



Catalonia: an example of coordination of spatial information between different levels of public authorities

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As a result of the administrative structure, Catalonia has three different levels of public authority with competences over the same territory: state administration, regional administration and local administration. In consequence, it is necessary to do a good coordination in order to avoid duplicate spatial information and to guarantee that spatial data collected at one level is shared between the other levels of public authority. But, in order to solve the problems related with the availability, quality, accessibility and sharing of spatial information, it is also essential to have official data specifications to cover the needs of different levels of administration and to answer the INSPIRE Directive.

In 2005, the Government of Catalonia established a legal framework that, respecting the respective autonomy, ensured the coherence of the actions and guaranteed the maximum effectiveness between regional administration and local administration. This will was collected in two legal rules:

- The Law 16/2005, of December 27th, of the geographic information and the Institut Cartogràfic de Catalunya.
- The Decree 398/2006, of October 24th, approving the Regulation for the development of the Law 16/2005, regarding the officiality and use of the cartographic services and the interadministrative relations and planning.

The law not only marks the principles to make possible this coordination, but also establishes some instruments to put these principles into effect:

- A body of management and coordination of the geographic information: the Cartographic Coordination Commission of Catalonia (C4).
- An instrument of coordination: the Cartographic Plan of Catalonia (PCC).
- An entity of permanent support to the Cartographic Coordination Commission of Catalonia: the Cartographic and Geological Institute of Catalonia (ICGC).
- Two basic bodies for publication of geographic information: the Cartographic Registry of Catalonia (RCC) and the Spatial Data Infrastructure of Catalonia (IDEC).



Cartographic Coordination Commission of Catalonia (C4)

The C4 is the basic body for meeting, collaboration and coordination between the administration of Generalitat and Local authorities in the field of mapping and related geographic information. Its main functions are:

- Establishing the framework governing the activities and relationships between public authorities in Catalonia that have cartographic services
- Establishing official rules and standards to be applied in the elaboration of maps and geographic information
- Ensuring the compliance of the objectives and priorities of the PCC
- Ensuring the compliance of the objectives of the INSPIRE Directive

The C4 works under the principles of institutional loyalty, effectiveness, efficiency, non-duplication, cooperation and mutual assistance and information between different levels of Catalonia public authorities (regional and local level).

The C4 is a peer commission composed of 13 representatives of various departments at the Regional level and 13 representatives at the Local level. Moreover, when the issues in the agenda so requires, the C4 invites to participate in its meetings, with voice, representatives of state bodies competent in the field of cartography and geographic information, members of representative of professional associations or academics related to mapping and other persons with accredited competence in these areas.

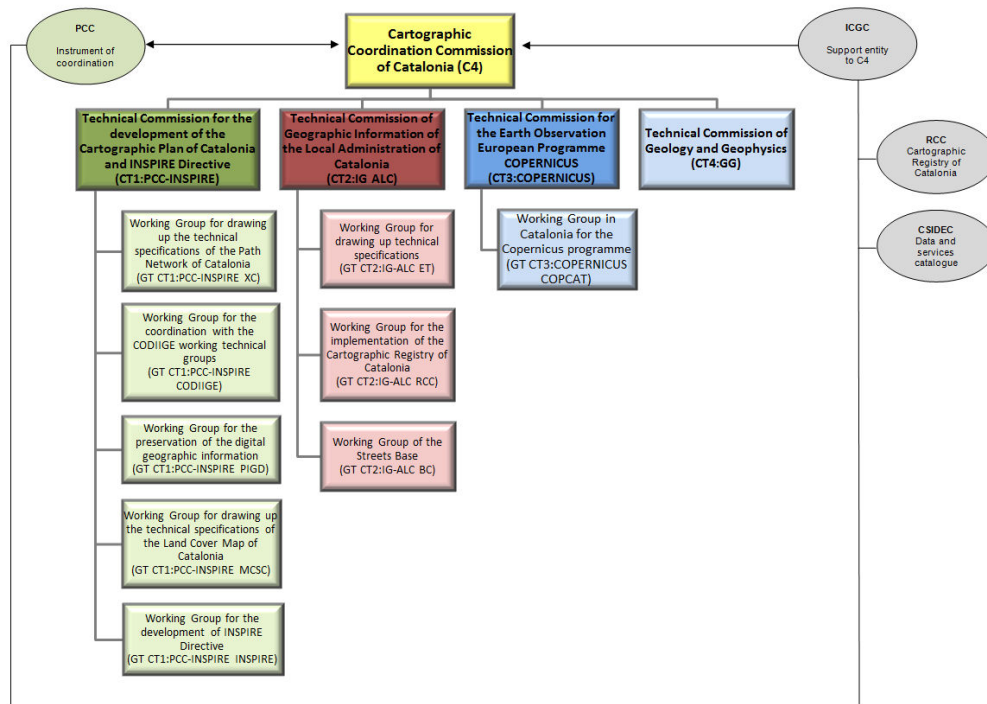
The composition of C4 at December, 31st 2014 is as follows:

