

THE ELECTRONIC ATLAS OF GREEK MONASTICISM

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SOMMAIRE

La vie monacale en Grèce a connu une très longue histoire. Depuis l'époque byzantine et même avant, la distribution de monastères en Grèce présentait déjà une densité remarquable.

Si l'on considère que la Grèce, depuis la prise de Constantinople, devient un des centres du Christianisme Orthodoxe le plus renommé (la cité monastique du Mont Athos en est un de plusieurs exemples), la prolifération du monachisme orthodoxe en Grèce n'apparaît que comme évidente.

La disparité géographique, la succession historique, la différenciation architecturale et anthropologique font de ce fait, un phénomène à cartographier et à systématiser par excellence.

Le nombre des variantes géographiques [le développement de la base des données prévoit cinq tableaux avec plus de quarante champs] et le grand nombre des monastères en Grèce (plus de 1200 monastères identifiés), organisées dans un Système d'Informations Géographiques (S.I.G), nous a permis de dessiner, de composer et finalement de stocker - imprimer, l'Atlas des monastères en Grèce.

Cet Atlas électronique obéit à des prescriptions technologiques que nous voulons avancées, afin de pouvoir nous servir de capacités de la toute récente technologie en la matière. La provision des outils pour l'analyse géographique, le rangement de différents niveaux et création de cartes dérivantes de la combinaison de divers niveaux thématiques, la gestion des données spatiales (créer, mettre à jour, effacer, créer de métadonnées [metadatas]), la provision de différents niveaux de mise au point, sont quelques unes des caractéristiques du système proposé.

Par une série de plus de 55 cartes à diverses échelles (nationale, régionale), des archives concernant toutes les caractéristiques géographiques de ces monastères, des diagrammes et de tableaux, nous pourrons présenter d'une façon systématique le trésor culturel et architectural de la vie monacale en Grèce, non seulement à ceux qui s'intéressent directement, les instances ecclésiastiques par exemple, mais aussi les scientifiques spécialisés comme géographes, architectes, historiens et autres.

La construction de l'Atlas électronique du monachisme grec (des monastères grecs) est une provocation scientifique - cartographique bien sûr, mais aussi culturelle par sa thématique ainsi que par sa « dynamique ». La création et l'utilisation, par la suite, de cet Atlas va enrichir la recherche et l'étude sur l'histoire de la vie monastique en Grèce, l'Architecture et l'Urbanisme monacales [les cités monastiques à elles seules sont un exemple], la Géographie et l'Histoire du pays, ainsi que la recherche sur la Cartographie, la Cartographie Thématique, l'Expression et la Sémiologie Graphique et la composition des Atlas thématiques.

MOTS – CLÉS

Production de cartes/ de données, Représentation multiple, Cartes et données à la demande.

1. INTRODUCTION

Greece is known mainly for its important civilization and its natural environment. The triad "sun, sea and antiquity" comprises the country's main income from tourism and the basic poles of attraction for tourists. Alongside this, however, Greece commands important resources of religious tourism, such as the large number of monasteries to be found dotted across almost the entire territory of Greece.

More particularly the monasteries constitute an important section of Greece's wealth of monuments and house some of the greatest and most important treasures of the Orthodox world. Monasteries in stunning settings, built on the peaks of hills or hidden in isolated valleys, are to be found scattered across the length and breadth of the country, from the central Peloponnese to the narrow peninsulas of Macedonia, and from the slopes of Thessaly to the remote Greek island (Kokkoris, 2002).

This great number of monasteries which have arisen in Greece is owing to the development of Monasticism. By the term Monasticism in Christianity is understood the religious movement of the laity that, following Christian teaching, have tried to achieve religious perfection by their withdrawal from the cities to the desert, where they lived with minimal food and submitted themselves to various hardships. The movement began in the period of persecutions for reasons of the safety of believers who, in the desert

