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The Technical Archive and the Map Library of the National Geographic Institute of Spain (IGN): Documentation, accessibility and applications

Keywords: Technical Archive; Map Library; Documentation; Accessibility, Applications

Summary: The Technical Archive and the Map Library (Cartoteca) of the National Geographic Institute of Spain (IGN) have a large number of original documentation: including different cartography series such as the Cadastral Topography of Spain, the National Topographical Map 1:50.000, their related documentation and other maps and cartography. This paper will collect and describe all the valuable information that is preserved in the facilities of the IGN, paying attention to both accessibility for users through the website and the different applications that can be given to the documentation. In the same way, we will explain how to download the documentation from the Download Centre of the IGN website, how to access to the documentation that is not digitized yet and, above all, we will show some examples of different problems users can face as practical cases.

Introduction

The aim of this paper is to give a global vision and to get to know the documentation (cartography but also other kind of documentation) that is preserved in both the Technical Archive and the Map Library of the IGN, but also provide an insight into how to access the documentation and the utilities or applications of this cartography. This paper focuses on practical cases that often occur in most of the user queries, so it could serve as a reference for future queries the IGN may have.

The Technical Archive, also called Topographical Archive, holds the documentation generated during the different cartographic production processes in the IGN: this includes all data produced from the Institute's foundation to approximately the use of photogrammetric aerial methods, from the end of 19th century to the first half of the 20th century. In addition, the Archive keeps numerous documents produced by the Junta General de Estadística and other public institutions that preceded the Geographical Institute (Instituto Geográfico).

The Map Library, "Cartoteca" in Spanish, has its origin in 1870, year of the Instituto Geográfico foundation. Nowadays, the Cartoteca of the IGN holds diverse cartography produced by the Institute but also from other public bodies or the private sector, incorporating maps and cartography through mechanisms for exchanging information, agreements between institutions or purchase. Most of the documentation is modern cartography, but the Cartoteca also abodes old maps from 16th, 17th or 18th centuries, in addition to atlases, national and international cartographic series, thematic maps, nautical charts, touristic maps and the IGN cartographic series from the first half of the 20th century until today.

So the main difference between the documentation held in Technical Archive and the one held in the Map Library is the authorship. The Map Library includes maps and cartography of diverse authoring, not only the documentation related to the cartographic processes in the IGN.

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Documentation

Technical Archive

- Catalonia and Balearic Islands cadastral maps (1847-1858)

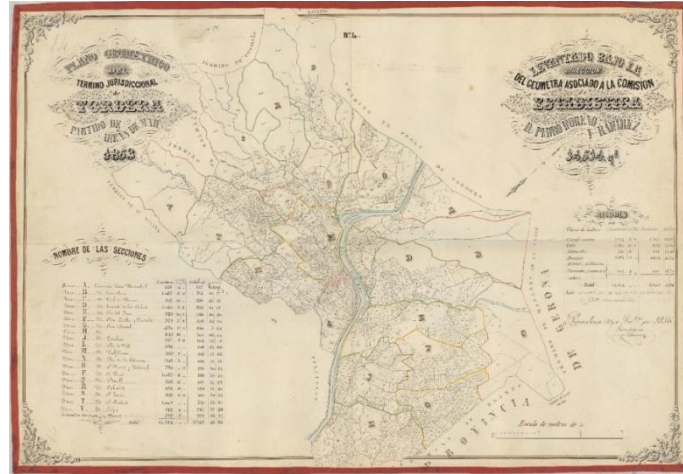


Figure 1: “Plano geométrico del término jurisdiccional de Tordera” 1856.
Cadastral map of Tordera municipality in the province of Barcelona. Signature 081064, IGN Archive.

The oldest maps held in the IGN Archive are these large dimension cadastral maps commissioned by some municipalities of Catalonia and the Balearic Islands and produced by geometers associated to the Comisión Estadística (Statistic Commission). These maps are not based in any geodetic network and the scale of each map varies: 1:5.000, 1:7.500 or 1:10.000. These maps show the land parcels, roads and paths, rivers and streams, but not the contour lines because it's strictly a cadastral map and it doesn't include any topographical information. There are also Land Registry books related to the cadastral maps that show the dimensions of the parcels and the different land uses.

