The archaeological map of Barcelona

Archaeology, history and heritage – from prehistoric times to the civil war

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Fig. 1 – Plànol Carta Arqueològica

The Archaeological Map of Barcelona [http://cartaarqueologica.bcn.cat] represents an inventory of the city's historical past, devised with the aim of providing a corpus of unified information that contains all the documentation on Barcelona's archaeological heritage, to create a document oriented towards the analysis, diagnosis and assessment of subsoil and built heritage. The timescale of the remains documented in the Map date from prehistory up until the Spanish Civil War.

The Map was carried out with a very clear dual aim: to create a document that would encourage reflection and raise awareness of the city, as well as providing an instrument for administrating land use which includes criteria for sustainability.
It is a project of the Barcelona City Council, developed by the Barcelona Institute of Culture, the Division of Heritage, Museums and Archives and coordinated by the Department of Documentation at the Archaeology Service. The online publication has been carried out in conjunction with the Department of Information Systems.

Objectives and methods

The main goals are to highlight to the citizenship and the researchers the information and the documentation generated by the archaeological interventions and the dissemination of the heritage of the city.
A series of points regarding the Map that characterize the project:

- The adoption of standard viewing tools will make the project easy to use for everyone, including the general public.
- Emphasis has been placed on facilitating the online presence of a large volume of cartographic and documentary information.
- The geographical display of each intervention and the documentation available for consultation in each case are well integrated. Thanks to the fact that most of the interventions are geo-referenced, geographical display has been used as the Map's main hub, which means that the user can access in-depth information using a more intuitive perspective, not only by carrying out searches with forms, but also by browsing across the land area.
- The Map has enormous didactical potential, thanks to the amount of linked information and its hierarchisation.
- A commitment to transparency and openness in documentation with respect to the general public and the scientific community. Both the Archaeological Map and its contents are fully accessible online, as well as being linked to Barcelona City Council's Open Data project.
- The Map represents a new tool for academic and scientific research in the field of Barcelona's history and heritage.
- The project promotes the dissemination of municipal heritage online. The availability of heritage collections online represents a step forward in terms of increasing people's access to their cultural heritage. Such promulgation not only fosters the spread of knowledge, it also increases the possibility of researching and studying this heritage by linking it up with specialised branches that would not otherwise be connected with heritage collections unrelated to their own branch of specialisation.
- It has been decided in favour of Google Maps, above all because it is a clear leader in non-professional geographical knowledge consultation environments, and also thanks to the huge range of display possibilities that it offers, both through the use of technologies such as Street View and the fact that 3D displays can be inlaid within it. However, consultations can also be made using Open Street Map, or with Barcelona City Council's plot map or its official city guide.

The archaeological interventions

The Map is an inventory of interventions and places of archaeological interest. It is based on the idea that Barcelona is a unique site with a number of different points of archaeological interest. As part of the interventions that have taken place including all the actions carried out on the archaeological heritage; on the one hand, the surveys (with or without lowering the subsoil) and on the other, the large-scale excavations, both preventive and planned. Also included are the sporadic finds and all the latest information on possible actions where archaeological material or historical structures have been located. Now there are more than 3500 points on the Map.

The timescale of the archaeological remains ranges from prehistory up until the 19th century, in addition to the heritage related to the Spanish Civil War, including examples such as the anti-aircraft battery on Turó de la Rovira and the underground shelters. It should also be noted that files have been created based on a

number of different historical studies, most of them on specific buildings. This section includes information about the archaeology of architecture and the non-invasive surveys in built heritage. Also included in this section are the files on the air raid shelters built in Barcelona during the Spanish Civil War.

Another feature is that we have identified all the old villages annexed to the city that make up the diversity of Barcelona (i.e. Sant Andreu, Horta, Gràcia, etc.)

The archaeological units

In addition to the intervention files, there are also unit files. Units are elements of interest or which have a distinct personality within the history of Barcelona, possessing their own differential features in terms of, for example, their typology (functional unit) or their chronology (temporal unit). A temporal unit refers to all the synchronic archaeological elements; that is, elements that belong to a specific historical period in the evolution of the site "Barcelona". For example: "The map of Barcelona in the Neolithic", "The map of Barcelona in the Iberian era", and so on.

