

## A GIS approach to the study of non-systematically collected data: a case study from the Mediterranean

Federica Massagrande

*Institute of Archaeology, University College of London, 31-34 Gordon Square, London UK*

### 24.1 Introduction

This paper presents a project aimed at studying the possibilities offered by GIS techniques in the investigation of the relationship between urban centres and country sites during the Roman period in the Mediterranean region. When work was started on this project, the first aim was to obtain as much data as possible about settlement in different areas of the Mediterranean. It soon became evident that a large amount of the type of data required existed in various archaeological units scattered literally all over the Mediterranean region. This information had been generally collected during non-systematic field surveys and had been stored in the form of card collections, one site per card, occasionally supplemented by maps on which the location of each site had been plotted. A few sites were also reported by local people and were sometimes included in the catalogues even without the local archaeologists actually checking for their existence.

### 24.2 Yes, but what does 'site' mean?

The basic archaeological unit used in the catalogues is the 'site'. What a site actually is has been long debated in archaeology, and occasionally even people from other disciplines have suggested ways to improve the definition of the archaeological 'site' (see, for example, Wagstaff 1987 for a geographical view of the archaeological site). The variety of opinions on the definition of the nature of the archaeological 'site' was summarised very nicely by Schofield:

'The term most widely used in describing surface distributions, therefore, appears to mean something different to the majority of people responsible for their interpretation.' (Schofield 1991, 4)

Since it is evident that no unique definition of the term 'site' exists in archaeology, it was decided to use this term to indicate any scatter of archaeological material that was entered as a single entry in a card catalogue in an archaeological unit, or in a published source.

### 24.3 The study areas

Four criteria were used to choose a selection of study areas from the Mediterranean region. The four criteria are:

- that the non-systematic survey had been carried out for enough seasons to cover a large enough region;
- that the data recorded in the surveys was available to the public either as published material or from the archives of local archaeological units;
- that enough information was recorded about each site (i.e. site contents, not just site location);
- that the survey areas, taken as a whole, should offer a good sample of the different geographical, geological and environmental conditions occurring around the Mediterranean basin;

Several areas which responded to these criteria were identified. Of these, four were chosen as sample study areas. These areas are:

1. **Veii:** the area around the Etruscan and then Roman town of Veii, north of Rome (Italy).
2. **Maresme:** the region of the Maresme, north-east of Barcelona (Spain).
3. **Tarragona:** the area around modern Tarragona, to the south-west of Barcelona (Spain).
4. **Seville:** The region of Seville in the Guadalquivir valley (Spain).

#### 24.3.1 Veii

The source of the information on Veii is the report of the survey published in 1968 in the Papers of the British School at Rome (Kahane *et al.* 1968). As this information is currently being revised and improved, it was judged better to use the data with some caution and therefore use the area for testing rather than drawing conclusions. The background data was digitised from maps of the region.

The region of Southern Etruria, where Veii is situated, is a volcanic area, characterised by round lakes and fertile soil.

The digitised information about the Ager Veientanus covers an area on the ground of 11km (east) by 18km (north). The co-ordinates of the south west corner of this area are 33TTG820510, and those of the north east corner are 33TTG930690 (UTM).

#### 24.3.2 Maresme

The information concerning the Maresme region was stored in the archives of the Archaeological Service of Catalonia (*Servei de Arqueologia*, Generalitat de Catalunya) in form of a catalogue of cards, each containing the information about one of the sites. The sites were grouped together according to which urban

centre was nearest. The background data was obtained from Spanish army maps of the region.

The sites of the Maresme are along the Mediterranean coast of Spain. The area is not very high above sea level.

The area on the ground covered by the digitised information is 20km (east) by 15km (north). The co-ordinates of the south west corner of this area are 31TDF370900, and those of the north east corner are 31TDG570050 (UTM).

### 24.3.3 Tarragona

The site information for the Tarragona area was kept at the Archaeological Service of Catalonia in Barcelona and stored in the same way as described for the data about Maresme. The background data was digitised from maps.

Tarragona is located, like the Maresme, along the Mediterranean coast of Spain. The elevation is slightly greater and the coast line more ragged than in the Maresme, but the valley of the river Francolí divides the region into two parts, which differ in geology and land form.

The size of the area which was digitised for the computer analysis is 34km (east) by 23km (north), the co-ordinates of the south west corner of this area are 31TCF390460, and those of the north east corner are 31TCF730690 (UTM).

### 24.3.4 Seville

The site data for the province of Seville was collected during surveys carried out in the Guadalquivir Valley, in south-west Spain, until 1986. The more recent data collected in the 1989 survey was not yet available. For the Seville area, maps of the different soil types are available too (these maps were included in De La Rosa & Moreira 1987).

Part of the site data was kept at the *Dirección General de Bienes Culturales* in Seville. The data was stored in a card catalogue and covered the whole of the province of Seville. Other site data for the Guadalquivir valley was obtained from the four books published by M. Ponsich (1974, 1979, 1986, 1992) and containing the information he collected during a number of survey seasons in the area. More data was obtained from the systematic surveys carried out by Amores Carredano (1982), Escacena Carrasco and Padilla Monge (1992) and Ruiz Delgado (1985).

The Guadalquivir valley is (nowadays) one of the most important agricultural areas of Spain, with very fertile soils.

This is the largest of the sample survey areas, covering a region of 143km (east) by 108km (north). The co-ordinates of the south west corner of this area are 29SQA545893, and those of the north east corner are 30SUG450880 (UTM).

For the scope of this paper, only the data from the Guadalquivir Valley will be discussed, mainly for reasons

of brevity and because, thanks to its size, it is the one that offers the most possibility of exploring the site settlement patterns.

