

Classe (Ravenna): An abandoned town in an urbanized landscape. New research for archaeological heritage protection and territorial planning.

Andrea AUGENTI | Federica BOSCHI

Department of History and Culture. Section of Archaeology, University of Bologna

Abstract: Classe was one of the most important ports of the Mediterranean Sea during late antiquity. The settlement was created as an infrastructure of the close-by city of Ravenna, one of the imperial seats of the late antique Mediterranean area, but it very soon became a proper town, with its own defensive walls, monuments and houses. The Department of Archaeology of the University of Bologna started here new investigations from 2001 (in collaboration with the Soprintendenza per i Beni Archeologici dell'Emilia Romagna and the Fondazione RavennAntica). The present paper is focused on the new research carried out for the Evaluation of the archaeological deposit of Classe. In fact, Classe is not a real urban area or a typical case of urban archaeology. Thus, this is an experiment for evaluating the archaeological deposits of an abandoned site, which has been urbanized just in recent times and only sporadically. The transformations of the last centuries have partially spared the ancient urban area and its suburbs, but in several areas the development of the modern settlement has heavily damaged entire sectors and buildings of the ancient city. This peculiarity encouraged us to promote a program for protection and enhancement, both mitigating the negative impacts of what has already been accomplished and, above all, in order to avoid new ones for the future. The new research represents a fundamental tool of a planned organic approach to the buried city. The integrated approach of the new research has involved GIS based systematization of both old and new different data sets, with a large use of aerial photography (historical and updated) and geophysical survey techniques, which have often stimulated new archaeological digs, favouring the recovery of information.

Keywords: Late Roman Age, Evaluation archaeological deposits, Landscape Archaeology, Urban Archaeology, Archaeological Prospections

Classe (Ravenna): the framework

Since 2001 the University of Bologna has been actively investigating the ancient town of Classe, which is located 5 km south of Ravenna.

The history of the site dates back to the 1st century AD, when Augustus established in Ravenna a seat of the military fleet to control the Adriatic Sea. In this period the area later occupied by Classe was a typical suburban landscape of the Imperial age, with isolated sub-urban villas and numerous

cemeteries situated on the sandy dunes, which run close to the coastline. A number of *stelae* belonging to the sailors of the military fleet based in Ravenna at that time, have been found here. This situation changed completely from the beginning of the 5th century, coinciding with the promotion of Ravenna to the rank of new imperial capital, when Classe developed as a satellite-town, adopting urban walls and important buildings and monuments (Fig. 1). From this moment onwards, Ravenna became the focus of an intense building programme, which also involved its suburbs.



Fig. 1 – Ravenna and Classe: satellite image with city areas.

Between the 5th and 7th century Classe had its most prosperous phase, when the great Christian basilicas were built and the centre took on a defined function: a new commercial port was realized and became one of the most important in the whole Mediterranean Basin. This was situated along a canal that constituted the northern edge of the settlement and connected the old Augustan inner basin to the sea. It was articulated into storage buildings, which revealed an impressive volume of goods, roads and other infrastructures. The port was fully functional until at least the beginning of the 7th century, a date after which we record the first symptoms of urban decline. In fact, between the 7th and 9th centuries the port was gradually buried, as a result of the combined action of the sea and the hinterland's rivers, and the progressive disappearance of Classe started.

From the 10th century Classe was no longer perceived as a town and its glorious past survives only with the basilica of San Severo, at which a monastery was added in the 10th century, and the basilica of Sant'Apollinare, the only building which has survived. The ancient Classe disappeared from the surface, becoming part of the countryside around Ravenna. The thriving late roman town was hidden under a desolate landscape, with a prevalent agricultural use.