Entity	Members
Department of Territory and Sustainability (<i>Presidency</i>)	1
Cartographic and Geological Institute of Catalonia (<i>Vice-presidency first</i>)	1
Department of Agriculture, Livestock Fisheries, Food and Natural Environment	1
Department of Economy and Knowledge	2
Department of Governance and Institutional Relations	1
Department of Territory and Sustainability	1
Department of Home Affairs	1
Department of Business and Labour	1
Department of Territory and Sustainability	4
Cartographic and Geological Institute of Catalonia	1
City Council of Barcelona	1
Association of Municipalities of the Metropolitan Area of Barcelona	1
Provincial Council of Barcelona	1
Provincial Council of Girona	1
Provincial Council of Lleida	1
Provincial Council of Tarragona	1

Catalan Association of Municipalities and Regions	3
Federation of Municipalities and Regions	4
total	26

The C4 functions as a Plenum and also in Technical Commissions depending on the subjects. The Plenum is the highest level organ and meets, at least, twice a year in ordinary call and, in extraordinary call, if it is requested by the chairman or half of its members. The resolutions are adopted by a majority vote of its members.

To carry out its tasks, the C4 is based on several Technical Commissions and Working Groups, whose conclusions and technical reports are submitted to the C4's plenary session to be approved. The composition of each Commission and the percentage of representation of different stakeholders vary according to its purpose. The Technical Commissions have the power to create, when necessary, working groups for specific issues. Following graphic shows the current C4 structure.



Currently, there are 4 Commissions and 9 Working Groups.

- The *CT1: PCC-INSPIRE* is composed of 28 representatives from the Regional Administration (82%), 12 representatives from the Local Administration (12%), and 2 representatives from the academia (6%). Its objectives are monitoring PCC development, including the analysis of the impact of INSPIRE Directive and its implementation. This Commission has created the following working groups to tackle specific issues:
 - Working Group for drawing up the technical specifications of the Path Network of Catalonia (*GT CT1: PCC-INSPIRE XC*): defining the data model



- and drawing up the technical specifications, as well as their integration into the Integrated road graph of Catalonia.
- Working Group for the coordination with the CODIIGE working technical groups (*GT CT1: PCC-INSPIRE CODIIGE*): coordinating and supporting the activities of the technical participants in different working technical groups of the Spanish State for the adaptation and implementation of the INSPIRE implementing rules, taking advantage of the work done in the PCC development.
 - Working Group for the preservation of digital geographic information (*GT CT1: PCC-INSPIRE PIGD*): coordinating and organizing the preservation of the digital geographic information of the 113 datasets that make up the PCC.
 - Working Group for the analysis of the use cases related with land cover and land use (*GT CT1: PCC-INSPIRE MCSC*): elaborating of the technical specifications of the Land Cover Map of Catalonia.
 - Working Group for the implementation of INSPIRE Directive (*GT CT1: INSPIRE*): supporting public entities in implementing the INSPIRE data set and services.
- The *CT2: GI* is composed of 6 representatives from the Regional Administration (18%), 27 representatives from the Local Administration (79%) and 1 representative from the professional sector (3%). Its objectives are to transmit to the PCC the contributions of the local authorities that produce geographic information. This Commission has created the following working groups to tackle specific issues:
 - Working Group for the elaboration of technical specifications (*GT CT2: GI ET*): drafting, with consensus of the different producers of large-scale cartography, the rules and specifications for carrying out this cartography.
 - Working Group for the implementation of the RCC (*GT CT2: GI RCC*): implementing the necessary resources and support to carry out the registration of the maps generated by the municipalities.
 - Working Group for the street database (*GT CT2: GI BC*): promoting and drafting the technical specifications that refer to two of the CIGs catalogued in the PCC: local gazetteers of streets and roads database and integrated road system.
 - The *CT3: COPERNICUS* is composed of 16 representatives from the Regional Administration, belonging to 5 different Departments. Its main objectives are all the issues regarding Copernicus European Programme (monitoring for environment and security). This Commission has created the following working group to tackle specific issues:
 - Working Group for the European Earth Observation Programme Copernicus COPCAT in Catalonia (*GT CT3: COPERNICUS COPCAT*): drawing up proposals to be presented to the calls for participation into COPERNICUS/HORIZON 2020.