- Comisión de Estadística General del Reino cadastral maps (1856-1859)

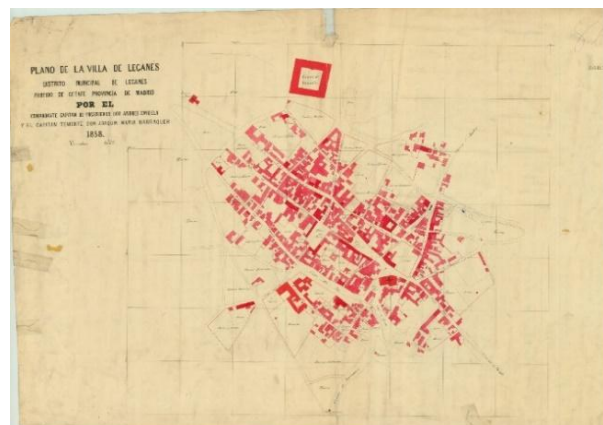


Figure 2: Urban cadastral map of Leganés. Scale 1:2.000. 1858.
Signature: 280811, IGN Archive.

The “Comisión de Estadística General de Reino” elaborated a cadastral project for registering the rural and urban parcels in some municipalities in the province of Madrid. The documentation held

in the Archive related to this project includes: sketches, rural cadastral maps, urban cadastral maps, etc.

- Cadastral Topography of Spain (1861-1870)

The Cadastral Topography of Spain was a project developed by the Junta de Estadística between 1861 and 1870. This is probably one of the most important cadastral projects in Spain and it includes kilometrical sheets, urban sheets, cadastral statements of both rural and urban parcels, triangulation sheets, distribution maps, sketches, numeric and alphabetic lists of land owners, etc. This project was too ambitious so it was abandoned in 1870 and they only finished the works in some municipalities of Madrid and some other cities in Spain, such as Soria, Murcia or Cartagena. Kilometrical sheets: Rural areas, each sheet is 1km x 1km, scale 1:2.000.

Urban sheets: Urban areas. Scale 1:500. It includes the floor plan of main buildings.



Figure 3: Left: Kilometrical sheet of Alcalá de Henares. Scale 1:2.000. Sig. 282248, IGN Archive.
Right: Urban sheet of Aranjuez. Scale 1:500. Signature 283204, IGN Archive.

Cadastral statements: This document includes information about a rural or urban land parcel in the kilometrical sheets and the urban sheets: owner, plot area, land use and a graphic of the parcel.

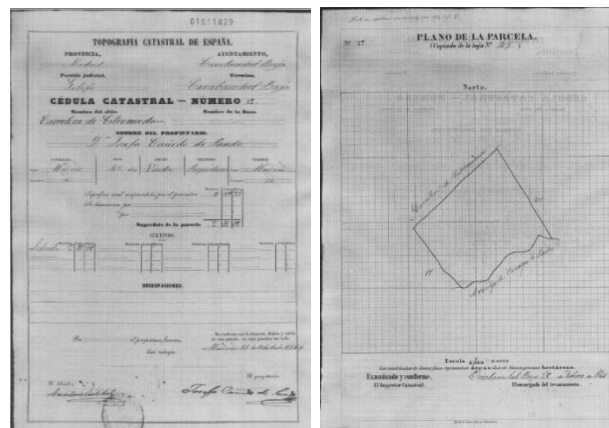


Figure 4: Cadastral statements of Parcel 27A in Carabanchel Bajo, IGN Archive.

- Work stages before the first edition of the Mapa Topográfico Nacional 1:50.000 (National Topographical Map of Spain scale 1:50.000).

The *Instituto Geográfico* started the “Mapa Topográfico Nacional 1:50.000” project in 1870. This cartographical work, with more than 1.100 final sheets, is the first complete map of Spain based

on a geodetic network and it is held in the IGN Map Library. Between 1870 and 1940 approximately, the first work stages of this project took place, it was the first field works based on municipalities right before the introduction of photogrammetric methods in topography. These documents produced in the initial work stages of the MTN50 project are hold in the Technical Archive of the IGN:

- 1- Outlining municipalities. **Boundary line statements and fieldwork notebooks** between each town and all municipalities around.