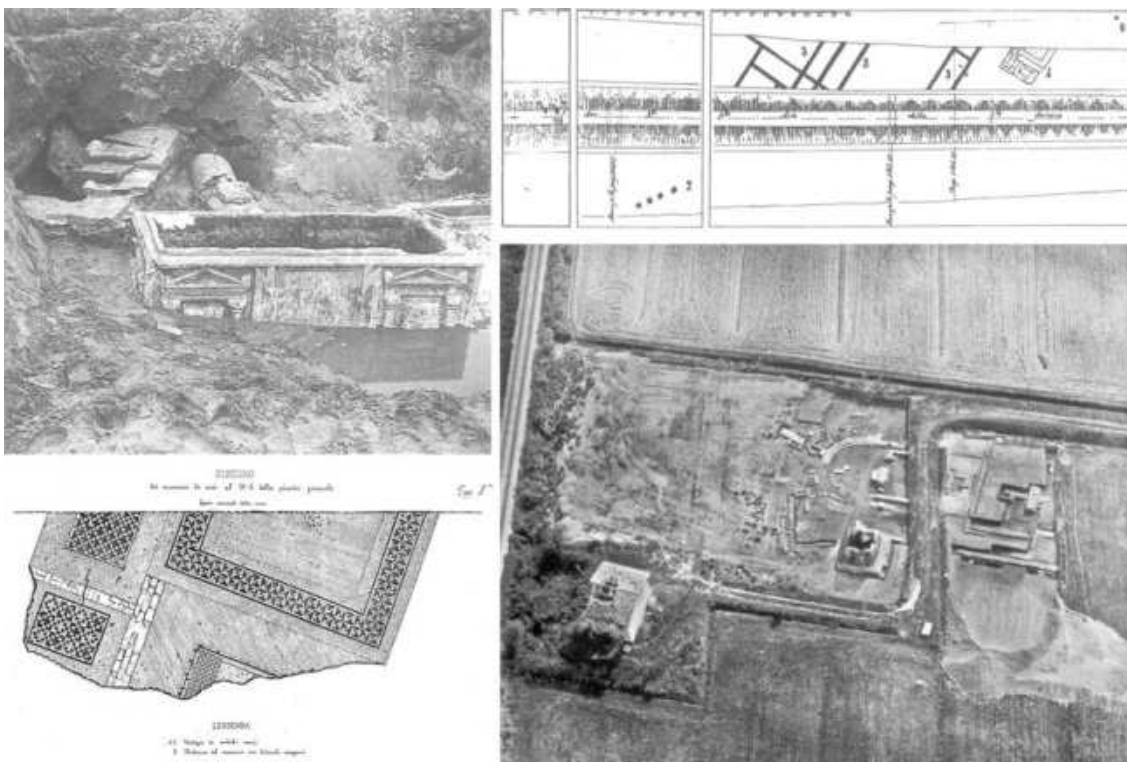


Fig. 2 – Some of the findings occurred during the railway line's construction and agricultural works (XIX-XX c.).

This situation persisted until recent times, when Ravenna realized a period of great expansion, which also involved the region of Classe. Here new quarters, urban subdivisions and infrastructures were built, partially damaging and covering the ancient urban area and its suburbs.

But, with the rise of the modern town, the discovery of Classe's past began. In fact, between the nineteenth and twentieth centuries, accidental and planned discoveries occurred, contributing to the development of a deep awareness of the rich archaeological record hidden under these soils (Fig. 2).

(A. A.)

Evaluating archaeology in a “difficult soil landscape”

After a period of non-systematic explorations, a new season of research started in 2001, thanks to the collaboration between the University of Bologna, the Soprintendenza per i Beni Archeologici dell'Emilia Romagna and the Fondazione RavennAntica, with the main goal to develop a new tool useful for knowledge, protection and enhancement of the archaeological site, as well as to support the urban and territorial planning of the region south of Ravenna (AUGENTI 2011).

The modern topography differs considerably from that of antiquity in several aspects. The Late Roman coastline is estimated to lie around 8 km inland from the modern coast. Along the ancient coastline we have to imagine a typical lagoon scenery, with a system of coastal dunes and water areas, due to the repeated alluvial deposits from the sea and the river system of the Po delta. This scenery no longer exists, but many traces remain in the modern landscape (Fig. 3).



Fig. 3 – Traces of the ancient coastal dunes in the modern landscape from aerial survey.

The territory under investigation covers an area of about 80 hectares, characterized by the widespread presence of clay soils, widely recognised as producing relatively limited aerial visibility, with a poor response to the formation of crop mark and soil mark evidence.

For these reasons, one of the major limitations for Classe's exploration is the potential depth of alluvial deposits masking the archaeological remains and, of course, the wide presence of difficult soils with high levels of groundwater. Therefore, operations of excavation and, in some cases, the application of remote sensing techniques are made particularly difficult (Fig. 4).



Fig. 4 – Clay soils and difficult operations of excavation at Classe.