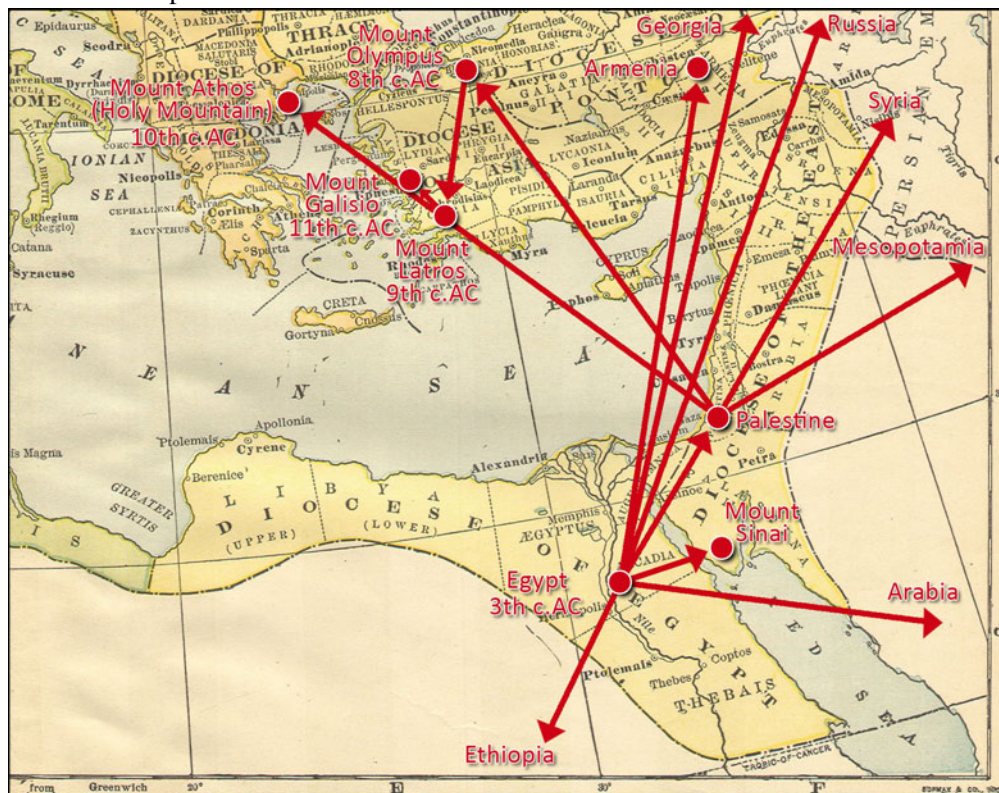
regions of Egypt, were able, without distractions, to devote themselves to prayer and fasting in order to approach the angelic realms (Papyrus Larousse Britannica, 1996).

2. HISTORICAL AND GEOGRAPHICAL ORIGINS

Monasticism begins in Christian society in the 4th century with Saint Anthony. It had already existed, however, in the deserts of Egypt from the middle of the 3rd century AD. Those who first repudiated worldly matters, the anchorites or hermits, took refuge chiefly in areas around the valley of the Nile.

Monasticism, from the time when it appeared in Egypt, spread quickly to the whole extent of the Byzantine Empire, and also outside it [Ethiopia, Arabia, Armenia, Georgia and later in Russia and the rest of Eastern Europe], wherever there were Christians. From Egypt, anchorites and coenobitic communities quickly appear both in Syria and Palestine. From Palestine the institution spread to Syria and Mesopotamia and from there to Asia Minor and Europe.

Particularly after the predominance of Monophysitism and the Arab conquest of Syria, Palestine and Egypt, the centre of gravity of Orthodox Monasticism moved across to Asia Minor. The most important monastic centre after the 8th century was Mount Olympus in Bithynia. After the 9th century it was Mount Latros near Miletus, and the Galesian mountain near Ephesus in the 11th century. [Map 1]. From the second half of the 10th century the Holy Mountain, Athos in Greece, became known as an important centre, and one which was to survive until today. After Iconoclasm, in other words the period from the tenth century, the most famous monasteries of the Byzantine Empire were founded and organised. Many of these were destroyed or plundered by the Crusaders, chiefly in the 4th Crusade, and their treasures are found today in museums and private collections.



Map 1: Spread of Christian monasticism

The centre of Monasticism in Greece is the Holy Mountain, a self-governing monastic community of Orthodox monks numbering 1496 [2001 census]. After the Holy Mountain the areas with the greatest monastic population are the County of Irakleio [500 monks], the County of Arcadia [370 monks] and Western Attica [272 monks].

In the census of 2001 there appear 230 monasteries in Greece as a whole, with an actual population of 5884 individuals. In the 1991 census the population of the monasteries was 4951 individuals, thus showing an increase of some 19% over the period 1991 – 2001.

3. CLASSIFICATION OF GREEKS MONASTRIES

The monasteries of the area of Greece can be classified according to different categories (News, 2007):

1. According to their administrative dependence into:

- Provincial or parochial, which come under the respective Metropolis, and
- Patriarchical or Crucifund, which are answerable to the Ecumenical Patriarch. Formerly, in Byzantium, there were also Autoepiscopal monasteries (under the protection of the emperor) as well as the Foundations, which were governed by the inheritors of their original founder.

2. According to the sex of the monastics into: a) monks and b) nuns.

3. According to their observances, i.e. their internal regulations, into:

- a) Coenobitic, in which the monks do not hold individual property and live in a communal manner, according to the rules laid down by Theodoros Stouditis and Athanasios of Athos.
- b) Idiorhythmic, in which the monks hold their own property and prepare food alone, in cells.

