Organizers

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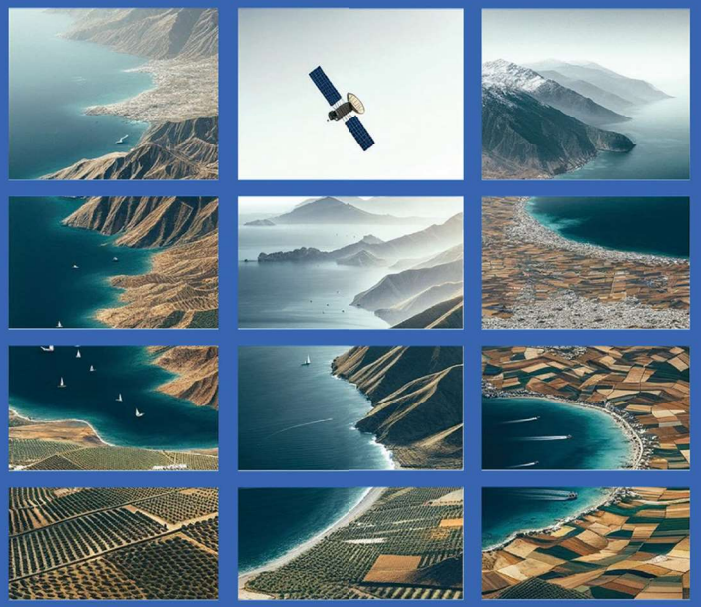
Organization and Support

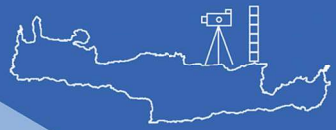
ANNA BOTINI, FRYNI GREVENIOTI, PANAGIOTIS KEFIS

Abstracts

GIS in Crete

Archaeological Questions and Computational Answers





30-31 May 2024
Athens 9.30 am

Auditorium "Leonidas Zervas"
National Hellenic Research Foundation
48 Vassileos Constantinou Avenue

Online attendance:

https://rb.gy/6pgs4n

Organizers

INSTITUTE OF HISTORICAL RESEARCH
NATIONAL HELLENIC RESEARCH FOUNDATION

GHENT UNIVERSITY
FACULTY OF ARTS AND PHILOSOPHY

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SESSION 1: GIS APPLICATIONS IN ARCHAEOLOGICAL AND HISTORICAL PRACTICES

Managing complexity in long term excavations: the GIS of Phaistos

Francesca Buscemi, Marianna Figuera

The construction of a GIS presents peculiar needs and challenges in those cases, as Phaistos, with a long history of investigations going back to 1900.
The huge amount and the importance of the legacy data, not digital native and not spatial-based, raises the problem of the relationship with the new registration methods in archaeology. Within this kind of frame, the GIS unfolds its potential in several directions and goes beyond the role of information container.
The construction of the GIS of Phaistos archaeological area was planned in 2015 by the University of Catania and the National Research Council, based on the first aerial photogrammetry of the site (University of Salerno) and on a new GPS points network. The inhomogeneous documentation of the area produced in 120 years of researches was collected and georeferenced on a spatial base. Contemporary, data from new excavations were added (orthomosaics, GPS positioning of trenches and finds, DEM etc.).
These more recent data can be used and processed in GIS environment in order to create new knowledge: at Phaistos, contour lines were created starting from elevation points generated by Pix4D in a recent aerial photogrammetry of the Palace. This topographical base is useful for the scientific research on the several hill collapses which in antiquity affected the structure of the settlement. Furthermore, the use of an open-source GIS software (QGIS) allows to enjoy the add-ons developed by the public community. We started this year a trial use of the plug-in PyArchInit in order to join both the stratigraphical and the pottery cards to the GIS and to transform these data in linked ones, findable and interoperable: gradually the GIS of Phaistos will become such an access point to an information system of the site.