In this difficult context, we have adopted a strategy shared with modern landscape studies (CAMPANA, FRANCOVICH 2007; CAMPANA, PIRO 2009; HAY *et alii* 2006; VERMEULEN *et alii* 2012), founded on the integrated use of a wide range of survey methods and technologies, applied at varying scales of detail, with a holistic approach which considers several aspects of the landscape: archaeology, topography, geology of soils, geomorphology, land use and coastal changes.

The archaeological investigation has included the study of the historical sources and archival documents, critical review and systemization of previous archaeological findings, analysis of historical and modern aerial photos and cartography, study of the pottery collections, different kinds of remote sensing, ground based geophysics and artifact surveys (AUGENTI 2011; BOSCHI 2012a). These datasets have offered invaluable information for many different aspects of the ancient town. The collection and integration of digital data at Classe aims mainly to assemble and interrelate fragmented data into a more informative whole, so as to increase their interpretive value. For the implementation of these aims a number of digital tools are being employed. Since most of the datasets consist of spatially referenced information the use of Geographical Information Systems (GIS) has been an integral part of data management. Data integration in a GIS significantly facilitates the interpretation of geospatial information, either by simply enabling the combined visualization and interrelation of different datasets, or via the use of spatial analysis and

statistics. GIS based systemization of both old and new data sets, and has often stimulated new archaeological digs, favouring the recovery of new information.

In this multidisciplinary approach, aerial photography and geophysical surveys play a key role. On the basis of previous experiences in the study of Classe and Ravenna's landscape by vertical aerial photography (see SCHMIEDT 1962; SCHMIEDT 1968), a new aerial survey program was started in 2007, with the aim of systematically mapping all no-longer-used features that can be seen on vertical and oblique aerial photography for the region of Classe. The identification of the evidence has been followed by methodical recording of data and their interpretation (Fig. 5).



Fig. 5 – Aerial surveys. Identification of the evidence, recording data and interpretation.

Turning to the geophysical surveys, since 2005, in Classe we have tested different geophysical techniques. The best results were obtained with the geomagnetic techniques, in particular with caesium and potassium gradiometers. The GPR system has encountered some difficulties due to the clay soils, and the resistivity system has been occasionally used to obtain information on the thickness of the archaeological stratification. Thus, magnetometry was most widely used for this research (BOSCHI 2012b).

Integrating old and new data

The key of this successfully adopted strategy is strictly connected with the peculiarities of the site: in fact, this is an experiment to evaluate the archaeological deposits of an abandoned site, which has been urbanized in recent times and only sporadically. The transformations of the last centuries have partially spared the ancient urban area and its suburbs. For this reason we are better able to recover the ancient cityscape, and to promote a program for protection and enhancement, both mitigating the negative impacts of what has already been done and, above all, in order to prevent

these in the future. The new research represents a fundamental tool of a planned organic approach to the buried city.

In several areas the development of the modern settlement has heavily damaged entire sectors and buildings of the ancient city. Historical cartography and aerial photos have aided the recovery of these disappeared areas (Fig. 6).



Fig. 6 – The transformations of the landscape of Classe over the centuries documented by historical cartography and aerial images. In several areas the development of the modern settlement has heavily damaged entire sectors of the ancient city, recoverable only in the historical cartography and photos.

Over the whole western sector of the ancient urban area the new town has developed since the second half of the last century, complicating the recovery of the archaeological record. But, thanks to the aerial historical photos' analysis we have been able to acquire important evidence of the urban walls and of some lost buildings. Other evidence speaks to us about the old presence of agricultural plots and division lands, frequently mentioned in medieval documents and contracts (Fig. 7) (BOSCHI 2012a).

Another important example concerns the basilica of Beato Probo, which the historical sources describe as existing in the 6th century in the suburbs, to the east of Sant'Apollinare in Classe, in an

area today completely obliterated by the modern urban development. Also in this case, the joint analysis of archival documents and historical aerial photos, have allowed us to recognize the ancient location of the building (AUGENTI 2011; BOSCHI 2012a).

