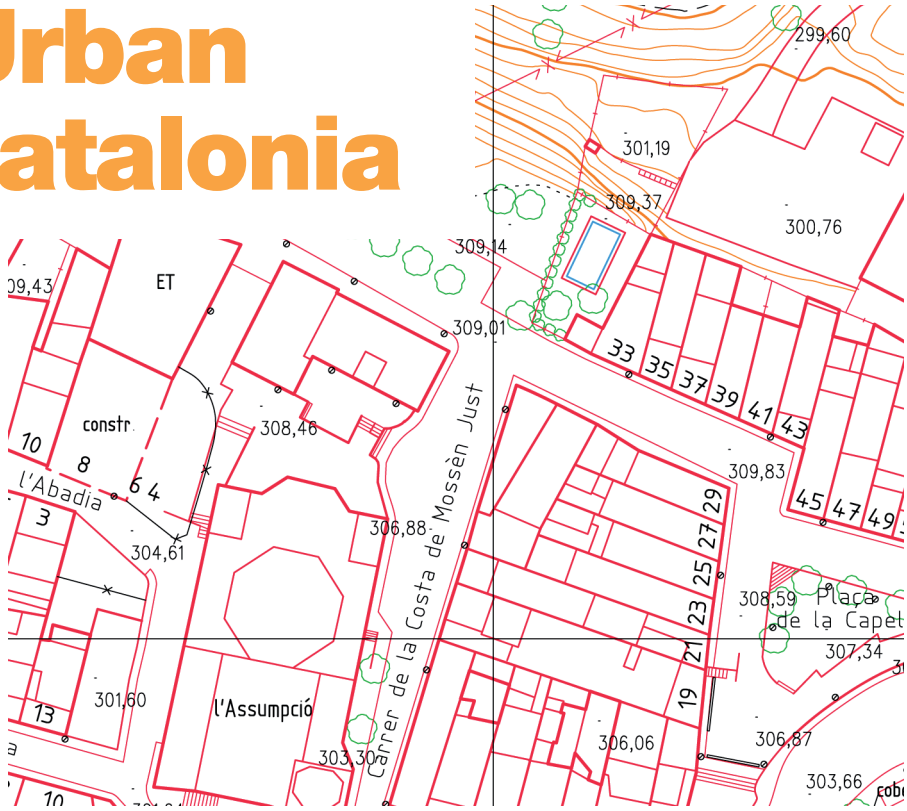
ICC
Institut Cartogràfic de Catalunya

Generalitat de Catalunya

Newsletter 37

1:1 000 Urban Map of Catalonia



In 2005, the *Mapa urbà de Catalunya 1:1 000* (MUC-1M) began to cover, at this scale, Catalonia's urban and urban development areas. The project charts the areas in which 1:1 000 cartography is necessary, while also planning a standardized update of the existing urban cartography.

The MUC-1M has several sources of financing: the Department of Town and Country Planning and Public Works (by program contract with the ICC) and through agreements with provincial governments, local councils and the Barcelona Association of Municipalities.

THIS CARTOGRAPHY HAS BEEN VALIDATED AND REGISTERED IN THE CARTOGRAPHIC REGISTRY OF CATALONIA (RCC)
http://www.rcc.cat

The cartographic process begins with photogrammetric flights using a digital camera with a ground pixel size 7.5 cm and GPS receivers to measure the camera projection centre that make it possible to reduce the number of control points necessary for the orientation phase.

The information is acquired with digital photogrammetric workstations that allow the superimposition of aerial images with the captured vector data in 2.5 D (each vertex is represented by 3 coordinates). Superimposition makes it possible to reduce errors during capture and is an essential part of data revision and verification. Stereoplotting must contain all the data identifiable in the aerial images in their exact position. Elements that measure more than 1 mm on the map are captured at scale, while those measuring less than 1 mm on the map are captured as symbols.

The relief is represented through contour lines and the master contour lines are labelled with their altitude. Within urban centres, the level lines are replaced with spot heights on paved surfaces.