GIS-DIARIES of Gortyn: an ongoing GIS project to recording, protecting and researching the archaeological site of the ancient capital city of Crete

Jacopo Bonetto, Alessandro Jaia, Roberto Perna, Enrico Zanini, Simone Amici, Edoardo Brombin, Jacopo Scoz

After almost 150 years of archaeological research, mostly conducted by Italian scholars, Gortyn in Crete has now emerged as one of the ancient, late antique, and early byzantine cities more comprehensively explored across the Mediterranean.
Nonetheless, detailed insights into the environmental context and urban fabric of the ancient city are still lacking: the wealth of information from prior research is scattered throughout an extensive and often challenging-to-access body of literature, while a substantial volume of data remains concealed within unpublished archives.
To tackle this challenge, within the overall research program coordinated by the Italian Archaeological School in Athens, a project for the construction of an archaeological Web-GIS was started in 2019, and it is currently in the implementation phase, funded by Italian Ministry of Research. The building process started with a feasibility study conducted by a group of doctoral students from the universities of Padua, Rome, and Siena, and resulted in:
- a new DTM of the site and its surrounding territory, using remote measurements as topographic high-precision instruments (TPS/GNSS, drone aerial photogrammetry with GNSS correction and Laser Scanner acquisitions);
- a GIS platform collecting a substantial part of the already published research and some sample coming from ongoing research.
In the next phase of the project will develop in three directions:
- Creating a standardization protocol to facilitate the efficient incorporation of additional data emerging from ongoing research, including contributions from other stakeholders.
- Looking for a seamlessly integration with 3D reconstruction systems for previously documented monumental complexes, while also considering the adoption of Building Information Modeling (BIM) systems for streamlined information management.
- Experimenting embedding within an open communication platform, utilizing dedicated MediaWiki software, designed to provide published information through an Open Access framework.

Legacy of the labyrinth: re-mapping the palace of Minos using the Sir Arthur Evans archive

John Pouncett, Karl Smith, Andrew Shapland

Building on a tradition of mapping that extends back to the late nineteenth and early twentieth centuries, this paper presents a 3D map of the Palace of Minos that is both grounded in and acts as a point of entry to the Sir Arthur Evans Archive at the Ashmolean Museum. The 3D map is based on a detailed 2D plan produced by the Ephorate of Antiquities of Heraklion which was modified using architectural plans, photographs and notebooks from the archive to create a representation of the palace at the time of Evan's excavations. Extensive consolidation and reconstruction work has been carried out both by Evans alongside excavation and as part of the ongoing conservation and management of the site. While later additions have been removed wherever possible by consulting the original excavation records, it is difficult in places to differentiate between in situ and modern fabric and this is very much an ongoing process. The map is enriched with attributes linking drawings, photographs and notebook entries from the archive to the architectural elements, buildings, rooms or external spaces to which they relate allowing the contents of the archive to explored in context. It was featured in the Labyrinth: Knossos, Myth & Reality exhibition at the Ashmolean Museum both physically as a 3D print and digitally in the form of an interactive web app. Development of the 3D map and web apps is continuing with a view to opening up access to the Sir Arthur Evans Archive to a wider audience.

Digitising the “Aqueducts of the Greater Iraklio Area” AGIA

Amanda Kelly

As part of my doctoral studies in the 2000s, I walked, and documented, the Roman aqueduct of Knossos using a Canon AE-1 camera (vintage), a photocopy of Hood and Smyth’s “Knossos Survey” and some handwritten notes taken from Gerola. In 2019, I launched my aqueduct study “Aqueducts in the Greater Iraklio Area”, or AGIA, and rewalked the Roman aqueduct using a handheld Trimble GPS station, my old photographs and a series of 1:5000 Hellenic Military Geographical Service Maps. Not only was I able to map the almost complete route of the Roman aqueduct, but I identified the architectural overlay of the 19th-century aqueduct commissioned by Mehmet Ali on top of the Roman aqueduct channel. In 2021 and 2022, I followed the Venetian aqueduct supplying Candia which joined the Roman aqueduct route to the west of Spilia. In summer 2023, I convinced Evan O’Keeffe (of Proveye in Dublin) to come to Crete to conduct a drone survey of all the aqueduct bridges using a DJI Mavic 3 classic drone with a Parazero Mavic 3 flight termination system for safety. Back in Ireland, Evan created 3D models using the Agisoft Metashape Standard Edition, he ran the data through openMVG with MVE for more detailed models. I study the models using the Potree viewer, we now have a website domain which we Will launch to audiences in due course. In my talk I will present a series of our models, the website as a work in progress, and perhaps flag a few of the challenges we faced in the field (from birds of prey to trees in full leaf).

