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Newsletter

OF THE INSTITUT CARTOGRÀFIC DE CATALUNYA

 Generalitat de Catalunya
Departament de Política Territorial
i Obres Públiques
Institut Cartogràfic de Catalunya

Information about the production, development and research projects
of the Institut Cartogràfic de Catalunya

15 713 422 distributed sheets of the *Mapa comarcal de Catalunya 1:50 000* Cartographic divulging record in Catalonia

The collaboration agreement between the Institut Cartogràfic de Catalunya (ICC) and Ediciones Primera Plana SA, publishing company of the newspaper "el Periódico de Catalunya", has meant a very important inflexion for the spreading of cartography in Catalonia. From the digital topographic cartography base at 1:50 000 scale of Catalonia, generated by the ICC, the company Ediciones Primera Plana SA has printed a special edition of the cartographic series *Mapa comarcal de Catalunya 1:50 000* to be divulged with the Sunday edition of "el Periódico de Catalunya".

The launching and commercialisation, by the ICC, of the first edition of the series, formed by 41 sheets, has meant, by itself, an important qualitative and quantitative change in the massive consumption of the printed cartography. Nevertheless, we are talking about relatively small figures if we compare them with the big launching that has meant the divulging of this series through a mass media as it is the case of the newspaper "el Periódico de Catalunya".

During 41 weeks, from February to November 1996, the sheets of

this series (1 sheet per *comarca* –administrative division in Catalonia–) have come out. The print run has been higher than 366 000 units per sheet, that is a minimum of one sheet for every 20 inhabitants; a minimum print run of 366 000 for the sheet of the *comarca* of Selva, and a maximum of 410 220 for the sheet of Cerdanya.

With this information two very important objectives could have been accomplished:

1. **To make the ICC and its products known.** It is hoped, first of all, that by

means of this divulgation the task of the ICC will be better known by all the citizens of Catalonia and, later, its cartographic products will become present everywhere in an increasing way. Therefore, we have to think in an increase of the cartographic culture which has to put us in the same terms as the European countries which are ahead in the use of cartography.

2. **Divulge a cartographic product on a massive way.** The *Mapa comarcal de Catalunya 1:50 000* will have entered thousands of homes and, without doubt, it will be an important tool for those who travel on business as well as leisure. We have to bear in mind that this scale has a great variety of potential users, from interested people until specialists in studying territorial variables.

Thus, this massive distribution of catalan cartography will have made available to people their own territory and it will have been a tool to know it much better.



New ICC Internet address: <http://www.icc.es>

From November 1996, the Institut Cartogràfic de Catalunya has connected to the Internet world wide web a server with the objective of making public its own information. At the moment, it is meant to supply static information to the users, like an introduction to the institution, its own products, technology and an illustrated annual report. In the near future it will supply

dynamic information like the avalanche report (winter season) and the seismological report (with information near the real time). Slowly this server will be enriched by more information and we hope it will be useful and visited by the users of the Internet network.

Project Argentina. Third year

The Instituto Geográfico Militar de Argentina (IGMA) signed in 1993 a collaboration agreement with the Institut Cartogràfic de Catalunya to do orthoimage cartography of the Argentinian Republic starting from data captured by Earth observation satellites. Furthermore, the agreement comprises the necessary transfer of technology so that, in a near future, IGMA personnel can continue the project on their own.