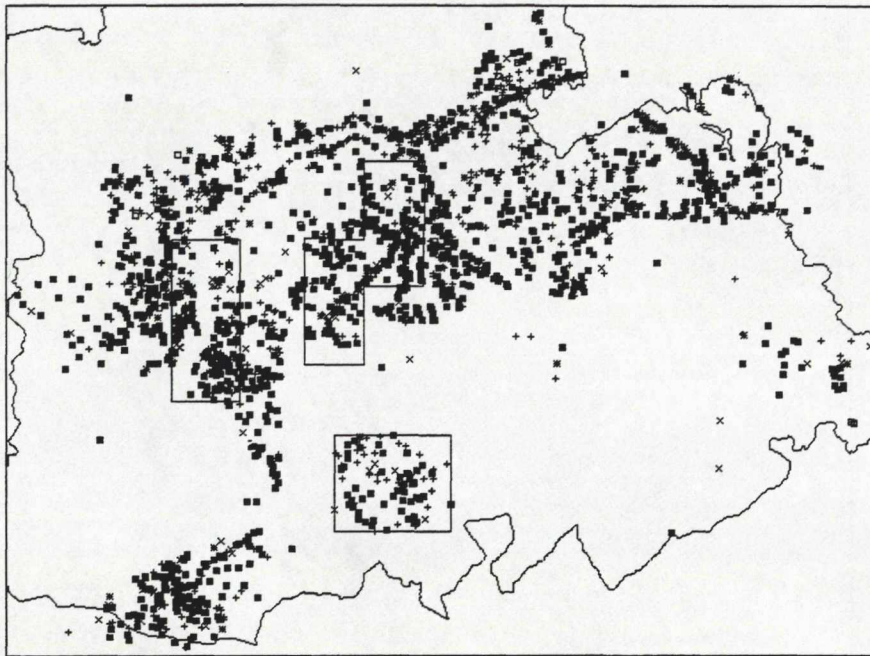
## 24.4 What is the non-systematic data like?

The data stored in the card catalogues is purely qualitative, the only information available being whether certain types of materials were present at the site or not. Other information contained in the cards includes the site co-ordinates and a rough dating of the periods in which the site was actually in use. Before the database structure could be designed in the first place, it was necessary to explore the data and decide which of the elements in the assemblage could actually be used to create site typologies and chronologies. Given the non-quantitative nature of the data, the structure of the database was designed with a boolean field for each of the diagnostic elements likely to occur at the site. This is probably a good example of the necessity to have a good knowledge of the form of the data before any sort of artificial structure is imposed upon it. Without a careful consideration of the importance and function (or assumed function) of all the elements of the database, it is impossible to be fully aware of all the implications of imposing a structure on the database itself. This is specially true when the structure is going to determine what can or can not be used as a diagnostic element in the analysis of the data. Table 24.1 (see Appendix) shows a small sample of one of the database files for the area of Maresme (a similar structure was used for the database of sites found in the valley of the Guadalquivir). Each row represents a site. When one of the boolean fields is set to TRUE, the diagnostic element was present at the site, when it is set to FALSE it was not. Some boolean fields are also used to indicate whether there is definite evidence that the site was in use at any one particular time.

## 24.5 Technical data

The main GIS software used for the storage and manipulation of the background data (elevation, geology, hydrology etc.) is Idrisi 4.1. The site database is managed with dBase III+ and AutoCAD 12 for Windows was used to input the map data. The Statgraphics and MV-ARCH statistical programs are used to provide statistical capabilities more advanced than those offered by Idrisi alone. A number of custom programs were produced in Turbo Pascal, AutoLISP and dBase programming language to supplement the capabilities of the commercial software available. These include:

- **AxisConvert** (Turbo Pascal). This program translates the co-ordinates of spatial data from one system of reference to another. It is necessary to be able to put data from different sources into the same system of reference, so that all the available information can be used in the same GIS.
- **IdrVals** (Turbo Pascal). This program automatically extracts the information from a background image



**Figure 24.1:** The areas surveyed systematically in the Guadalquivir valley. From left to right: Escacena Carrasco and Padilla Monge (1992), Amores Carredano (1982) and Ruiz Delgado (1985).

(soil, distance from water, elevation etc.) at locations where an archaeological site occurs. The information about site location is recorded in a reference site point image.

- **Idrtools** (AutoLISP). This is a set of routines which attach extended data types to AutoCAD drawing entities and then extract the information in Idrisi format. It is used to prepare and export maps digitised in AutoCAD to Idrisi.
- **KS and KS2** (dBase III+ language). These two programs perform Kolmogorov-Smirnov 1-sample and 2-sample tests on the data as extracted by the IdrVals program.

## 24.6 Surface data interpretation

Because the data has been collected and classified by a number of different people, it is necessary to create a standard classification of the sites. Since the same material can have a slightly different meaning as a status and chronology indicator in each of the study areas, it is not possible to create a generic site classification to be applied to the four study areas. Instead, an individual classification based on the study of the contents of sites excavated in the region was created for each one of the study areas.

However, because the non-systematic data used is surface data, it is also useful to compare it with data from systematic surveys. Archaeologists who have carried out systematic surveys in the Valley of the Guadalquivir and published the results are Escacena Carrasco and Padilla Monge (1992), Amores Carredano (1982) and Ruiz

Delgado (1985). The areas covered in the systematic surveys is shown in Figure 24.1.