4. According to their independence or otherwise, into: a) Independent and b) Dependent

In this project we attempt to identify and record the historical tradition of Greek monasteries clearly and effectively, utilising the potential of electronic technology and cartography. The information collected about monasteries in the area of Greece has been organized as a Geographical Information System and is presented as a series of thematic maps, in such a way as to appeal to a broad public. Possible applications of the present project are its employment as a tool in the work of specialist academics (theologians, historians, architects, geographers etc.), and also its use in religious tourism for the supply of information to visitors of monasteries.

More analytically, the work is structured into four parts:

- In the first part there is an analysis of questions concerning the construction of electronic atlases (structure, composition, function etc.)
- In the second part there are proposals for the design and organization of the atlas of Greek monasteries, [creation of Databases (descriptive and cartographic), synthesis and production of thematic maps etc.].
- In the third part there is an examination of the potential for using the internet as a platform for the electronic atlas, with the realization of a pilot application for the atlas of Greek monasteries.
- In the fourth and final part, utilizing the data of the preceding sections, there is a formulation of conclusions concerning electronic atlases and their use via the internet.

4. CONCERNING ELECTRONIC CARTOGRAPHIC ATLASES

The monasteries comprise an important section of the wealth of monuments in Greece and house some of the greatest and most revered treasures of the Orthodox world. Interest in the monasteries cannot be restricted in point to their architecture or their structural characteristics, but focuses on their broader geographical distribution, as they have been built in places and settings which are particular and characteristic in each case, producing a geographical expansion which is composite and comprehensive not only as regards physical relief and physical space, but also as regards geographical and administrative organisation and distribution (Kerry et al., 2010).

Isolation from the rest of the world comprises the chief aim of monastics, but acquaintance with the historical tradition of monasteries is very important, and can be achieved very easily, comprehensibly and felicitously with the utilization of the potential of electronic technology and cartography. In other words, the organisation of an electronic atlas of monasteries which is called upon to constitute an instrument in the work of a large number of academics, and for the public at large.

The structure of the atlas of the monasteries of Greece, given that the users to whom it is directed can be academics, students or simple tourists, allows it to be flexible and user-friendly. In addition it can permit expansion of its potential in the future. The Atlas comprises the primary data and the application of visualization and its presentation (Myridis et al., 2001). The method of presentation combines the data in such a way as to present it in a suitable way to users. The data is stored on hard disk and backup copies are also held. The application is simple in structure, and powerful computers are not required for its execution. It is available in HTML, which ensures access from wherever in the world there is a connection to the Internet, while at the same time it offers the opportunity to be viewed also on the plethora of appliances apart from computers such as hand-held devices and netbooks.

Beginning with the data, the main part of the application is the database in which it is stored. Given that the aim was storage of all data as compactly as possible and the avoidance of fragmentation, the database PostgreSQL was chosen, with the extension PostGIS activated. The original spatial data, the generation of which took place in the form of shape files, was introduced into the database, in which was stored, in fields, both descriptive and geometrical information, once the geometrical storage field was activated following the installation of the extension PostGIS. The creation and publication of the maps was done with the tool of choice par excellence, UMN MapServer, which worked perfectly with the programming language PHP

for the production of HTML pages. For each map a configuration file was created for the MapServer (.map, e.g. arithmos_mesobyzantinon.map). This file contains, with suitable commands, the instructions for reading the descriptive data and geometry from the database and creating the picture file which is published by being sent via PHP to the application page (www.mapserver.org). In this way it is determined for each map which data is presented and in what way, from the point of view of opticalization (colours, line thickness etc.). An Atlas, however, is not only an ensemble of maps. It includes texts, photographs and even video (Lorenz, 2000). As storage of video on the database is not possible these were stored on hard disk.

In the application, there is mainly a combination of the details which exist for each monastery and they are presented accordingly. In other words, data is recovered from the database, details which may be stored on hard disk, and finally the appropriate map is called up. The user chooses the monastery which interests him, either by means of the map which has been created for this purpose or via the list which exists, while there are also search capabilities. [Diagram 1].

The structure of the Atlas of Greek Monasteries appears in the following scheme.