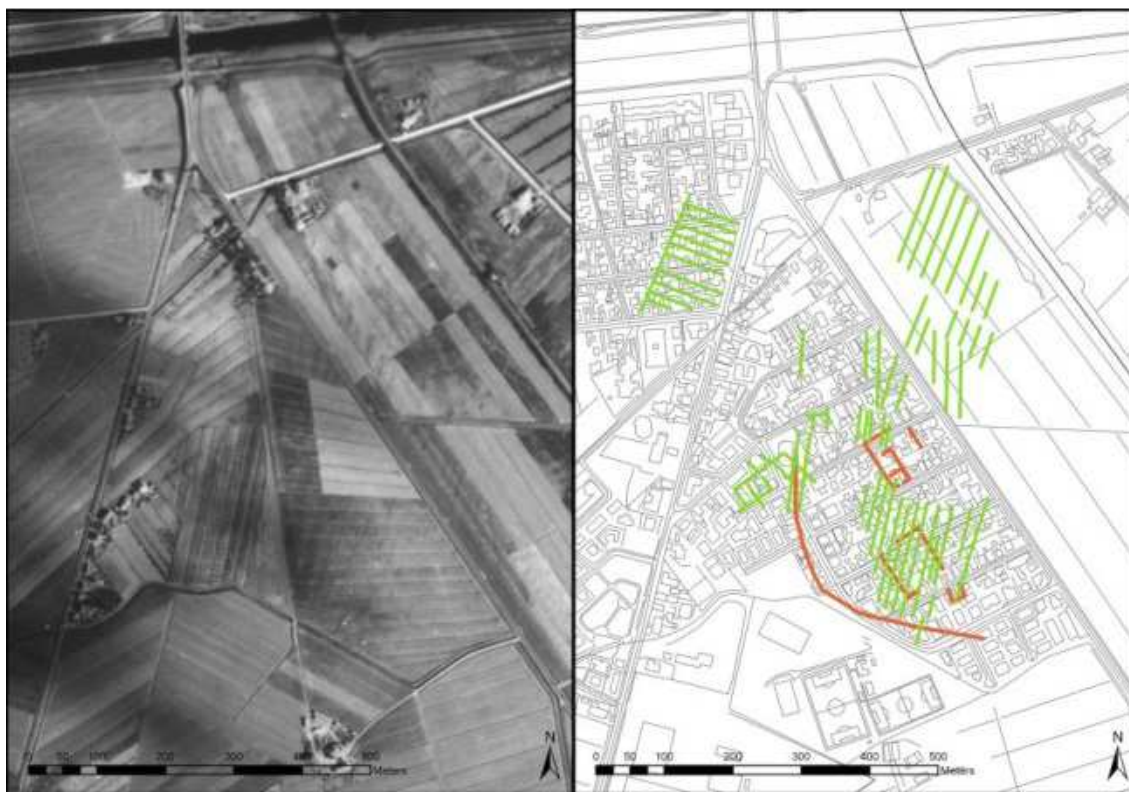


Fig. 7 – The western sector of the ancient urban area of Classe in the historic aerial photography and modern cartography. Analysis of the historic aerial photos and graphical restitution of the main evidence that reveal the ancient presence of buildings and of the urban walls (orange) and of agricultural plots and division lands (green).

The same applies to the area immediately north of Sant'Apollinare in Classe, now partially built, where the historical photos reveal an articulated texture of buildings and internal roads, that remind us of the *Vicus Leprosus*, testified by Andrea Agnello during the 9th century, right nearby to the church (Fig. 8) (BOSCHI 2012a).