As far as the classification of the sites is concerned, in the study of the relationship between town and country the main division of the sites is between high status and low status ones. Since the data is not quantified, when the presence of fine pottery is recorded we don't know whether we are dealing with a single isolated sherd or with a deposit of pots. To use the sole presence of fine pottery as an indicator of status is, therefore, misleading. Hence, the status of a site must be determined after taking other elements in consideration. A problem with determining the status of a site is that, just like it happens for the term 'site' discussed above, the archaeological literature certainly abounds with definitions of the term 'villa'. Before any attempt is made to divide sites into categories, the categories themselves must be defined. Any country site which can be shown to have been a high status one will therefore be labelled a 'villa', while a country site without evidence of high status will be called a 'farm'. Unluckily, one of the important elements in determining the status of a site, its size, is not available from non-systematic data. Another problem is posed by the fact that there can be no unique definition of what a site should yield to be called a villa. Items that were imported into an area because they were considered a luxury need not have the same importance in the exporting region, as they would be more readily available even to lower class households where they were produced. This is particularly true for pottery, as fine pottery was considered a status symbol and was often exported to considerable distances. Variations in the pattern of supply also had an influence on the creation of the archaeological

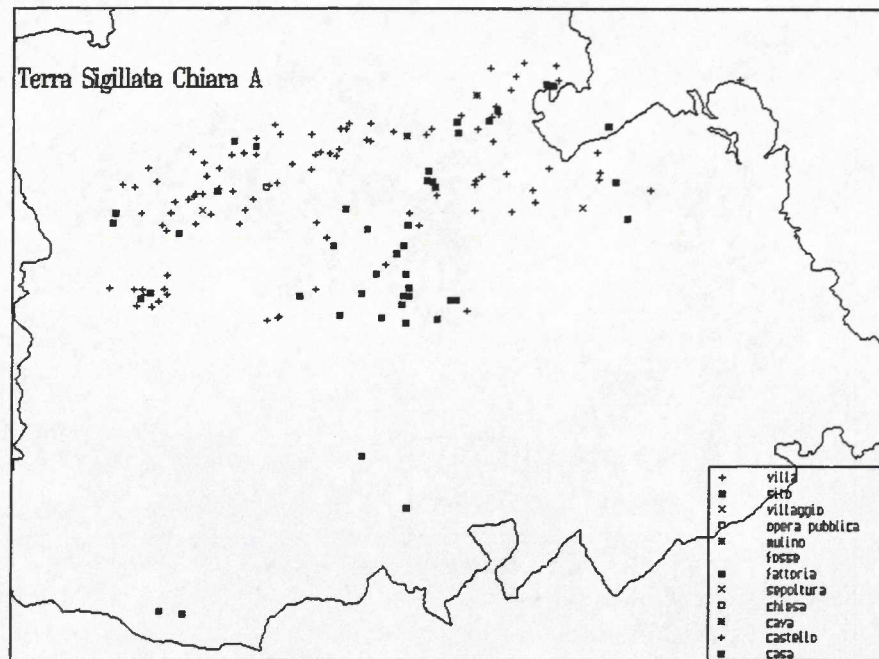


Figure 24.2: The distribution of Terra Sigillata Chiara A

assemblage, as has been demonstrated by Marsh (1981) for the Roman sites of Great Britain.

An example of this variation in supply is the amount of different types of Terra Sigillata Chiara which were retrieved in the non-systematic survey carried out by Escacena Carrasco and Padilla Monge (1992) in the area around Seville. They report that in their surveyed area the number of sites containing Terra Sigillata Chiara with Terra Sigillata Chiara C is 14%, while the Terra Sigillata Chiara A, which is earlier, is found in 32.5% of the sites and the Terra Sigillata Chiara D, which is later than the Terra Sigillata Chiara C, is found in 53.5% of the sites. Taken at face value, these percentages could indicate that most sites were abandoned in the second half of the III century AD and then reoccupied at the early IV century AD. On the other hand, there is evidence from other parts of the western Mediterranean, such as *Turris Lisbonis* (Cerdeña) and Sperlonga (Campania), that the relative percentage of Terra Sigillata Chiara C to Terra Sigillata Chiara A and Terra Sigillata Chiara D tends to be rather low.

If we check on the number of sites which contain the three types of Terra Sigillata Chiara in the valley of the Guadalquivir, we see that the trend observed by Escacena Carrasco and Padilla Monge is reflected in the non-systematic distribution (see Figures 24.2–24.4).

In the whole of the valley of the Guadalquivir, there are 150 sites with Terra Sigillata Chiara A, 261 with Terra Sigillata Chiara D, and only 28 sites with Terra Sigillata Chiara C. The number of sites which contain unidentified Terra Sigillata Chiara is 432. In percentage, the Terra Sigillata Chiara A is 34.2%, the Terra Sigillata Chiara D is 59.4% and the Terra Sigillata Chiara C is 6.4%. As these values reflect those found by Escacena Carrasco and

Padilla Monge in their systematic survey, it is safe to assume that the lack of Terra Sigillata Chiara C in the whole of the valley of the Guadalquivir is more likely to be due to lack of supply rather than abandonment and subsequent resettlement. The lack of diagnostic material from the late III century must be treated with caution in this area.