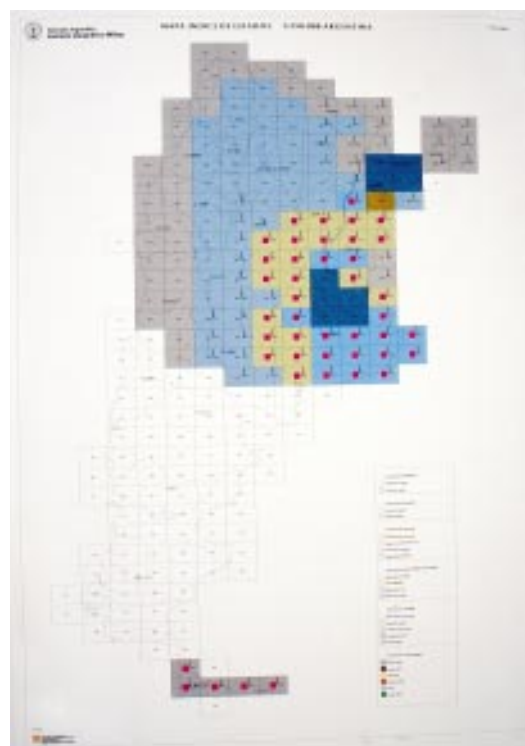
The project, which started in September 1994, is now in its third year of execution. The production of the first year consisted of the publication of 117 sheets at 1:50 000, 1:100 000 and 1:250 000 scales, and the installation of different cartographic systems and logic support for the production of this cartography. During the second year, 200 more sheets were published in the above mentioned scales and, in this third year and the next one the remaining 400 sheets will be produced, adding up the 717 sheets of the project.

The sheets at 1:50 000 scale are performed by merging images obtained by the SPOT satellite with images captured by the Thematic Mapper sensor of the LANDSAT satellite. If we observe the distribution of the sheets planned at this scale, it shows up that they are especially concentrated in the main urban areas. The total number of sheets to be published at 1:50 000 scale is 153, which will cover an approximate area of 65 000 km².

For sheets at 1:100 000 and 1:250 000 scales, only LANDSAT images are used. At 1:100 000 scale the total number of sheets to be produced is 408, covering an approximate area of 677 000 km², and at 1:250 000 scale the total number of sheets is 156 with an approximate area of 2 200 000 km². Almost all these maps are situated to the North of parallel 39, with the only exception of the Tierra del Fuego region.

For the production of this cartography, the different working phases have been:

1. Acquisition of images: directly from SPOT Image in the case of SPOT panchromatic images and from the Instituto Nacional de Pesquisas Espaciais for the images LANDSAT-TM, which cover the Northern half of the Argentinian Republic. With reference to the LANDSAT images, images at level 0 have been obtained and, therefore, a specific and highly sophis-



ticated geometric and radiometric correction has been performed.

2. Necessary field work has been carried out through the identification and measurement of the position of well identified points with GPS receptors.
3. Adjustment of the characteristic geometric model for the images has been performed using tools of spatial triangulation, as well as corrected using terrain elevation model expressly obtained from the topographic map 1:250 000.
4. Mosaic and combination of images; improvement of the boundaries and contrast, and colour enhancing. Each process has been quality and calibrated and quality-controlled.
5. Insertion of the legend, toponymy, frame and other marginal elements; filmation of colours separation and printing.

The area comprised within this cartography includes the Argentinian territory with the highest economic activity and where the highest percentage of population is located, where the highest number of changes have occurred and where the highest public investments in the last years have been caused. All this has caused a natural obsolescence of the existent topographic cartography. The image cartography obtained within the frame of this project complements naturally traditional cartography. In the same way, the transfer of technology will allow IGMA staff to complete the coverage of the country, in the three mentioned scales.

The products generated during this third year of project activities include 1 500 printed issues of each of the 200 orthoimage sheets that are being elaborated, as well as a complete set of CD-Roms with the original digital information and the sheets in a standard format. Also, the application of digital image processing is contemplated in order to improve the productivity of some areas of activity in the production of this type of cartography at IGMA.

Furthermore, in the second year, IGMA produced more than 100 sheets by their own means, starting the process which will end with the full coverage of the Argentinian Republic.

Hansa Luftbild award

Last month of September 1996, Mr. Josep-Lluís Colomer Alberich, technical sub-director general and Mr. Ismael Colomina Fosch, head of the Geodesy Service, both from the ICC, were awarded the 1996 Hansa Luftbild award of the Remote Sensing and Photogrammetry German Society.

This prize is given to the best applied article published in the Society's magazine during 1995. Specifically corresponds to the article "Digital photogrammetric systems under production: experiences in the Institut Cartogràfic de Catalunya", published in the issue 1/1995.



Congratulations!

