

UNDERWATER AND COASTAL CULTURAL HERITAGE

This session examines issues related to the tangible and intangible cultural heritage of coastal areas and waterbeds. It covers a wide range of archaeological, historical, geographical, landscape topics, including the landscapes and their evolutionary dynamics, the settlements and settlement patterns, navigation in its various aspects, the transmission of goods, cultures and ideas, the structures of ports and landings, historic buildings and museum heritage, enhancement and protection, fishing traditions and fish processing activities, etc.

The papers published in this volume have been accepted by the Scientific committee of the Livorno 2024 Symposium for oral presentations or posters at the conference itself. They examine numerous Central Mediterranean coastal areas and one Sea of Marmara district, apply different highly topical approaches and cover a vast chronological range from prehistory to the present day. The authors work in institutions aimed at research, protection and enhancement of heritage.

The topics include archaeology, landscape and underwater archaeology, archaeological diagnostics and related documentation, architectural heritage, landscape protection, territorial planning, anthropological/identity studies, historical themes and local traditions, conservation and enhancement.

A few papers examine coastal stretches and the related sea beds (Aveta; Repola *et Al.*; Karadoller *et Al.*), conservation of ancient (Zicarello *et Al.*) and medieval/modern age buildings (Rescic *et Al.*), aspects of navigation (Benincasa *et Al.*). Other essays examine submerged and semi-submerged archaeological contexts in lagoon waters (Costa-Lucarini), specific coastal features, their recovery and enhancement (Comino-Lanza; D'Ecclesiis-Pellettieri). One paper applies the landscape archaeology methodology to the relationship between man and the environment in a territory rich in waters (Jaia-Ebanista).

Each of these contributions deserves attention from researchers and local authorities with various expertise. I point out a few details of the contributions, just to stimulate researchers and interested parties to read them in full.

In her paper *Coastal archaeological evidence in the Bay of Naples: vulnerability and directions for conservation and enhancement*, C. Aveta examines the areas bordering the gulfs of Naples and Pozzuoli, the islands of Procida, Ischia and Capri and their seabeds. This peculiar district is characterized by an exceptional wealth of archaeological evidence and by specific fragility and vulnerability. In fact, the area is exposed to damages caused by human activities and natural events, including the seismic activity and bradyseism that characterize the district.

According to the Author, the archaeological record should be considered as a document of the past and, above all, as a segment of local history to be reconnected in the territorial context, in the frame of active and integrated conservation and valorisation actions. Initiatives as the establishment of the Submerged Parks of

Baia and Gaiola are meritorious for the recognition of identity and historical-documentary values, but remain fragmentary. It is urgent to identify and implement a new policy aimed at creating a real network at national, regional and local level, which can achieve the protection, restoration, enhancement of the heritage and a full enjoyment by local communities, national and international visitors

In their paper *Archaeological markers below the lagoon waters*, E. Costa and C. Lucarini underline the peculiar characteristics of investigations in lagoon contexts. Surveying and studying submerged and semi-submerged archaeological contexts in lagoon waters can testify the impact of anthropogenic changes on the landscapes and allow the identification of significant archaeological markers relating to ongoing environmental changes. In particular, the lagoon of Venice is a very at-risk ecosystem, which needs to be monitored and protected from ecological, environmental and archaeological points of view. The applied methodology includes both traditional and digital up-to-date technologies (multibeam, topographic survey, photogrammetry, DEM, etc.) which provide a complete and comprehensive picture of the underwater sites, with significant advantages for interpreting, studying and monitoring the state of conservation/ degradation of the archaeological sites. The authors focus on a few relevant case studies in the Venice Lagoon and significant markers, e.g. the Relative Sea Level and construction techniques in Roman times.

L. Repola, V. Morra, J. Leidwanger, E. Greene and F. Sgroi present the paper *Coastal cultural landscapes: analysis and visualization of data*. Examining traditional tuna fishing in South-Eastern Sicily, they note that many of the related anthropogenic traces are still legible on the seabed, in close connection with the processing facilities on land. Therefore, they apply a new and strongly interdisciplinary approach to the study of the evidence related to the traditional “mattanza”, supported by digital technologies for the production and management of information. The research methodology focuses on the analysis of spaces and on the phases and processes of use that have occurred over time. After an initial data acquisition steps consisting of three-dimensional digitization using laser scanners, LIDAR from UAS, terrestrial and underwater photogrammetry, the data are processed and segmented to support the subsequent geospatial analysis activities of the models both within modelling software and within a GIS platform.