The stereoplotting is completed with field campaigns that are concentrated especially within urban centres, housing developments and industrial areas; verifying the interpretation carried out in the previous phase and adding the elements that are not visible in the images, as well as details hidden by shadows, projections of buildings, trees or artificial or natural obstacles. Additionally, it is gathered the toponymic information.

In the editing phase, the mapsheets are formed and stereoplotting information is updated with the new data captured in the field campaigns. The structure of the data as regards encoding, connections and polygonizations is verified. The placenames are incorporated, and the marginalia and metadata are generated.

The elements represented are distributed in 8 groups (orography-relief, hydrography-hydraulic works, vegetation-land uses, communications-roadways, constructions-population, energy-telecommunications, toponymy-annotations and records). Overall, 103 elements are represented.

THE ICC'S 1:1 000 PROJECTS HAVE BEEN AVAILABLE FOR DOWNLOADING ON LINE SINCE NOVEMBER 2009
http://www.icc.cat/vissir2

The MUC-1M cartography is distributed in various vector formats (DGN, DXF and Shapefile) and with metadata, according to the ISO 19115 and MIGRA standards of AENOR. As regards the digital information in the DGN and DXF formats, each file contains only the information corresponding to one sheet. The Shapefile format contains information from the sheets such as the metadata of the elements, but the delivery unit is the project, not the sheets. ■

2009 ICA Award

24th International Cartographic Conference was held in Santiago de Chile from November 15th to 21st, 2009.

This biannual conference is promoted by the International Cartographic Association (ICA/ACI). Attendees are recognized experts in cartography, representatives of organizations responsible for geographical information in their countries and companies related to the disciplines discussed: cartography, remote sensing and geographic information systems.

The conference includes a Map exhibition, where best cartographic products are awarded in different categories through the attendees ballots.

List of prizes that ICA has awarded to the ICC

Year	Conference	City	Product
1993	16th	Cologne	01. Mapa hipsomètric de Catalunya 1:500 000
1995	17th* X	Barcelona (ICC HQ)	02. Mapa comarcal de Catalunya 1:50 000, Alta Ribagorça 03. Carta de imagen satelitaria de la República Argentina 1:250 000, Ciudad de Buenos Aires (made by the Military Geographic Institute of the Republic of Argentina and produced and edited by the ICC)
1997	18th	Stockholm	04. Mapa topogràfic de Catalunya 1:25 000, Parc Nacional d'Aigüestortes i Estany de Sant Maurici 05. Mapa d'usos del sòl de Catalunya 1:250 000 (3rd edition)
1999	19th* XI	Ottawa	06. Atles Universal
2001	20th	Beijing	07. Mapa excursionista dels Pirineus 1:50 000, Gavarnie-Ordesa
2003	21th* XII	Durban	08. European-Mediterranean Seismic Hazard Map 1:5 000 000 (map published by the ICC in collaboration with the Swiss Seismological Service, the Institute of Earth Sciences Jaume Almera (CSIC), the European Sismological Commission and the International Geological Correlation Program)
2005	22th* XIII	La Coruña	09. Mapa de relleu submarí de Catalunya 1:250 000
2007	23th* XIV	Moscow	10. Mapa topogràfic i batimètric de Catalunya 1:450 000
2009	24th	Santiago de Chile	11. Les cartes portolanes. La representació medieval d'una mar solcada

* Celebration of General Assembly (indicated by Roman numerals).

ICA AWARDED THE BOOK: PORTOLAN CHARTS. THE MEDIEVAL REPRESENTATION OF A PLOUGHED SEA

ICC publication Les cartes portolanes. *La representació medieval d'una mar solcada*, by Ramon J. Pujades (see ICC Newsletter no. 31) received the award given by the public voting.