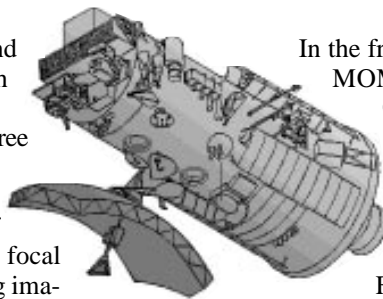
MOMS-2P

On May 5th, 1996 it was successfully launched the MOMS-02 camera (Modular Optoelectronic Multispectral Stereo-Scanner) and it was docked with the PRIRODA (NATURA) module of the Russian space station MIR on May 7th, 1996. In this mission, called MOMS-2P, there will be a daily registering of 5 minutes of images during an estimated minimum period of 18 months. Since the inclination of the MIR orbit is 51.6°, Catalonia and most of Europe will be covered.

The MOMS-02 camera is designed to satisfy the needs of photogrammetry and photointerpretation, which are: complete stereoscopy in the flight direction (producing three images of the same area from different perspectives), high resolution

images, multispectral images and combination of stereoscopy with multispectral images.

The system has five lenses: three of which form the stereoscopic module and two of the multispectral one. The nadir lens of the stereoscopic module has a focal length of 660.0 mm, registering images of high resolution (pixel of 6 m x 6 m at 400 km high). The fore and aft lenses, inclined $\pm 21.4^\circ$, have focal lengths of 237.2 mm, they capture low resolution images (pixel of 18 m x 18 m). The lenses of the multispectral module have focal lengths of 220.0 mm and they register low resolution images in the green, blue, red and near infrared bands.



In the frame of the mission MOMS-2P, the Institut Cartogràfic de Catalunya collaborates with the Institut für Optoelektronik of the DLR (Deutsche

Forschungstalt für Luft und Raumfahrt) and the Lehrstuhl für Photogrammetrie und Fernerkundung of the TUM (Technische Universität München) in the scientific projects GEOCAL (periodic in flight calibration of the camera) and LPFICC (evaluation of the MOMS cartographic potential).

Inauguration of the LUCC International Office

October 11th, 1996 was a significant day for the global change environment science, it was the inauguration in Barcelona, specifically in the Institut Cartogràfic de Catalunya, of the LUCC office (Land Use and Land Cover Change). This event attracted more than 120 scientists from all over the world as well as representatives from organisations such as the European Commission (DGXII), the National Science Foundation from the United States, the Scientific Committee on Problems of the Environment and NAFTA from Japan. In this inauguration there were present the LUCC Scientific Steering Committee and the executive directors of the sponsoring programmes: Mr. Chris Rapley, the IGBP (International Geosphere-Biosphere Programme) and Mr. Arild Underdal, the IHDP (International Human Dimensions Programme on Global Environmental Change), as well as Mr. Luis Ramallo, chair of the ISSC (International Social Science Council), founder of the IHDP. The event was presided by the minister of Política Territorial i Obres Públiques (Regional Planning and Public Works), Mr. Artur Mas, and the minister of Medi Ambient (Environment), Mr. Pere Macias, of the Generalitat de Catalunya (Catalan Autonomous Government).

The four general objectives are defined, where we can see reflected that LUCC is an interdisciplinary project:

1. To obtain a better understanding of global land use and land cover driving forces.

2. To investigate and document temporal and geographical dynamics of land use and land cover.
3. To define the links between sustainability and various land uses.
4. To understand the inter-relationship between LUCC, biogeochemistry and climate.

The keynote address of doctor Ramon Folch: "The social significance of the LUCC: pattern and processes in Western Mediterranean" underlined another characteristic of the LUCC: its interdisciplinary or "socio-economic" approach. Dr. Folch in his speech gave numerous examples of the immediate utility of the study of the land use and land cover changes in territorial organisation, natural resources management and socio-economic policy. Dr. Folch as well as Dr. Steven Sanderson, from the LUCC Scientific Steering Committee, underlined the need to deal with the investigation in this field as a com-

plex function of biogeochemical and socio-economic dynamics. The message was clear: the earth sciences will not be able to explain reality until they see the human being as another component of the biosphere.

