INSTITUT CARTOGRÀFIC DE CATALUNYA

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CONTRIBUTION OF THE ICC TO THE XXII INTERNATIONAL CARTOGRAPHIC CONFERENCE OF THE ICA

On 9-16 July 2005 the XXII International Cartographic Conference of the International Cartographic Association (ICA) entitled "Mapping Approaches into a Changing World" will be held in La Coruña.

As in previous years, the ICC will be a very active participant, since it will present 5 papers during the general conference and another in the Working Group on Cartographic Generalization. Each of these contributions is included in summarized form in this edition of the ICC Newsletter, and once the Conference has been held, they will be published in greater detail at the ICC's website:

www.icc.es

Official gazetteer of the main toponyms of Catalonia

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Toponymy in cartography constitutes a valuable resource for other sciences and disciplines. This is demonstrated by the use of cartographic toponymy in the elaboration of national gazetteers, task that has been encouraged by the United Nations Group of Experts on Geographical Names (UNGEGN). This paper introduces the *Nomenclàtor oficial de toponímia major de Catalunya*, elaborated to give official status to basic toponymy.

The ICC, in collaboration with other bodies and organizations, has drawn up this gazetteer following Resolution 563/V of the Parliament of Catalonia passed in 1998 and entrusted to the Catalan government.

The gazetteer contains almost 40,000 toponyms. It includes a topographic map for each municipality of Catalonia (946), in addition to a toponymic index, which is in fact the official list of names. This is a multidisciplinary work produced in close collaboration with the most important territorial authorities.

In the year 2003, the gazetteer was published and circulated as a reference book for consulting official names such as regions, municipalities, towns, villages and the main oronyms and hydronyms. Its circulation has been complemented by digital format and the Internet. Thanks to this service, the ICC contributes to publicizing the main Catalan toponyms through official channels.

SUMMARY

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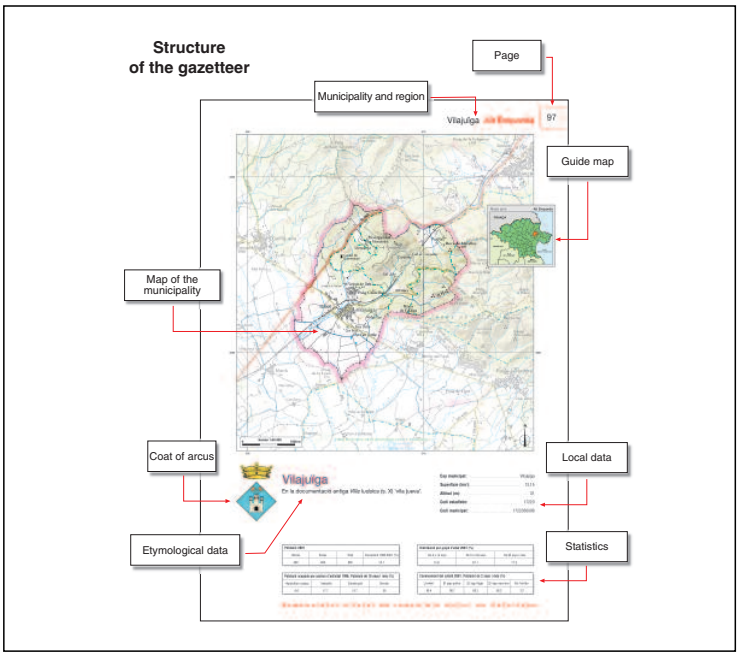

Reorganization of the topographic databases of the ICC applying generalization

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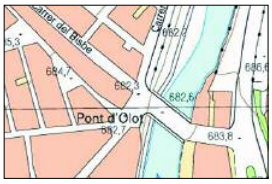
Since its foundation in 1982, the ICC has been producing and updating three topographic vector databases covering Catalonia at 1:5 000, 1:50 000 and 1:250 000 scales. The 1:250 000 database is used for applications that require full coverage of the territory at a small scale. The 1:50 000 is used for GIS applications in public administration, and the 1:5 000 scale is used for planning of public works and GIS applications for completion of larger scale coverage, such as 1:1 000 and 1:500.

