

A new work of the National Atlas of Spain called *Spain on Maps. A Geographic Synopsis* has been published

Noelia Pérez^a, Andrés Arístegui^a, Alfredo del Campo^a, Pilar Sánchez-Ortiz^a

^a National Government of Spain – Ministry of Development – National Geographic Institute of Spain, Noelia Pérez, npmayoral@fomento.es, Andrés Arístegui, aristegui@fomento.es, Alfredo del Campo, adelcampo@fomento.es, Pilar Sánchez-Ortiz, psanchezortiz@fomento.es

Abstract: The National Atlas of Spain is a compendium of maps, charts, reports, tables and photographs that aims to depict the detailed human and physical geography and history of Spain. This project began in 1880 and it is nowadays immersed in its fifth stage of life. The National Atlas of Spain of the 21st Century has been published in the year 2018 by the National Geographic Institute of Spain in cooperation with a scientific network of 38 institutions and 140 researchers and professors as well as 200 scientific experts. It is divided in 24 chapters and includes nearly 1200 graphic contents, 827 of which are maps. Data have been provided by over 125 national and international official organisations. This work may be obtained both on digital and paper formats on various conduits for information. New proposals and projects are also currently being carried out at the National Atlas of Spain, i.e. a new Geoportal has recently been published on the internet, chapter I.1.1. of the National Atlas has started being extended so that it may become a monograph, and a new Interactive Atlas is about to be published on the web. Other tasks for the coming months include keeping all resources updated on all conduits for information, translating the Atlas into English, improving the tool used for producing and publishing charts and transforming the product called the Atlas Thesaurus into an ontology so that all contents may be offered as semantic resources.

Keywords: Thematic maps, statistical maps, atlas, cartography, data visualization

1. Introduction

The National Atlas of Spain is a compendium of maps, charts, reports, tables and photographs that aims to depict the detailed human and physical geography and history of this Member State of the European Union.

Five phases along the History of the National Atlas of Spain can be drawn. First, the Geographical and Statistical Review, accomplished from 1880 to 1914. Second, the Geographical and Statistical Atlas born in 1930. Third, the National Atlas of Spain planned in 1965. Fourth, the National Atlas of Spain proposed by the National Government in 1986. And last, the current National of Spain of the 21st Century named *ANEXXI*.

The first phase started in 1880 when the first Head of the National Geographic Institute of Spain planned a Geographical and Statistical Review that could include information provided by all sorts of departments of the National Administration. This work should have been published once a year. However its first version was finally released in 1888 and included 23 articles and one single map of the Iberian Peninsula and the Balearic Islands with its military divisions (Instituto Geográfico y Catastral, 1888). A second version of this Geographical and Statistical Review was released from 1912 to 1914 and included several thematic maps and charts.

The second stage, precedent of the current National Atlas of Spain, began in 1930 when a Sovereign Ordinance proposed an annual release of a Geographical and Statistical Atlas of Spain that could outline the economic and geographic aspects of the Spanish territory. However,

this project could not flourish due to various political changes that took place in the early 1930's and the Spanish Civil War that ravaged the country from 1936 to 1939.

Once the Civil War was over and once the Second World War had finished, reconstructing the country became critical. Therefore a synthesis of the geographic aspects that could provide a concise summary of the weaknesses and strengths of the territory was needed. A group of famous geographers were gathered in 1955 with the aim of publishing a new National Atlas. This Atlas was conceived as a collection of single sheets following the model that Sweden, Denmark and Switzerland were carrying out at the time. A new concept was also proposed in which the old written review was replaced by the modern image of a map compilation that could help understanding geographic features. For the first time a national map of Spain on scale 1:500,000 could be drawn using the 50,000 Topographical Map of the country that had been recently completed after one hundred years surveying the country. 28 sheets of topographic maps and 24 sheets of thematic maps were published in 1968 out of the 72 sheets that were originally planned (Vázquez, 1965; Capel, 1968). Some years later, a 227 page long geographic review and a 176 page long toponymy index including over 40,000 geographic names were released. This first version was never completed in all 72 sheets that were initially proposed, yet some of those geographical sheets that were published in 1968 were then updated in the early 1980's.