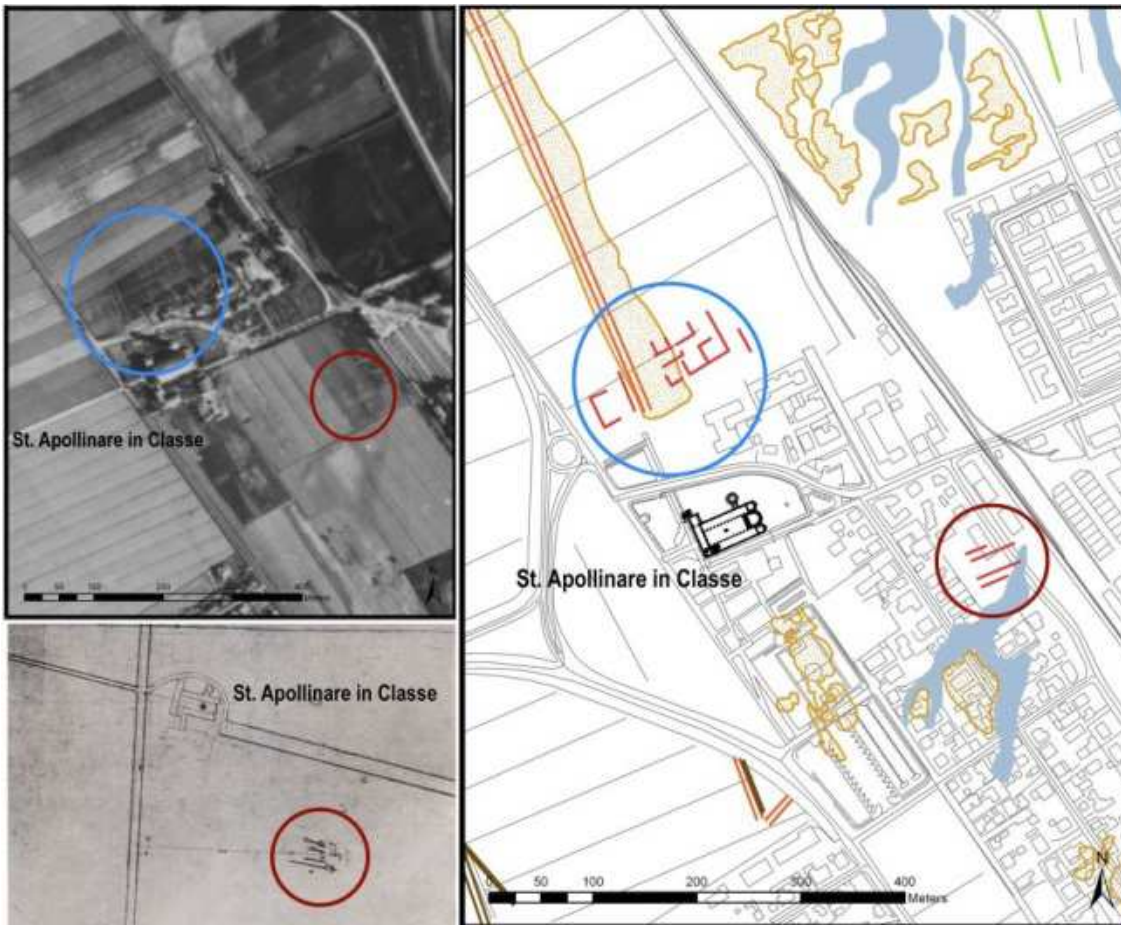


Fig. 8 - The area of the Basilica of St. Apollinare in Classe in the historic aerial photography and cartography.

The integration of aerial and geophysical surveys has highly contributed to understanding entire sectors of the ancient town, especially in some survived open areas and has resolved some questions that had been unsolved for decades.

The first example is the case of the basilica Petriana, founded during the 5th century and vanished from the surface more than a millennium ago. The historical sources describe it as a magnificent and very great building, part of a large complex, which included a baptistery and monasteries. However, the localization and characterization of the plan of this important church has for a long time been an unresolved question. In the 18th century some remains of walls were found during agricultural works in an open area. Later, also on the basis of an auguring survey and a limited excavation, some researchers proposed to attribute them to the Petriana complex, but with insufficient evidence (AUGENTI 2011; BOSCHI 2012a).

The recent systematic analysis of the aerial photos and the new aerial surveys have confirmed the presence of buried structures, revealing many details of a buried complex, without showing the standard pattern of a basilica or typical characteristics of the ecclesiastic architecture (Fig. 9). Instead, the geomagnetic survey has largely contributed to the discussion, fostering a better

understanding of the archaeological record (BOSCHI 2012a; BECKER, BOSCHI, CAMPANA 2009).



Fig. 9 – The site of the basilica Petriana in the aerial photography. (a): Quick Bird Image (2003); (b): photo RAF-Royal Air Force (1943); (c) aerial survey (2005); (d) aerial survey (2008).



Fig. 10 – Area of the basilica Petriana. Magnetic map obtained with the Caesium magnetometer in the vertical gradient configuration, in collaboration with Helmut Becker (Becker Archaeological Prospection, Beuerberg, Germany), and interpretation of the main magnetic anomalies.

The final magnetic map shows the complete plan of the buried complex, which appears more extended and articulated than suggested by the aerial photos (Fig. 10).

In the central part of the field the plan of a basilica is clearly visible, with a tripartite division into aisles and a central apse. A narthex seems to occupy the western side. To the north and west, the map shows other buildings, which we are trying to understand also through limited excavations, but which we assume to be the baptistery and monasteries attested by the historical sources. The archaeological exploration confirmed the magnetic measurements, revealing the presence of walls and remains of flooring in mosaic and *opus sectile* between 60 centimetres and 1.50 m depth.