In the year 2003, the ICC began to generate the 1:25 000 database for new GIS applications and mapping, applying generalization to the 1:5 000 database. The 1:25 000 database has more detail than the 1:50 000 and is more manageable than the 1:5 000. Moreover, as elevation data is becoming essential for visualization and analysis applications, the topographic database 1:25 000 scale maintains the 2.5D character of the original data.

After two years of producing the 1:25 000 database and applying generalization, the results are excellent: the product fulfills user requirements with respect to quality and data volume, and the productivity obtained is about three times higher than by compiling all the information using photogrammetry and other methods.

The paper will present a proposal to maintain the topographic database at 1:25 000 and to obtain all the products that are currently derived from the topographic database 1:50 000, by applying generalization methods to the 1:25 000 database.



scale 1:5 000

scale 1:10 000

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Boundaries, fieldworks and GIS management

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The generalized use of digital maps and GIS has highlighted the need for more accurate knowledge of the boundaries of Catalan municipalities.

The ICC is currently working on the Catalan municipality map project. The aim of this project is to gain more accurate knowledge of the boundaries.

The municipal boundaries in Catalonia were defined between 1910 and 1930. During this period, Acts of Proceedings describing boundary marks were drawn up. Maps concerning Acts and survey traverses were also defined.

Today, few old landmarks remain in their original location, due to important geographic transformations. Furthermore, mapped boundaries have lost a little of their accuracy each time that they have been copied from a map to a new one. At present, there may be differences of around one hundred meters in the boundaries on various maps, which entails significant problems for the management and administration of municipalities.

In this context, the Autonomous Government of Catalonia is engaged in the Catalan Municipalities Map project, in order to ascertain the position of the old landmarks and to accurately trace the boundaries described in the Acts of Proceedings. The certification of each old boundary is a necessary step, prior to further updating and correction, which is the ultimate aim of the project.

This paper outlines the technical processes involved in revising the boundaries of Catalan municipalities: how the old compass-made survey traverses are calculated and how field data is collected with powerful pen tablets and PDAs. It also refers to the GPS solution and receivers used; to the way in which the position of the landmarks not located have been determined; and to the software solutions chosen in order to include all the various operations in a single environment in which different groups are working simultaneously.

All the information generated in this project is managed by a GIS called ADLGis. All the boundary data relating to the 946 Catalan municipalities and more than 22 000 landmarks (coordinates, pictures, location maps, etc.) will eventually be included in this GIS. The possibility of making spatial queries allows the geographic analysis of boundaries. The paper will also describe the specific tools developed for the ADLGis relating to fieldwork applications, data management and document generation.

This project links ancient times with the present age, ancient maps with digital maps, in addition to GPS, GIS, Internet, corporate data, fieldworks, pen tablets, PDAs, etc. The process of delimiting the Catalan municipalities is a global project of considerable territorial scope. This paper refers to the boundaries, but also to the techniques, the hardware and the software chosen to carry out the project.

Two hundred years of cartography of Catalonia produced in France (1633-1835). Intentions and outcomes