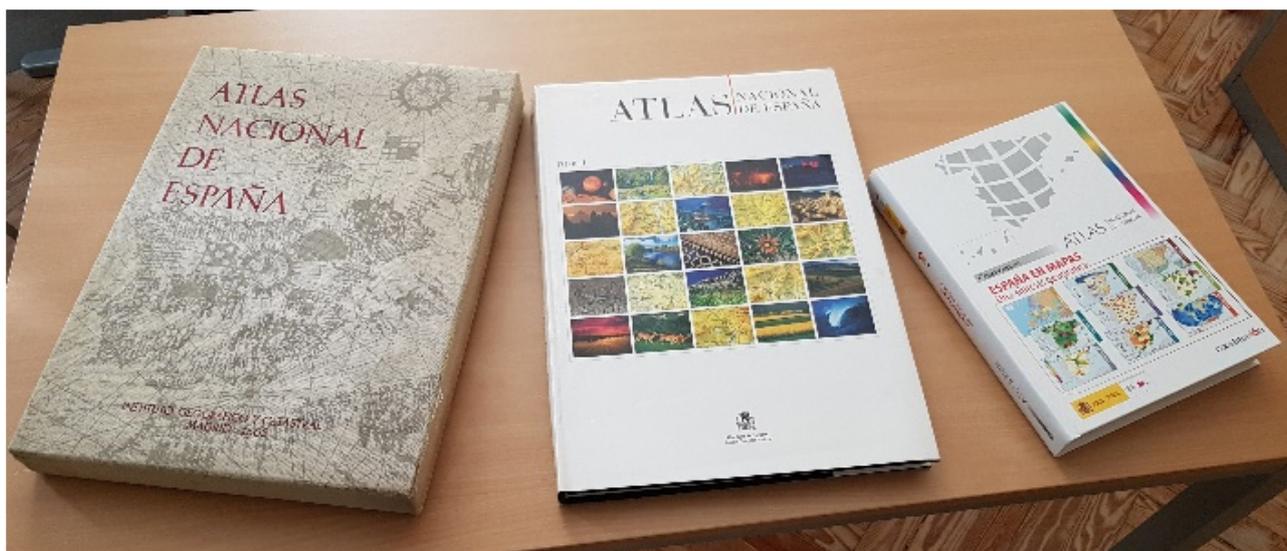


Figure 1: National Atlas of Spain: 1965,1986 and 2018 versions

In June 1986 an Agreement of the National Government proposed devising a new National Atlas of Spain. 13 sections comprising 48 working groups were organised. Several Ministries of the National Government as well as the Regional Administrations took part in this project. The first version of this work was published from 1991 to 1997 and included all aspects of the national geography. It was released in five big format volumes that showed over 4500 maps, as well as a toponymy index with over 2200 pages. The thematic structure and format of this Atlas meant a great step forward in relation to the previous stages of the National Atlas (Barredo, 1986; Sanz, 1992).

The fifth stage of history of the National Atlas of Spain is the one that started towards 2010 and has recently been published, called National Atlas of Spain of the 21st Century *ANEXXI*.

2. The National Atlas of the 21st Century *ANEXXI* has been published

The National Geographic Institute of Spain noticed that a new era ought to be launched at the *Department of Thematic Mapping and National Atlas* towards the beginning of the 2010's. New interests by potential users were perceived, several new contents were to be introduced, new technologies offered unique possibilities, cooperation with Universities and other scientific institutions could flourish and the new Atlas could benefit from the vast experience held at the technical working group gathered at the *Department of Thematic Mapping and National Atlas* within the National Geographic Institute of Spain. Therefore deploying a new strategy became crucial (Sancho et al., 2014; Sancho et al., 2018).

MEMBERS

This publication *Spain on Maps. A Geographic Synopsis* has been accomplished by the National Geographic Institute of Spain in cooperation with a working group called red ANEXXI that includes a wide range of scientific and academic organisations, i.e.