A second case study concerns the urban walls. For a long time the route of the urban walls was suggested on the basis of limited auguring conducted in the past. In 2008 new archaeological excavations were carried out in a field where previous studies has indicated the presence of buried structures relating to the necropolis. The new research discovered the remains of a circular tower and of a large structure interpreted as part of the urban walls, encouraging the use of geophysical techniques in order to survey the whole field. The magnetic map obtained shows a scattered signal, due to recent excavations, but also other linear features. Though the evidence is more difficult to read than the Petriana's site, it's possible to identify a continuation of the walls both north and south of the excavated tower and other alignments interpreted as part of a system of ducts and canals. Following the presumed course of the walls, we recently organized a new geomagnetic survey in the southern field, which has confirmed the development of the urban perimeter for at least another 100 m. In this case the 'wall' anomalies are clearly visible and characterized by a strong positive magnetization contrast, maybe indicating better conservation of the buried structures or less covering clay. The presence of circular towers similar to that excavated is also suggested.

The geomagnetic survey conducted in these two fields allows us to follow the urban walls for about 300 m in total, significantly contributing to the reconstruction of the urban perimeter (BOSCHI 2012b) (Fig. 11).



Fig. 11 – Area of the urban walls. Magnetic maps obtained with the Optically pumped Potassium Gradiometer and interpretation of the main magnetic anomalies.

Other anomalies have also been shown, possibly related to environmental and geomorphological changes, in particular to the presence of the ancient coastline and of the coastal sand dunes. A small widening of the excavation around the circular tower has confirmed the interpretation formulated by geophysics and aerial photography, suggesting the presence of a system of ducts and a large canal leading to the sea. The exploration also allowed us to explain the weak magnetic anomalies in relation to the greater depth of the structures, about 2.20 m.

A third area where we have adopted the same strategy is the commercial port, above all in the field divided from the archaeological area by the railway line. Here, the last aerial surveys had documented some interesting cropmarks, but, despite repeated aerial surveys, the clay soil has limited their visibility; thus magnetic prospection was used to overcome the unfavourable soil conditions. In this area we also used the optically pumped Potassium gradiometer, which demonstrated a high tolerance to magnetic variations from the nearby railway line. The magnetic survey confirmed the aerial photos suggestion, revealing new data on the port district and on the development of the port canal towards the sea (Fig. 12).

(F. B.)



Fig. 12 - Area of the late-roman port of Classe. To left: aerial photo of the archaeological area and the field over the modern railway line, where interesting cropmarks are visible. To right: magnetic map of the field obtained with the Optically pumped Potassium Gradiometer.

Conclusions

The above mentioned case studies emphasize the contribution of the geophysical and aerial surveys for understanding and reconstructing the ancient town of Classe, showing in particular that the magnetic prospection can be an effective survey system even in a urbanized context, despite the presence of different sources of noise, such as railway lines, roads and buildings, at a short distance from the survey area (Fig. 13) (BOSCHI 2012b).

The analysis and interpretation of the thousands of aerial photos collected, historical and modern, and of the geophysical data has led to the production of a Map of the evidence from remote sensing for Classe and its territory (BOSCHI 2012a).

The integration of all data, from old and new research, has lead us to propose a reliable reconstruction of the urban area of Classe, allowing us also to identify the main topographical elements of this ancient landscape and its transformation over the centuries (Fig. 14).

The end point of our work is the Evaluation Archaeological Deposits Map, which we have been developing on an algorithmic base, once specific evaluation parameters have been established (AUGENTI 2011). It represents the “hot zones” of Classe’s region, the most relevant for the buried archaeological record (Fig. 15).



Fig. 13 – Classe, urban area: total map of the magnetic prospecting results and interpretation.