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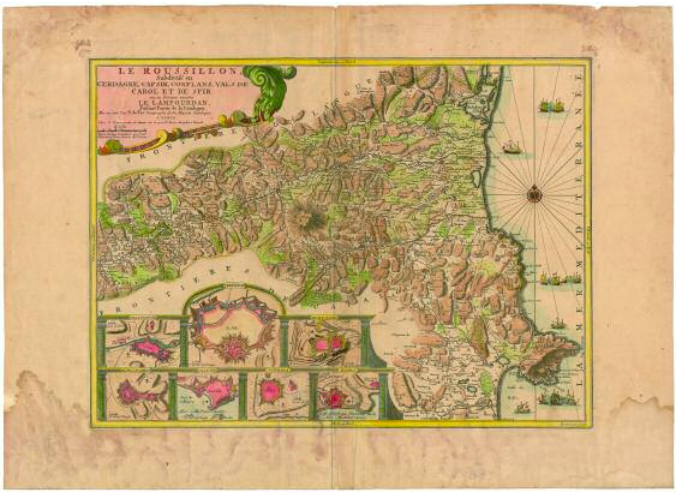
For almost two hundred years, most cartography of the Catalonian Principality was completed by French cartographers, particularly military cartographers. While Spanish cartographic production focused on America, French official and military cartographers used all their resources to draw up maps of the lands bordering French territory which they sought to annex. Catalonia provides a good example of this, and we have been lucky enough to find a hundred manuscript maps of areas of Catalonia, besides the printed ones already known, in several French archives. Particularly revealing are the manuscript map by M. Tavernier (mid-17th century) and the test pressing, with manuscripted place names, from the workshop of the Sanson (late 17th century).

This paper assesses French cartographic production in Catalan territories in terms of quantity and quality, taking account of both printed and manuscript material. The background to this production is one of almost uninterrupted war: from *La Guerra dels Segadors* (Reapers' War, 1640-1652) to *La Guerra del Francès* (Independence War, 1808-1814), there were very few periods of peace. Special attention is drawn to the Treaty of the Pyrenees (1659), which established the border between Spain and France. The various strategies and techniques employed by the French army in order to obtain geographic information are also described, one example being the plundering of Spanish military archives. The paper also makes reference to cartographic campaigns such as the one carried out during the times of the *Cent Mil Fills de Sant Lluís* (1823-1827), the French army that helped King Ferdinand VII restore the absolute monarchy in Spain. The period of study will conclude with the publication of a map of Catalonia made by a French cartographer (A. H. Dufour), of which many editions were produced throughout the 19th century.

This study aims to stress the eminent importance of wartime cartography undertaken by the Crown and the French Republic, which led to the existence of maps of Catalonia during these two hundred years. Without this contribution, the cartographic description of the Principality would have been considerably poorer, given that it produced far fewer maps itself.



GEOMOBIL: ICC land based mobile mapping system for cartographic data capture

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Since the early developments made in the 1990s, LBMMS (Land Based Mobile Mapping Systems) have successfully demonstrated how they can improve the efficiency of GIS and cartographic data capture. The final accuracy and performance of LBMMS depends on direct sensor orientation systems, which are mandatory due to the large amount of raw data that they acquire (digital photographs, laser ranging data and other sensors).

In the last few years, the ICC has worked on the development of a GEOMOBIL. This is a LBMMS designed and built at the ICC. It is a modular system that allows the direct orientation of any sensor mounted on the roof rack of a van. The main components of the GEOMOBIL are the orientation subsystem (based on a GPS/IMU orientation system), image subsystem, laser ranging subsystem, synchronization subsystem and the data extraction software.

This paper offers a brief description of the GEOMOBIL, its subsystems and the data extraction software. This software supports data extraction by measuring elements in pairs of stereoscopic digital images. The system functionality for image and vector visualization, data digitalization, editing and data storage takes advantage of the basic tools of MicroStation using MDL languaje. As the same tools are used in data compilation, editing and storage for other topographic databases created at the ICC, data integration can be achieved without any data transformation.

The results in terms of accuracy and precision of several campaigns carried out under different environmental conditions are shown and conclusions are drawn. Finally, the paper provides a brief description of future developments with respect to strategies aimed at improving trajectory computation and element collection.