- The CT4: GEOLOGY AND GEOPHYSICS is now in phase of constitution.

As well as the C4, each Technical Commission meets, at least, twice a year. Working groups meet more than this, 4 or 5 times a year.

Through the C4 and all the technical committees and working groups attached to it, the Catalan government ensures a consensual management of geographic information in the field of public administration. All these commissions and working groups allow the participation of different stakeholders, who can play an active role at the moment to decide policies related with geographic information. All activities and decisions of the C4 are published in <http://www.ccartografica.cat>.

Cartographic Plan of Catalonia (PCC)

The first task of the C4 was to determine the basic dataset that regional and local authorities of Catalonia needed to carry out their responsibilities. To accomplish this, on November 30th 2006 the C4 created a Technical Commission composed of different representatives from regional and local authorities, academy and professional sector related with geographic information. The Technical Commission started its work with a consultative process to know all the needs and opinions, and to involve into the process the maximum number of agents related to geographic information of Catalonia. During the process it took into account the needs and considerations of about 120 stakeholders comprising different areas.

As a result of this participative process, the Technical Commission generated a proposal of PCC, which was approved by the C4 on April 20th 2009 and passed by the Catalan Government on May 18th 2010.

The PCC is the basic tool for planning the cartographic and geographic information of the public authorities in Catalonia. The PCC defines and identifies the 113 datasets that the regional and the local administration produce and use in Catalonia. These 113 CIGs are included into a catalogue, in which they are grouped according to the topics of Annexes I, II and III of the INSPIRE Directive. Group 0 has been added to integrate the topographic cartography and databases. The following table lists the number of CIGs of the PCC included in each of the themes of the INSPIRE Directive.



INSPIRE Classification	Number of CIGs
Group 0 - 1. Topographic referential	9
Group I - 1. Coordinate reference systems	1
Group I - 2. Geographical grid systems	3
Group I - 3. Geographical names	2
Group I - 4. Administrative units	2
Group I - 5. Addresses	1
Group I - 6. Cadastral parcels	1
Group I - 7. Transport networks	7
Group I - 8. Hydrography	2
Group I - 9. Protected sites	7
Group II - 1. Elevation	3
Group II - 2. Land cover	1
Group II - 3. Orthoimagery	2
Group II - 4. Geology	7
Group III - 1. Statistical units	1
Group III - 2. Buildings	1
Group III - 3. Soil	1
Group III - 4. Land use	4
Group III - 5. Human health and safety	2
Group III - 6. Utility and Government services	9
Group III - 7. Environmental monitoring facilities	3
Group III - 8. Production and industrial facilities	4
Group III - 9. Agricultural and aquaculture facilities	6
Group III - 10. Population distribution - demography	2
Group III - 11. Area management/restriction/regulation zones and reporting units	15
Group III -12. Natural risk zones	7
Group III -13. Atmospheric conditions	1
Group III - 14. Meteorological geographical features	1
Group III - 17. Bio-geographical regions	1
Group III - 18. Habitats and biotopes	3
Group III - 19. Species distribution	2
Group III - 20. Energy resources	1
Group III - 21. Mineral resources	1
TOTAL	113

For each dataset, the catalogue establishes an unique identifier, the public authority responsible, the level of access authorization, the maximum recommended update frequency and the description.

The PCC development is carried out in three phases, whose status is as follows:

- Phase II (characterization of datasets):
 - 71 datasets with specifications (63%)
 - 61 datasets with Metadata (54%)
 - 61 datasets catalogued into the SDI of Catalonia (54%)
 - 82 datasets with some kind of geoservices (73%)
- Phase III (standardization of datasets):
 - 23 datasets with specifications passed by C4 (20%) = 34 specifications approved (each dataset can have several specifications)
- Phase IV (officialization and publication of datasets):
 - 17 datasets registered in the RCC (15%)
 - 22 official datasets catalogued into the SDI of Catalonia (19%)

The PCC is a live instrument. The law establishes that each 8 years it will be revised, but the C4 has competences to revise it when deemed necessary. Technical and political changes in the field of geographic information induce necessary adjustments of PCC. Activities of Commissions and Working Groups are the first way to know when the PCC needs a change, but, at this moment, it is in a process to establish a new channel to know other requirements from public and private users who aren't represented in the commissions.