The term functional unit refers to a specific archaeological element, or to an interrelated collection of such elements with their own personality, characteristics and individual functions, whether they are synchronic or diachronic, for instance: Burial Area, Shelters, Aqueduct.

Several examples are included in which the numerous possibilities of the functional unit concept can be seen, such as the various walled enclosures, the Roman aqueduct and Rec Comtal.

There are three types of entities: THEMATIC: a house; TEMPORAL: Early Empire and SPATIAL: the Roman city.

The geographical data

The basic work unit for the graphic display of areas of archaeological interest are closed polygons, though occasionally some displays take the form of line or dots. In the case of interventions, the polygon on the map corresponds exactly to the excavated area, which always has a unique identifying code that links it to the corresponding alphanumerical information. There are also cases where the geographical entity is not shown as a polygon, but as a dot. This basically refers to interventions where the information is so scarce that we have not been able to attribute a specific area to them, only a general location. This is the case with the Civil War shelters, as it's only a suspect that they exist, but we do not know their exact location, not to mention their shape or layout.

On the website different types of searches can be made. Users can search for an archaeological intervention by street name, type of heritage (for example, defensive elements, burial areas, etc.) or by chronology.

A specific thesaurus has been devised for the city of Barcelona, for both the different types of heritage, and the chronology, which ranges from prehistory up to the present day. Users can refine their search in more detail and carry out combined searches, by defining the types of heritage they want to find, and setting them within a specific timescale. For example, if a user is searching for defensive elements, then all the city's walled enclosures and the elements from the Civil War will be listed; however, if the user searches not only for defensive elements, but also specifies the Roman Age, all the interventions that have affected Barcelona's Roman walls will be listed.

The information associated with each point is organised into five thematic blocks:

1. Geographical location
2. Description and historical notes
3. Chronology and typology of finds
4. Technical and legal information
5. Documentation

With respect to the technology used, the environment of the web publication is Internet Information Server, programmed in .NET and supported by SQL Server database. The digital cartography used is Google Maps, with the optional extra of the WMS (World Map Services) services of Barcelona City Council (plot map and city guide) and OpenMaps.

Geoportal

One of the project's strong points is that archaeological information can be consulted on the Barcelona City Council Geoportal in a broader context that includes all the other layers of corporative geographical information (town planning, heritage catalogue, cadastre, topographic data, etc.).
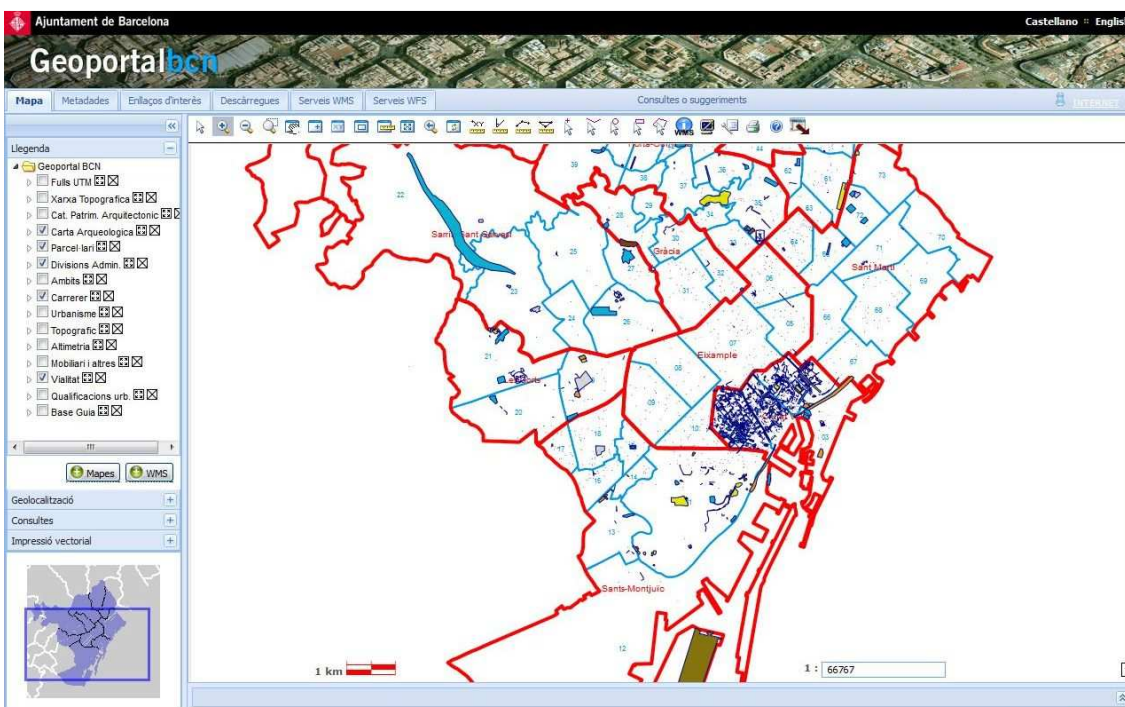