### 24.7 Chronological division

The sites dating to the Roman period found in the Valley of the Guadalquivir were dated into three broad chronological categories based on the diagnostic pottery found in them. The three categories are:

- **Period 1 — Republic:** The sites included in this category were those in which Black Glaze pottery was found. The chronological limits of this period for the purposes of the data dealt with in the project are III century BC to end of the I century BC. The distribution of sites from period 1 is shown in Figure 24.5.
- **Period 2 — Early Empire:** To be included in this category sites had to have one or more of the following pottery types: Terra Sigillata Aretina, Terra Sigillata Sud Gallica, Terra Sigillata Hispanica, Thin-Walled ware or Terra Sigillata Chiara A. This period spans from the beginning of the I century AD to the mid III century AD. The distribution of sites from period 2 is shown in Figure 24.6.
- **Period 3 — Late Empire:** Sites dated to this period had either Terra Sigillata Chiara C or Terra Sigillata Chiara D. It should be noted that a large part of the Terra Sigillata Chiara D found and identified in local excavations is actually imitation produced locally.

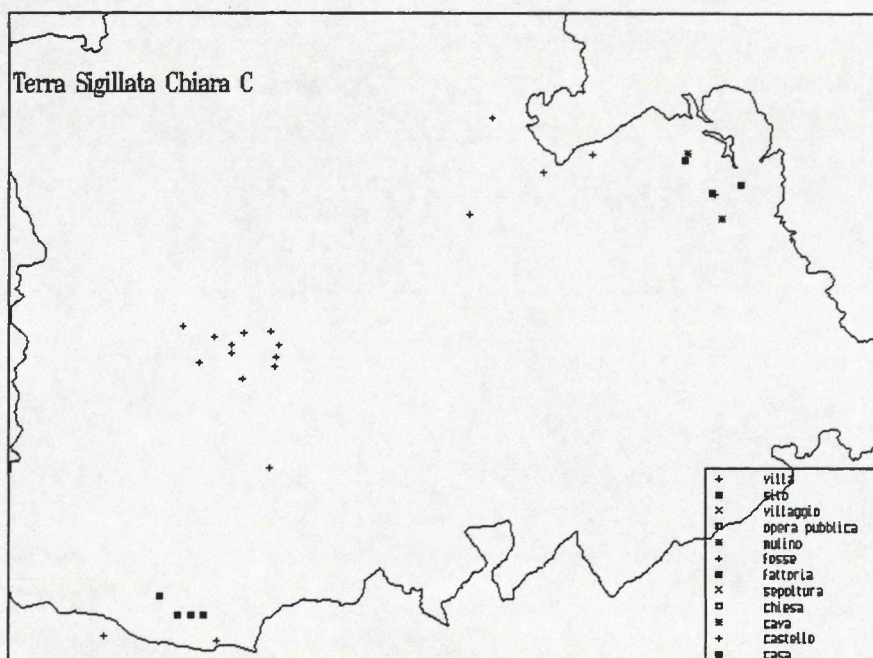


Figure 24.3: The distribution of Terra Sigillata Chiara C.

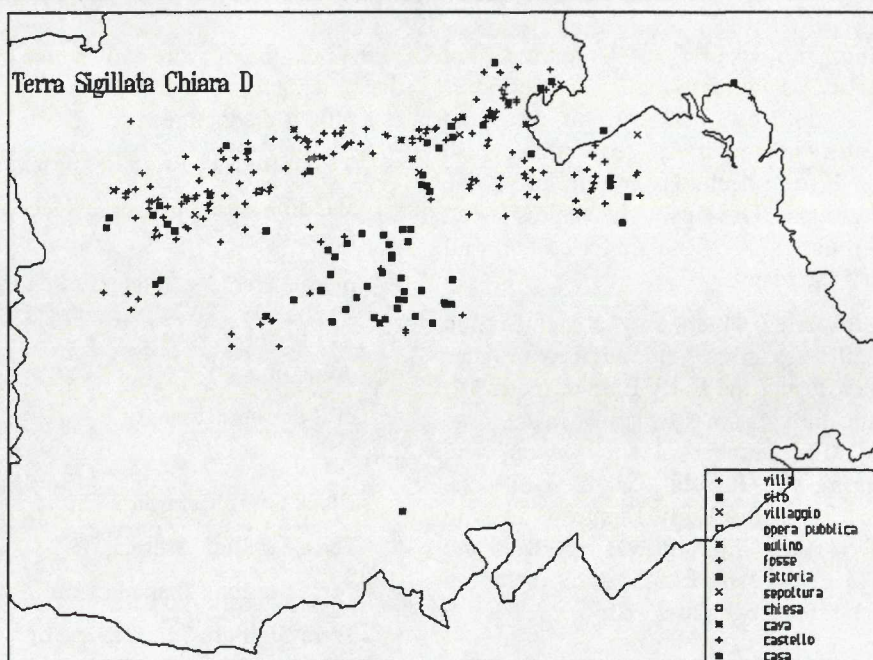


Figure 24.4: The distribution of Terra Sigillata Chiara D

This fact, however, has no effect as to the value of this type of pottery to the dating of the sites, as the imitation pottery must be contemporaneous of or later than the type it imitates. Interestingly, the fact that local imitation of Terra Sigillata Chiara D is so widespread in the area is a positive factor in terms of dating because, generally, sites are more likely to have local fine pottery than imported fine pottery. The same factor, however, can cause a site to be classified as a high status one, even though it might not have

been, if the imitation of Terra Sigillata Chiara D was easily available to low status sites as well. The chronological limits are from the mid III century AD to the VI century AD. The distribution of the sites classified as belonging to period 3 is shown in Figure 24.7.