With this ICA Award, our cartographic products have been recognized in nine consecutive conferences. In fact, ICC has been honoured with eleven awards from the ICA, as a total. ■

Portolans in the middle ages

In December 2009, the ICC published the Catalan edition of the book by geographer Konrad Kretschmer (Berlin, 1864-1945) with the original title *Die italienischen Portolane des Mittelalters. Ein Beitrag zur Geschichte der Kartographie und Nautik* (*Els portolans de l'edat mitjana. Una contribució a la història de la cartografia i la nàutica*: version in Catalan). This book is the result of the research done by Kretschmer on Portolan cartography, which was commissioned by Richthofen in 1907.

Now, 100 years after the publication of the research (in 1909), the ICC thought it appropriate to republish it, in the belief that 100 years provide sufficient perspective to truly evaluate such a body of work, as complex as it may be, and justify a reconsideration of it in the cartographic community.

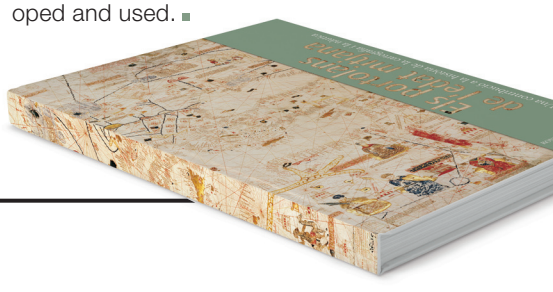
In addition to the transcribed Portolans, that make up the most substantial part of the work, the author embarks on an extensive analysis of the medieval navigation charts and wrote physical, historical and cultural analyses to better understand, or explain, the contemporary reality of the Portolans.

The introduction to the book includes a bibliography of 18 titles (1818-1903) and 8 collections of chart reproductions or facsimiles.

This catalogue is made up of 75 charts or atlases that Kretschmer organized and commented on in chronological order. Especially noteworthy are the ten charts by Vesconte and the eight charts by Grazioso Benincasa. It makes special reference to the chart by Rafel Soler and the insulars, especially that of C. Buondelmonte, as mixed-type sources: cartographic and literary. Yet, our opinion is that the most interesting part of the book is the true and literal transcription of the Portolans from before 1500.

The Catalan translation respects the original German, although it was necessary to adapt the terminology.

The act of juxtaposing this "classic" and the innovative work of *Les cartes portolanes. La representació medieval d'una mar solcada* (2007), by Ramon J. Pujades, underlies a greater objective: to revaluate our navigation charts, without taking them from the Mediterranean context in which they were conceived, developed and used. ■



Official gazetteer of toponymy of Catalonia (2nd edition)

Following the first edition of the *Nomenclàtor oficial de toponímia major de Catalunya* (in 2003), in November 2009, the second edition is being published. As in the first one, the new edition has been developed as an internal project of the Catalan Toponymy Commission, a body assigned to the Department of the Vice-Presidency of the Government of Catalonia, whose members come from the Government Ministries of Town and Country Planning and Public Works, Governance and Public Administrations, Economy and Finance, the Cartographic Institute of Catalonia, the Institut of Catalan Studies, the Catalan Municipalities and Regions Association, the Catalonia Federation of Municipalities and the Consortium for Language Standardization, and has also been participated in by the Vale of Aran Administration and the local councils of Catalonia.

The Gazetteer, as requested by the Parliament of Catalonia and given its official character, is an instrument meant for cartography, reference works, signposting, textbooks, tourist guides, news media, etc. to incorporate correct Catalan language toponymy.

