to regulate the behaviour of the commercial companies operating through the sea and introduced customs exemptions for specific traffics and for the naval works.

Coming back to the harbour system of the Abruzzo region, it is clear that it was weak and mainly supported with a number of stocks for the arrangement of goods, distributed along the coastline and included within the defensive network based on the coastal towers (Pierucci and Benegiamo 2013). This defensive network was able to protect the maritime business and allow its further development.

At the beginning of the Modern Age, the Abruzzo region was mainly connected with the Ragusa Republic having the latter, the greatest fleet in the whole Adriatic Sea in its harbours. Goods reached Abruzzo at the time of the important exhibitions occurring in the city of Lanciano. Nevertheless, the

[8] Levi Annalina e Levi Mario Attilio, La Tabula Peutingeriana, in scala 1:1, Edizioni Edison, 1978 The Peutinger Map is an illustrated version of the ancient Roman road network map, drawn probably in the 13th-century from a roman chart. It has been named after the german antiquarian Konrad Peutinger who recovered it in the 16th-century. The map is now conserved at the Austrian National Library in Vienna. It has been included in the UNESCO's Memory of the World Register in 2007 and exposed to the public for one day to celebrate this award.

[9] According to this hypothesis, Gino Albi in his book "*L'Abruzzo marittimo*" (1914), wrote: "*At the time of the war with Rome, Ortona already had a great naval relevance. Then, after the peace and the subsequent alliance, Ortona became a military base of the Roman navy. This condition allowed the naval industries and the trading to develop*".

harbours were also used to deliver the goods directly produced in the area, and specifically the wine and the olive oil, as documented in several books and papers.[10]

In between the XIV and XV centuries, the maritime traffics became much relevant in Ortona. The historian Corrado Marciani, expert in the economic and commercial relationships between Abruzzo, Venice and the eastern coast of the Adriatic Sea, wrote: "T*he maritime cities of Abruzzo which were mainly involved in the commercial relationships with the Ragusa Republic were Lanciano, Ortona and Vasto, because of the commercial exhibitions of May and August, the presence of the harbour, very used for the connections with L'Aquila and Rome, and the fertility of its land, respectively*" (Felice 1983).

In 1830, the king Ferdinando II designated an expert commission with the aim of establishing the most suitable localization of a harbour along the Abruzzo coastline (Figure 6): the choice was Ortona

After the unity of Italy in 1860, and the consequent union of the Kingdom of Naples with the Kingdom of Italy, the maritime traffics of Ortona started to decline, while the relationships with the capital Rome became stronger.

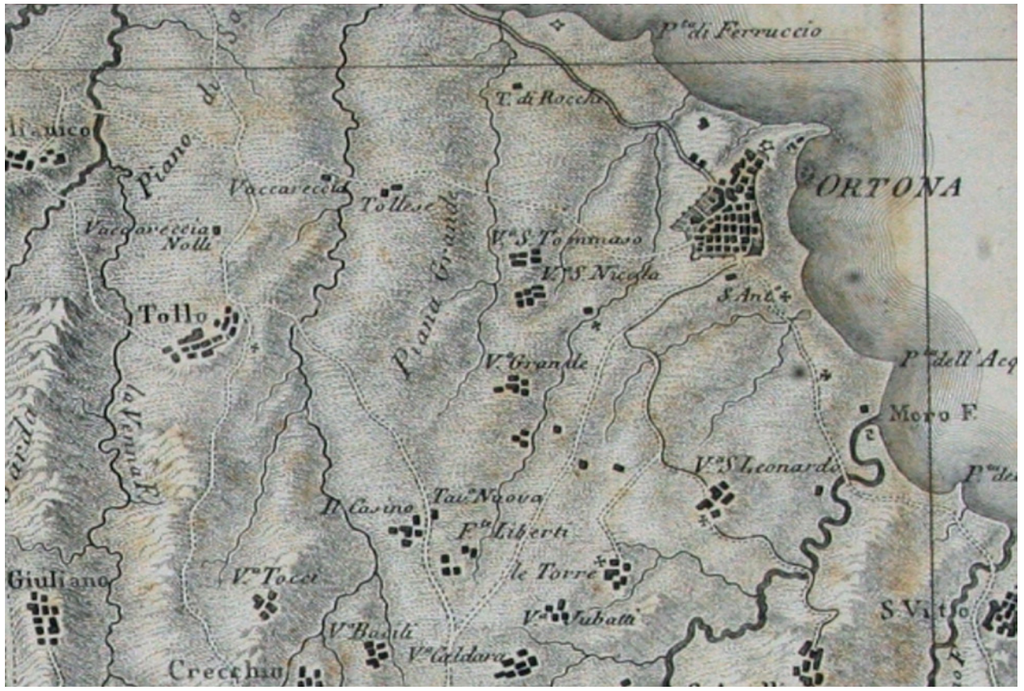


Figure 6. Map of the Ortona region from an atlas created during the Borbouns' domination.[11]

[10] For example, the abbey Domenico Romanelli, in a paper dated 1805, wrote: "the countries of Ortona produce high quality oil and abundant wine which are exchanged with people of the other side of Adriatic ... the town reached the culmination of prosperity before and during the Roman Age .... The harbour held the Frentani's fleet and the commercial ships, also according to Strabone, and this availability allowed the development of the naval manufacture" (Romanelli 1996). Also, the historian Fernand Braduel wrote: "*the Adriatic Sea was like a river where the transfer of goods was much easier and cheaper than along terrestrial routes. Since the Abruzzo shoreline were in central position along that river, it was certainly positively influenced. Its harbours became more and more important along the N-S and E-W direction, as well, thus increasing the commercial relationships with the East*" (Felice 1983).

[11] *Antonio Rizzi-Zannoni geografo di Sua Maestà e terminato nel 1808*. Napoli, s.n., 1788-1812. *Atlante geografico del Regno di Napoli delineato per ordine di Ferdinando IV re delle Due Sicilie & C. & C*

Then, with the construction of the coastal railway connecting Ancona, Pescara and Foggia in 1863, the coastal lands increased their importance because many people came down from the hills and founded new towns close to the coastline. At the same time, the coastal railway produced a systematic decline of the maritime trading, mainly because the railway was able to assure quickness and correctness of the delivery, and a risks reduction as well.

Coastal evolution and climate in the late quaternary

Geological and geomorphological landscape studies are necessary to archaeology because drive the settlement changes. Coastal regions provide a wide range of resources to the populations that inhabit them. Coastal landscapes are increasingly the focus of discussions from the earliest exploitation of littoral resources, to the inundation of the earliest permanently settled fishing villages and eventually, formative centres of urbanisation.

On the other hand, the acceleration of sea level rise caused by global warming and considering the vertical land movements that affect the active tectonic region of the Mediterranean basin, the maritime archaeological sites play a key role in understanding the local and global causes of their submersion. Thus, it is necessary to define the overall climatic and tectonic settings that control the sea level variations when talking about the coastal evolution through time.

Fundamental constraints on the recent studies of coastal evolution is given by radioisotopic dating. Specifically, the study of oxygen isotope ratios in nanofossils of deep-sea cores in the second half of the XX century, has revealed a consistent pattern representing changes in the ocean-atmosphere system through time and the major variations in this dataset have been defined as numbered stages, which are now commonly known as "Marine Isotope Stages" (MIS) (Railsback et al. 2015) compiled a global scheme of marine isotope substages: the 18% changes directly as a result of temperature fluctuations, so it provides a very good record of the climate. High oceanic 18% values represent *cold climates*, while lower values indicate a *warm climate*; this trend occurs because of the effects of precipitation and evaporation. During cold periods some of the ocean's water is evaporated and stored in ice caps or mountain glaciers, meaning a lower sea level, while during warmer periods sea levels rise as the ice melts and once again is added to the volume of the oceans.