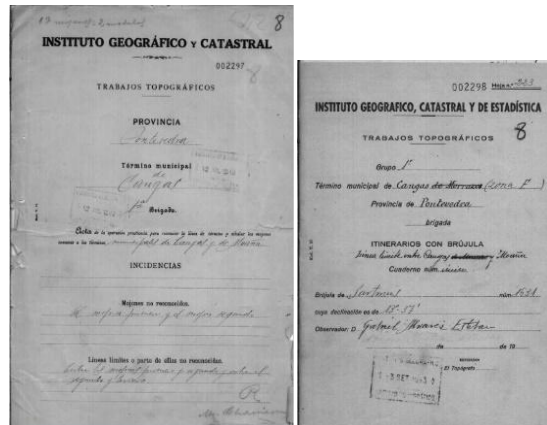


Figure 5: Boundary line statements and fieldwork notebooks between Cangas and Moaña municipalities 1943. Signatures 002297, 002298; IGN Archive.

- 2- **Planimetric maps** scale 1:25.000 of each municipality. It includes boundary lines, roads and paths, rivers and streams, land uses (for taxes), place names, etc.
- 3- **Altimetric maps** scale 1:25.000 of each municipality. It includes contour lines and altitudes in meters.

Planimetric and Altimetric maps are usually elaborated separately and they were mixed together for the creation of the final sheet of the MTN50. However, sometimes Planimetric and Altimetric maps appear together in just one sheet.

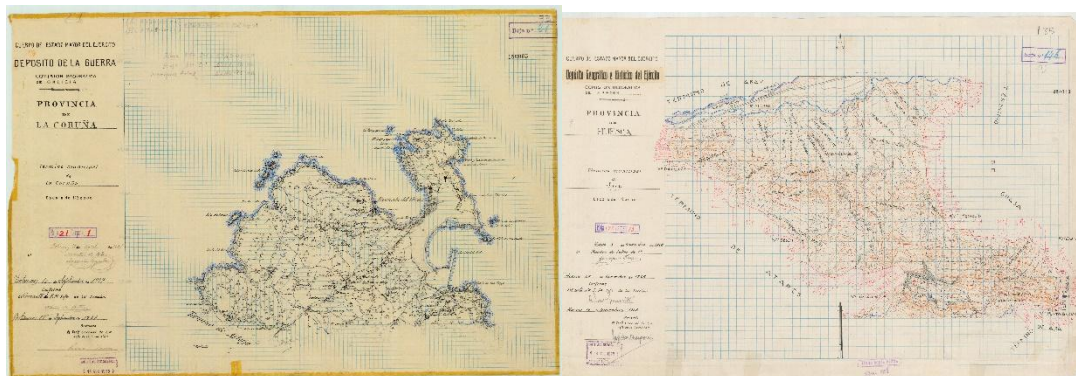


Figure 6: Left: Planimetric map of A Coruña municipality 1927. Signature 150065, IGN Archive. Right: Altimetric map of Jaca municipality 1928. Signature 220813, IGN Archive.

- 4- **Built-up area maps, built-up area maps in fieldwork notebooks and outstanding buildings maps** scales 1:5.000 or 1:2.000. This map shows the population centre of the municipality: polygons, names of the streets.

