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SACRED LANDSCAPES IN THE PELOPONNESE: ACHAIA AND
NORTHERN ARCADIA

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Summary

<i>INTRODUCTION</i>	5
METHODOLOGY.....	6
USE OF GIS AND SPATIAL ANALYSIS.....	7
ACKNOWLEDGEMENTS.....	12
CHAPTER I	15
APPROACHING (THE STUDY OF) SACRED LANDSCAPES IN ACHAIA AND NORTHERN ARCADIA ...	15
GENERAL GEOGRAPHICAL AND HISTORICAL CONTEXT	15
1.1 GEOGRAPHY OF THE REGION UNDER EXAMINATION	15
1.1.1 Climate	17
1.1.2 Orography	17
1.1.3 Hydrology.....	20
1.1.4 Earthquakes	26
1.2 HISTORICAL BACKGROUND: A BRIEF OVERVIEW	27
1.3 A HISTORY OF RESEARCH ON SACRED LANDSCAPES IN GREECE.....	35
1.3.1 Where to begin? A Brief History of Landscape archaeology and General studies on Sacred Landscapes.....	35
1.4 STUDIES ON GREEK SACRED LANDSCAPES	41
1.4.1 Exploring regional case studies on sacred landscapes within the Greek world	45
1.4.2 Toward an Integrated Methodology in the Study of Sacred Landscapes	48
1.5 APPROACHING ACHAIA AND NORTHERN ARCADIA: EXPLORING SANCTUARIES AND CULT PRACTICES IN THE PELOPONNESE	49
1.5.1 A History of Research on sanctuary and cults in Achaia and Arcadia.....	52
CHAPTER II.....	61
ACHAIAIAN CITIES: HISTORICAL AND TOPOGRAPHICAL ASPECTS	61
2.1 EASTERN ACHAIA.....	61
2.1.1 Pellene	61
2.1.2 Aigeira	66
2.1.3 Phelloe.....	75
2.1.4 Aigai	77
2.1.5 Boura	79
2.1.6 Keryneia	84
2.1.7 Helike	88

2.1.8 Aigion.....	92
2.1.9 Rhyes.....	101
2.1.10 Leontion	103
2.2 NORTHERN ARCADIA.....	106
2.2.1 Nonakris.....	106
2.2.2 Kynaitha.....	108
2.2.3 Lousoi.....	112
2.2.4 Kleitor	119
2.2.5 Psophis	124
2.2.6 Paos.....	128
2.3 WESTERN ACHAIA.....	130
2.3.1 Patras	130
2.3.2 Pharai.....	140
2.3.3 Olenos.....	144
2.3.4 Dyme	147
2.3.5 Tritaia	159
CHAPTER III.....	163
ACHAIAN AND ARCADIAN SACRED LANDSCAPES	163
3.1 SACRED SITES AND CULTS	165
3.1.1 Shrines and cults on the Acropoleis	165
3.1.2 Urban sanctuaries and cults	168
3.1.3 Cult sites near the coastal area and in ports.....	170
3.1.4 Sanctuaries in the territory (Country sanctuaries).....	173
3.2 ACCESSIBILITY AND CENTRALITY OF SANCTUARIES IN ACHAIA: A CUMULATIVE COST ANALYSIS	198
3.3 SACRED LANDSCAPES THROUGH TIME.....	200
3.3.1 The Geometric Period	200
3.3.2 The Archaic Period	203
3.3.3 The Classical period	206
3.3.4 From the Hellenistic period to the Roman conquest.....	211
3.4 DEITIES AND CULT SITES IN ACHAIA AND ARCADIA: A SACRED CARTOGRAPHY.....	215
3.4.1 Athena	215
3.4.2 Artemis.....	217
3.4.3 Poseidon.....	223