THE GAZETTEER IS A REFERENCE WORK TO CONSULT THE OFFICIAL FORMS OF THE PLACE NAMES IN CATALONIA, AND THEIR LOCATION ON CARTOGRAPHY

Certain statistics are telling of the technical and human challenge behind the development of this work:

- The second edition has increased the number of place names up to 52 688, from the 39 661 of the first one. These toponyms cover the geographic elements of Catalonia with more detail and coincide with the toponomastic corpus of the *Mapa comarcal de Catalunya 1:50 000*. The written form and cartographic localization of each place name in the first as well as in this new edition have been analysed, validated and made official.
- The inclusion in this second edition of the phonetic transcription and phonic recording of the names of towns, villages and hamlets, which will make for significant progress for the social and public use of Catalan toponymy, as it provides a tool for a more correct and appropriate use and pronunciation of the real names of our towns and cities.
- The formal aspect of the work: the first edition was in a single volume, while the second one has been published in three volumes to facilitate its use. In volumes one and two the place names are located on the topographic map 1:50 000, for each municipality; volume three contains the index, which also includes the kind of geographical feature and the UTM coordinates of each place name.

Last, mention must be made of the multidisciplinary team of people from various institutions and organizations, without whom the formation and publication of this work would not have been possible. ■

New TASI sensor

In November 2009, the ICC validated the TASI (Thermal Airborne Spectrographer Image), a multispectral thermal sensor.

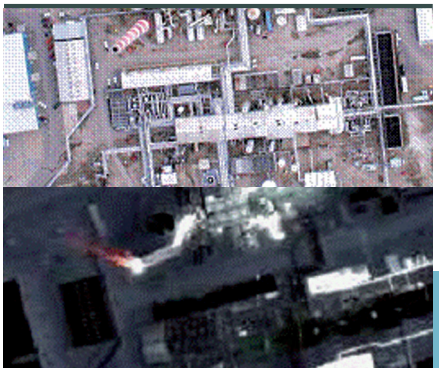
The scientific community devotes efforts to assess the potential of applications that use sensors operating in the middle and thermal infrared range. Detection and radiance measurements of chemical elements in gaseous state can be conducted in the thermal interval of the electromagnetic spectrum. For example, several absorption peaks for water vapour, carbon dioxide, oxygen, ozone and nitric oxide can be found in this wavelength range, allowing detection and analysis of gaseous plumes. Literature also states the ability of these sensors to distinguish artificial objects based on their chemical composition.

The traditional TASI applications exploit the relationship between the amount of electromagnetic radiation emitted in this zone of the spectrum and the temperature of the observed objects. The following applications can be quoted:

- Determination of the Urban Heat Island effect.
- Energy loss in buildings, related to either air conditioning or heating.
- Assessment of thermal plumes in cooling pools of nuclear reactors.
- Fresh groundwater detection in coastal areas.
- Evaluation of crop evapotranspiration to determine their specific water needs. ■

Technical specifications

- Pushbroom sensor in the spectral range of 8 to 11.5 microns (thermal infrared) with 32 spectral bands, approximately 125 nm wide.
- 40 degrees FOV (Field Of View).
- 600 spatial pixels per line, with a dynamic range of 14 bits per pixel.
- Diffraction limited optics.
- Recording rate appropriate to allow low-altitude flights.
- Spectral smile/keystone distorsion better than ± 0.35 pixels.
- NEDT (Noise Equivalent Delta Temperature) 0.2º to 300ºK.



Images used with permission of ITRES.

Two images of a sulphur recovery plant emitting gases through its chimney. The gases are invisible in the optical range, but are identifiable in the thermal interval.

Brief notes

1956-1957 AERIAL PHOTOGRAPH COLLECTION

Since October 2009, the photographs of Catalonia taken by the US Air Force have been available for consultation on ortoXpres (see ICC newsletter no.35).

To make them available to users, a digitalization of the contranegatives was necessary, in addition to aerial triangulation for their continuous viewing.

As they are old photographs, they lack geometric quality. Nonetheless, they are an interesting product because of their historical value and the possibility of comparing them with current metric photographs.

http://www.ortoxpres.cat

THE 2010 CALENDAR, AVAILABLE FOR INTERNET DOWNLOADS

Each year since 1987, the ICC has disseminated a historic map from the Map Library of Catalonia collection. This is how it has made known its historic cartography collection, in addition to the massive dissemination conducted over the Internet.

The calendar is distributed free of charge and can be downloaded in pdf format at its actual size (44.5 cm x 68.5 cm).