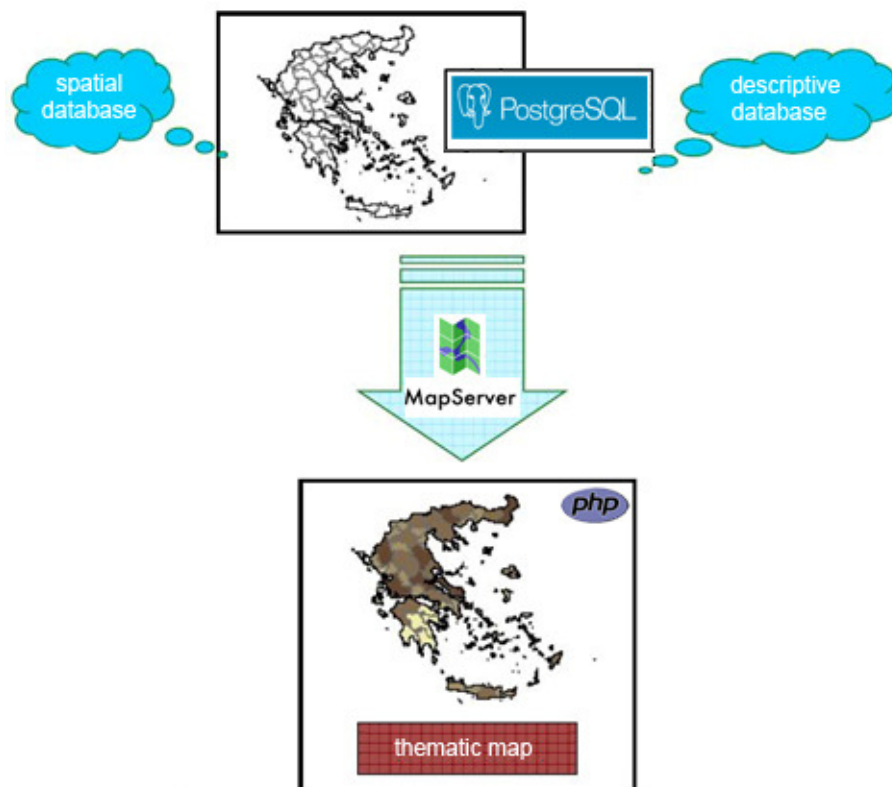


Diagram 1: Structure of the Atlas

5. ORGANISATION OF THE ATLAS

5.1 Organisation and creation of database.

Following the collection of data on the monasteries, a database was constructed, consisting of five interrelated tables, chief of which is the table “MONASTERIES” (“monastiria”) and the rest having an auxiliary – supplementary role, as is shown in the following scheme. [Diagram 2]

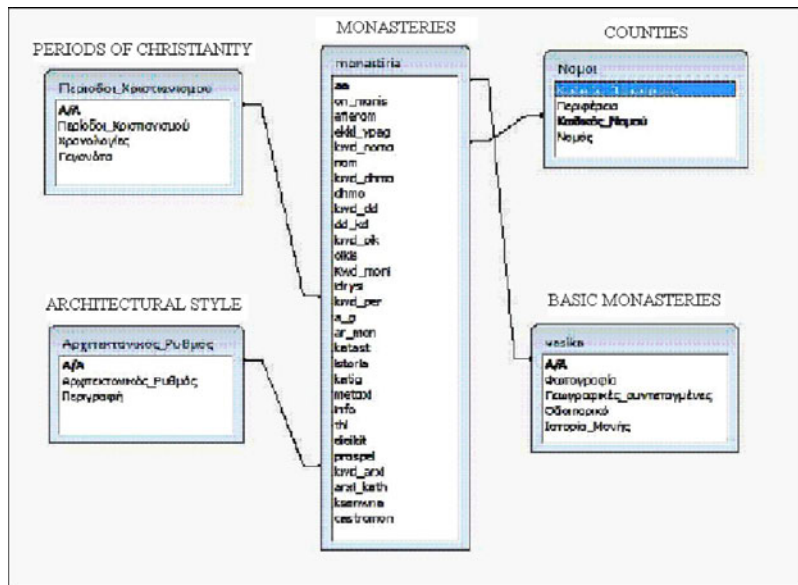


Diagram 2: Structure of the Database

The table “MONASTERIES” (monastiria) contains all the basic data for each monastery. It holds 1114 entries, as many as the depicted monasteries of Greece. Each monastery has been given a unique code to characterize it. The table includes many fields relating to geographical position, the number and sex of monastics, the history, the type, along with details of the construction and architecture of the monasteries.

The chart “COUNTIES” (NOMOS) is an auxiliary table containing 55 entries, as many as the counties of Greece. The table “PERIODS OF CHRISTIANITY” (PERIODOI) is supplementary to the table “MONASTERIES” and contains 7 entries, as many as the periods into which Christianity is divided. A further chart, supplementary to the table “MONASTERIES”, is the table “BASIC MONASTERIES” (VASIKA) and contains the 48 basic monasteries of Greece. This table contains historical details and photographs along with travelogues for the monasteries. Finally, the base is supplemented by a further auxiliary table, the chart “ARCHITECTURAL STYLE”, with 12 entries.