Dealing with overlapping layers of the past: GIS and the entangled history of archaeology and World War II in Crete

Valentin Schneider

The island of Crete was occupied by German and Italian military units between 1941 and 1944 (for some parts of Western Crete until 1945). Due to the ideological character of the Second World War and the need of the Axis authorities to create or renew historical narratives, archaeology constituted an important component of occupation politics in Crete.
This paper will present the techniques used to map in detail the German occupation of Crete on a day-by-day basis for the purpose of the research project “German Occupation Database”, focusing in particular on the complex process implemented in order to create a digital basemap of the island with regard to its administrative structure (municipalities, communities, provinces, prefectures) in force at the beginning of the Second World War, using the 1940 population census of the Greek state. The cartography of the Axis occupation of Crete will ultimately allow to fathom the points of contact between the occupation forces and the major archaeological sites over time and in quantitative terms (how many soldiers were theoretically in position to visit these sites?), as well as shed a new light on qualitative sources such as archaeological information leaflets for the simple soldier or references to archaeology in private sources, such as photographs, letters and diaries.
Finally, the “German Occupation Database” will enable archaeologists nowadays to improve their interpretation of complex sites that present overlaying material remains from the times of the Second World War, such as contemporary fortifications or burial sites, for example.

SESSION 2: MULTISCALAR APPLICATIONS OF GIS IN ARCHAEOLOGICAL AND HISTORICAL STUDIES

Reassessing the organization and social structure of the Prepalatial settlement at Myrtos Fournou Korifi through GIS

Ermioni Vereketi, Eleftheria Paliou, Yiannis Papadatos

Due to the large amount of material that was found intact and in situ in the destruction layers of the settlement, the Prepalatial village of Myrtos Fournou Korifi has always played a central role in the discussion about the social structure of Prepalatial communities. Initial interpretations conceive the site as a single building complex, others are in favor of a small community divided into a few self-sufficient, independent households, while others lie in the middle by accepting the organization of the settlement into small households, while suggesting that some practices had a more collective character.

Due to the amount of finds (over 700 clay vases, 100 stone tools, 120 loomweights, and 40 other artefacts) the use of Geographical Information Systems not only offers a new method to manage the material, but also allows new ways to visualize and comprehend the intricate organization of spaces of the settlement. GIS mapping and point pattern analysis performed with the R statistical package are used to explore artifact concentrations across the site and to examine relationships between various artifact categories, providing a contextual framework for the site's material culture.

The preliminary results may, indeed, suggest the organization of some areas as households, but they also show discrete artifact clusters within the settlement, which point to functional or activity zones that challenge the identification of some clusters of rooms as small self-sufficient households. Furthermore, intriguing trends in the distribution of artifact categories, point to specialized activity inside specific areas of the settlement. Thus, the data-driven insights point to a more complex and diversified social organization than previous interpretations had suggested.

This study contributes to a deeper comprehension of organization and complexity in the middle of the Prepalatial period in addition to offering a new viewpoint on the site's archaeological record and may offer a case study for similar analysis of other Prepalatial settlements in the future.