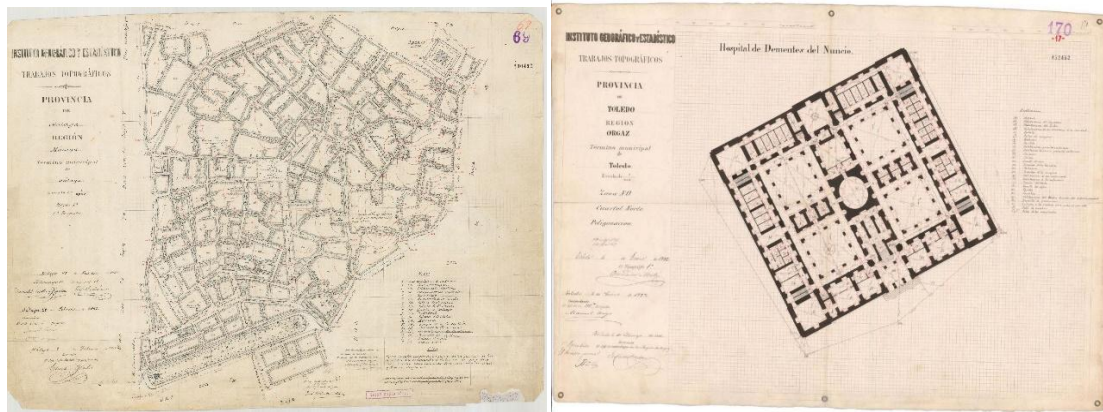


Figure 7: Left: Built-up area map of Málaga municipality 1897. Signature 290492, IGN Archive.
Right: Buildings map of a hospital in Toledo 1892. Signature 452452, IGN Archive.

5- **Other documentation** related to these previous works to the first edition of the MTN50 that is preserved in the Archive, especially fieldwork notebooks: paths and roads notebooks referred to the Planimetric maps, Altimetric notebooks, polygon notebooks, triangulation, geodesic vertex index, etc.

- Cadastral Topographical Map (1925-1990)

The Technical Archive also preserves the original cartography related to the Cadastral Topographical Map project (1925-1990) for some municipalities of the province of Madrid. The maps from this project show the land parcels of the rural areas ordered by polygons, excluding the population centre. The *Instituto Geográfico y Catastral* committed this project, but when the Geographical Institute disposed of the cadastral functions in the 80s, almost all the documentation showing cadastral information and land parcels were transferred to the Cadastre of the Ministry of Finance of Spain.

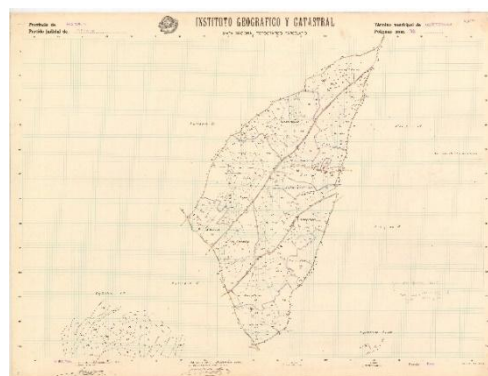


Figure 8: Cadastral Topographical Map of Ciempozuelos municipality 1947.
Signature 880878, IGN Archive

Map Library

- Printed editions of the cartography produced by the IGN: **Mapa Topográfico Nacional 1:50.000 (MTN50)**, **Mapa Topográfico Nacional 1:25.000 (MTN25)** (National Topographical Map of Spain scales 1:50.000 and 1:25.000), the **MTN50 drafts (1915-1960)**, **provincial maps**, thematic maps, relief maps, Spain's National Atlas, etc.

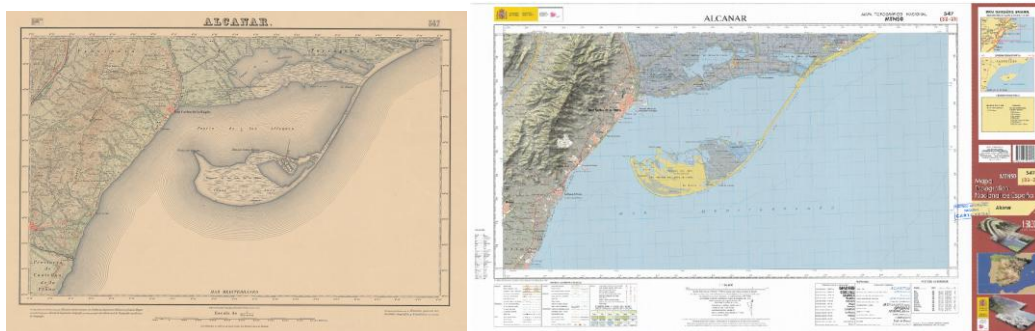


Figure 9: The first and the last edition of the 547-sheet of the MTN50, 1920 and 2014.

- Cartographic collection: national and international maps: modern cartography, old maps (before 1900), atlases, cartographic series, thematic maps, nautical charts, touristic maps and more.