Currently, 21 stages of MIS have been identified in the last 1 million years, including the last glacial maximum event (LGM) which occurred about 18.000 years ago. The principal contributions to sea level change along the Italian coast are:

- **(i)** the sea level response to the past glacial cycle;
- **(ii)** changes in ocean volume in more recent times from thermal expansion, recent glacier melting etc.;
- **(iii)** vertical land movements (tectonic uplift).

Together, these components result in a *complex spatial and temporal pattern of relative sea-level change around the central Mediterranean coastline*, observations which provide information on rock rheology, on rates of vertical tectonic movements, and on the global ice–ocean balance during glacial cycles. Furthermore, observations of sea-level change around the coast include the age–height relationship of geological deposits and archaeological structures whose positions relative to coeval sea level can be established.

Lambeck et al. revised all published geomorphological and archeological data on sea level variations along the Italian coasts based on observations from more than 130 coastal sites with

different geomorphological and archaeological settings, adding estimates of the vertical tectonic contribution to the relative sea level change (Figure 7) (Lambeck et al. 2011). This curve represents the main updated reference for the eustatic variations of the Mediterranean area.

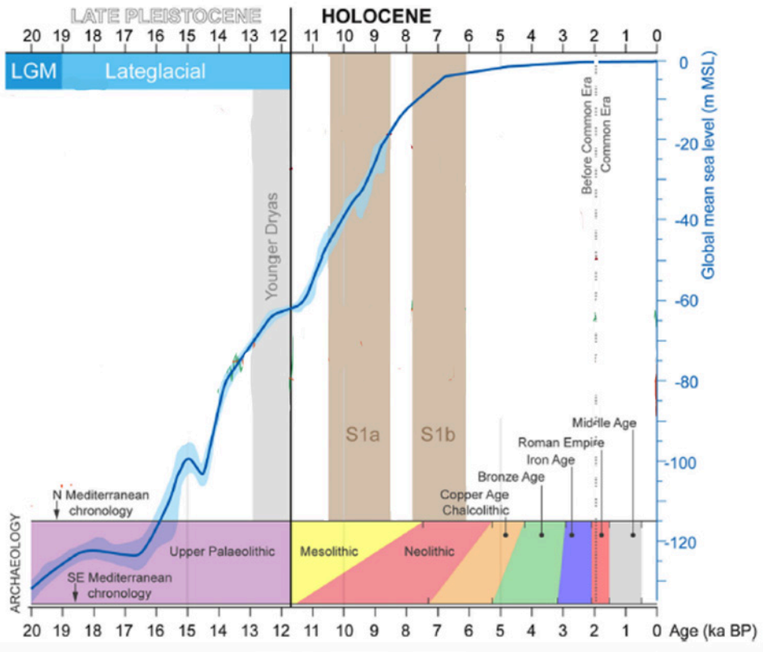


Figure 7: Relative sea level changes since the last 20.000 yrs BP and archaeological period. (modified from[12]) S1a and S1b refers to presence of sapropel deposits.[13]

During the lower Paleolithic, marine terraces and shorelines formed during MIS 5.5 (~125 kyrs BP) known as the Tyrrhenian highstand with warmer climate and higher sea level, lies at different altitude along the Adriatic and Tyrrhenian coasts, varying from a few meters to about 120-140 m (Bordoni and Valensise 1999, 71-110) due to a later uplift associated with the Apennines formation.

On the contrary, the configuration of the Adriatic side during the upper Paleolithic period (glacial condition) was dramatically different from the present one. The Ortona territory was more similar to a tundra environment because the Adriatic Sea level was ~120 m below its present position (Figure 8) and only at 6.000 yrs BP it raised up to a few meters below its present level. Since then, it has been characterised by slower rates of sea level rise.

[12] (Benjamin et al. 2017, 29-57)

[13] In the eastern Mediterranean, the depositional sequences of deep waters are characterised by the quasi-cyclical occurrence of dark layers, rich in organic carbon, called 'sapropels'. They correspond to hypoxic or anoxic episodes that are recorded east of the Sicily Strait (Fig. 1) and during which oxygen starvation occurred in deep basins and caused the collapse of the deep ecosystems, but affected the entire water column. The causes that led to the sapropel formations are still a question of debate, but their deposition was probably influenced by astronomical forces and generally corresponds to periods of enhanced monsoon rainfall.

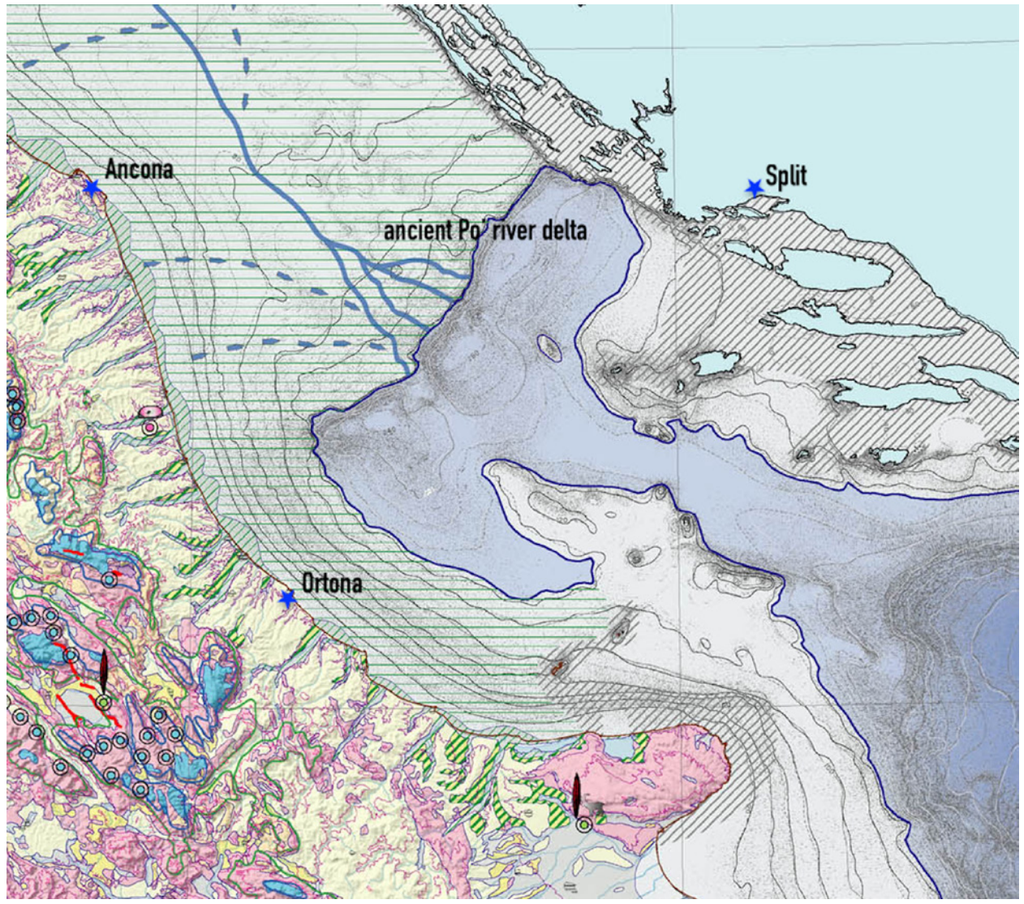


Figure 8: Palaeogeographic reconstructions of paleo-environments and coastline (blue line) during the last glacial maximum (LGM) ~22.000 years ago in Italy[14]

Thus, the most recent tectonic uplift may have exposed archaeological remnants which were originally at lower altitude as happened in the Apulia region (Mastronuzzi et al. 2017, 65-78) where archaeological sites located along the coasts (above or below the present sea level) of central Apulia region have been used to estimate the relative sea level changes in this region since the Bronze Age. In this work, the relative sea level changes were estimated using detailed topographic surveys, tide analyses and/or hydrodynamic equations. Although not all archaeological markers allowed univocal interpretations, the relative sea level stands higher than about 2 m from present one during the Bronze Age, and at least 0.90 m in the last 2.0/1.5 kyrs was estimated by Mastronuzzi et al.