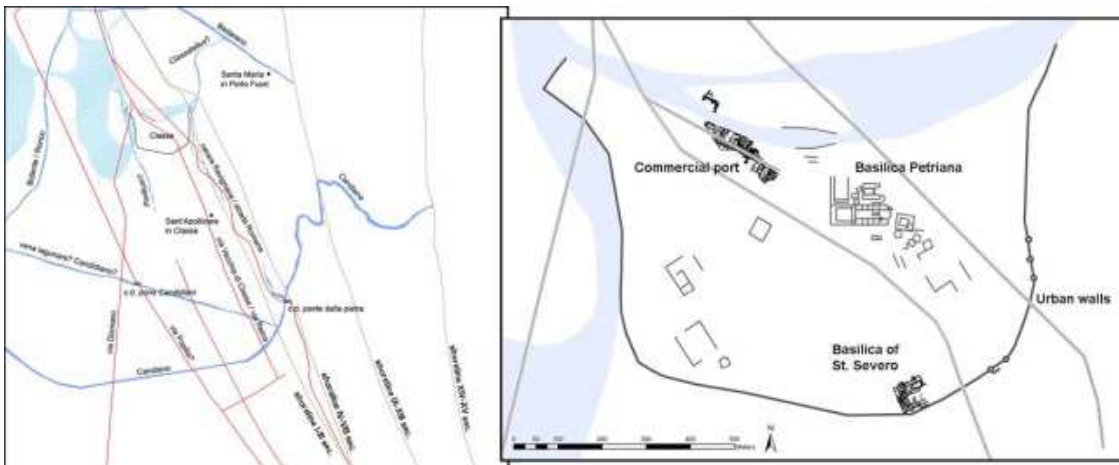


Fig. 14 – Reconstruction of the landscape south of Ravenna during the century (left) and of the ancient urban area of Classe during the Late Antiquity (right).

This map will be a tool-guide during urban and territorial planning, defining archaeological restrictions, but also useful in identifying what and where to dig, thus to set a correct archaeological research strategy.

Concerning the methodology, the region of Classe is not easy for remote sensing and geophysical techniques, particularly due to the presence of urbanized areas and clay soil, as well as for the depth at which the archaeological record lies. Despite this, the adopted research strategy founded

on the integration between several sources of information, survey techniques and archaeological excavations is providing positive confirmation of its validity for this territory, considering the problems associated to the excavation and conservation of the archaeological record in these soils, where the remains are often underwater and their exploration involves higher costs and times of work.

(A. A.)