3.4.4 Zeus	224
3.4.5 Demeter, Kore and Eileithya	227
3.4.6 Aphrodite	230
3.4.7 Hermes	232
3.4.8 Hera	235
3.4.9 Apollo	237
3.4.10 Dionysus	239
3.4.11 Asclepius	240
3.4.12 Minor deities	242
CHAPTER IV	247
CONCLUSIONS	247
4.1 RECONSTRUCTING SACRED LANDSCAPES IN ACHAIA AND NORTHERN ARCADIA	247
4.1.1 Sacred Landscapes as Dynamic Systems	247
4.1.2 Methodological Reflections and Interdisciplinary Integration	251
4.1.3 Spatial Distribution and Environmental Contextualisation	253
4.1.4 Local Diversity and the Absence of Theological Uniformity	254
4.1.5 Directions for Future Research	254
APPENDIX	256
<i>THE POLIS OF OPOUS IN AKKOREIA</i>	256
CATALOGUE	259
<i>EASTERN ACHAIA - AIGIALEIA</i>	259
PELLENE	259
AIGEIRA	267
PHELLOE	285
AIGAI	286
BOURA	290
KERYNEIA	299
HELIKI	306
AIGHION	309
RHYPES	319
LEONTION	325
NORTHERN ARCADIA	328
NONAKRIS	328
KYNAITHA	330

LOUSOI.....	335
KLEITOR.....	346
PSOPHIS.....	354
PAOS.....	364
WESTERN ACHAIA.....	368
PATRAS.....	368
PHARAI.....	388
OLENOS.....	391
DYME.....	397
TRITAIA.....	413
OPOUS.....	415
FIGURES.....	417
BIBLIOGRAPHY.....	436

INTRODUCTION

Over the past two decades, scholarly interest in sacred landscapes has grown significantly. While earlier research primarily concentrated on the archaeology of the sacred and the history of cults, more recent studies have begun to integrate these themes within broader landscape analyses. Investigating sacred landscapes requires a multidisciplinary approach that draws on archaeology, anthropology, religious studies, geography, and related fields. Researchers have increasingly recognised the need for a more holistic perspective on the sacred, one that goes beyond the analysis of material remains and artefacts to encompass environmental factors and their influence on human activity. This broader framework offers deeper insight into how ancient societies interacted with, and imbued meaning into their surroundings.

Sanctuaries and cults have played a pivotal role in shaping social identities throughout history, and ancient Greece is no exception¹. But how can a sacred landscape be defined as such? A sacred landscape is a geographical area with special religious, spiritual, or cultural significance for a group of people or a community and is often permeated with symbolic values, mythological narratives, and rituals that connect the physical environment with the divine. Sacred landscapes are not fixed entities, as they are subject to change over time and space. They are also influenced by a human presence: we are part of it, we act in relation to it, and it acts in us².

Temples, shrines, altars, or other religious buildings may also be present in sacred landscapes. The landscape itself, for example, mountains, rivers, forests, or other natural features, may also be considered sacred. The natural environment is in fact often perceived as an integral part of the divine or as a manifestation of spiritual forces.

This dissertation focuses on reconstructing the sacred landscapes of Achaia and Northern Arcadia (the modern province of Achaia, fig. 1) from the Early Iron Age (10th

¹ EDER 2019, 25.

² TILLEY – CAMERON-DAUM 2017, 7. See also HÄUSSLER – CHIAI 2020, 2.

century BC) to the Roman conquest of Greece (146 BC). The aim of this work is to systematise all known cultic evidence, while also paying close attention to spatial and environmental contexts. The cult sites are not isolated entities; they are integral to understanding the socio-political structures, territorial organisation, and ritual practices of the communities which inhabited this region. Achaia and Northern Arcadia, in fact, present a particularly rich case for such a study. Despite their peripheral location in relation to the major centres of the Greek world, they were home to vibrant local traditions and participated in broader regional networks, which were both religious and political.

METHODOLOGY

The methodological approach adopted in this study is deliberately interdisciplinary. It combines traditional archaeological and historical analyses with newer spatial and digital tools. Key sources include published and unpublished excavation reports, topographic surveys, historical and literary texts, epigraphic and numismatic evidence, as well as previous studies on topography and religion in the area. These have been critically evaluated, and particular care has been taken to keep distinct documentary types analytically separate before finally integrating them to build a coherent reconstruction of the sacred landscape.