A number of sites contained a type of pottery which the surveyors just classified as Terra Sigillata Chiara without specifying the sub-type. These sites were included in both the period 2 and period 3 groups, but were flagged to

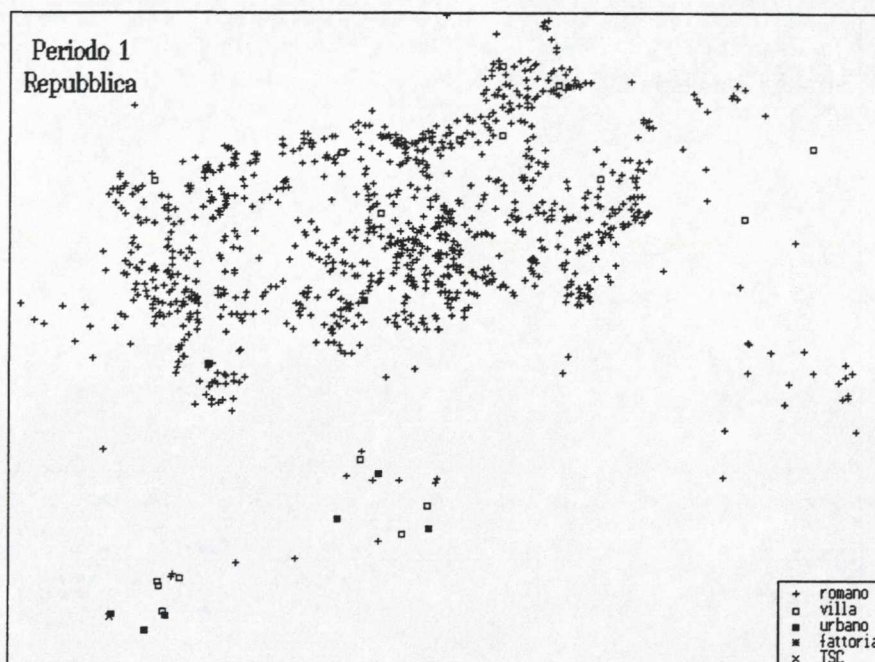


Figure 24.5: The distribution of sites dating from the Republic (period 1).

signify that the dating is not accurate. A large number of sites (1007) were classed as dating to the Roman period by the surveyors, but no diagnostic pottery was recovered from these. These sites were again flagged to distinguish them from those which have been classed into any of the three chronological groups. Obviously, the same site can have been in use throughout the Roman period and will therefore appear in all the maps.

Even excluding the sites which only contained non identified Terra Sigillata Chiara, the number of sites increases dramatically during the Early Empire (period 2) and then drops again, though not so sharply, in the Late Empire (period 3). The number of sites which were certainly in use during the Republic is 42, while the number increases to 618 in the Early Empire (721 with the sites where generic Terra Sigillata was recorded) and then decreases to 283 in the Late Empire (467 including those sites with generic Terra Sigillata).

### 24.8 Status classification

The classification of the sites was standardised according to the characteristics of the data stored in the database. As the most relevant distinction among the site types is between country sites with low status (farms) and those with a high status (villae), it was decided that a combination of certain specific elements had to be present at one location before that site could be labelled a villa. Where these diagnostic elements are missing, the site is classified as a farm. Farms are also differentiated from 'generic' sites which the surveyors did not classify as 'rural', to indicate that 'generic' sites are characterised by a higher degree of uncertainty.

For the valley of the Guadalquivir the standard classification was built up by comparing the interpretation

of the function of a site done by the people who carried out the systematic surveys in the region. A site was classified as a villa if it contained:

- a floor (mosaic or *opus caementicium*), or
- standing structures or evidence of their presence in the past, or
- marble elements (statues, architectural parts), or
- a kiln, or
- dolia, or
- mill or quernstones,

and

- Black Glaze Ceramic, or
- Terra Sigillata Aretina, or
- Terra Sigillata Hispanica, or
- Terra Sigillata Sud-Gallica, or
- Terra Sigillata Chiara (any subtype), or
- Thin-walled ware.

On the other hand, if a kiln and only local pottery were present, but no other elements such as imported pottery or floors, that was not considered enough to classify the site as a villa. Also, if a site contained early pottery (*i.e.* Black Glaze or Terra Sigillata Aretina) and an *opus signinum* floor, the site was classified as a villa because the *opus signinum* is an indicator of status in the early period, though not so in later periods. Any site which had been classified as a villa by the surveyors (systematic and non-systematic) was classified as a farm if it did not meet the specifications outlined above. As a result, according to the standardised classification, 436 sites were classified as villae. Of these, 247 had been originally classified as

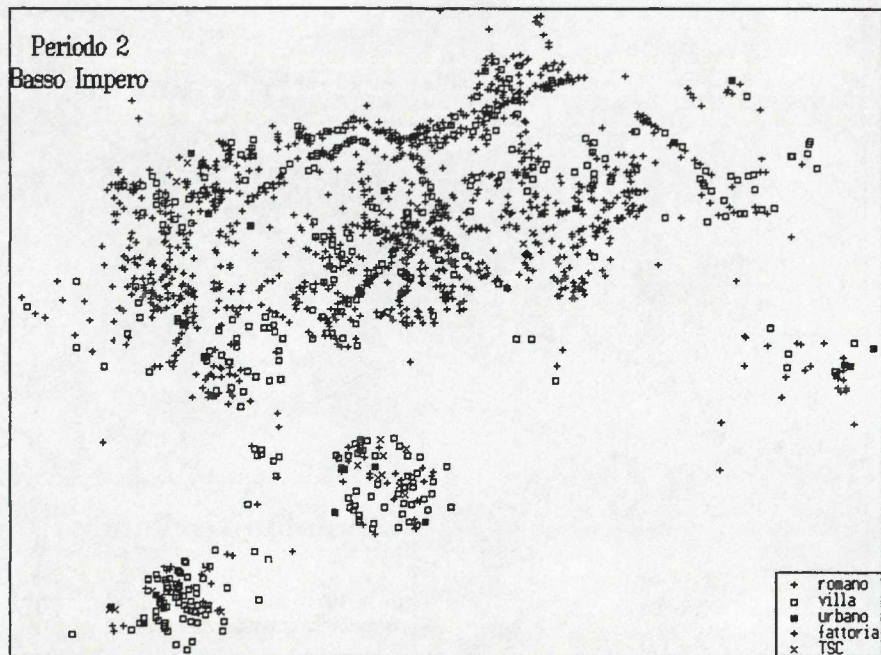


Figure 24.6: The distribution of sites dating from the Early Empire (period 2).