5.2 Construction of thematic maps

For the construction of thematic maps the system of projection chosen for use was the Lateral Mercator Representation of a zone (Representation TM87), with geodesic reference system (Datum) E.G.S.A. 87, central meridian 24o, scale factor equal to 0.9996 and ellipsoid of reference GRS80. The scale 1:3.000.000 was chosen for the maps which represent the whole of the Country, while for smaller geographical areas, larger scales were used.

For the composition of the maps, apart from the thematic information which relates to the monasteries, information was used relating to the natural environment of Greece (relief, main rivers and lakes), with its administrative organisation (urban, county and regional boundaries), with the transport network (road and rail) and with its network of settlements. The network of settlements has been divided into 3 categories which refer to the population of each settlement (1st: less than 2000 residents, 2nd: 2000 – 5000 residents, 3rd: more than 5000 residents) and 2 categories which refer to the administrative classification of the settlement (capitals of counties and regions).

For the visual presentation of thematic information, the basic principles of Cartography were followed. The monasteries were represented using the symbol of a square with a cross on top of it. A square was chosen because it is a simple geometrical symbol which does not cause “noise” and is easily understood. It is also a pictorial symbol and given that the symbolic scheme in cartography is often chosen according to the criterion that it should be reminiscent of the real form of the image of the information which it represents (Nakos, 2006), the square resembles a building and the cross looks like something religious. For the qualitative differentiation of the monasteries there was a differentiation in the colour of the symbol. The basic colours were used, to make reading the map and understanding the information easier.

The thematic maps which were produced, and which together constitute the Atlas, are classed according to the following categories:

A. Regional level maps

In this category, 13 maps were constructed, as many as the regions of Greece [Map 2], in which the functioning monasteries in each area were mapped. A uniform scale for all the maps was not used, as the extent of the regions differs.

- A. 1 Monasteries of Eastern Macedonia and Thrace
- A. 2 Monasteries of Central Macedonia
- A. 3 Monasteries of Western Macedonia
- A. 4 Monasteries of Epirus
- A. 5 Monasteries of Thessaly
- A. 6 Monasteries of Central Greece
- A. 7 Monasteries of Western Greece
- A. 8 Monasteries of the Peloponnese
- A. 9 Monasteries of Attica
- A. 10 Monasteries of the Ionian Islands
- A. 11 Monasteries of the Northern Aegean
- A. 12 Monasteries of the Southern Aegean
- A. 13 Monasteries of Crete



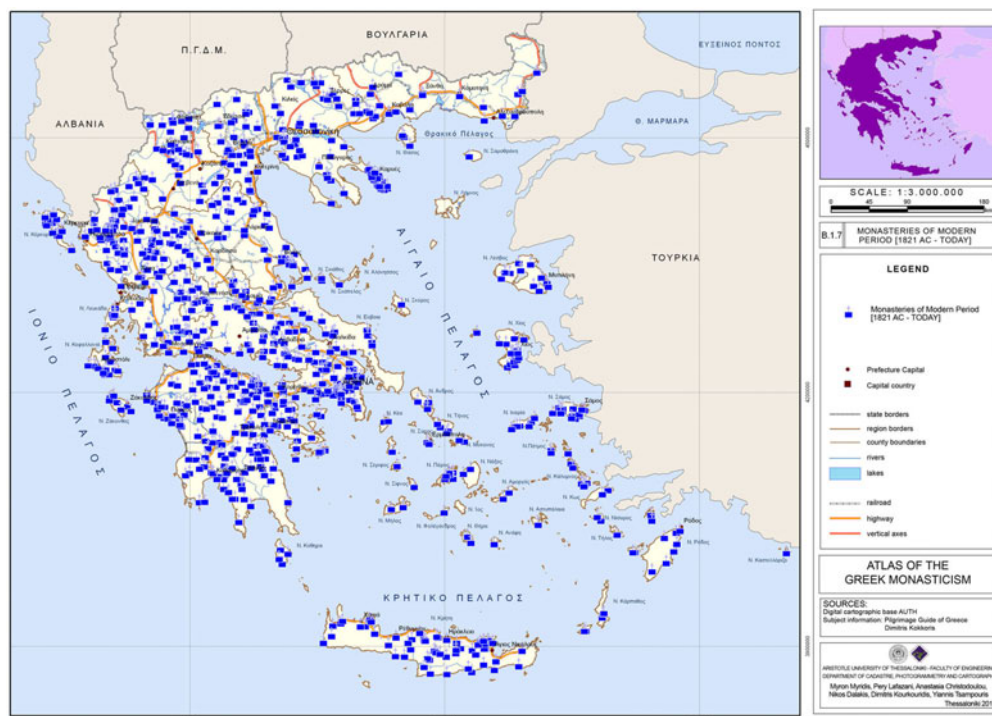
Map 2: Regions of Greece

B. National level maps

This category has to do with the chronological periods during which the monasteries were built (7 maps) and also with the type of monasteries (6 maps) where the functioning monasteries are mapped for the whole of Greece. [Map 3].