An accurate representation of the coastal heritage, submerged elements and geomorphological characteristics of the area have been produced and studied, providing interaction matrices between the factors that make up the cultural context characteristic of this area of Sicily

The future lines of research include an expansion of underwater surveys for the production of an extended model of the seabed and the optimization of the information processing and analysis workflow.

In *The exploration of the coasts of Perinthos: what does the multibeam bathymetry survey tell us*, B. Karadoller, C. Imren and Z. K. Erdem present their research in *Perinthos* (Marmaraeğlisi/Tekirdag/Turkey).

This ancient city is one of the most ancient and significant Thracian harbour settlements. In 46 AD the emperor Claudius made it the capital of the Thracian province. Thanks to its well-sheltered harbor, *Perinthos* was a base of the Roman

fleet entrusted with the security of the *Propontis* (Marmara Sea). The functions and role of the city changed as Istanbul's importance grew.

From a historical-archaeological point of view, the district is a laboratory of great interest. A recent systematic multidisciplinary archaeological project initiated by the Ministry of Culture and Tourism involved both the ancient settlement and the adjacent seabed, applying marine and land-based multidisciplinary studies in a comprehensive approach.

Ground penetrating radar and magnetic methods were applied in specific areas identified through surveys. The remains of several buildings were identified. The offshore multi-beam bathymetry covered more than 1000 hectares and provided data of great interest, including a shipwreck of peculiar dimensions and features probably referable to the Roman inner port.

L. Comino and S. G. Lanza present the paper *The quarries in the coastal municipalities of western Liguria: reflections on landscape protection with a view to their recovery*. The study concerns areas characterized by radical transformations, due to industrialisation and urbanisation linked to seaside tourism, the railway and related infrastructures. Mining activities, and in particular open-cast quarries, have contributed to the transformation of the landscape, due to their strong impact on the morphological structure of the territory. They have played a strategic economic role in the national economy, e.g. for construction and infrastructure construction, but are no longer economically relevant or sustainable from an environmental and landscape point of view and therefore must be 'healed'.

This work examines some case studies and deepens the formation, evolution and decommissioning of quarries, focusing on the role that landscape protection can have in governing and directing operational choices in situations that are particularly delicate from a landscape, environmental and economic point of view.

A. M. Jaia and L. Ebanista present the paper *The Latium coast from Ostia to Circeo: settlement dynamics in a peculiar context*.

They examine the ancient settlement dynamics in a coastal stretch about 100 kilometres long, characterized by low sand dunes and lagoons which in ancient times occupied about half of the entire coast strip. The research is aimed at discussing the fundamental relationship between man and the environment in a territory dominated by rivers, ditches, historic canalizations, lagoons. Here water is both an element to be contrasted, as demonstrated by the numerous reclamations works carried out over the centuries, and an attractive element for settlements.

Human presence is documented since the Lower Palaeolithic in various connections with watercourses and basins. In Protohistory and in the archaic period the coastal settlements rose and developed at the mouth of rivers, ditches or built canals.

The fundamental break in the settlement process in this area is represented by the Roman conquest in 338 BC. This event determined a series of dynamics that are outlined in this contribution in the light of the relationships of urban centres with Rome and among themselves.

In this territorial and historical-archaeological context, the analysis of the role and exploitation of watercourses and lake basins until recent times is also fundamental. They have had multiple functions in the field of communications, as waterways used with inland waterway navigation techniques, in the field of

reclamation, as collectors of stagnant water in subsequent hydraulic regimentation works, and have been used as basins for fish supply.

In the paper *Diagnostics and Conservation of coastal Archeological sites: the case study of the Roman Villa of Casignana, Reggio Calabria (Italy)* M. A. Zicarelli Barca, M F La Russa, A. Macchia, L. Randazzo, M. Ricca, S.A, Ruffolo examine the Roman coastal Villa of Casignana, dated back to the 4th cent. AD and known for its valuable mosaics. The structures of the Villa are partly submerged. In addition, the archaeological area is crossed by SS 106 Jonica and by the railway.

For centuries the site has been exposed to the risk of natural and human damage, ranging from erosion and rising sea levels to modern urbanization. Preserving the site involves a multi-disciplinary approach that includes archaeological, environmental, engineering expertise and the involvement of the local community.

For some years now, the University of Calabria, through the Restoration course and the Heritage Science Research Group, has been engaged in strategies related to the conservation and enhancement of the site.

The mosaics suffer several degradation forms such as salt crystallization, deformation, deposits and lacks. The single *tesserae* are investigated in order to gain information about the composition and the provenance of the stone materials used by the Roman artisans.

Within the framework of the national PNRR "Tech4You" project, the Villa has been chosen as a pilot site for the identification of innovative technologies aimed at the conservation of cultural heritage, in the frame of the climate change and the transformations of shorelines.