Asociación de Geógrafos Españoles	Association of Spanish Geographers
Biblioteca Nacional de España	National Library of Spain
Instituto de Economía, Geografía y Demografía del Centro de Ciencias Humanas y Sociales del Consejo Superior de Investigaciones Científicas CSIC	Spanish High Council for Scientific Research – Committee for Economy, Geography & Demography at the Social Sciences Office
Real Academia de la Historia	History Royal Academy of Spain
Universidad Autónoma de Madrid	Autonomous University of Madrid
Universidad Carlos III de Madrid	King Charles III University of Madrid
Universidad Complutense de Madrid	Complutense University of Madrid
Universidad de Alcalá	University of Alcalá
Universidad de Alicante / Universitat d'Alacant	University of Alicante
Universidad de Burgos	University of Burgos
Universidad de Cádiz	University of Cádiz
Universidad de Cantabria	University of Cantabria
Universidad de Castilla-La Mancha	University of Southern Castile
Universidad de Córdoba	University of Córdoba
Universidad de Extremadura	University of Extremadura
Universidad de La Laguna	University of La Laguna
Universidad de La Rioja	University of Rioja
Universidad de Las Palmas de Gran Canaria	University of Las Palmas de Gran Canaria
Universidad de León	University of León
Universidad de Málaga	University of Málaga
Universidad de Murcia	University of Murcia
Universidad de Navarra	University of Navarra
Universidad de Oviedo	University of Oviedo
Universidad de Salamanca	University of Salamanca
Universidad de Sevilla	University of Seville
Universidad de Valladolid	University of Valladolid
Universidad de Zaragoza	University of Saragossa
Universidad del País Vasco / Euskal Herriko Unibertsitatea	University of the Basque Country
Universidade de Santiago de Compostela	University of Santiago de Compostela
Universidad Isabel I	Queen Elizabeth I of Castile University
Universidad Nacional de Educación a Distancia	Spanish Distance Course National University
Universidad Pública de Navarra	State University of Navarra
Universitat Autònoma de Barcelona	Autonomous University of Barcelona
Universitat de Barcelona	University of Barcelona
Universitat de les Illes Balears	University of the Balearic Islands
Universitat de Lleida	University of Lleida
Universitat de València	University of Valencia
Universitat Jaume I	Jaume I University of Castellón

Figure 2: Members of the scientific network called Red ANEXXI

On the one hand, the technical direction and the coordination of this new Atlas named *ANEXXI*, which stands in Spanish for National Atlas of Spain of the 21st Century, was kept at the *Department of Thematic Mapping and National Atlas* within the National Geographic Institute in compliance with the Law which designates this organisation as the official responsible institution for fulfilling this project. This included gathering texts, drawing maps, printing, publishing, disseminating and giving a legal support to the new Atlas. On the other hand, arranging a new thematic structure and developing the scientific contents was approved to be led by a scientific network called *Red ANEXXI* which stands for Network for the National Atlas of Spain of the 21st Century. *Red ANEXXI* now includes 140 researchers and professors who work at 34 Spanish Universities as well as the National Library of Spain, the History Royal Academy of Spain, the Association of Spanish Geographers and the Institute for Applied Economy, Geography & Demography at the Spanish High Council for Scientific Research. Funding for this scientific cooperation was obtained from Santander Bank. Also 200 experts not included in *Red ANEXXI* were consulted (Pérez, 2018; Sánchez-Ortiz, 2014, Sancho, 2013).

Towards the end of the decade a new Atlas called “*Spain on Maps. A Geographic Synopsis*” has been published. It is included in the *Synopsis Series* of the National Atlas of Spain. This new Atlas was unveiled in Autumn 2018 by the Minister of Development of Spain. Only four months later it has received an award from the Spanish Geographic Society given by His Majesty King Felipe VI. This new Atlas is divided in 24 chapters. The first chapter is devoted to the art of mapping, the image of Spain along History and the role the National Geographic Institute plays in Spanish cartography. Thematic structure continues then with physical geography and the natural environment where the human being settles, what includes geophysics, geology, geomorphology, climate, water resources, coasts, flora, fauna and soils. It then moves on to human geography and how the human being settles nowadays on the Iberian Peninsula as a result of many centuries of human evolution in Southern Europe. This includes history, demography, urban settlements, society, economy, social facilities and transports. The new Atlas is completed with two chapters devoted to the territorial structures, political divisions and institutional organisations within Spain as well as how Spain as a whole is included in the European Union, is linked to Latin America and is integrated in the global context. This thematic structure may be considered a classical approach as it is rather usual in most national Atlases throughout the World.