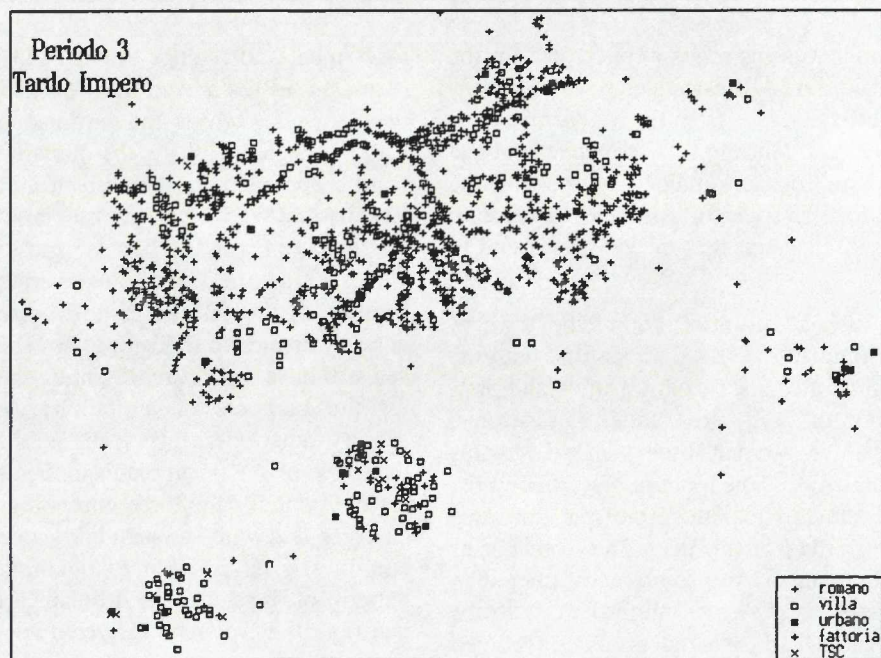


Figure 24.7: The distribution of sites dating from the Late Empire (period 3).

villae by the surveyors, while 189 were otherwise classified. The total number of sites which had been classified as villae by the surveyors was 561, which reflects the tendency for this methodology to stay on the 'low status' side when classifying country sites.

## 24.9 Looking at the data

In the valley of the Guadalquivir, major concentrations of sites are present around the two towns of Lebrija and El Coronil, while the area to the north of Seville presents a

more uniform pattern of site distribution (see Figure 24.8). This is due to lack of data for the area south of Seville, where surveys have not been carried out yet, rather than reflect a real archaeological pattern. The position of Roman sites in the area appears to be influenced by the position of modern features such as modern towns and roads. A good example of this is the pattern around the modern town of Carmona, where the sites follow the main roads, especially the C432 motorway. Ancient sites also seem to be related to major rivers. Cost distance buffers

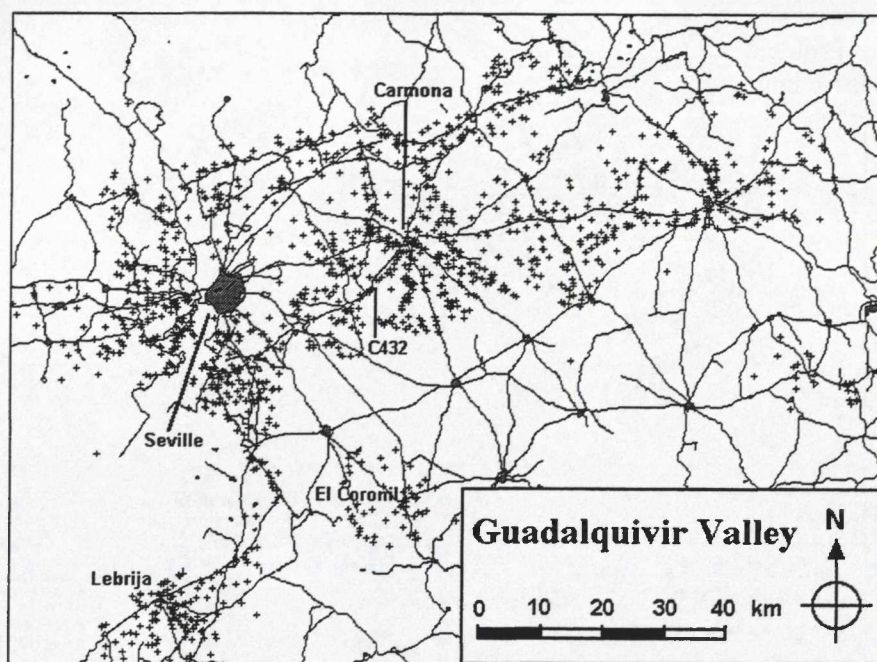


Figure 24.8: The distribution of Roman sites and the position of modern roads and towns.

starting from modern towns and roads were created for the valley of the Guadalquivir. The frequency of sites was then plotted against the distance from the modern features (Figure 24.9): the largest concentration of archaeological sites lies within 3 Km from any major feature, with the curve dropping sharply afterwards, with the increase of distance (the sites at 0 distance account for sites found in towns).