Accessibility

Regarding the accessibility for users to the above-mentioned documentation and cartography, it can be summarized in the following table. There is an explanation for every situation at the bottom:

		Dig+CdD	Dig+NoCdD	NoDig	Cartoteca
Catalonia and Balearic Islands cadastral maps			X		
Comisión de Estadística General del Reino cadastral maps			X		
Cadastral Topography of Spain (1861-1870)	Kilometrical sheets		X*		
	Urban sheets		X		
	Cadastral statements		X*		
	Other documents			X	
Boundary line statements and fieldwork notebooks	Boundary line statements	X			
	Fieldwork notebooks	X			
Previous works to the first edition of the MTN50	Planimetric maps	X			
	Altimetric maps	X			
	Built-up area maps	X			
	Outstanding buildings maps	X			
	Other documents			X	
Cadastral Topographical Map (1925-1990)			X		
MTN50		X			
MTN25		X			
MTN50 drafts (1915-1960)		X			
Provincial maps		X			
Atlas					X
Old maps					X
Other authorships cartography					X

Dig+CdD: Digitized and accessible from the Download Centre (Centro de Descargas, CdD)

Dig+NoCdD: Digitized but not accessible yet from the Download Centre (CdD).

NoDig: No digitized due to the huge volume of the documentation.

Cartoteca: Digitized or not but registered in the Cartoteca's Catalogue.

*: About kilometrical sheets and cadastral statements: They are not available for download yet but there is a visualization method through the Kilometrical Sheets Web Service (WMS).

Download Centre: Most of the documentation found in the Technical Archive is digitized and uploaded to the IGN *Centro de Descargas* "Download Center": boundary line statements and fieldwork notebooks; Planimetric, Altimetric, built-up area and outstanding buildings maps; MTN50 and MTN25; provincial maps, etc. This documentation has in common that it is produced by the IGN or the institutions that preceded the actual IGN, therefore, it has a great value due to its uniqueness.

Digitized but not uploaded to the Download Centre: There are some products that are not accessible yet from the website, but there are plans to upload them in the near future. Most of these products are not complete series and only affect a particular area: Comisión de Estadística General del Reino cadastral maps, Cadastral Topography of Spain (1861-1870) and the Cadastral Topographical Map (1925-1990) are only available for some municipalities of Madrid province and from Catalonia and Balearic Islands cadastral maps there are just a few maps preserved.

No digitized documentation: The documentation that is not digitized occupies a large part of the Technical Archive and it includes all the fieldwork notebooks and sketches from the Cadastral Topography of Spain (1861-1870) and the previous works to the first edition of the MTN50. This documentation is accessible for site consultation, so anyone can make a reservation for coming to the IGN Technical Archive to make a research about a map, an area, a road, a building, a boundary, etc.

Cartoteca Catalogue: The maps that are preserved in the Map Library are all catalogued, currently there are a total of 12.142 maps, atlases and other cartographic material registered. Most of the documentation is not digitized yet, but there are some other that is accessible for visualization through the Cartoteca catalogue. Old maps from 16th, 17th or 18th centuries are almost all digitized for conservation reasons.

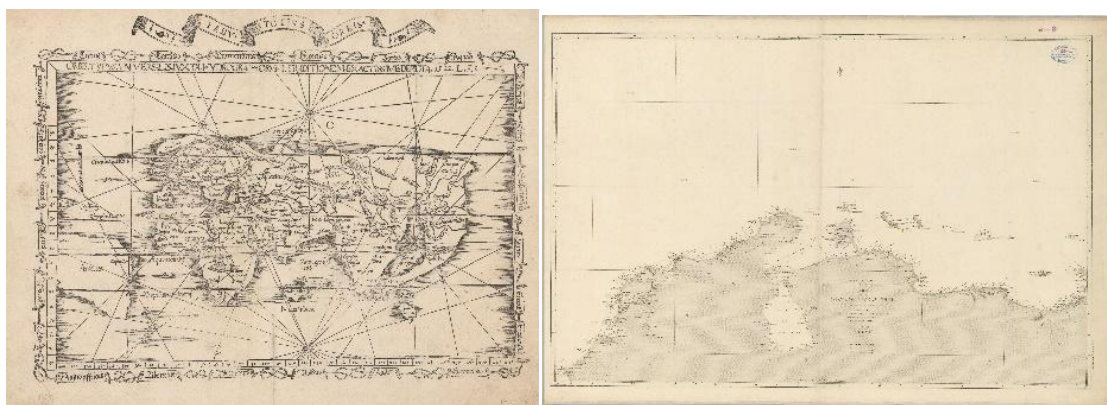


Figure 10: Some examples of Map Library maps. Left: *Orbis Typus Universalis*, 1535. Sig. 13-D-2.
Right: Nautical chart of the north coast of South America 1866. Sig. S1-35-A-56