Afterward, Europe experienced a relatively mild climate conditions during the earliest centuries of the second millennium (known as *Medieval warm period*, Figure 9). Agriculture was possible at higher

[14] CLIMAX Maps Italy, C. Margottini and G.B. Vai, 2004. During the Last Glacial Maximum, the large Po plain was reaching the middle Adriatic and the sea level was about 120 m below the present one.

latitudes (and higher elevations in the mountains) than is currently possible in many regions. For examples, grapes were grown in England several hundred kilometers North of their current limits of growth, and subtropical flora such as fig trees and olive trees grew in regions of Europe (northern Italy and parts of Germany).

Geological evidence indicates that mountain glaciers throughout Europe retreated substantially at this time, relative to the glacial advances of later centuries. A host of historical documentary proxy information such as records of frost dates, freezing of water bodies, duration of snow cover, and phenological evidence (e.g., the dates of flowering of plants) indicates that severe winters were less frequent and less extreme at times during the period from about 900–1300 AD in central Europe.

Another important climatic change has been registered between roughly AD 1300 and 1850: the Little Ice Age (Figure 9), a period of regionally cold conditions.

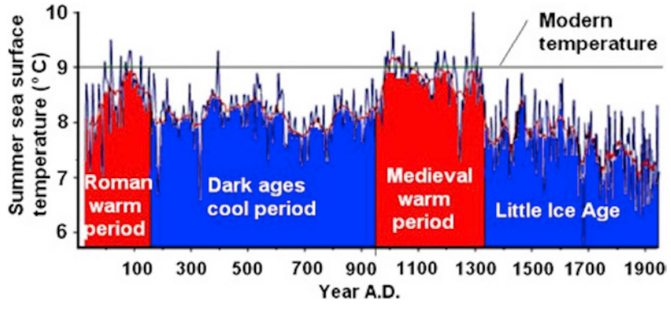


Figure 9: Temperature variations in the last 2000 years (Sicre et al. 2008, 137-142).

There are indications that average winter temperatures in Europe and North America were as much as 2°C lower than at present. From historical evidences, we know that the Baltic Sea froze over, as did many of the rivers and lakes in Europe. Pack-ice expanded far south into the Atlantic making shipping to Iceland and Greenland impossible for months. These conditions led to widespread crop failure, famine, and population were reduced to starvation and poverty. In summary, on the basis of the literature, we can refer to the following range of sea level variation for the central Adriatic coastline (Table 1):

Age BP	Period	Relative (RSL) and eustatic (ESL) sea level above present
140 kyr - 100 kyrs	Lower Palaeolithic/ Late Pleistocene	ESL: + 8 m*
125 kyrs	Tyrrenian Period	Marine terraces of Tyrrenian age (125 kyrs) along the Italian coastline have been uplifted up to ~140m during the Apennines formation
100 kyrs – 40 kyrs	Middle Palaeolithic/ Late Pleistocene	ESL: Min -20 m - Max -80m*
30 kyrs-18 kyrs	Upper Palaeolithic/ Late Pleistocene	Last Glacial Maximum (LGM): ~22 Kyrs ESL: - 120m*
10 kyrs- 5 kyrs	Holocene	ESL: + 8 m*
3.3 kyrs – 2 kyrs	Lower Bronze age/ Holocene	RSL: max + 2 m**/***

LGM: last glacial maximum
*(Lambeck et al., 2011) **(Mastronuzzi et al., 2017) ***(Lambeck, 2004)

Table 1. Main sea levels in the last 140 kyrs.

This geo-archaeological approach is largely missing for the Ortona area and generally is not followed for the entire Abruzzo region. This work represents and initial attempt to establish the potentiality of combining different types of geological, climatic and archaeological information collected either from the literature or processing satellite data.

The Adriatic Sea is a narrow epicontinental basin and with its shallow depth makes this area one of the key sites of winter cooling and consequent deep-sea ventilation in the Mediterranean area through a mechanism of dense water formation.

The main morphological features detected on the bathymetry of the Adriatic reflect the oceanographic circulation that is responsible for banking fine sediments along its western side, at current sea levels. Away from the near-shore area, the seafloor morphology of the Adriatic reflects, instead, processes that were active when global sea level was 120 m lower than today and the area occupied by the modern continental shelf was a broad alluvial plain (Figure 8).

Based on the reconstructed bathymetry, and already knowing that away from the areas of modern sedimentation the seafloor is substantially a relict alluvial plain of the Last Glacial Maximum (when sea level was about 120 m below the modern position), he also sketched a conceptual image of the network of interpreted fluvial valleys debouching in the Mid Adriatic Deep (MAD). These valleys were drowned during the following sea level rise between 19.000 and 5.000 years BP.

The central Adriatic has indeed been affected by large historical tsunamis of which the 1627, 1646, 1731 AD and December 8, 1889 were the most devastating (Tinti et al. 1995, 227-241). Further investigations would be needed to better understand the evolution of these intriguing features in the Ortona off-shore and to reconstruct the geological evolution of the sea floor in this area.

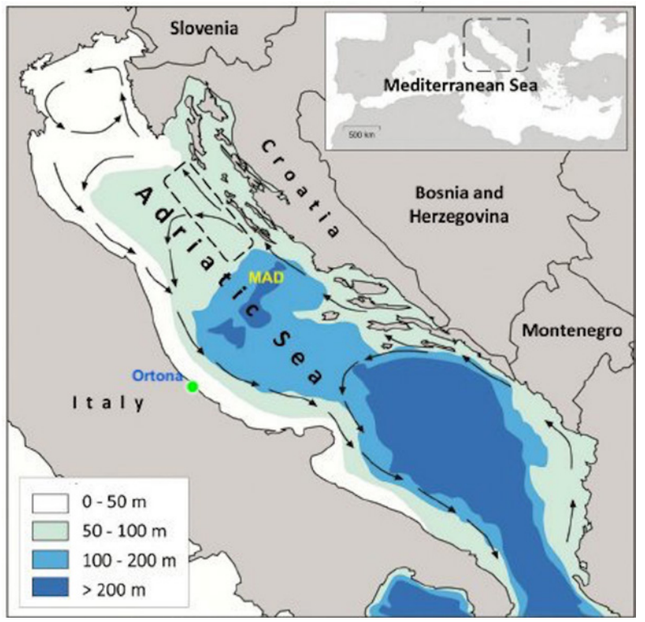


Figure 10: General bathymetry of the Adriatic Sea (Trincardi et ali. 2014).

From a topographic point of view, proceeding from East to West one passes into a fairly gentle way to the hills, reaching an average altitude of about 100 m above sea level. The coast of Ortona is mostly dominated by high cliffs (Figure 11), the presence of sandy/pebble beaches is very limited (i.e. northern side of the port).