However, if we look at the area around the town of Carmona in detail (Figure 24.10), we notice that both the main motorway and the sites follow the landform. Carmona is on the top of a hilly area, called Los Alcores, which has (and had in Roman times) many streams running down its south side. The modern road follows the ridge at the top of the hill and therefore has the same direction as the line of the Roman sites. The Roman sites seem to be more abundant on the south side rather than the north side of the Alcores, which might be due to the presence of the streams and also the protection offered from the northern winds in winter.

When the site distribution is plotted against some of the background variables, it appears that some of these are related to the position of archaeological sites. To the north of the study area, the archaeological sites are found on riverine geology and they follow the geology so well that it is unlikely that this pattern is only influenced by the distance from the river. The sites are present up to the limit of one geology type and not in the neighbouring one. So far, not enough work has been done to assess whether this is a real settlement pattern or whether it reflects a bias in recovery or in the survival of the sites.

The next stage of the research will be to create a site suitability map of the Valley of the Guadalquivir. The concept of land suitability has been used in soil

assessment and ecology to determine the best use of land (e.g. De La Rosa & Moreira 1987, 85-130). This is based on elements such as the intrinsic characteristics of the soil, the degree of slope, the climate and the drainage. A similar approach can be used in archaeological research. The natural variables will be classified into a series of classes (from worst to best for site location) and then the values of all the background variables in any one cell location in the GIS maps will be added up, just like is done in predictive modelling. In the resulting map each cell will have a value representing the degree of suitability for the purposes of agricultural exploitation weighed against other elements such as the distance from the nearest known Roman road and the nearest town. The site distributions for the three chronological classes will then be compared with the suitability map. Hopefully, in the end it will be possible to obtain an indication of the pattern of land use in Roman times. Some of the questions that might be answered are:

- Did people start to move the settlement into marginal land when new sites were created in the countryside in the Early Empire?
- Are the sites in marginal land those which were preferably deserted when sites started to be abandoned in the Late Empire?

Another type of question that will be investigated is whether the relationship of rural sites (villae and farms) to urban centres changed in the three chronological periods. At a first glance, it appears that the site type which is closer to the urban centres are the farms, while the villae appear to be in an outer layer around the farms. This idea will be tested by creating a weighed cost surface around the urban centres and statistically testing the association between certain distance bands and the status of sites.



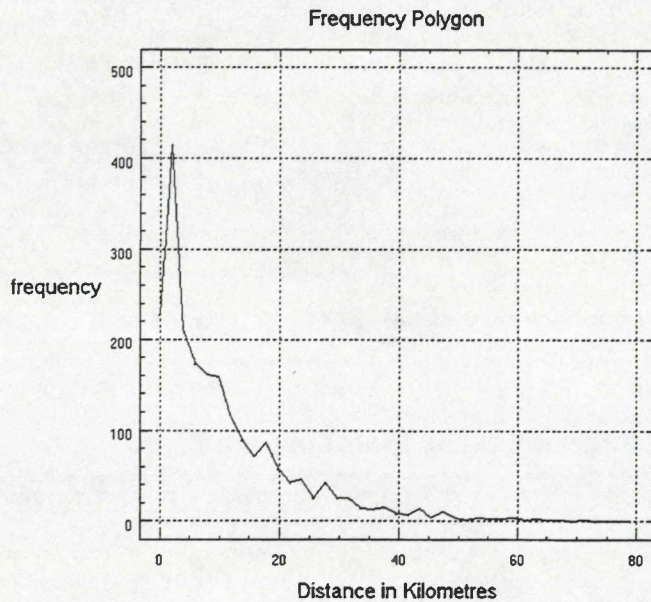


Figure 24.9: Graph of the site frequency plotted against the distance from modern features

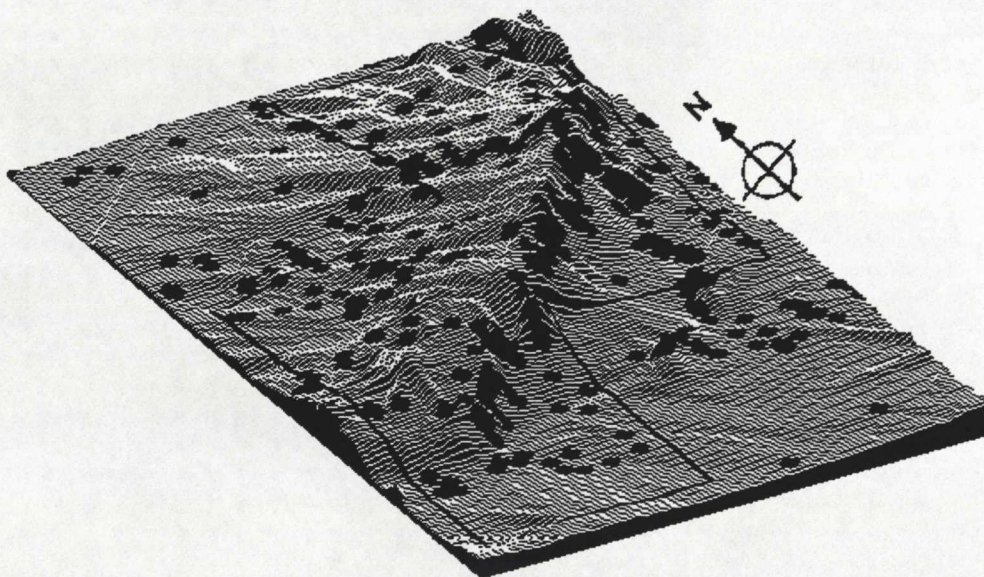


Figure 24.10: The area around modern Carmona. The dark patches represent concentrations of archaeological sites.