New markets, new sales methods and copyrights in the field of spatial data infrastructures

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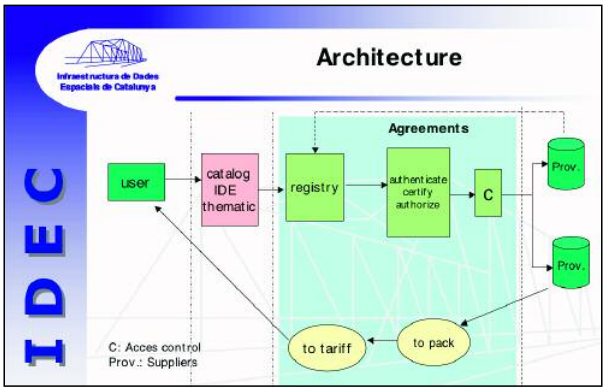
Following a first definition of some concepts such as market, goods and transactions in the geographical information (GI) area, the paper analyses the differences in scope between the old market and the new one based on Internet information, their advantages and their consequences.

At all events, several problems must be anticipated, most importantly the legal problems related with protection of the providers' copyrights. Without regulation and the means to guarantee legal aspects, market prospects are unlikely to increase. Consideration must also be given to the different ways in which GI and related services can be provided to end users and their influence on global solutions.

Within this framework, which has been improved and enhanced by spatial data infrastructures (SDI) initiatives, especially on a regional scale, setting up new distribution and control services is fundamental, for they constitute the basic commercial infrastructure. Therefore, the paper outlines the role that an institutional (regional) SDI must play in this scenario, in addition to the conclusions of the Catalan Working Group on Digital Rights Management, which has considered these issues over the last few months.



BRIEF NOTES

6TH BARCELONA GEOMATICS WEEK

As announced in ICC Newsletter No. 21, on 8-11 April 2005 the 6th Geomatics Week was held in the Congress Hall of Fira de Barcelona. This international and multidisciplinary congress on geomatic sciences, which is held every two years, was organized by Institut Cartogràfic de Catalunya, Institut de Geomàtica, Col·legi Oficial d'Enginyers Tècnics en Topografia, Catalonia division, and Escola Politècnica Superior d'Edificació de Barcelona.

This year's congress included 174 papers (74% given by speakers from within Spain and 26% from overseas), which covered all aspects of geomatics. 421 people attended this event, including scientists and technicians, users, academics and entrepreneurs, young students and expert professionals.

To coincide with this congress, the II Geomatic and Geotelematic International Show (GlobalGeo) was staged at the same venue. This exhibition was organized by Fira de Barcelona and is also held every two years.

It serves as an international meeting point, providing an insight into supply and demand in the geomatics and geotelematics market.

This was the second time the exhibition had been held and it attracted more than 1 613 visitors and 46 companies, including the ICC. Of particular interest at the ICC's stand were the images captured using a digital photogrammetric camera (panchromatic, color and infrared), which were compared with those obtained on a simultaneous flight using an RC30 analog camera. The ICC also displayed products drawn from the LIDAR and CASI sensors, and the GEOMOBIL system.

EXHIBITION 25 YEARS OF THE GEOLOGICAL SERVICE OF CATALONIA

In celebration of 25 years of the Geological Service of Catalonia, from 4 February to 6 June 2005 the ICC staged the exhibition "25 anys del Servei Geològic de Catalunya (SGC)" at its headquarters.

The exhibition provided a historical review of geology in Catalonia from both an institutional and a technological perspective. The cartographic series related with geology were on display, and the exhibition highlighted initiatives undertaken in the fields of geotechnics and civil engineering, applied geology, avalanche prediction, seismology, and territorial geology and planning.

The exhibition displayed ancient geological documents and instruments used in geology in the past, in addition to the records in real time of the stations in the seismic network of Catalonia. Access was offered to the avalanche registry database and a demonstration was given of GeoShow3D technology applied to the case of geological risk in the region of Bages at 1:50 000 scale.

On 23 May took place the event to commemorate the 25 anniversary of the creation of the SCG presided over by Minister of Regional Planning and Public Works, Hon. Mr. Joaquim Nadal Farreras.

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