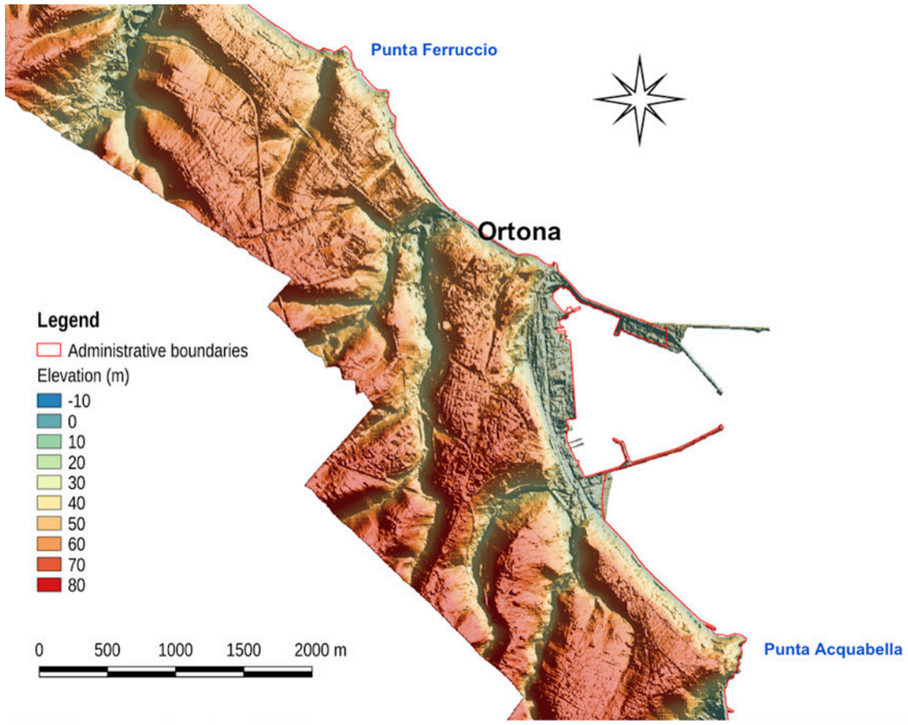


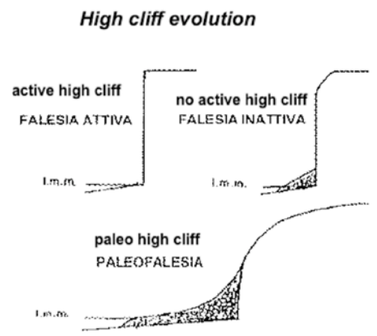
Fig.11: Altimetric view of the Ortona coastal area based on LIDAR data.[15]

The coastal area is also affected by active and quiescent landslide phenomena. D'Alessandro et alii proposed a classification of the coast based on morpho-evolutive features and related to rock lithology, stratigraphy, subaerial and marine erosional strength (Figure 12)(D'Alessandro et ali 2001, 53-60).

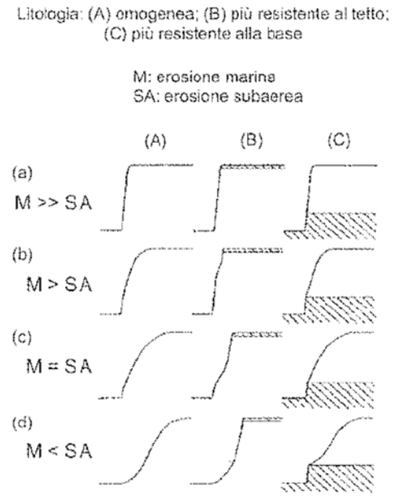
Thus, based on this work, this part of the Adriatic coast appears to be mostly not active in the last century in terms of landslide but with high potential to develop new mass movements of variable size if erosional processes (mainly marine wave energy) increase. The same authors, based on the available maps and aerial images, observed a general coastal retreat between 1876 and 1954, while in 1954-1976, some beaches progradation have been observed likely due to the construction of artificial barriers.

Afterward, an intensification of the erosive process characterizes the coast, even where artificial barriers are present. An overall retreating process is active nowadays with a rate higher in the Mucchia Tower and Punta Ferruccio area, reaching ~90 m of retreating between 1876-1985.

[15] LIDAR data courtesy of Ministero dell'Ambiente e della tutela del Territorio e del Mare MATTM of Italy.



Evoluzione di una falesia (da Ernery & Khun, 1982; leggermente modificato)



Matrice per la classificazione delle falesie (da Ernery & Khun, 1982)

High cliff classification

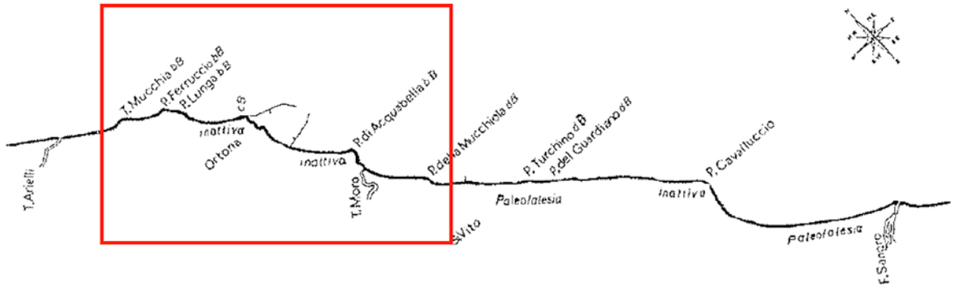


Figure 12. Cliff classification of the Abruzzo coasts.[16] (A) homogeneous lithology; (B) lithology more resistant on the top of the sequence (C); lithology more resistant at the bottom of the sequence; M: marine erosion; SA: subaerial erosion; (a) very strong marine erosion; (b) strong marine erosion; (c) same erosional strength; (d) strong subaerial erosion.

Location	Cliff classification
Mucchia Tower	bB: coast dominated by marine erosion and more resistant lithology on top
Punta Ferruccio	bB: coast dominated by marine erosion and more resistant lithology on top
Punta Lunga	bB: coast dominated by marine erosion and more resistant lithology on top
Ortona	cB: equal strength of marine and subaerial erosion and more resistant lithology on top
Punta Acquabella	bB: coast dominated by marine erosion and lithology more resistant on top

Table 2. Morphometric classification of the Ortona coastal area.[17]

[16] Aerial image of Regione Abruzzo, http://opendata.regione.abruzzo.it/
[17] Ibid.

In order to estimate the recent evolutive trend of the coastline within the Ortona administration limit, we compared the following set of data (Figure 13):

- GPS survey from Regione Abruzzo of 1998;
- Coastline from Google Earth image acquired on August 28th 2009;
- Coastline from Google Earth image acquired on June 25th 2017.

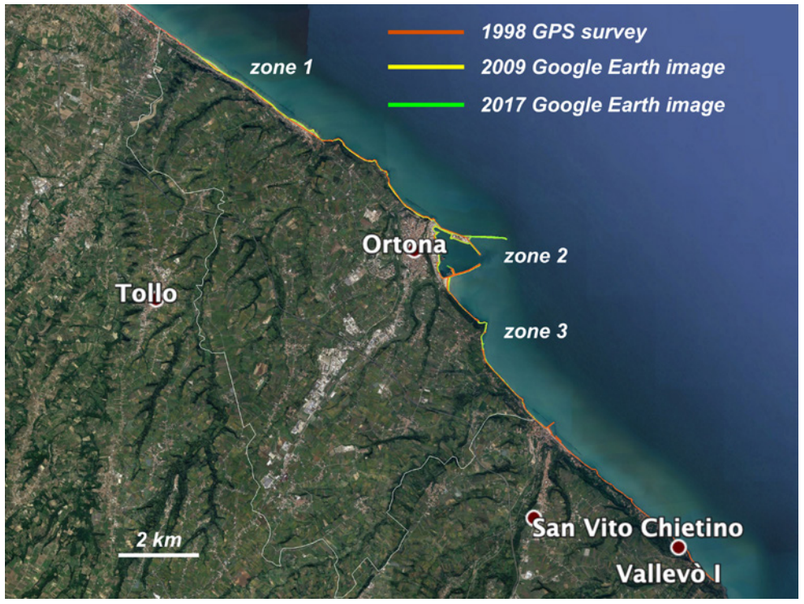


Figure 13. Comparison of the coastline variation from 1998 to 2017. The zone 1,2,3 represents sites where the variation of the coastline occurred.