A core element of this methodology is the systematic creation of a catalogue which gathers all cult-related sites in the region. This catalogue serves as both a research tool and a foundation for spatial analyses and includes descriptive information, chronological ranges, associated deities, types of cult activities and, where possible, references in ancient sources. The organisation of the catalogue is based on the GIS catalogue created by the Austrian Archaeological Institute which records all the archaeological evidence in the Peloponnese. One hundred and seventeen sites have been recorded to date. Surveys have been conducted, where possible, to verify the locations cited in the bibliography and pinpoint the sites on an updated regional map (fig. 2).

Basic categories according to which the data have been organised are:

- Geographical location of the evidence recorded under the fields "Site Name," "Nomos," "Demos," and "Polis".
- Chronological range of the cult places, as far as can be determined: the "Dating" record refers to the century (e.g., 3rd, 4th century), while the "Period" record indicates the broader chronological period, using abbreviations such as "G" for Geometric, "A" for Archaic, "C" for Classical, "H" for Hellenistic, and "R" for Roman.
- Characteristics/ functions of the venerated deities (the fields "Deity"; "Deity Epiclesis" and "Deity gender").

The catalogue also records the characteristics of each site's location and natural environment (e.g., coastal, *chora*, city centre, etc.). The field "Localisation Accuracy" indicates the reliability of the site's identified location, whether determined through archaeological survey or derived from secondary sources and previous scholars' studies. "Localisation Accuracy" is assessed on a scale ranging from High, Medium-High, Medium, Medium-Low, to Low.

In order to analyse the relationship between sanctuary locations, settlements, and the road networks connecting them, it was essential to integrate major settlements and relevant studies on regional road connections into the GIS. Particularly helpful in this regard was the access granted to the database of the Austrian Archaeological Institute at Athens, which, as previously mentioned, compiles all available information on sites in the northern Peloponnese, drawing from archaeological reports and published sources.

USE OF GIS AND SPATIAL ANALYSIS

In order to visualise and interpret the spatial relationships between sacred sites and their environmental and cultural contexts, this research makes extensive use of GIS. The platform enables the creation of layered, georeferenced maps that highlight

the distribution of cult sites across different periods, and their relationship to natural features such as rivers, mountains, and communication routes.

Through the application of GIS, both diachronic and synchronic spatial analyses were conducted to visualise temporal and geographical patterns of religious activity, delineate potential ritual networks, and assess the strategic, symbolic, and topographical features of sanctuary placement. These GIS-based visualisations contribute to a more granular understanding of regional sacred geographies and substantiate interpretative models concerning the persistence, transformation, and spatial diffusion of cultic practices across the modern region of Achaia. To enhance the spatial resolution and topographic accuracy of the analyses, a high-precision Digital Elevation Model (DEM) with a 5-metre resolution was utilised. The DEM was made available through a collaborative agreement with the Ephorate of Classical Antiquities of Achaia and the Hellenic Military Geographical Service.

The following key analyses were conducted:

- Distribution analysis of sanctuaries and cult sites relative to settlement patterns, road networks, and natural features such as rivers, mountains, and coastal zones. To investigate these relationships, two primary spatial analysis techniques were employed: *Thiessen Polygon Analysis* (commonly known as *Voronoi polygons* in QGIS) and *Kernel Density Estimation*. *Thiessen analysis* enabled the creation of spatial tessellation based on proximity to known cult sites. This method divides the landscape into discrete zones, with each polygon representing the area that is geographically closest to a particular site. The polygons were generated by calculating the perpendicular bisectors between all pairs of sites, producing a network of non-overlapping cells that model potential territorial spheres of influence around each location. This approach provides a theoretical framework for interpreting how space may have been organised and controlled in relation to sacred places³.

³ BRUGHMANS – PEEPLES 2020, 282.

Complementing this, *Kernel Density Estimation* was used to generate a continuous surface representing the intensity of cultic activity across the region. By applying a quartic kernel function and a search radius appropriate to the average spacing of sites (approximately 10 km), the *KDE* highlights zones of higher or lower site concentration. This allows for the identification of potential ritual centres and networks based on the empirical density of cult sites. Taken together, these analyses offer complementary perspectives on the spatial logic of cultic landscapes— one emphasising territorial reach, the other illuminating patterns of clustering and connectivity⁴.