Fig. 2 – Geoportal [http://w24.bcn.cat/GWMPNet61_bcn/extlayout.aspx]

A number of different agents have participated in this project, including the Municipal Information Technology Institute of Barcelona City Council's Urban Habitat sector.

The archaeological layer, within the viewer of the Geographic Information System (GIS) also means that the archaeological information can be situated within the broadest context of the official cartography.

On the Geoportal, apart from being able to locate all the archaeological interventions, country house, urban centre and raid shelters, a programmed search has been included according to the results:

1. Negative. Stratigraphy exhausted. These are interventions where no archaeological remains have been documented, and researchers have reached the natural terrain, the geological substratum. Thus, these are areas that are completely free from all archaeological restrictions.

2. Positive. Stratigraphy exhausted. These are interventions where remains have been located, but also where researchers have reached the natural terrain, the geological substratum, and the remains have usually been dismantled.

3. Negative. Stratigraphy not exhausted. These are interventions where no archaeological remains have been found, but part of the sediment has yet to be excavated, as a result of which any architectural or urban planning actions, or any lowering of the subsoil must bear in mind the need for preventive archaeological intervention.

4. Positive. Stratigraphy not exhausted. These are sites where excavation has been carried out, remains have been documented, but part of the sediment has yet to be excavated. As a result of this any architectural or urban planning actions, or any lowering of subsoil must bear in mind the need for preventive archaeological intervention.

5. Positive without lowering of the subsoil. This group covers, on one hand, interventions of the archaeology of architecture (that is, archaeological interventions carried out on built and conserved edifications, such as a mediaeval palace or the Roman Wall, while on the other, the section also includes most historical heritage studies.

This project has been devised with the aim of ensuring transparency of information and access to same by the general public. Both the Archaeological Map and its contents are fully accessible online, and users can also download the data from Barcelona City Council's Open Data Project. [http://w20.bcn.cat/opendata]
With the integration of the Archaeological Map in the Geoportal, the following will be facilitated:

- The management of preventive archaeology in the city in all the municipal situations in which it is required (town planning, district technical services, etc.)

- The system will streamline the day-to-day work of technicians in the Archaeology Service and the Documentation Centre when archaeological intervention projects have to be implemented.

- An additional layer of archaeological information for basic public consultation by all professional groups interested (builders, architects, historians, etc.), as well as the general public, has been added to the municipal cartography display on the internet (Geoportal)

The immediate objective of the current project is to incorporate into the City Council's Geographic Information Systems all the information contained in the database of archaeological interventions and other archives (intervention reports, photographs, etc.), and which constitute part of the collection of the Documentation Centre for the Archaeology Service and the History Museum.

The future

- After all the work that creating the Archaeological Map has involved, we must consider all the different ways in which the general public can make use of it.

- Our main objective must be to ensure transparency of information and the regular updating of the archaeological heritage of the city of Barcelona, with a wide diversity of interpretations.