CONTENTS	
PART I	CARTOGRAPHY IN GEOGRAPHY
Chapter 1	Mapping Geographic Knowledge
Chapter 2	General Cartography and Toponymy
PART II	PHYSICAL GEOGRAPHY
Chapter 3	Earth Structure and Landforms
Chapter 4	Climate and Hydrosphere
Chapter 5	Biogeography and Soils
PART III	HISTORY
Chapter 6	Historical overview
PART IV	POPULATION, SETTLEMENTS AND SOCIETY
Chapter 7	Population
Chapter 8	Urban Settlements
Chapter 9	Society
PART V	ECONOMY
Chapter 10	Farming, Forestry and Fishing
Chapter 11	Manufacturing, Construction, Energy, Mining and Quarrying
Chapter 12	Tourism
Chapter 13	Sales, Services and Trade
PART VI	SOCIAL FACILITIES
Chapter 14	Education, Science, Culture and Sports
Chapter 15	Health and Social Care
Chapter 16	Justice and Home Affairs
PART VII	TRANSPORT AND DIGITAL SECTOR
Chapter 17	Transport
Chapter 18	Digital sector
PART VIII	INTERNAL TERRITORIAL STRUCTURES
Chapter 19	Treasury, Business and Labour Market
Chapter 20	Landscape
Chapter 21	Environment
Chapter 22	Regions and Local Government
PART IX	SPAIN IN THE WORLD
Chapter 23	Spain and the Global Context
Chapter 24	Spanish presence in the World

Figure 3: Contents

Nearly 1200 graphic contents have been included along its 620 pages, 827 of which are maps. Data have been provided by over 125 national and international official organisations, primarily by the different departments, agencies and public bodies of the National Government of Spain.