This comparison basically confirms the stability of the coast as analyzed by D'Alessandro et ali. but there are three zones where we observed significant changes in the period 1998-2017 as shown in Figure 13 (D'Alessandro et ali. 2001, 53-60).

The major changes observed in Zone 1 (Figure 14) are related to variation of the beaches due to the placement of new artificial barriers. Similarly, Zone 2 shows changes in the development of new Ortona pier which occurred after the 1998 GPS campaign (Figure 15). Furthermore, there is an increase of the beach extension.

Zone 3 shows the uncertainties in determining the correct position of the coastline due to the different data resolution and approximative co-registration (Figure 16). A more detailed work with higher resolution datasets, meteo-marine data and information on the placement of artificial barriers is needed to correctly assess the coastal evolution of this area. However, this type of work is beyond the objectives of the APPRODI project and should be considered for future activities

However, this preliminary comparison is acceptable to provide an overall estimation of the most recent coastline evolution which may have implication in the recognition of submarine archaeomaterials. An interesting example comes from the landslide which partially destroyed the Aragonese castle in 1946 (Figure 17).

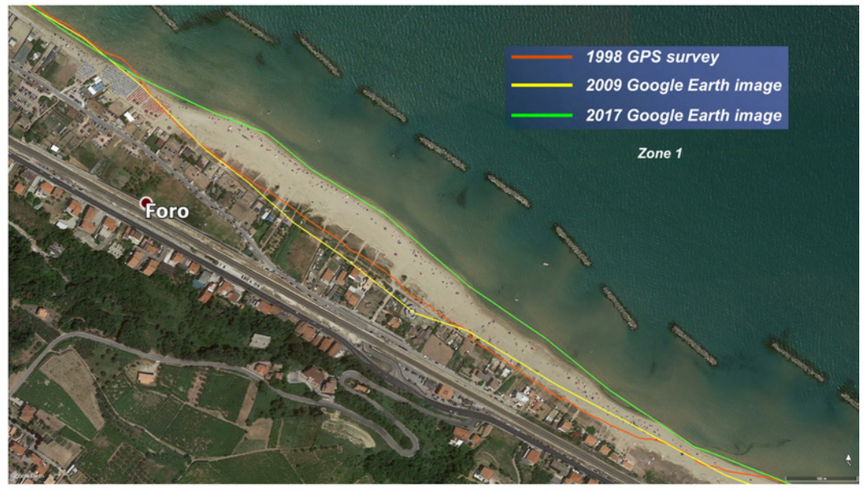


Figure 14. Comparison of the coastline variation from 1998 to 2017 in two sites of Zone1 (refer to Figure 13).

Figure 15. Comparison of the coastline variation from 1998 to 2017 in Zone2 (refer to Figure 13).

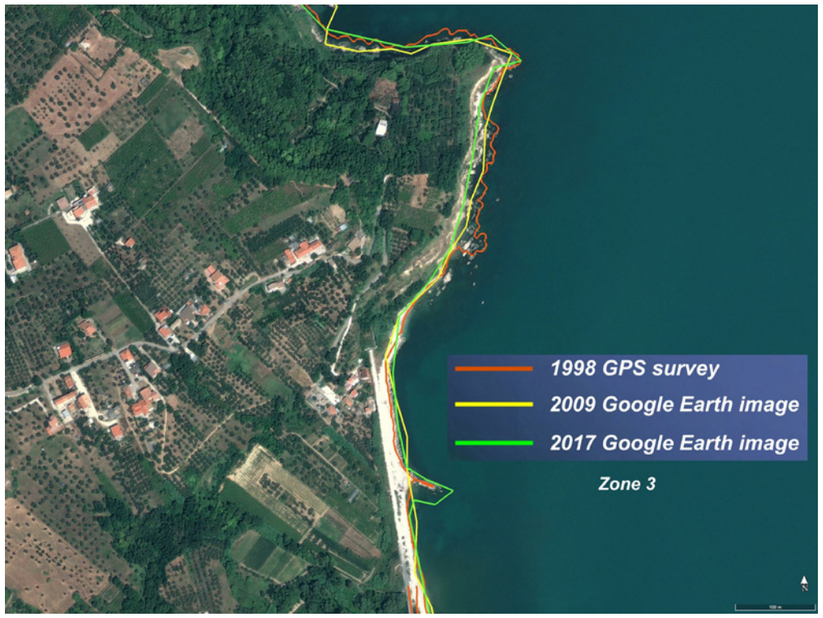


Figure 16. Comparison of the coastline variation from 1998 to 2017 in Zone3 (refer to Figure 13).

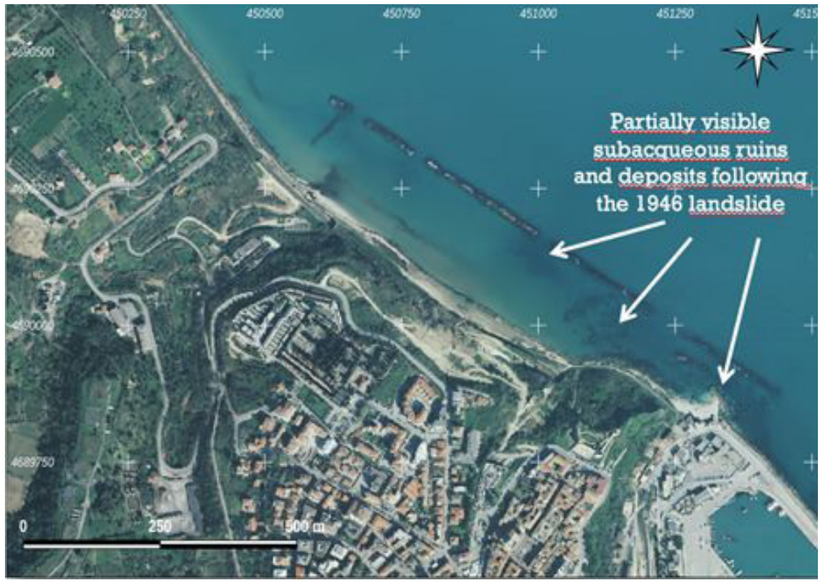


Figure 17. Aerial image[18] of the Ortona coastline in the 'Lo Scalo' site, in the northern side of the modern harbor, where subacqueous landslide deposits and ruins are visible.

[18] Ibid.

Archaeological and hystorical sites

The identification of the archeological and historical sites we mostly referred to the work done by Staffa 2002 and 2004 (Figure 18)[19]. There are out two main areas of archeological interest within the subacqueous remnants of the ancient Ortona harbour: the site of the Roman port corresponding to the "Scalo" area and a still visible part of medieval port, enclosed within the structures of the modern harbour (Orlandi 199; Staffa 2002, 2004; Fossataro, 2005).