GIS methods in the analysis of intra-site architectural remains of Neopalatial Crete

Jonas Rapakko

My presentation concerns my current research focusing on spatial analyses carried out in a GIS to assess questions of the social use of space in Minoan Crete. My study has recently utilized GIS methods that have previously been used widely in landscape analysis in intra-site contexts: cost surface analysis and viewshed analysis. I have applied cost surface methods previously suggested by Piraye Haciguzeller with the Palace of Malia, to all known Minoan Palace sites (Knossos, Phaistos, Malia, Zakros and Galatas) of the Neopalatial period (ca. 1750-1490 BCE), and modified her methodology to include new parameters (stairs with a higher value than level floors), to get a more realistic output, as well as applying a comparative scheme of all Palace sites. My current research has also utilised viewshed analysis in GIS to intra-site Palace sites, essentially producing isovists that highlight local visibility from specific observer points (Minoan visibility studies of architectural sites have been previously dominated by Space Syntax methods, with possible pros and cons in both approaches). My study has also assessed the ingenious Minoan device – the pier-and-door partition – and how accessibility and visibility are manipulated by different opening/closing options of the architectural structure. My research has combined GIS methods of intra-site architectural sites to social approaches to space, as the methods used allow us to gain deeper insights into the social meanings behind the accessibility and visibility patterns thus revealed in the ancient built environment.

Placing the Polis: GIS Investigations into the Settlement and Landscape Context of Ancient Lyktos

Christina Stefanou, Dominic Pollard

The city of Lyktos was one of the most powerful poleis of Archaic-Classical Crete, with occupation at the site ranging from the Bronze Age to the Byzantine period. Under the Lyktos Archaeological Project, new excavations at the site are uncovering evidence of the settlement and its associated cemeteries. As a complement to these on-site investigations, GIS tools and digital datasets are being used to characterise and further investigate the wider landscape context of Lyktos, preliminary results of which will be presented in this paper. Firstly, we will outline the historical background of the site, introduce the GIS tools employed by the Lyktos Archaeological Project, and consider the location, scale, and the spatial relationships of the settlement and cemetery areas. Secondly, drawing on results from the Pediada and Galatas archaeological surveys, we will situate Lyktos within its long-term settlement history. We will consider patterns of diachronic occupation in the broader region of the ancient city from the Bronze Age to the Roman period. Finally, with topographic and environmental datasets, we will examine the opportunities and constraints offered by Lyktos' hinterland, including issues of visibility, mobility, and agricultural potential, and their implications for understanding the development, extent and integration of the Lyktian polity. Through this work, we will demonstrate the complementary roles that GIS can play alongside excavation, both as a means of on-site documentation, and as a tool for wider exploration and problem-oriented research.

Point Process Modelling: applications, challenges and limitations of exploring human-landscape relations in Eastern Crete

Andriana-Maria Xenaki

In recent years Cretan archaeology has witnessed an upsurge in the use of GIS and computational methods. Even though it has become apparent that these new methods and approaches allow us to look at landscapes through a different and more formalised lens, it is also clear that with great power comes great responsibility. Significant problems have arisen with the use of such methods without answering a specific research question or in attempts to infer single and unequivocal truths about past human-landscape relations corroborated through the use of statistical approaches.

Taking these challenges into consideration, and out of the multitude of methods that have emerged in recent years, the current study uses Point Process Models (PPM) to examine the relationship between archaeological sites and environmental variables while simultaneously taking into account social variables. It explores the settlement pattern within eastern Crete's most dominant landscape features – its rugged terrain and iconic mountains – through several case studies. Legacy survey data from the Final Neolithic up until the Early Iron Age, as well as data coming from excavations on the area, are used to examine the relationship between ancient societies and their surrounding landscape.

The questions of interest include the following: how have locational preferences in the mountain regions in eastern Crete changed over time? Can site location preferences be explained by environmental and/ or social factors or are there key latent variables? How do the results of the statistical analysis fit within/challenge past preconceptions about mountainous areas?

Mapping landownership on Venetian Crete: three case studies (13th-16th c.)