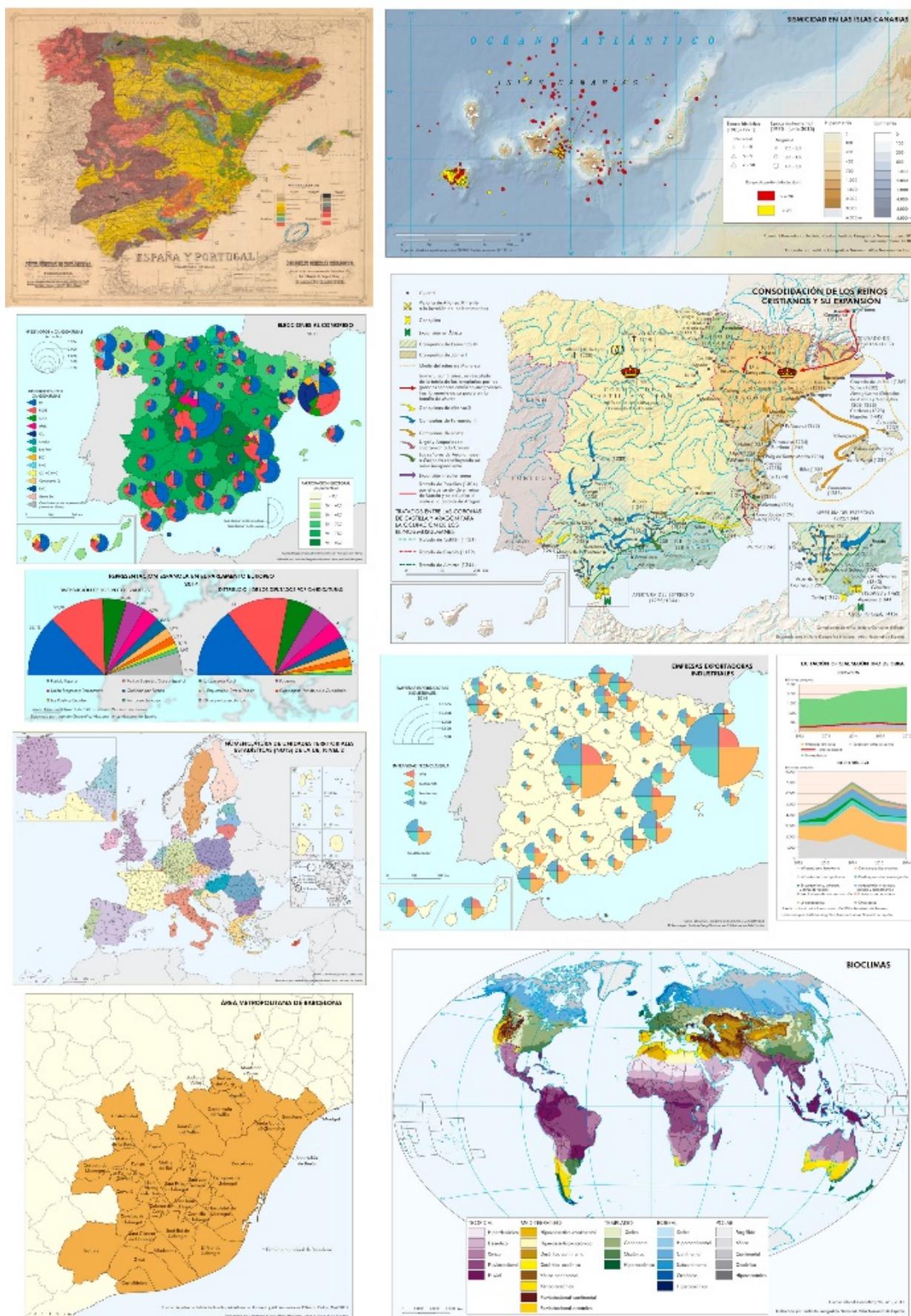


Figure 4: Different types of graphic contents

This Compendium comprises different types of graphic contents, i.e. thematic maps considering various aspects of life and nature, maps showing how those aspects have changed over time, maps comprising various geographic areas, i.e. the World, Europe and Spain, showing data for manifold administrative units, i.e. countries, regions, counties, local authorities, boroughs, etc, as well as charts, drawings, reports, tables and pictures (Alonso, 2005).

24 working groups included in Red ANEXXI
 140 researchers and professors included in Red ANEXXI
 200 scientific experts not included in Red ANEXXI
 125 national and international official organisations providing data
 34 technicians working on graphic design
 620 pages
 827 maps
 215 charts
 57 tables
 157 photographs
 Reports

Table 1: Significant information

This work may be obtained both on digital and paper formats on various conduits for information. Were the digital formats to be viewed, both downloading the whole work and examining the graphic contents on a web catalogue service would be available. Also maps and their linked data, i.e. base maps, thematic maps, linked thematic data and metadata may be downloaded simultaneously in case data providers allow so (Alonso, 2009).

This publication is available at:

- A paper hardback version of this publication is available at the **Online Shop** under <https://www.cnig.es>
- The whole book may be downloaded on a digital format at the National Geographic Institute **website** under the digital book section at <http://www.ign.es/web/publicaciones-boletines-y-libros-digitales>
- Whole chapters and graphic contents may be displayed and downloaded at the National Geographic Institute of Spain **website** <http://www.ign.es/web/ign/portal/espana-en-mapas>
- Data, metadata and shape files may be obtained (if licences allow so) at the **Download Center** under *Thematic Maps of the National Atlas of Spain* at <http://centrodedescargas.cnig.es/CentroDescargas/catalogo.do?Serie=RTANE#selectedSerie>
- Maps and graphic contents may be accessed by means of a thematic search at **El Buscón** (which stands for *The Searcher*), based on the Atlas Thesaurus at <http://www.ign.es/ane/bane/>
- Base maps may be downloaded under *CartoBaseANE* (which stands for Base Cartography for the National Atlas of Spain) at the **Download Center** at <http://centrodedescargas.cnig.es/CentroDescargas/catalogo.do?Serie=RTANE#>



Figure 5: "Spain on Maps. A Geographic Synopsis" is available at various conduits for information

3. Current works and forthcoming targets

New proposals and projects are currently being carried out at the National Atlas of Spain.