- B.1.1 Roman Period [Before 4th century]
- B.1.2 Ancient Christian Period [324-630 AC]
- B.1.3 Early Byzantine Period [630-864 AC]
- B.1.4 Middle Byzantine Period [864-1204 AC]
- B.1.5 Late Byzantine Period [1204-1453 AC]
- B.1.6 Ottoman Period [1453-1821 AC]
- B.1.7 Modern Period [1821 AC - today]
- B.2.1 Monasteries – Religious houses

- B.2.2 Monasteries – Churches
- B.2.3 Monasteries – Hermitages
- B.2.4 Monasteries – Dependencies
- B.2.5 Monasteries – Shrines
- B.2.6 Monasteries – Retreats



Map 3: Monasteries of modern period [1821 AC - TODAY]

C. Maps (choroplethic) of densities

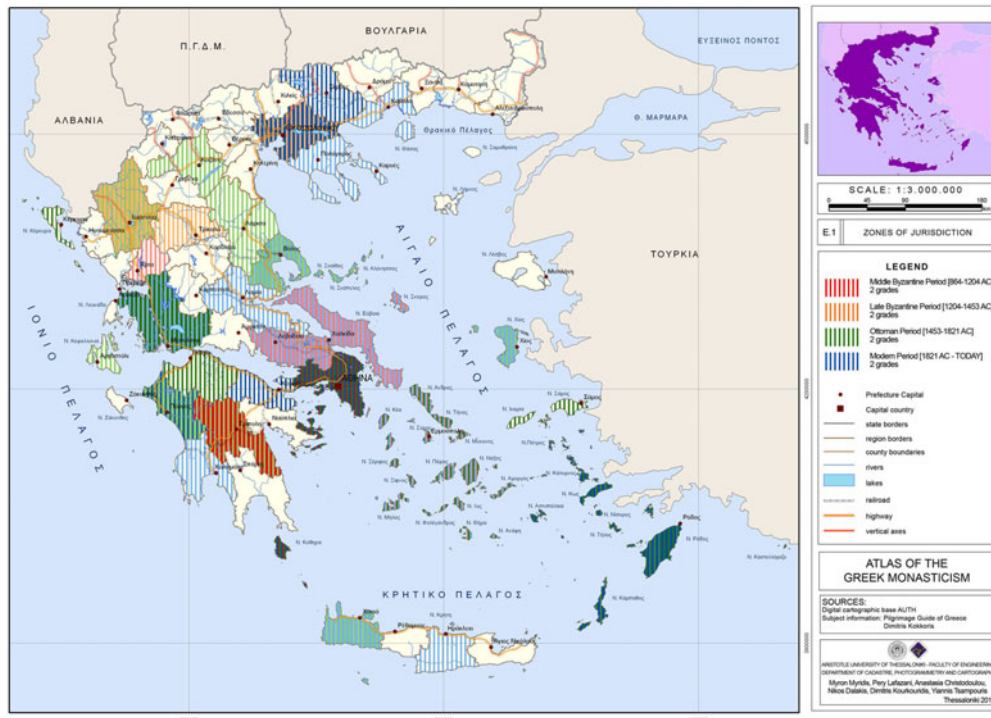
The maps of this category are 17 in all, of which six refer to the density of monasteries in each chronological period of Christianity for each county of Greece. Five are density maps of each category of monasteries for each county of Greece, and the other six show the density of the sum total of monasteries in each chronological period against the extent of the county (per 10000 sq. km.). The maps were made for the prevailing categories of monasteries and chronological periods.

D. Maps (choroplethic) of ratios

There are 2 maps, in all, in this category. One of these represents the ratio of monasteries in each chronological period of Christianity to each county of Greece. The other map represents the ratio of each category of monastery to each county of Greece. The maps include all the categories of monastery and chronological periods.

E. Maps of zones of domination

The map in this category presents, with surface symbols (line diagrams) the zones of jurisdiction for the chronological periods of the monasteries, that is to say, which are the main chronological periods of the monasteries in each county of Greece, given that these buildings exist. [Map 4]. It includes only the monasteries which are functioning in each area.