- *Visibility Analysis*, which assesses the visual prominence of sanctuary sites from surrounding areas, especially in relation to major communication routes or other sanctuaries, in order to understand their symbolic and strategic placements. This approach helps to shed light on the symbolic and strategic reasoning behind the placement of these sites. Through *Viewshed Analysis*, it is possible to evaluate intervisibility, determining what is visible from a specific vantage point. Such analyses supports discussions on issues of surveillance, communication, and symbolic presence, offering a deeper understanding of how sanctuaries were intended to function within their geographical and cultural contexts⁵.
- Proximity and accessibility studies, including buffer zones around roads, rivers, and settlements, to explore how easy it would have been for populations to reach cult sites and how ritual mobility may have been structured thanks to *Least Cost Path* and *r.walk Analyses*. *Least Cost Path Analysis* calculates the most efficient route between locations by minimising travel costs over a terrain, often used to hypothesise ancient

⁴ BEVAN 2020, 61-69.

⁵ GILLINGS – WHEATELY 2020, 314- 325.

routes or movement patterns⁶. However, this method typically calculates the most efficient route between two specific points. When applied to entire cities or larger settlements, this can be problematic, as it reduces the complexity of urban movement to a single point, thereby producing only one possible route. This oversimplification can obscure the multiple access points and routes that may have existed in and out of a city, limiting the interpretive power of the analysis. In this project, *LCP* analyses were conducted between cities to determine whether sanctuaries or cult sites lay along these interurban routes, thereby illuminating their spatial and religious relationships to the *poleis* and their surrounding territories. Additional analyses were carried out between individual *poleis* and nearby sanctuaries and based on topographic studies; a selection of historically plausible routes was integrated into the model. Validation of these routes relied heavily on the Austrian Archaeological Institute's database and prior studies on ancient routes and networks⁷. The *GRASS tool r.walk*, on the other hand, calculates the anisotropic cumulative cost of walking between different geographical locations (expressed in units of time) on an input elevation raster map. Integrated through the *GRASS GIS* plugin in *QGIS*, the *r.walk tool* takes into account slope, terrain ruggedness, and user-defined parameters such as walking speed and friction to simulate realistic human or animal movement across a raster surface. Unlike simpler cost-distance models, *r.walk* incorporates Tobler's hiking function or user-defined cost equations to represent energy or time-based movement costs more accurately⁸.

⁶ HERZOG 2020.

⁷ See most recently, ALEXOPOULOU – SANTORIELLO 2016; ALEXOPOULOU 2021.

⁸ <https://grass.osgeo.org/grass72/manuals/r.walk.html>. On the application in archaeology see an example in ANTONIADIS 2024, with previous bibliography.

- Temporal layering (diachronic mapping) to visualise changes in the cultic landscape across different historical phases and to detect patterns of continuity, transformation, or relocation of sanctuaries over time.
- Topographic and environmental analysis, integrating digital elevation models (DEMs) to assess elevation, slope, and terrain ruggedness as factors influencing site selection and ritual behaviours.
- Deity distribution and landscape associations in order to examine the spatial distribution of deities across the region, identifying potential correlations between specific divine figures and environmental features (e.g., river gods near watercourses, mountain deities at high elevations).

These analyses have allowed for the identification of spatial patterns that are not immediately visible through traditional textual or archaeological studies. The geospatial perspective thus provides new insights into the relationship between cult practice, environment, and political geography in ancient Achaia and Northern Arcadia.

By integrating digital mapping with archaeological and historical data, this research approaches sacred landscapes not only as an object of analysis but also as a critical methodological framework. It convincingly demonstrates that sacred space in the northern Peloponnese was neither static nor isolated but dynamically negotiated and continuously reshaped across time. Far from being abstract or symbolic alone, religious practices were deeply embedded in the physical terrain and socio-cultural fabric of the region. This study therefore offers new insights into the interplay between landscape, ritual, and memory, highlighting how sacred topographies actively structured human experience, mobility, and identity in the ancient world.

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