From January to March 2019 a new Geoportal of the National Atlas of Spain has been developed in order to improve internet dissemination. This new Geoportal is now available under <http://atlasnacional.ign.es/wane/>. MediaWiki technology has been used for developing this new Geoportal due to various reasons. First, its display and capabilities with which most people are familiar makes web surfing easy and friendly. Second, it is open source and has got a very active community supporting and a wide range of modules, libraries and extensions available. Also, a multimedia viewer enables surfing all contents and images. Images can be downloaded on various resolutions needing no computer programming. Furthermore HTML code and Wikitext can be shared so that images can be directly inserted on different programming languages. Moreover information, i.e.

images and web pages, can be categorised, so that each image has got a category such as “map”, “table”, “statistics”, “image”, etc that helps searching them. Besides all maps are linked to the Download Center so that they may be downloaded for further purposes. Additionally its language is homogeneous to all sites created using MediaWiki. Also articles can be signed and shared and MediaWiki is respectful in terms of data protection policy in the way a summary is attainable and a license is available. Besides MediaWiki imports Exif metadata directly, so that there is no need to type in again all metadata. Moreover all pages may be shared on social networks such as Facebook, Twitter, etc. Also searches by keywords may be carried out on all web pages contained in this new Geoportal. Furthermore internal and external hyperlinks have been added to the content, so that related information, articles and products both within the National Atlas webpage and on other web pages can be consulted.

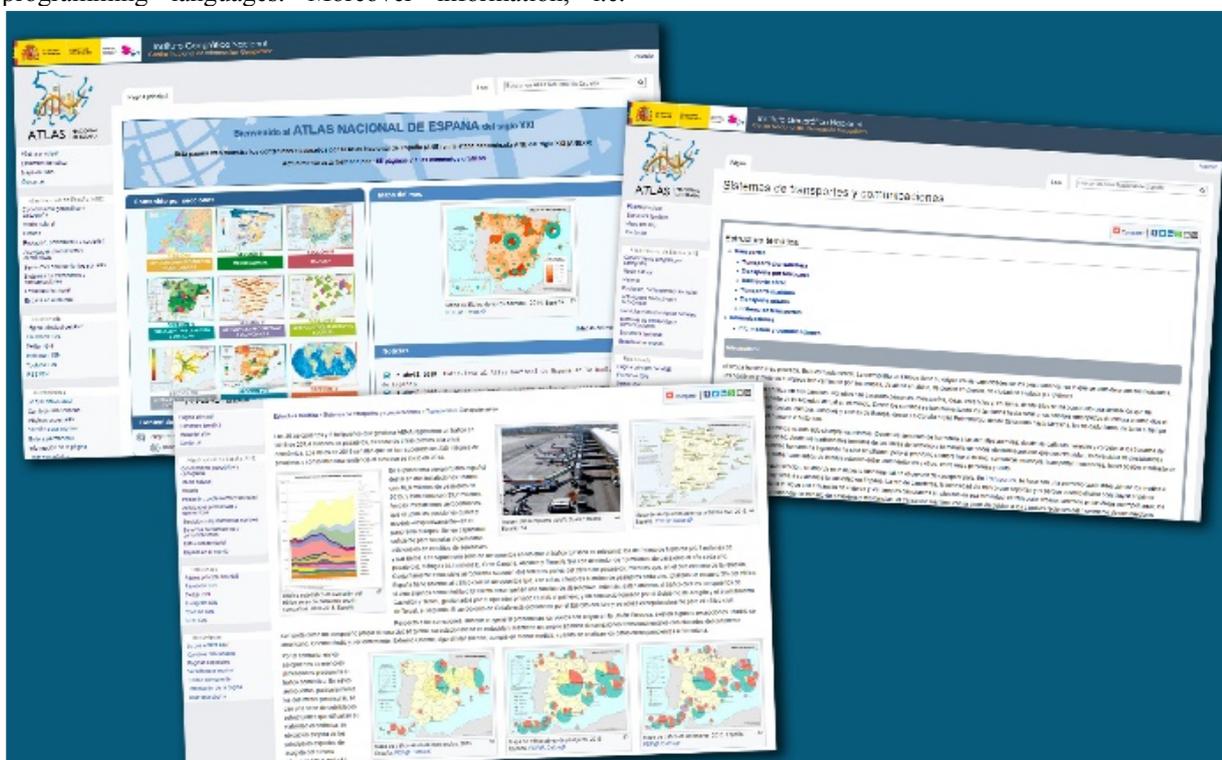


Figure 6: Geoportal of the National Atlas of Spain

In March 2019 Chapter I.1.1. of the National Atlas of Spain called *The image of Spain along History* has started being extended so that it may become a monograph. Its current 12 pages that include a text and 20 maps shall be developed and expanded into a full book with about 400 pages and 200 maps. This work ought to be carried out along the year 2019 so that it may be printed and