Map 4: Zones of domination

F. (isarithmic) map of the emergence potential of the total number of monasteries in the whole of Greece
 In this case a method was adopted which is used for physical phenomena and rests on the principle of the universal Law of Gravitational Attraction. From this arose the acknowledgement that the number of monasteries which exists in each County influences or affects the number of monasteries existing in other Counties in direct proportion to the number of monasteries, and in indirect proportion to the distance between their Counties. The map of the potential is presented with isarithmic contours and colour-graded zones, the zones of equal potential of monasteries. It includes only the monasteries which are functioning in each county. [Map 5]. The potential was calculated on the basis of the formula:

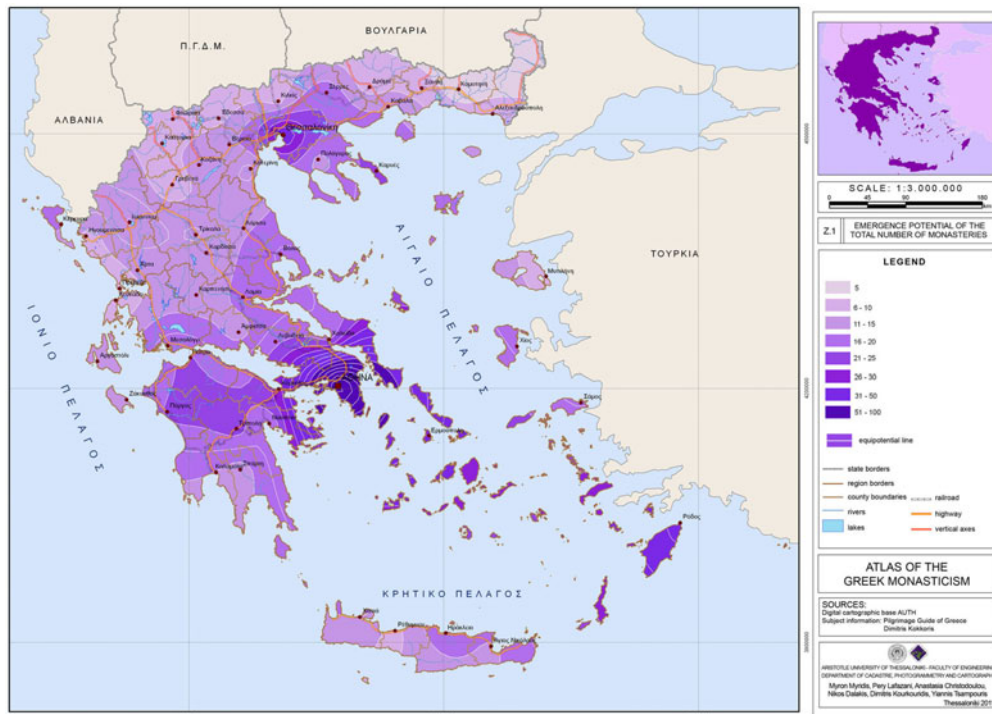
$$P_i = M_i + \sum_{j=1}^n \frac{M_j}{S_{ij}}$$

Where: P_i is the potential of each county

M_i is the number of monasteries in each county

S_{ij} is the distance between counties i and j

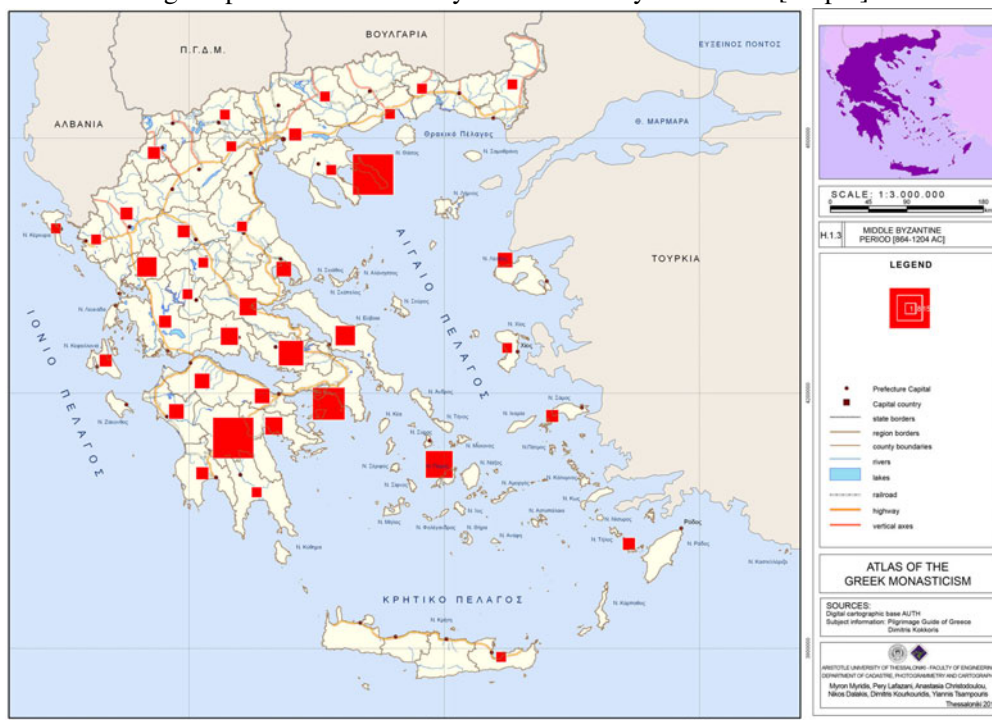
n is the total number of counties in the land.