Charalambos Gasparis, Marina Koumanoudi, Aggeliki Panopoulou, Charalambos Papoutsakis

This paper employs Geographic Information System (GIS) and geospatial analyses to scrutinize the intricate landscape of landownership in Venetian Crete during the late medieval and early modern periods. By focusing on three distinctive case studies spanning from the 13th to the 16th century, the study seeks to evaluate the efficacy of GIS techniques as research methodologies for comprehensively mapping the evolution of landownership in Venetian Crete, shedding light on potential methodological challenges stemming from the available source material. The first case draws on the medieval land registers of Venetian Crete (early 13th - early 15th century) to meticulously map properties in the villages of Kounavi and Kato Archanes in the year 1306. Serving as a pilot study, this case not only illustrates the capacity of GIS in mapping entire villages and their assets but also endeavors to trace changes in the property landscape over two centuries. The second case delves into the landholdings of the female Catholic convent of St Catherine of Candia. Utilizing dispersed and fragmentary archival sources, such as notarial and judicial documents from the 14th to 16th centuries, this research aims to map the geographical distribution and types of the convent's properties. The objective is to discern the feasibility of tracing the evolution of the convent's estates and land exploitation over time. The third case examines the geographic location of property owned by the Venetian monastery of Saint Thomaso of Borgognoni in Crete during the 16th century, drawing on information provided in the register of the notary Giovanni Semergos. The primary objective is to map the villages where the monastery's property was situated and categorize its types. This investigation contributes significantly to a broader understanding of the economic and spatial dynamics surrounding religious institutions in Venetian Crete during the specified timeframe.

Each case study serves to explore a specific facet of landownership dynamics in Venetian Crete, drawing on diverse archival material from different periods. Through these cases, this paper aims to make a substantial contribution to the scholarly understanding of the role of GIS techniques as methodological tools in mapping the dynamic evolution of landownership, thereby enriching our comprehensive understanding of the socio-economic history of the region.

SESSION 3: GIS AND PAST ENVIRONMENT

GIS and economy in the vicinity of Minoan Crete: the case of Kasos

Giorgos Mastropavlos

The island of Kasos, situated as the nearest landmass east of Crete, serves as a stepping stone in the natural insular chain that connects Crete with southwest Anatolia. Archaeological investigations in the southwest tip of the island, around Chelatros bay, have revealed a dense and dispersed pattern of habitation during the first half of the second millennium BC. These sites exhibit a pronounced influence of Minoan cultural traits, indicative of a significant connections between the two islands. The current presentation aims to evaluate the efficacy of Geographical Information Systems (GIS) computational tools in the documentation, organization, and analysis of archaeological data derived from the Minoanised sites of Kasos. The value of GIS mapping techniques is underscored in the documentation of archaeological artifacts during the fieldwork expedition undertaken in Chelatros bay during the 2023 season, with a specific focus on identifying archaeological sites and determining their geographical features (location, area, etc.). Advancing beyond initial field documentation, GIS geospatial analysis (LCPA, SCA, etc.) is employed to determine social and geographical boundaries, the distribution of available natural resources, and the different microecologies of each individual site. The results of these spatial analyses, in conjunction with analogies drawn from contemporary and recent economic activities around the Chelatros bay, contribute substantively to a more comprehensive understanding of occupation and economy modes within marginal environments surrounding Crete during the first half of the second millennium BC.

Implementing relative sea level change indicators and ancient coastlines of Crete into GIS: methodological issues and prospects