The map chosen shows the division of Catalonia in *vegueries* (territory of the principality governed by a veguer, or royal delegate), in a map from the early 18th century, authored by Alexis Hubert Jailot.

http://www.icc.cat/web/content/en/prof/cartografia/descarrega.html

This newsletter is a free publication available in Catalan, Spanish and English.

Year 15 / February 2009 / Number 37
ISSN: 1137-2370 / DL: B-40970-1996

Headquarters of the Institut Cartogràfic de Catalunya
Parc de Montjuïc / E-08038 Barcelona
Telephone (+34) 93 567 15 00 / Telefax 93 567 15 67
E-mail: esther.muns@icc.cat

Customer Service Centers
Parc de Montjuïc / E-08038 Barcelona
Telephone (+34) 93 567 15 90 / Fax 93 567 15 91
Gran Via de Jaume I, 38 / E-17001 Girona
Telephone (+34) 972 22 72 67 / Fax 972 22 73 15 / EADOP
Doctor Fleming, 19 / E-25006 Lleida
Telephone (+34) 973 28 19 30 / Fax 973 26 10 55 / EADOP
Major, 37 / E-43003 Tarragona
Telephone (+34) 977 21 17 97 / Fax 977 22 01 27 / EADOP

http://www.icc.cat

Completion of specification drafting for Annex I of INSPIRE, and how the ICC is participating

The INSPIRE (Infrastructure for Spatial Information of the European Community) Directive has been in force since May 2007. Its aims are to facilitate citizens' access to relevant, harmonized and quality geographic information of the 27 countries that make up the European Community, and provide support to the environmental policies of the Community.

To ensure the exchange of the geographic data and the compatibility of spatial data infrastructures, and facilitate their use, the Directive establishes (through committees) common mandatory technical standards for all member states.

The Directive defines 34 subjects for the environmental applications, classified in 3 annexes. The definition model is based on the application of international standards (ISO,OGC).

The ICC has taken part in this project with the contribution of reference material, in the technical meetings and in the data model prototypes, all of which has aided in the development of the Annex I data specifications (9 data themes). The themes in which ICC experts have participated are: geographical names (Miquel Parella), hydrography (Dolors Barrot) and transport networks (Jordi Escriu). The Institute has contributed providing the specifications of the topographic bases of Catalonia, at scales of 1:5 000, 1:25 000 and 1:50 000 as reference material. ■

What the GIS4EU project is and how the ICC participates

The year 2007 marked the beginning of the GIS4EU research project: Provision of interoperable datasets to open GIS to the EU communities, co-financed by the European Community. The goal of this project is to organize a system to share European spatial information with no need for a central database. The data must be accessible, useful and interoperable for all public and private users of the European Community.

To achieve this objective, several mechanisms must be developed to achieve interoperability of geographic data (pursuant to the standards and requisites of the INSPIRE Directive) and a general and common data model must be defined to provide harmonized cartographic datasets throughout Europe.

The ICC's participation in the GIS4EU project is taking place in the process of implementation of the European INSPIRE Directive, either as a supplier of regional data, or as a collaborator in the design of a common data model and in the establishment of the transformation mechanisms for our data to favour their joint use with those of other European organizations.

The participating ICC experts are: Maria Pla (coordinator of the tasks assigned to the Institute), Anna Lleopart and Santi Sánchez (as data model experts), and Dolors Barrot and Jordi Escriu (as experts in INSPIRE specifications and geographic information standards).

The GIS4EU project is a pilot project to detect and conduct real data experimentation with the problems that European organizations will experience when INSPIRE is implemented in the European Union.

The GIS4EU project is participated in by 24 European organizations (universities, governmental public organizations and private companies) from Germany, Slovakia, Spain, France, Hungary, Italy, Poland, Portugal and the United Kingdom, with the Consorzio per il Coordinamento delle Ricerche sul Sistema Lagunare di Venezia acting as coordinator. ■