- The Map should be a tool for debate and administration, and should be linked up to other projects from the Institute of Culture, such as the new project BARCINO.
- A specific project has been developed this year related to the celebration of the third centenary of 1714 [http://cartaarqueologica.bcn.cat/monografics/1714/]
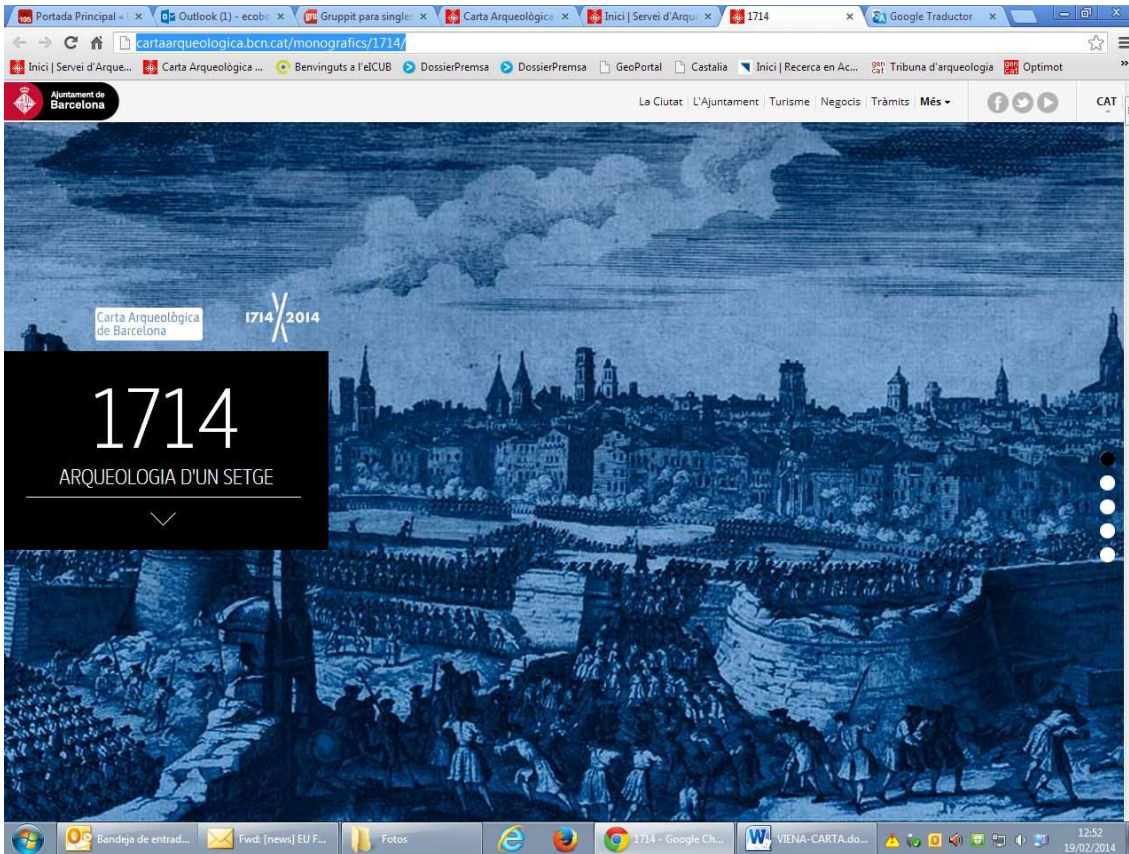

Fig. 3 – Monografic-1714

- Plans exist to create a geo-referenced layer of historical cartography that can be viewed using Vista. Barcelona City Council possesses a large collection of historical cartography of the city; this part of the project should be developed in tandem with the City Historical Archives, as well as with the IMI. There is a whole range of crucial planimetry documents available –for instance, the plans by Garriga i Roca, Martorell and Cerdà.
- A new phase has been started in the graphic display of the data on the Archaeological Map. At present only the polygon affected by interventions have been included. The specific planimetry could be drawn according to phases, which would provide us with chronothematic maps of the territory from prehistory up until the present day.
- The Archaeological Map makes available to the public in general a great amount of information that must be updated constantly to include the new finds. Archaeological heritage is an ever-changing asset, and the Archaeological Map of a particular location should reflect this.