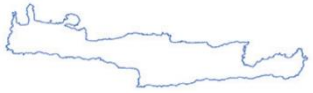
Eleni Kolaiti, Nikos Mourtzas

The submerged or uplifted ancient remains and geomorphological relative sea level (rsl) indicators identified and recorded throughout the coast of Crete robustly determine and date the former sea level stands, shedding light on the Late Holocene history of the rsl change in Crete and enabling the palaeogeographic shoreline reconstruction during the last 5.3 ka. GIS has been extensively used to study and analyse the spatial extent and impacts of sea level rise, as a result of rapid global warming in recent years, having been proved effective for simulating different hazard scenarios related to sea level rise and often to storm surge at regional and local levels. However, GIS has not been systematically used so far for analysing and interpreting data related to the rsl changes, which have definitely shaped Crete's coastal landscape along its historical route.
In this paper we attempt to introduce a theoretical basis for a methodological approach to implementing the multifaceted results of the rsl change research into GIS, explaining the motivation behind this application and examining the challenges, limitations, and prospects of this endeavour. Through a case study of a coastal landscape from the southern coast of Crete, which provides multiple sources of sea level data, we are focusing on the potential pros and cons of integrating GIS into the geoarchaeological study of coasts and the understanding of coastlines as dynamic natural and cultural systems.

Constructing the Cretan landscape: exploring parameters and expectations of ancient terracing on Bronze Age and Iron Age Crete using GIS

Dominic Pollard, Todd Whitelaw

The role of agricultural terracing in the subsistence systems of prehistoric and early historic Crete remains poorly understood, despite its significant transformation of Aegean landscapes. While ancient terraces have been identified in limited areas on Crete, little research has addressed where they were constructed, the potential organisational requirements for construction and management, and variations in their deployment in time and space, questions on which ancient historical sources are silent. These questions are significant, given the agrarian foundations of the Bronze Age and later Iron Age societies on Crete, and the significant constraints imposed by topography, hydrology, erodibility and suitable soils on cultivable land. While understanding ancient terracing systems on Crete will require extensive excavation and detailed survey, we employ GIS for exploring fundamental parameters and developing expectations regarding the use of terraces in antiquity. We review archaeological and anthropological studies of terracing in agrarian societies, recent work in Mediterranean geomorphology, agricultural development and heritage preservation, and the evidence for ancient and recent terracing in the Aegean. Building on work examining the relationships between demography, agricultural catchments, settlement location and territorial dynamics on Crete, we explore the potential role of terracing in supporting populations and ameliorating competition over land through modelling different food production and consumption scenarios, and the costs and benefits of terrace infrastructure. We apply these models to the topographic contexts and dynamic development of Cretan Bronze Age and Iron Age settlements, to assess the suitability of their hinterlands to support their reconstructed populations with varying investment in terraces.



SESSION 4: GIS AND ANCIENT ROAD SYSTEMS

The Minoan Central Asterousia as a case of DEM-aided study of network connectivity

Nasser Bovoleti Ayash

The implementation of GIS techniques provided an innovative means to shed light on a hitherto less explored region, namely the central Asterousia. Least cost path and network connectivity analyses were subsequently evaluated by physically walking the paths proposed by the GIS, noting their usability as a tool as well as their limitations. The paths produced and walked prove the existence of a certain network that illustrates the strategic roles of sites near the Messara - like Apesokari and Koumasa - in the Middle and Late Minoan period.

Furthermore, the results of studying the waterflow accumulation for the area were presented. These were extracted utilizing GIS tools on a DEM via the toolset of hydrological analysis. The seasonality of streams was shown to be of importance based on their vicinity of Early Minoan tholoi. Furthering this systematic approach can contribute to our understanding of the distribution of tholoi in the Messara in a holistic manner.

The steps were performed using tools in QGIS and ArcGIS, allowing for a discussion of usability and accessibility. This work thus demonstrates a case study that showcases the potential of GIS methods in archaeology, including an inquiry into their reliability, and proposing a methodology for defining their shortcomings and applicability, which can help gain acceptance in the archaeological community.

Modeling ancient pathways of Cretan landscapes: building networks and social landscapes

David Laguna-Palma

Mapping human-environment interactions involve understanding complex systems based on material and non-material continuous flows. These interactions are linked to the ecological context and encompass both physical and social dynamics. The present work explores such interactions within ancient Crete in a long-term and multiscalar perspective, with a specific focus on the entanglements that contributed to the formation of patterned landscapes. This research is part of the PERAIA project, which combines Landscape Archaeology with principles from Human Ecodynamics and Human Ecology. From a methodological standpoint, the project leverages the possibilities of digital research methods, such as site mapping and spatial analysis, to shed light on emerging spatial patterns and historical mobility arising from the interconnectedness of specific variables within the Cretan landscapes. The results offer new insights that enhance our understanding of the spatial network configuration of complex social landscapes within this region, which holds strategic historical connections in a broader Eastern Mediterranean context.