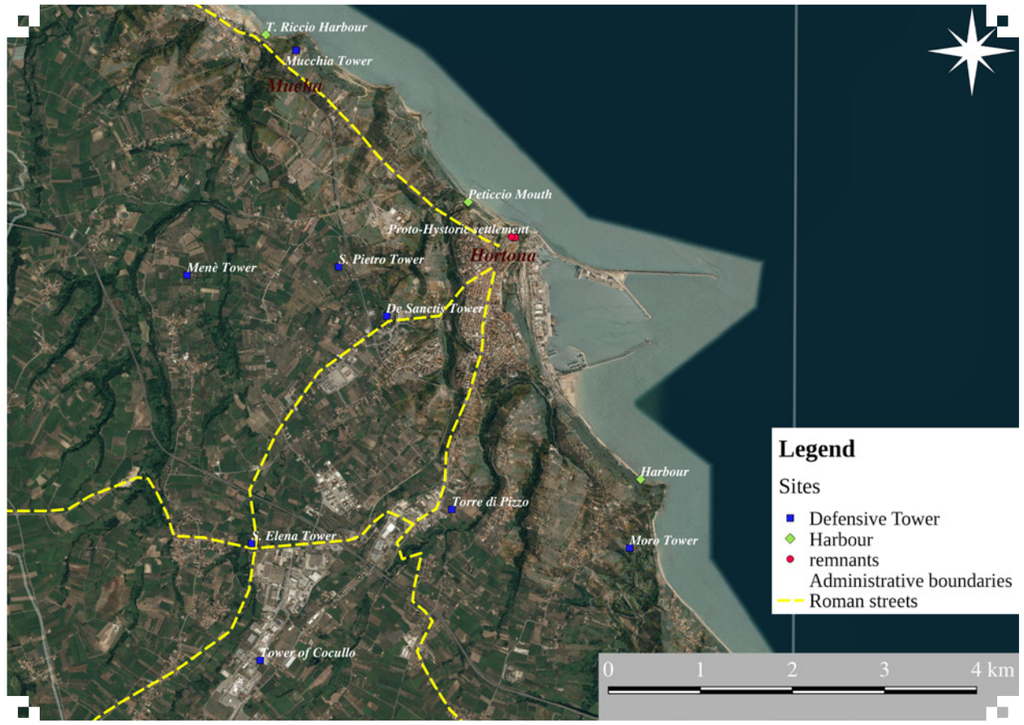


Figure 18. Preliminary list of sites of interest from Staffa 2002 and 2004 over an aerial image.[20]

Fossataro, combined remote sensing, eco-sonar, thermo-photos to identify the position of the ancient pier to the North and within the modern structure, confirming that the Hortona harbour was an '*epineion*' (Fossataro 2005). The preliminary underwater survey in the northern sector of the modern harbour, allowed the observation of squared stones, possible structures, which need a more systematic survey. Also, from the area of the port numerous materials were found (Figure 18) such as:

- several ancoras, attesting the maritime navigations;
- amphorae, amphora stops with stamps and decorations, probably related to the content of the vessels or to the potter product.

[19] (Staffa 2002; Staffa 2006)
[20] Ibid.

Among the stamps one in particular is extremely important because is a Rodian Amphora, attesting trades with Greek areas.

Figure 19. Example of the archeological artifacts (Fossataro, 2005).

However, it is not clear where the main town was located. Fossataro (2005)[7] suggested that at the beginning *Hortona* was born as a settlement related to the harbour and serving some internal and more important town, possibly *Teate* (modern Chieti) at about 18 Km away, but it soon became an important and developed urban centre, acquiring the role of town and not only port-settlement.

The sea level controls the level of navigability of the rivers and thus influenced the humans settlements. For example, we made a simulation of the sea level rise along the Ortona coastline and during a high sea level stand, the Peticcio river valley was largely navigable (Figure 19). It is thus important to combine the archaeological and geological information to correctly interpret the evidences in the territory.

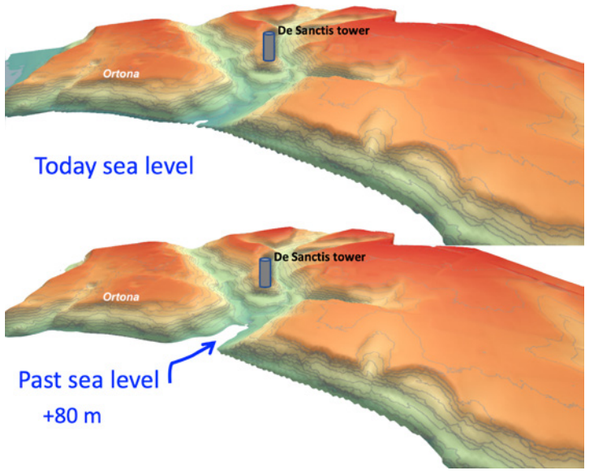


Figure 20. Reconstruction of the coastline position with the sea level at +80m higher (bottom image) than current position (upper image) using a 3D digital elevation model reconstructed from LIDAR data[21]. (Vertical exaggeration x5)

Also, it is indeed interesting to note that the remnants of the inner towers (Staffa 2002[6] and 2004[35]) lie at similar altitude, drawing theoretical lines parallel to the coastline (Figure 18).

The innermost towers are located at an altitude of about 100 m in correspondence to main fluvial valleys. It would be worthwhile to plan further studies on the connection with the uplift rate due of the area due to the Apennines formation and sea level changes during the Quaternary geological evolution of this part of the central Adriatic, information not found in the literature and requires more detailed analysis and study which is beyond this project.

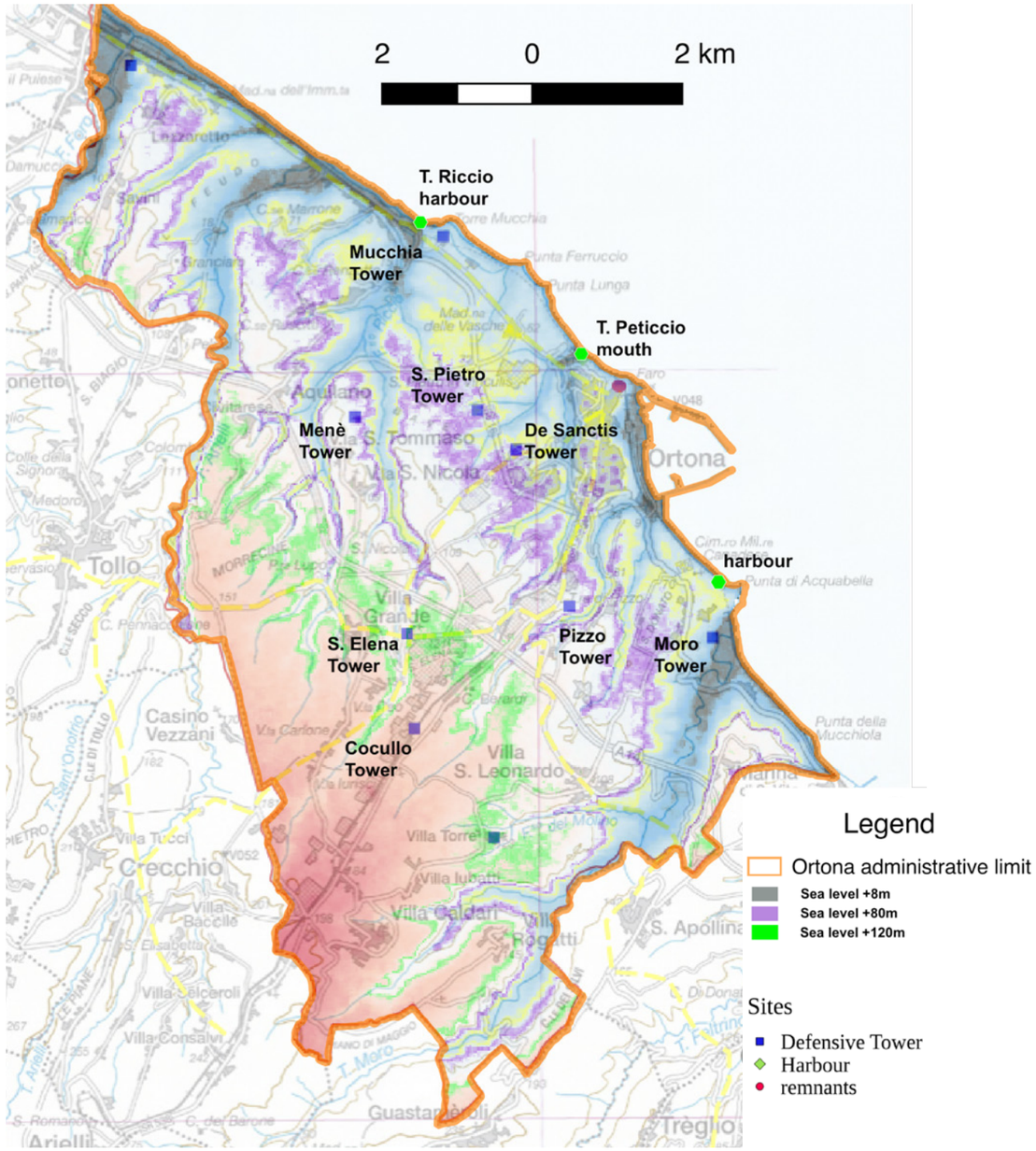


Figure 21. Defensive towers location and altitude compared to different position of past sea level in the Mediterranean area. Digital Elevation Model DEM from Regione Abruzzo (Staffa 2004).