published on the internet before Christmas 2019. This work will be part of the *Monograph Series* that intends to extend all contents included briefly in this *General Series* of the National Atlas and delve into specific fields of inquiry. Also, cross curricular subjects such as social policies may also be expanded and deepened in this monographs over the coming years.



Figure 7: One of the maps that will be included in the monograph called *The Image of Spain along History*

In April 2019 a new Interactive Atlas has started being developed. It will hopefully be available by Summer/Autumn 2019. Graphic contents on the internet shall become interactive or animated and shall be subject to further edition. Two different technologies, i.e. *ArcGISOnline* and *Geoclip*, are being used to make maps become interactive. On the one hand *ArcGISOnline* developed by *ESRI* is used to create interactive maps, animated maps, animations on several maps, storytelling on maps and other graphic contents developed with *ArcGIS Desktop*. These maps which are basically composed of qualitative data, or quantitative data with specific techniques of representation such as isolines, flow lines, etc., include a layer manager, navigation tools, pop-up windows and other tools. On the other hand, *Geoclip* developed by *EMC3* is used for representing statistical maps. This tool contains all statistical indicators used in the new Atlas. Users are able both to check data and to change the different techniques used for classifying, calculating, symbolising and representing maps, tables and charts. Furthermore including on the webpage interactive and animated apps using *ArcGISOnline* is to be implemented. These apps shall use a map as a basic resource and shall then develop thoroughly the subject adduced on the map using a *storytelling* technique. In this case, *History of Spain on Maps* using the chapter on the *Historical Overview* is being used as a pilot testing. Another major target for the coming months is keeping all resources updated on all

conduits for information. Chapters related to Human Geography such as economic indicators, social facilities, transports, etc. tend to get quickly out-of-date. Therefore, gathering the latest existing information from other official institutions and depicting it on maps that may help understanding trends, strengths and weaknesses of the country is a major task.

Producing is just as important as disseminating the product. Therefore in the last years a major effort has been made to introduce technologies and publish the National Atlas on the internet so that a wider range of people may have an access to it. However, despite the vast amount of people that speak Spanish around the World what makes it the second language after Chinese, a linguistic barrier has been detected. Currently the National Atlas of Spain is often consulted both from Spanish and from Northern and Southern American computers. However, a lack of interest has been detected in inquiries coming from the rest of the European Union as well as from the rest of the World. Obviously, a linguistic barrier lays behind this. Therefore a translation into English of both the text and the maps is planned for the coming years. Disseminating the product in English has become a major target.

Other forthcoming projects include improving the tool used for producing and publishing charts and transforming the product called the *Atlas Thesaurus* into an ontology so that all contents may be offered as semantic resources.



Figure 8: One of the maps included in the chapter devoted to *History of Spain on Maps*

4. Conclusions

A new work of the National Atlas of Spain called “*Spain on Maps. A Geographic Synopsis*” has recently been published. It has been accomplished by the National Geographic Institute of Spain together with a scientific network of researchers from over 38 institutions. This Atlas includes a new thematic structure of 24 chapters including all aspects of physical and human geography and history. The new Atlas is available both on a digital and on a paper format and a new Geoportal has recently been created to access the Atlas on the web. The different chapters will be gradually extended into monograph books. This has started with the first chapter devoted to *The image of Spain along History* which is to be published towards the end of 2019. A new interactive Atlas will soon be released so that maps can be downloaded and edited with all related information. A translation of the Atlas into English has become a major target to be accomplished in the nearby future. Updating data especially in all chapters related to Human Geography is nowadays a major issue.

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