Experiments are underway to define the use of innovative and environmentally sustainable products for the mitigation of the biodeterioration, based on essential oils and agricultural by-products.

These strategies will be tested on site after the necessary laboratory tests. As the involvement of the local community is crucial for the sustainable conservation and lasting success, outreach initiatives, educational activities and guided tours will be organised.

In *When geology becomes cultural wealth: Praia a Mare, town of caves* G. D'Ecclesiis and A. Pellettieri present a specific case study.

The territory of Praia a Mare (Cosenza, Italy) is characterized by the presence of many caves both on the coast of the mainland and the adjacent island of Dino. These caves have been frequented by man since the Paleolithic era. The largest one provides geological evidence of sea level changes and human activities, in particular prehistoric depictions on the walls. At present the cave houses the Sanctuary Madonna della Grotta, patron saint and protector of Praia.

Since the early Middle Ages other caves were occupied by Greek monks, who established monasteries and places of worship. According to tradition, the local hero Vitigno defended the city from an assault by the Turks in 1639 and died in a cave on the Dino Island.

Since many caves in the Praia district are connected with the most ancient history and/or with the most deep-rooted local traditions, a census and when necessary a recovery from vegetation and debris as well as a careful protection from the sea were carried out. These interventions were aimed at including the caves in a tourist itinerary accompanied by information panels.

In *The building materials of the Lorenese forts of the Tuscan coast*, S. Rescic, F. Fratini, M. Mattone examine the natural and artificial (bricks and mortars) stone materials used in the construction of the fortifications realized by the Grand Duke of Tuscany Pietro Leopoldo between 1786 and 1793 along the Tuscan coast.

The studied buildings are part of the complex coastal fortification system of Tuscany, that overall includes 160 fortified centres, individual fortresses (or redoubts and batteries), watchtowers and accommodation for soldiers and cavalry guards. They have been constructed in the time span from the Middle Ages to the 19th century and remained largely intact until the unification of Italy.

The research aims to identify the relationships between the building materials and the resources (stone, clay and limestone for the production of lime) in the territory, or to ascertain a standardized use of materials coming from a single production center.

In addition, the state of conservation of the structures and the decay phenomena are studied, in order to identify the role of environmental factors in relation to the characteristics of the building materials.

The applied methodology includes the classic mineral-petrographic techniques.

F. Benincasa, M. De Vincenzi and G. Fasano, all with a technical-scientific background, explore multidisciplinary, mainly historical themes and propose themes on ancient navigation to researchers in various disciplinary fields. In *Ancient navigation and Mediterranean coastal meteorology*, they consider several aspects of ancient navigation in the Mediterranean Sea. They examine problems associated with coastal or offshore routes, the experience of sailors, the winds and currents and underline the fact that sailors relied largely on personal experience. As documented by ancient written Greek and Latin sources, ancient sailors tried to pick up on warning signs from the sky, the flight of birds and the behaviour of certain aquatic animals, in order to predict weather changes.

In *The historic lighthouses of the Italian Coasts*, the same authors deal with a topic closely related to navigation: the function and history of lighthouses. They examine the origin of the name *pharos*, the techniques and instruments used to assist navigation in the dark, the fuels used to produce lighting, the architectural characteristics of the buildings, etc., and draw attention to several historic lighthouses in Italy, outlining the historical-geographical-geomorphological contexts in which they were built.

Once again, my invitation is to read carefully all these works, which have ensured the success of the session.

I would like to express my warmest thanks to all the authors for their participation in the conference and their commitment to present the results of their research to the scientific community.

For their continued advice and active participation in the organization of the scientific work I am especially grateful to Michel Gras, co-chair of the session (former Director of the École française de Rome, Emeritus CNRS, Foreign Fellow of Accademia dei Lincei), to Peter A.J. Attema (University of Groningen), Giovanna Bianchi (University of Siena), Giulio Ciampoltrini (former official Soprintendenza Archeologica per la Toscana, Firenze), Elif Koparal (Mimar Sinan Fine Arts University, Istanbul), Tessa Matteini (University of Florence), all of them members of the Scientific Committee.

Finally, I extend my best thanks for the event and for the publication of these Proceedings to the President of the Conference Marcantonio Catelani (University of Florence) and to all the organizers, in particular to Fabrizio Benincasa, Laura Bonora, Matteo De Vincenzi, Giorgio Matteucci (CNR-IBE, Florence): without their invaluable and patient work the realization of the Symposium would have been impossible.

Marinella Pasquinucci
University of Pisa
email pasquinuccimarinella@gmail.com