To conclude our study, a list of the potential sites of interest for the APPRODI project is summarized in the following Table 2 and their positions is indicated in Figure 21.

[21] LIDAR data.

id	Latitude	Longitude	Toponym	Age	Type	State of preservation
1	42°21′46″N	14°24′2″E	Lo Scalo -Peticcio river Mouth	Pre-roman/ Roman age	Ancient Harbour	Not available
2	42°21′34″N	14°24′31″E	La Ritorna beach	Middle age	Ancient Harbour	Not available
3	42°21′46″N	14°23′54″E	Peticcio Fountain	Renaissance	monument	Good
4	42°22′24″N	14°23′23″E	Ripari di Giobbe	Middle Paleolithic – Middle Ages	Defensive tower	Poor
5	42°22′42″N	14°22′43″E	Punta Ferruccio	Roman age	Ancient Harbour	Not available
6	42°20′7″N	14°25′23″E	Punta Acquabella	Roman age – Middle age	Ancient Harbour	Not available
7	42°22′37″N	14°22′39″E	Mucha Tower	Middle Ages	Defensive Tower	Poor
8	42°22′37″N	14°22′39″E	Settlement of Mucchia	Middle Ages	Defensive Tower	Poor
9	42°19′43″N	14°25′18″E	Moro Tower	Byzantine age	Defensive Tower	Poor
10	42°21′25″N	14°24′17″E	Terravecchia village-settlement of Hortona	Roman Age	Village	Good
11-12	42°21′32″N	14°24′22″E	Proto-Hystoric settlement (inside the Aragonese castle)	Bronze age – Iron age	Remnants	Poor
13	42°21′32″N	14°24′22″E	Roman cistern (inside the Aragonese castle	Roman age	Remnants	Poor
14	42°21′32″N	14°24′22″E	Aragonese Castle	1447-1542	Castle	Poor
15	42°21′26″N	14°24′16″E	St. Thomas' cathedral	From roman age to present	Church	Good
16	42°21′20″N	14°24′14″E	Farnese palace	Late Renaissance	Museum	Good
17	42°18′59″N	14°26′17″E	"Costa dei Trabocchi" Bardella area	1500-1700	Typical fishing and food	Good

Table 2. List of identified archaeological and historical sites in the Ortona administration.

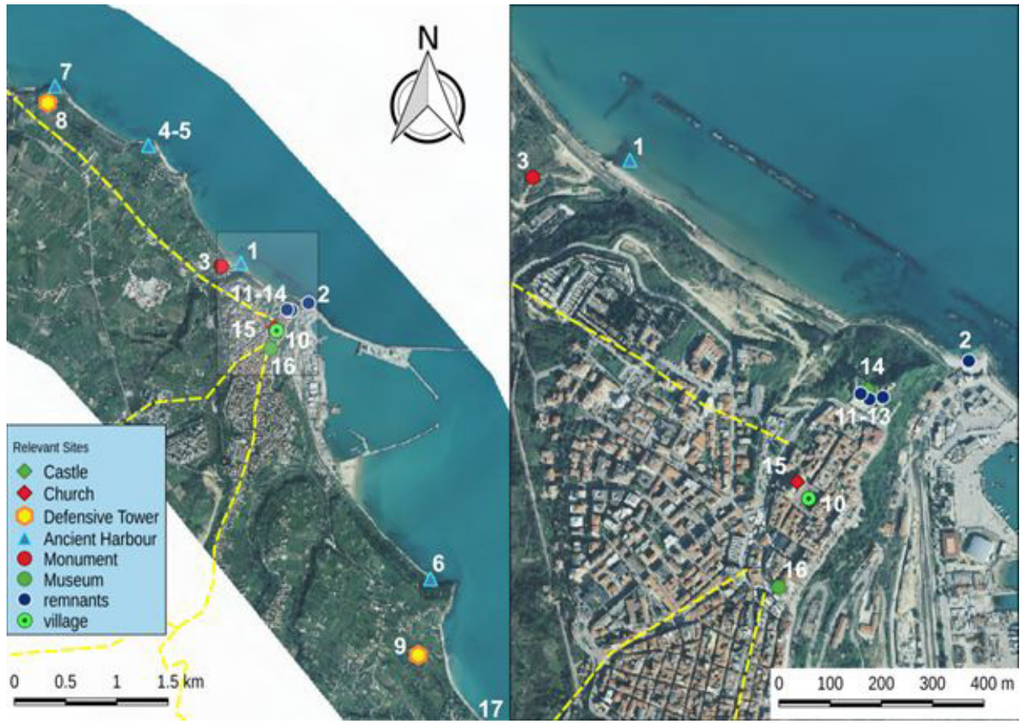


Figure 22. Position of the identified sites over an aerial image from Regione Abruzzo.[22]

Final remarks

Our objective was to collect the geological, archaeological and historical information to better understand the presence of ancient ports in the Ortona administrative area and prepare a list of potential sites of interest to be valorized for touristic purposes. This work represents an initial stage of a more detailed study to be carried out in the future to address all the remaining open questions. For example, it'd be useful to make a more detailed work combining different satellite/aerial images and geophysical survey of the shallow sea to provide a more complete context for the subaqueous archaeological exploration in search of the ancient ports.

[22] Aerial image of Regione Abruzzo, http://opendata.regione.abruzzo.it/

Bibliography

Antonio Rizzi-Zannoni geografo di Sua Maestà e terminato nel 1808. Napoli, s.n., 1788-1812. *Atlante geografico del Regno di Napoli delineato per ordine di Ferdinando IV re delle Due Sicilie & C. & C*

Benjamin, J. et al. 2017. "Late Quaternary sea-level changes and early human societies in the central and eastern Mediterranean Basin: An interdisciplinary review." *Quaternary International* 449: 29-57.

Bordoni, P. and Valensise, G. "Deformation of the 125 kys marine terrace in Italy: tectonic implications." *Geological Society, London, Special Publications*. 146, 71-110.

Castagnino Berlinghieri, E.F. 2003. *The Aeolian Islands: crossroads of Mediterranean maritime routes: a survey on their maritime archaeology and topography from the prehistoric to the Roman periods*. EFC Berlinghieri.

CLIMAX Maps Italy, C. Margottini and G.B. Vai, Bologna, 2004.

D'Alessandro, L., Genevois, R. and Marino, A. 2001. "Dinamica recente della costa alta fra Ortona e Vasto (Abruzzo centro-meridionale)". *Mem. Soc. Geol. It.* 56: 53-60.

Falcone, A., 2004. *Storia di Ortona*. Editore Centro Studi Sociali.

Felice, C. 1983. *Porti e scafi. Politica ed economia sul litorale abruzzese-molisano (1000-1980)*. Cannarsa.

Fossataro, D. 2005. „Central Adriatic sea: real 'importuosa litora'?" *Symposium of Mediterranean Archeology*. Dublin-Oxford: SOMA.