The opening of the LUCC international office unquestionably puts Catalonia ahead of the scientific research related to global change. This is caused by the renown importance of land use and land cover change due to the great social, economic, political and environmental impact, at local, regional and global scale, at short, medium and large term, as well as for being connecting factor in the global change science. Several speakers from the inauguration stated that LUCC will occupy a central position in the global change science, at least during the next ten years, since the global impact produced by the land use and land cover changes can be as meaningful or more than those produced by the climatic change.

A great echo of LUCC in the Spanish society is foreseen, due to the fact that the science plan fully integrates topics of high priority for this country (e.g. water management and the fight against desertification). At the same time, LUCC chairman, Dr. David Skole, took this opportunity to express the interest of the Scientific Steering Committee in creating an initiative dedicated to these and other specific problems of the Mediterranean area.



Urban regional maps

The Direcció General d'Urbanisme with the Institut Cartogràfic de Catalunya (ICC) have elaborated the *Mapa del planejament urbanístic i usos del sòl de Catalunya 1:50 000* (Town planning and land use map) corresponding to the *comarca* (administrative division in Catalonia) of Vallès Occidental.

The planimetric base, that the ICC supplies, has been updated from colour orthophotos at 1:25 000 scale (ICC flight 1993 and other sources). It is an extraction of information from the digital cartographic base 1:50 000 of the ICC, since some information levels have been cancelled to give priority to the town planning thematic content and to avoid the visual confusion which is produced by an excess of information. Regarding the road network, updated in January 1996, it is only represented the one that clarifies the functional general structure and the morphology of the urban fabric. The delimitation of the municipal boundaries has been extracted from the cartographic base of the ICC.

On the other hand, the town planning information has been supplied by the Direcció General d'Urbanisme. It comprises the delimitation of the legal regime of the land and the differentiation of the dominant uses that the planning establishes over the territory. These uses are synthesised according to an unique legend of concepts and colours which allows a continuous reading of the planning through the different municipal boundaries.

The thematic content comes from the current documents of the urban general and sectorial planning at Desember 31st, 1995, in

the territory of the *comarca* of Vallès Occidental. For each of the municipal areas, the approved files have been consulted from the final approval of the General plan or the Subsidiary norms until the above mentioned date.

As a complementary information, we have to notice a text explaining the methodological process used; a table with municipal and urban data where the population, area, type of plan and the final data of approval for each municipal area and, finally, a table of the juridical regime of the land where the urban regime and the building land is specified.

We have to add that the maps of Baix Llobregat, Barcelonès, Maresme and Vallès Oriental areas are being developed and will be printed.



New edition of the *Mapa oficial de carreteres de Catalunya 1:250 000*

The Institut Cartogràfic de Catalunya published, in October 1995, the third edition of the *Mapa oficial de carreteres de Catalunya 1:250 000* (Official road map), which already had a first reprint in May 1996. The time passed from the first edition (April 1985) is patent in the present edition, which collects the technological and aesthetic logical changes, the exponential increase of the cartographic experience at the ICC, and in a different area, the constant working on the territory.

As in the previous editions, this map is fruit of the thematic information given by the Direcció General de Carreteres. In addition to the information that any new edition has, it is worth mentioning that the map has been digitally developed from the generalisation of the cartographic bases 1:250 000 and 1:50 000 of the ICC.

On a grey background representing the mountain shadows, there have been situated the urban nuclei, the hydrological network and the basic toponymy, and it is shown the actual Catalan road network classified according to its own categories (highway, dual carriageway, road, etc.) and the institution responsible for them (MOPTMA –when printing the map–, Generalitat de Catalunya –Catalan Autonomous Government– and *diputacions* –provincial council offices–). Also there is the codification of

each road according to the management institutions' classification, the beginning and end of each road and the distance in kilometres between crossroads.

The map, apart from its own mapped area, has 4 windows at 1:125 000 scale of the areas of Barcelona, Girona, Lleida and Reus-Tarragona, and 59 windows at 1:50 000 scale which are at the back of the sheet, and show the regional capitals and areas where due to its complex road system.



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