Travel times to the sanctuary of Syme Viannou: rules of thumb, formulas and slope-dependent functions vs historical documentation

Vyron Antoniadis

The sanctuary of Hermes and Aphrodite at Syme Viannou in Crete was a major religious center through most of antiquity. Pottery studies and epigraphic evidence establish that this mountainous site attracted visitors from different parts of central and east Crete. The paper uses modern historical documentation for travels before the advent of mechanized transport in Crete and Least Cost Path Analysis (LCPA) to shed light on the routes, the length and duration of travels to Syme Viannou in antiquity. It also explores the methodological and technical considerations which pertain to selecting slope-dependent functions for LCPAs to calculate speed and travel time. We also problematize the reliance of both rules of thumb and formulas used for LCP computations, and modern historical documentation on evidence for travels by male hikers and travelers active in the late 19th- and early 20th-century. Can this be considered as a dependable basis for estimating the speed and travel time of the diverse groups of ancient visitors to Syme Viannou? The inquiry takes into account the evidence from computational models used in other Mediterranean case studies for the purpose of assessing the effectiveness of different models for the study of the Cretan landscape.

Passing by the dead in Crete: spatial organization and accessibility of funerary areas in the Hellenistic and Roman city-states

Manos Rapanakis, Quentin Drillat

A funerary law from Gortyn (c. 500-525 BC) stipulated that a corpse may be carried over private property only if there is no public road. The same idea is still considered both in Hellenistic and Roman times, where public roads were used for the ekphora to avoid civil disputes. The area around city gates was the perfect place to display wealth, power and prestige to those passing by, while at the same time, the polis advertised its splendor through its dead. This paper aims to study the spatial organization of funerary areas in the landscape of Hellenistic and Roman city-states. Hence, it focuses on the spatial relationship between funerary areas, roads, and cities on both a broader island-wide scale and localized case studies encompassing inland cities and their harbors. To study the spatial relationship between roads and funerary areas, a road network is modeled with cost-based methods in a Geographic Information System (GIS) environment. This approach aims to both evaluate the modeling methodology and gain a deeper understanding of the intricate connection between burials and roads. Additionally, burial types are also studied regarding their location in the landscape, to study how the tombs themselves and the associated practices were instrumental in the development of intercommunity relationships among the cities.

Iron Age land routes in Crete: a GIS-based approach

Judith Muñoz Sogas

Orientalia and Egyptianizing artefacts belonging to the Iron Age were found in central and mountainous areas of Crete. There is no doubt that they arrived at the island on board of merchant ships, and left them at ports like Kommos or Knossos, but the question on how they travelled to the most inaccessible areas of the island, such as the Idaean Cave, remains unanswered. Locals or merchants surely moved those artifacts from one site to another, both on foot and on beasts of burden, but ancient land routes remain unclear. An attempt to define them using different methods is made in this study. Least Cost Path analysis, together with Time Distance and Catchment analysis, conducted with GIS, will be compared to other traditional methods, including field walking. Technical problems that arise during the process are also approached. After assessing the material record and the island's orography, some routes are suggested to be taken as reference for Crete's first millennium's connectivity.