Kirigin, B., Johnston A., Vučetić M. and Lušić Z. 2009. "Palagruža - The Island of Diomedes and Notes on Ancient Greek." *A Connecting Sea: Maritime Interaction in Adriatic Prehistory*. Ed. Forenbaher, S. Oxford: Archaeopress Publishers of British Archaeological Reports.

Lambeck, K., Antonioli, F., Purcella A. and Silenzi S. 2004. „Sea-level change along the Italian coast for the past 10,000 yr." *Quaternary Science Reviews*, 23: 1567–1598

Lambeck, K., et al. 2011. "Sea level change along the Italian coast during the Holocene and projections for the future." *Quaternary International* 232: 250-257.

Levi, A. and Levi, M. A. 1978. *La Tabula Peutingeriana, in scala 1:1*. Edizioni Edison.

Mastronuzzi, G, et al. 2017. "Evidence of Relative Sea Level Rise Along the Coasts of Central Apulia (Italy) During the Late Holocene Via Maritime Archaeological Indicators." *Quaternary international*, 439: 65-78

Orlandi, M.L. 1999. „Mappa archeologica del territorio Ortonese, tesi di Laurea". *Giornale Storico Ortonese.*

Pierucci, P. and Benegiamo, M. 2013. *Patrimonio industriale marittimo nell'adriatico centrale*. Franco Angeli.

Polland, A.M. 1999. "Geoarchaeology: An introduction." *Geoarchaeology: Exploration, Environments, Resources* 165(1): 7-14 DOI: 10.1144/GSL.SP.1999.165.01.01

Railsback, L.B., Gibbard, P.L., Head, M.J., Voarintsoa, N.R.G., and Toucanne, S., 2015. "An optimized scheme of lettered marine isotope substages for the last 1.0 million years, and the climatostratigraphic nature of isotope stages and substages." *Quaternary Science Reviews* 111: 94-106.

Romanelli, D. 1996. *Storia dei frentani. Istonio, Anxano, Ortona e altre antiche città scomparse nei secoli bui*. Editore Polla.

Sicre, M.A., et al. 2008. "Decadal variability of sea surface temperatures off North Iceland over the last 2000 years." *Earth and Planetary Science Letters*. 268: 137-142. DOI: 10.1016/j.epsl.2008.01.011. insu-00311666

Staffa, A. R. 2004. „Ortona tra tarda antichità e alto Medioevo. Un contributo alla ricostruzione della frontiera Bizantina in Abruzzo." *Archeologia Medievale.* 39: 1-39.

Staffa, A.R. 2002. *L'Abruzzo costiero. Viabilità, insediamenti, strutture portuali, assetto del territorio fra Antichità ed Altomedioevo*. Lanciano.

Strabone. *Opera Geografia, Libro V.*

Tinti, S., Maramai, A. and Favali, P. 1995. "The Gargano promontory: An important Italian seismogenic-tsunamigenic area." *Marine Geology.* Vol. 122, 3: 227-241.

Tito Livio. *Ab urbe condita Libro X*.

Trincardi, F., et. Al. 2014. "Bathymetry of the Adriatic Sea: The legacy of the last eustatic cycle and the impact of modern sediment dispersal." *Journal of Maps*. 10: 151-158. DOI: 10.1080/17445647.2013.864844

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Ancient Harbors in their historical and archaeological Setting: The Case of Corfu.

The name of Κέρκυρα (Kerkyra) comes from Κόρκυρα (Korkyra), a nymph who was the daughter of Ασωπός (Asopos), a personified-deified big Greek river of the mainland. Poseidon fell in love with her and brought her on this island, and it was out of this incident that the island was named, since Korkyra became Kerkyra in the Doric dialect. The Φαίακες (Phaeacians) were believed to be the first residents[1], and the first founder was supposed to have been Φαίαξ (Phaeaks); his son Ναυσίθοος (Nausithoos) was believed to be the father of king Αλκίνοος (Alcinoos), known from the *Odyssey*, where Alcinoos and his daughter Ναυσικά (Nausicaa) are said to have helped Odysseus to return to Ithaca.

In fact, the penultimate stop of the return journey of Odysseus was the Homeric Σχερίη (Scheria/e)[2], which for many scholars, but also for many ancient authors, is identified with Korcyra/Kerkyra, the current Corfu. This idea, already popular in Antiquity, made Napoleon Bonaparte, when he occupied Corfu in 1797 (till then belonging to the Venetian republic), write that the island of Korkyra was the country of princess Nausicaa; he also noted that, when the Chief of Greek Orthodox priests welcomed the French commander, he officially offered him a copy of the *Odyssey* (Vidal-Naquet 2002, 39). Odysseus/Ulysses, after having abandoned Calypso and her island (Ωγυγία, Ogygia, also as difficult to identify as Corfu and Ithaca, despite the speculations identifying it with Gaudos, Γαύδος, a Greek island in the south of Crete), fell into a storm and reached a bay of Scherie as a shipwreck. There he fell asleep and, awaken, he met the Phaeacian princess, Nausicaa, as Homer states in the 6th book of *Odyssey*, vv. 149-160[3].

1 The Phaeacians had previously inhabited, according to Homer, far from any inhabited area, in Hypereia (Ὑπερεία), near the uncultured Cyclops. With King Nausithoos, the son of Poseidon and Perivia, they settled in Scheria, although, as we will see this mythical Scheria is situated at the ends of the earth, not necessarily identified with real Kerkyra/Corfu. See Homer *Od*. 6, 1-10 speaking of the original residence of the Phaeacians, Hypereia, outside the known world.

2 It is Homer that calls the land "Scheria". *Od*. 5, 34-35; 6, 1-12.

3 γουνοῦμαί σε, ἄνασσα: θεός νύ τις, ἦ βροτός ἐσσι;
εἰ μέν τις θεός ἐσσι, τοὶ οὐρανὸν εὐρὺν ἔχουσιν,
Ἀρτέμιδί σε ἐγώ γε, Διὸς κούρῃ μεγάλοιο,
εἶδός τε μέγεθός τε φυήν τ᾽ ἄγχιστα εἰσκω:
εἰ δέ τίς ἐσσι βροτῶν, τοὶ ἐπὶ χθονὶ ναιετάουσιν,
τρὶς μάκαρες μὲν σοί γε πατὴρ καὶ πότνια μήτηρ,
τρὶς μάκαρες δὲ κασίγνητοι: μάλα πού σφισι θυμὸς
αἰὲν ἐυφροσύνῃσιν ἰαίνεται εἵνεκα σεῖο,
λευσσόντων τοιόνδε θάλος χορὸν εἰσοιχνεῦσαν.
κεῖνος δ᾽ αὖ περὶ κῆρι μακάρτατος ἔξοχον ἄλλων,
ὅς κέ σ᾽ ἐέδνοισι βρίσας οἴκόνδ᾽ ἀγάγηται.
οὐ γάρ πω τοιοῦτον ἴδον βροτὸν ὀφθαλμοῖσιν,
οὔτ᾽ ἄνδρ᾽ οὔτε γυναῖκα: σέβας μ᾽ ἔχει εἰσορόωντα.
["I beseech thee, O queen,—a goddess art thou, or art thou mortal? If thou art a goddess, one of those who hold broad heaven, to Artemis, the daughter of great Zeus, do I liken thee most nearly in comeliness and in stature and in form. But if thou art one of mortals who dwell upon the earth, thrice-blessed then are thy father and thy honored mother, and thrice-blessed thy brethren. Full well, I ween, are their hearts ever warmed with joy because of thee, as they see thee entering the dance, a plant so fair. But he again is blessed in heart above all others, who shall prevail with his gifts of wooing and lead thee to his home. For never yet have mine eyes looked upon a mortal such as thou, whether man or woman; amazement holds me as I look on thee. Translated by A.T. Murray, as happens with all passages from the *Odyssey*].

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