In the PCC development, the C4 takes into account the INSPIRE Directive and the recommendations of other national and international normalizing agencies.

Cartographic and Geological Institute of Catalonia (ICGC)

All activities carried out by the C4 are supported by ICGC, which acts as a technical secretary. Other functions of ICGC are:

- Elaborating and proposing the PCC as well as its development and updating.
- Coordinating and cooperating with the bodies of the Spanish State, Regional and Local administrations in the field of cartography and geographical information.
- Leading and managing the RCC.
- Creating, organizing, disseminating and maintaining the IDEC.
- Promoting the public and private cartographic services.
- Promoting the research, teaching and technological development in the cartographic field.
- Coordinating, within Catalonia, the execution of international rules and obligations related to the functions assigned to ICGC.
- Monitoring and reporting the degree of development of the PCC and the degree of implementation of the INSPIRE Directive in Catalonia.

Cartographic Registry of Catalonia (RCC) and Spatial Data Infrastructure of Catalonia (IDEC)

The RCC is a basic registry that catalogues the cartographic and geographic information that is considered official in Catalonia.

For public administration in Catalonia, the use of official registered cartographic and geographic information is mandatory for the elaboration of new maps, and when they need, in the exercise of their function, to use cartographic or geographic information.

What geographic information is included in the RCC?

- The cartography produced by the ICGC has the character of official cartography in Catalonia.
- The cartography elaborated by other administrations or other public and private subjects if:
 - This cartography has been elaborated in accordance with the rules and the standards established by the C4.
 - It incorporates the metadata approved by this commission.
 - It is maintained in a sufficient state of updating and availability.

At this moment, near 28.000 datasets are registered in the RCC and every year about 14.000 datasets are updated.

The RCC is the body that certifies the quality of cartography and geographic information in Catalonia because, prior to its registration, all the information submitted is subject to a quality control by the ICGC. The quality control that the ICGC

performs checks the data compliance with the technical specifications approved by the C4 and the metadata compliance with the rules issued by the IDEC.

In order to coordinate the official geographic information produced by Regional and Local public authorities of Catalonia with the official information produced by the Spanish State, the RCC will be connected to the Cartographic Central Registry.

Finally, the RCC catalogue is included into the SDI of Catalonia and is published in www.rcc.cat

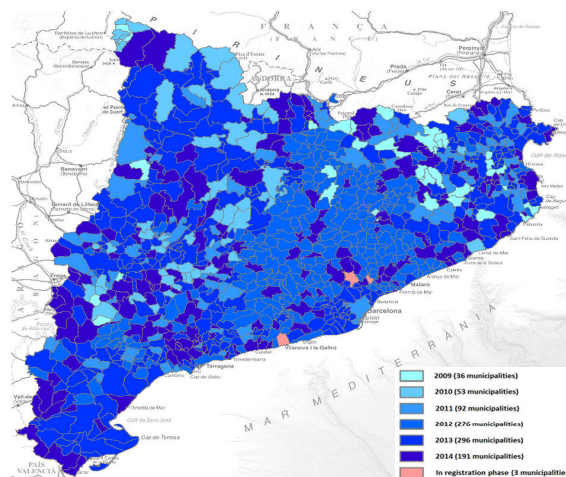
Conclusion

Catalonia has a legal and technical infrastructure that facilitates carry out the management of geographic information under the principles of institutional loyalty, effectiveness, efficiency, non-duplication, cooperation and mutual assistance and information between different levels of Catalonia public authorities (regional and local level and also national level).

An example of this coordination is the activity of the *GT CT2: GI ET* related to the large-scale cartography. In Catalonia this dataset is produced by different regional and local entities.

Ten years ago each producer made the topographic cartography 1:1 000 under his own specification and the result was an heterogeneous map of projects with different characteristics. In 2006 the *GT CT2: GI ET*, with representatives of all producers, started working at establishing a common specification and generated the first official version of 3D Topographic cartography 1:1.000 and 1:2.000, which was passed by the C4 on November 30th 2006. After this, all producers started a process to adapt their own specification to the official one.

The inscription of urban cartography projects on the RCC shows the process of homogenization of this dataset, as you can see in the map below.





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