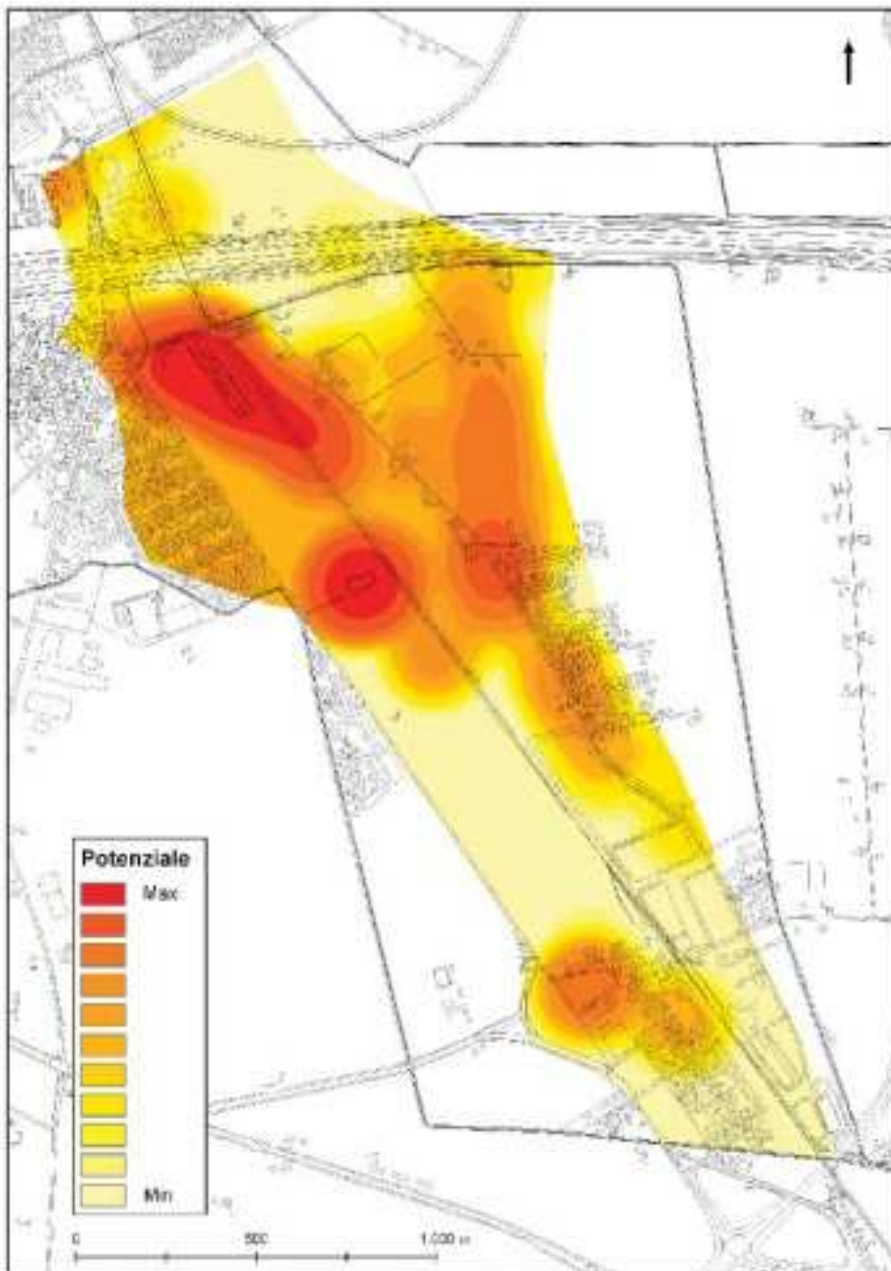


Fig. 15 - Evaluation Archaeological Deposits Map of the territory of Classe (AUGENTI 2011).

References

- AUGENTI A. 2011 (ed). Classe. Indagini sul potenziale archeologico di una città scomparsa. Ante Quem, Bologna.
- AUGENTI A., BOSCHI F., CIRELLI E. 2010. Il sito della basilica Petriana a Classe: dalla diagnostica archeologica allo scavo. Ocnus. Quaderni della Scuola di Specializzazione di Bologna, 18: 103-116.
- BECKER H., BOSCHI F., CAMPANA S.. 2009. Nuove ricerche nel sito della basilica Petriana a Classe (RA) con magnetometria Overhauser e magnetometria al cesio. Indagini 2007-2008. In E. Giorgi (ed). Groma 2. In profondità senza scavare. Metodologie di indagine non invasiva e diagnostica per l'archeologia. Bradypus Press, Bologna: 390-396.
- BOSCHI F. 2012a. Tracce di una città sepolta. Aerofotografia e geofisica per l'archeologia di Classe e del suo territorio. Ante Quem, Bologna.
- BOSCHI F. 2012b. Magnetic prospecting for the archaeology of Classe (Ravenna), in «Archaeological Prospection», 19, 2012, pp. 219-227. Article first published online: 8 AUG 2012 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/arp.1430
- CAMPANA S., PIRO S. 2009 (eds), Seeing the unseen. Geophysics and Landscape Archaeology, Proceeding of the XVth International Summer School, London.
- HAY S., KEAY S., MILLET M., STRUTT K. 2006, Roman urban landscapes in Italy: an integrated approach. In S. Campana, M. Forte. 2006 (eds.). From Space to Place: 2nd International Conference on Remote Sensing in Archaeology, Proceedings of the 2nd International Workshop, CNR, Rome, Italy, 2006, Oxford, pp. 149-156.
- SCHMIEDT G. 1962. Contributo della fotografia aerea alla ricostruzione della situazione geografico-topografica di Ravenna nell'antichità. In AA.VV., Atti del Convegno per lo studio della zona archeologica di Classe a mezzo dell'aerofotografia (Ravenna 1961), Faenza, pp. 45-82.
- SCHMIEDT G. 1968. Considerazioni sui rilevamenti aerofotografici utilizzati durante il convegno del 1961 per la ricostruzione del ravennate nell'antichità, in AA.VV., Atti del Convegno Internazionale di Studi sulle Antichità di Classe (Ravenna 14-17 ottobre 1967), Faenza, pp. 171-184.
- VERMEULEN F., BURGERS G.-J., KEAY S., CORSI C. 2012 (eds.). Urban Landscape Survey in Italy and the Mediterranean. OXFORD: Oxbow Books, ISBN/ISSN: 978-1-84217-486-9.

Imprint:

Proceedings of the 17th International Conference on Cultural Heritage and New Technologies 2012 (CHNT 17, 2012)

Vienna 2013

<http://www.chnt.at/proceedings-chnt-17/>

ISBN 978-3-200-03281-1

Editor/Publisher: Museen der Stadt Wien – Stadtarchäologie

Editorial Team: Wolfgang Börner, Susanne Uhlirz

The editor's office is not responsible for the linguistic correctness of the manuscripts.

Authors are responsible for the contents and copyrights of the illustrations/photographs.