Map 5: Emergence Potential of the total number of monasteries

G. Maps of number of monasteries / category / county

There are six maps in all in this category. Each of these depicts the absolute number for monasteries in each chronological period of Christianity for each county of Greece. [Map 6].



Map 6: Middle Byzantine Period [864-1204 AC]

6. POTENTIAL FOR USE OF THE INTERNET AS PLATFORM

Although the printed form of the Atlas is of great value, its electronic form and the uploading of it to the Internet, offers more opportunities for the diffusion of geographical and cartographic information to the public at large. In addition there is the possibility of connecting the Atlas to auxiliary media, such as photographs, texts etc. Thus within the parameters of the project it was undertaken to create a pilot application for the Greek Atlas of Monasteries.

The application contains all the maps contained in the printed form of the Atlas, with the difference that in the application the user can also have access to other information, such as photographs, historical facts, maps of routes to the monasteries, along with all the information collected about the monasteries themselves.

At the outset of the application there are the following five choices:

1. Monasticism in Greece
2. Catalogue of maps
3. Monasteries per region
4. Periods of Christianity
5. Types of monastery

The user has the ability to tap information about the monastery which interests him by selecting it on the map, as shown in the diagram below. [Diagram 3]

Map of the monasteries Monasteries per region and period

Selection of monastery Presentation of monastery



Diagram 3: Snapshots of the practical application of the electronic Atlas of Monasteries

7. CONCLUSIONS

Reading the maps gives rise to conclusions about the distribution of monasteries in the area of Greece, and also the differences in their distribution over time and location. Looking at the maps at a regional level gives rise to conclusions related to the concentration and distribution of monasteries. In general it may be observed that Athens has the largest population of monasteries, but the islands, too, despite their small size, are areas of high concentration of monasteries in Greece. A high concentration of monasteries is also found in Mainland Greece, even during the wars, mainly at high altitudes and more generally in inaccessible places. It must be stressed that the role of the monasteries during the Ottoman period was many-sided. Apart from being religious centres they were also cultural and educational centres and even hideouts. Because of this, many of them suffered serious or entire destruction. Monasteries are also found in all the counties of Greece with a long history. The largest monastic community in Greece is on the Holy Mountain, renowned as the “Garden of Our Lady”. The second largest and most important monastic complex in Greece is Meteora. More specifically, the greatest concentration of monasteries is:

- On the Holy Mountain, where most monasteries were built in the Mid-Byzantine period.
- In Thessaloniki, where most monasteries were built in the Modern period.
- In Attica, where there are monasteries of the Late Byzantine period mainly, of the Ottoman period, and also the Modern period.
- In the county of Arcadia, with the greatest number of post-Byzantine monasteries.
- In the Cyclades and Dodecanese, where despite their small size there is a high concentration of monasteries. Also, in the regions of the Ionian Islands and North Aegean.
- In Crete, particularly in Irakleio, with the largest quantity of recent monasteries.

As regards the distribution of monasteries according to category, the newer monasteries [in the period 1821 AC - today] occur in the largest numbers, as is natural since many of the older ones have been destroyed. There is also a large number of monasteries from the Ottoman period [1553-1821 AC] in which the feeling of faith was intense. During the Byzantine period [4th to 15th centuries] monasticism began to spread significantly and thus we see a gradual flowering of monasteries at the time of the Byzantine Empire. In previous periods, [3d to 4th centuries] monasticism mainly took the form of asceticism at an individual level and did not have a collective character.

In addition, some “quantitative” conclusions can be drawn. Thus as a whole in Greece today 1114 religious houses have been identified, of which 458 are convents (for nuns) and 340 accommodate monks. As regards type, there are 671 Monasteries (60,2%), 148 Dependencies (13,3%), 93 Retreats (8,3%), 72 Churches (6,5%), 44 Shrines (3,9%) and 11 Hermitages (1%). As regards the periods of Christianity, 2 monasteries (0,2%) were constructed during the Roman period, 10 (0,9%) in the Ancient Christian period, 12 (1,1%) in the Early Byzantine period, 145 (13%) in the Middle Byzantine period, 87 (7,8%) in the Late Byzantine Period, 298 (26,8%) during the Ottoman period and 319 (28,6%) in the Modern period. Finally, the number of monastics comes to 5884, of whom 32% are monks and 68% nuns.

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