The weighed cost surface will include physical geographical information such as the landform and the soil type (swamps are not uncommon in this region), and human geographical information such as the position of known Roman roads.

Another point which will be investigated is whether the status of a site appears to have changed in time, for example, whether a farm in period 1 is promoted to villa in periods 2 or 3 or whether a villa in period 2 becomes a farm in period 3.

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**Appendix: Sample of database for the Maresme area**

CD	NO	X	Y NOME	VA TIPO	ST PAV	TL	AR	HI	RE	AU	EE	TC	LE	MA	DO	AM	CA	CO	TI	TH	TA	TG	GL	MB
al	1	639	561 Castell d'Altafulla	3 astle	T	F	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F
al	2	640	573 Village de la Coma	11 village	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
al	3	646	572 Vil.la de la Casera	13 villa	T	T	F	F	T	T	T	T	F	F	T	F	T	T	T	T	F	F	F	F
al	4	637	579 Vil.la de la Revella	13 villa	T	T	F	F	F	F	F	T	F	F	T	F	T	F	F	F	F	F	F	F
al	5	648	553 Pedrera 'Els Munts'	4 quarry	F	F	F	F	F	T	T	T	T	F	F	F	F	F	F	F	F	F	F	F
al	6	635	565 Pedrera Sant Antoni	4 quarry	F	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F
al	7	647	554 Els Munts	13 villa	T mosaic	F	F	F	F	T	T	T	T	F	F	F	F	F	F	F	F	F	F	T
al	8	639	560 Vil.la de l'Esglesia	13 villa	T sign	F	F	F	F	T	T	T	F	T	F	F	F	F	F	F	F	F	F	F
al	9	649	561 Vil.la del Costat	13 villa	T sign	T	T	F	F	F	T	T	F	F	T	F	T	F	T	F	T	F	F	F
al	10	635	567 Sant Antoni	5 site	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
ca	1	589	587 Vil.la dels Cocons	13 villa	T	T	F	F	T	T	T	T	F	T	T	F	T	F	T	T	F	F	F	F
ca	2	585	624 Vil.la Mas Moragues	13 villa	F	F	F	F	T	T	T	T	F	F	F	F	F	F	F	F	F	F	F	F
ca	3	552	572 Manous	5 site	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
ca	5	590	599 Mas d'En Ros	13 villa	T	T	T	F	T	F	F	F	F	F	T	T	F	T	F	F	F	F	F	F
ca	6	579	613 Mas d'En Bernat	13 villa	F	F	F	F	T	F	F	F	F	F	T	F	F	F	F	F	T	F	F	F
ca	7	595	598 Castell el Catllar	3 castle	T	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F
ca	8	568	587 Quadra de Vilet	13 villa	T	T	F	F	T	T	T	T	F	F	T	T	F	F	T	T	F	F	F	F
ca	10	568	632 Mas Fortuny	2 house	T	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F
ca	11	585	624 Mas Moragues	2 house	T	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F
ca	12	597	585 Camp de Tir	5 site	F	F	F	T	T	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
ca	13	566	618 Sitja Carrettera	5 site	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
ca	14	552	575 Manous	5 site	F	F	F	T	F	F	F	F	F	F	T	F	T	F	F	F	T	F	F	F
co	1	488	567 Mas dels Frases	13 villa	T sign	T	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
co	2	501	576 Castell de Constantí	3 castle	T	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F
co	3	492	578 Vil.la de Centcells	13 villa	T mosaic	F	F	F	T	T	T	T	F	F	F	F	F	F	F	F	F	F	F	F
co	10	492	578 Les Tries	13 villa	T sign	F	F	F	T	T	T	T	F	F	F	T	F	T	T	T	T	F	F	F
co	13	485	567 Sant Llorenç	7 church	T	F	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F	F	F
co	14	492	574 Mas de Serapí	13 villa	T sign	F	F	F	F	F	F	F	F	F	T	F	T	F	T	T	T	F	F	F
co	15	499	571 Sant Pol	5 site	F	F	F	F	T	T	T	T	F	F	F	F	F	F	F	F	F	F	F	F
co	16	485	566 Sant Llorenç	13 villa	F	F	F	F	T	T	T	F	F	F	F	T	T	T	T	F	F	T	F	F
co	17	498	566 Riuderenes II	5 site	F	F	F	F	T	T	T	T	F	F	F	F	F	F	F	F	F	F	F	F
co	18	489	553 Les Gavarres	11 village	F	F	F	T	F	F	F	F	F	F	T	F	F	F	F	F	F	F	F	F
co	19	502	558 Riuderenes	5 site	T	T	T	F	T	T	T	T	F	F	F	T	T	F	F	T	T	T	F	F

Key to the database field names:

CD	Town code	AR	Architectural Remains	AM	Amphorae
NO	Number	HI	Hiberic Period	CA	Campanian Pottery
X	X coordinate	RE	Republican Period	CO	Common Pottery
Y	Y coordinate	AU	Augustus	TI	Terra Sigillata Italica
NOME	Name	EE	Early Empire	TH	Terra Sigillata Hispanica
VA	Value	TC	Third Century	TA	Terra Sigillata Africana
TIPO	Type	LE	Late Empire	TG	Terra Sigillata Sud Gallica
ST	Structure	MA	Middle Ages	GL	Glass
TL	Tiles	DO	Dolia	MB	Marble

Table 24.1: Sample of database for the Maresme area