Tracing the threads of luxury. A GIS approach to gold and silver jewellery in Pre- and Protopalatial Crete

Davide-Giulio Aquini

The study of gold and silver jewellery is significant as it provides evidence of how Pre- and Protopalatial Crete (ca. 3100-1700 BCE) was integrated into networks for precious and exotic goods since the dawn of Minoan civilisation. The evidence in this field necessitates a tool different from a traditional catalogue for a more versatile analysis. Therefore, a database was built to represent the evidence corpus through an extensive literature review of excavation reports, articles, monographs, and catalogues. It has been further integrated into a Geographic Information System (GIS), in which each database artefact has been georeferenced to the structure of its discovery site, along with a set of information made consistent, including details about the object, such as description, typology, materials, manufacturing techniques, chronological range, bibliography, and the context of its discovery. This approach facilitated answering archaeological questions about the dynamics of jewellery circulation within Crete. The preliminary results and prospects of the study are presented, emphasising the effectiveness of a GIS-focused analysis, even with a primary reliance on legacy data. The research examined the distribution of classes and typologies of gold and silver jewellery over space and time, producing specific maps through the GIS. This analysis has enabled the identification of plausible entry points for raw materials and delineating routes involved in the circulation of precious metals and finished jewellery. Additionally, the investigation has encompassed the development of goldsmithing techniques and the differentiation of Minoan jewellery, outlining the distinct characteristics of local productions that identify potential regional styles.

A GIS for Cretan pottery in the Mediterranean. The project Crete in a connected Mediterranean (ca 900 - 480 BCE)

Athéna Tsingarida, Isabella Bossolino

Since the earliest studies of trade in the ancient Mediterranean, Crete has always been seen as a major player in the re-establishment of the main routes, especially between the Levant and North Africa and the Aegean. This intense trading activity is clearly visible in the archaeological record of sites such as Kommos or Knossos, but some ancient evidence (e.g., Hdt. 4.151) underlines the importance that port settlements such as Itanos must have had in Archaic times. However, archaeological analyses on these topics have so far focused mainly on sites in central Crete, failing to refute the scholarly idea of a monolithic Cretan identity, austere and inward-looking.

The project Crete in a connected Mediterranean (ca 900-480 BC) (FNRS 2023-2026) aims to investigate issues of mobility and exchange in the Mediterranean world by examining the role

of Crete in the construction of these exchanges from the beginning of the Iron Age to the end of the Archaic period, focusing on less studied areas of Crete, such as the eastern region. The project aims to clarify the role of this region in the construction of cultural and economic interactions on and off the island at the micro and macro levels; as well as to better define the role of coastal sites in the mobility processes of goods and people in the Mediterranean. Within the framework of this project, the construction of a freely accessible database plays a fundamental role, which will return the sites of Cretan pottery with their contextual data in the form of a GIS. In our contribution, we will explain the reasons for creating this new project and its objectives, highlighting the role of GIS and its potential for scientific research of this kind.

Exploring Byzantine and Venetian pottery in Crete: GIS applications and Insights

Anastasia G. Yangaki, Vyron Antoniadis, Georgios D. Chiotis

In recent decades, there has been a growing interest in the study of pottery unearthed in Byzantine areas, leading to the continuous collection of evidence from various parts of the Byzantine empire. Crete is one such region where a wealth of information has been gathered, spanning from the 4th to the 16th-17th centuries, encompassing both Byzantine and Venetian periods. The meticulous examination of ceramic materials remains a central focus in exploring trade relations.

Efforts to visualize the distribution of ceramics and analyze its patterns have involved mapping the evidence and applying network analysis to a corpus of materials. These efforts aim to enhance our comprehension of distribution patterns and potential trade connections. This paper builds upon prior research and material collected within the framework of a project by the National Hellenic Research Foundation’s Institute of Historical Research, conducted as part of the GSRI’s KRIPIS and ANAVATHMIS actions.

By reviewing existing evidence regarding the mapping of ceramic materials from the aforementioned periods in Crete, this paper explores the advantages, challenges, and limitations of using GIS (Geographic Information Systems) and geospatial analyses for a comprehensive study of pottery circulation over time and space. The goal is to emphasize GIS's potential contribution in highlighting sites’ interconnectivity and interdependence. This includes examining the diffusion and penetration of specific imported ceramic types into areas with diverse geographic and political characteristics.