Applications

This paper also focuses on practical cases that often occur in most of the queries when users request geographic documentation and cartography, so we will show some examples of problems, conflicts or doubts together with the documentation that can help to solve the case.

- **Paths and roads:** One of the most common queries is about paths and roads conflicts: the shape of the path, the parcels that are affected by a path, problems about the property, the geographical name of the path, the existence or not of the path in the official cartography, etc. There are considerable cartography about this query, but none of the documents shows the property of the paths and roads, which is one of the principal interest of users... This information is available in the Cadastre of the Ministry of Finance or in the Property Registry. The exact measurements of the paths are contained in the fieldwork notebooks of paths and roads referred to the Planimetric maps, so this could be the most useful document for a path study. Documentation that is helpful in this case:
 - Planimetric maps
 - Fieldwork notebooks of paths and roads referred to the Planimetric maps
 - MTN50 and MTN25
 - Aerial photography (IGN *Fototeca*)
 - For some municipalities of Madrid: Kilometrical sheets and Cadastral Topographical Map (1925-1990)

- **Parcels:** Some users come to the IGN looking for historical cartography of their land parcel from different provinces of Spain. Nevertheless, there is only a few cadastral cartographies where parcels appear and it is just related to some municipalities of Madrid, so it is very common to redirect this kind of queries to the Provincial Cadastre office or to the Provincial Historical Archives, where this documentation is preserved sometimes. This is the principal documentation for this case:
 For some municipalities in Madrid:
 - Kilometrical sheets, urban sheets and Cadastral statements (1861-1870)
 - Cadastral Topographical Map (1925-1990)
 - Comisión de Estadística General del Reino maps (1856-1859)
 For some municipalities of Catalonia and Balearic Islands:
 - Cadastral maps (1847-1858)
 Other: Aerial photography, planimetric maps, MTN50, MTN25, etc.

- **Boundaries:** Municipal councils usually look for information regarding the boundaries between their municipality and their neighbour municipalities for to elaborate their boundary line statements, so they resort to the IGN Archive to get the historical statements as well as the fieldwork notebooks related to the boundary line.
 - Boundary line statements
 - Fieldwork notebooks
 - Planimetric maps
 - MTN50 and MTN25

- **Research:** The documentation held in both the Map Library and the Technical Archive is very useful for researchers from various fields:

- **Urban studies:** urban sheets and cadastral statements from the Cadastral Topography of Spain (1861-1870), built-up area and outstanding buildings maps and some other maps from the Map Library (Cartoteca)
 - **Place names:** Planimetric maps, MTN50, MTN25, maps from the Map Library.
 - **Historical studies** Old maps from the Map Library, etc.
 - **Archaeology**
 - **Others**
- **Gifts and decoration:** It is necessary to take into account that cartography does not need to have a technical or useful purpose only, it is also considered as a work of art or as a gift, since people generate an emotional bond with places that inhabit. Due to this, users often look for maps to decorate or to give them to their family, friends or co-workers as a gift.

Conclusion

The Technical Archive and the Map Library of the National Geographic Institute of Spain hold numerous documents: most of them, especially the final products, are digitized but some others are not digitized yet because of the large volume of the information, but there are plans to upload them in the near future. Most of the documents are available and accessible through the IGN Download Centre or the Cartoteca Catalogue, so it is easier for users to get the cartography, maps or documents they need, so the website is improving to be more accessible for users. Giving some examples of applications and utilities of the documentation that is preserved in the IGN could serve as a reference for the future queries the IGN may have, so the Archive and Map Library workers can better serve the need of users in terms of cartography and geographic documentation.

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