THE NEW INSTITUT GEOLÒGIC DE CATALUNYA: THE GEOWORKS PROGRAMME OF THE YOUNGEST GEOLOGICAL INSTITUTE OF EUROPE

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KEY WORDS: ten words as a maximum.

The Institut Geologic de Catalunya

Through the Law 19/2005 of the Catalan Parliament, the Catalan Government created the Geological Institute as a new instrument to contribute to the availability of basic and updated geological, pedological and geothematic information. The Law relates the activity of the Geological Institute to “the research, advice and production of information relative to the ground and the subsoil, which constitute indispensable tools to promote the several policies, both public and private, that have their operative axes in the ground and the subsoil, and also to establish the necessary preventive or corrective measures for situations of risk. For the exercise of these functions, the geological map of Catalonia is configured as a fundamental instrument".

The GeoTreballs, a new concept of geological map

The geological works, both in their theoretical and applied aspects, have a long tradition in Catalonia, which precedents go back to the last decades of the 19th century. However, because of some historical vicissitudes, there is still an important lack concerning modern, basic geological, pedological and geothematic information, necessary for land and urban planning. The availability of this information and the subsequent generated knowledge about the soil and the subsoil, are essential items for the right management of these natural, limited and non renewable resources.

What we call GeoTreballs (the Catalan word for “Geo-Works”) is a set of programs through which the several layers of information that constitute the Geological Map of Catalonia have to be completed. The GeoTreballs are organized through six programs aimed to acquiring, elaborating, integrating and publishing the basic geological, pedological and geothematic information concerning the whole of the territory, in the suitable scales for the land and urban planning, to be produced in a period of time estimated in about fifteen years.

In this way, the Geological Map of Catalonia results from the integration of the results produced by the completion of six *GeoTreballs*, each of which generating a complete cartographic series and the corresponding systems of associated data bases. Namely, the six *GeoTreballs* are:

- Geological Map 1:25000.
- Geological Map of the Active and Recent Processes
- and of the Anthropic Activity 1:25000 (GeoAntròpic 25).
- Geological Map of Urban Areas 1:5000.
- Soil Map 1:25000.
- Hydrogeological Map 1:25000.
- Map for the Prevention of Geological Risks 1:25000.

The concepts, contents, covered areas, and uses and applications of the informations resulting from the completion of each of the GeoTreballs are sumarized as follows:

- **The Geological Map 1:25000** is the basic, general geological map. It reaches the whole area of Catalonia (31.895 Km2), divided into 304 sheets. From a conceptual point of view, it is the general geological framework for the other GeoTreballs, and provides them with the necessary, basic geological information. As other classical geological maps, the Geological Map 1:25.000 summarizes the basic geological knowledge of the Region. It is produced from specific field and laboratory reserach supported by the available subsurface and remote sensing data. It informs about the lithology, the stratigraphy, the age, the structure and other geological characteristics of the materials that form the basement, about the surficial and recent deposits, and about those of antrhopogenic origin.

- **The Geological Map of the Active and Recent Processes and of the Anthropic Activity 1:25000** is an applied geothematic map produced to the suitable scale for the land planning. As its name is a so long title, we call it GeoAntròpic 25. The map covers the whole area of Catalunya divided into 304 sheets, and informs about the basic lithology and structure of the geological basement, about the lithology and the processes that have generated the surficial deposits and about the human actions that have resulted in modificatons of the land’s original geometry and/or its natural attributes (Fig. 1). As in other geothematic maps occur, the basic information partially derives from the analysis of that contained in the general geological map, completed with specific field research, geotechnical and subsurface data, and from the analysis and interpretation of old and recent topographic maps and aerial photographs, as well as other documents produced using remote sensing techniques. To summarize, the GeoAntròpic 25 deals with the constraints that the geological environment imposes to the development of the human activity,

and about the effects that the human activity produces in the geological environment. Moreover, the information contained in this map is essential for the realization of the Map for the Prevention of Geological Risks 1:25 000, and for the implementation of its related Information System.

- **The Geological Map of Urban Areas 1:5000** is also an applied geothematic map, produced at the suitable scale for the urban planning. It covers an area of 2109 Km2, corresponding to that of all cities and towns of more than 10.000 inhabitants, and the county capital towns of Catalonia of less than 10.000 inhabitants. Conceptually, the information contained in this map is of the same type than that of the GeoAntròpic 25, but the methodology for data capture is strongly conditioned by the scale and very especially by the physical particularities which characterize the highly anthropised zones (Fig. 2).

- **The Soil Map 1:25000** is a map of pedological content, produced at the suitable scale for the agricultural and general land planning. It covers the whole area of Catalonia, and it is also divided into 304 sheets. The availability of information about the physical constitution and chemistry of the soils, as limited and non renewable resources, is essential for the management of the agricultural land as well as for the general and environmental planning in the widest sense of the term. The soil maps are the minimum that is required to manage the edaphic resources and to carry out national and European strategies of sustainable development. The information included in the Soil Map is also essential to complete the Information System of geological risks.

- **The Hydrogeological Map 1:25000** is an applied geothematic map especially designed for the management of the groundwater resources and for the policies of protection of other environmental issues. The information that it contains allows reducing the costs of constructive projects. Its scale also allows to a detailed delimitation of the water resources in the subsurface, both spatially and temporarily, resulting in a useful administrative instrument.

- **The Map for the Prevention of Geological Risks 1:25.000** is an applied, multi – risk map that forms part of the policy of prevention of natural risks in Catalonia. The treatment of the data concerning the several geological risks (risk of movement of the terrain, seismic risk, risk of avalanches or risk of floods, among other) allow to make a zoning of the territory, which is necessary for the general land planning, and is the basis for the development of local analyses related to urban planning (Fig. 3).

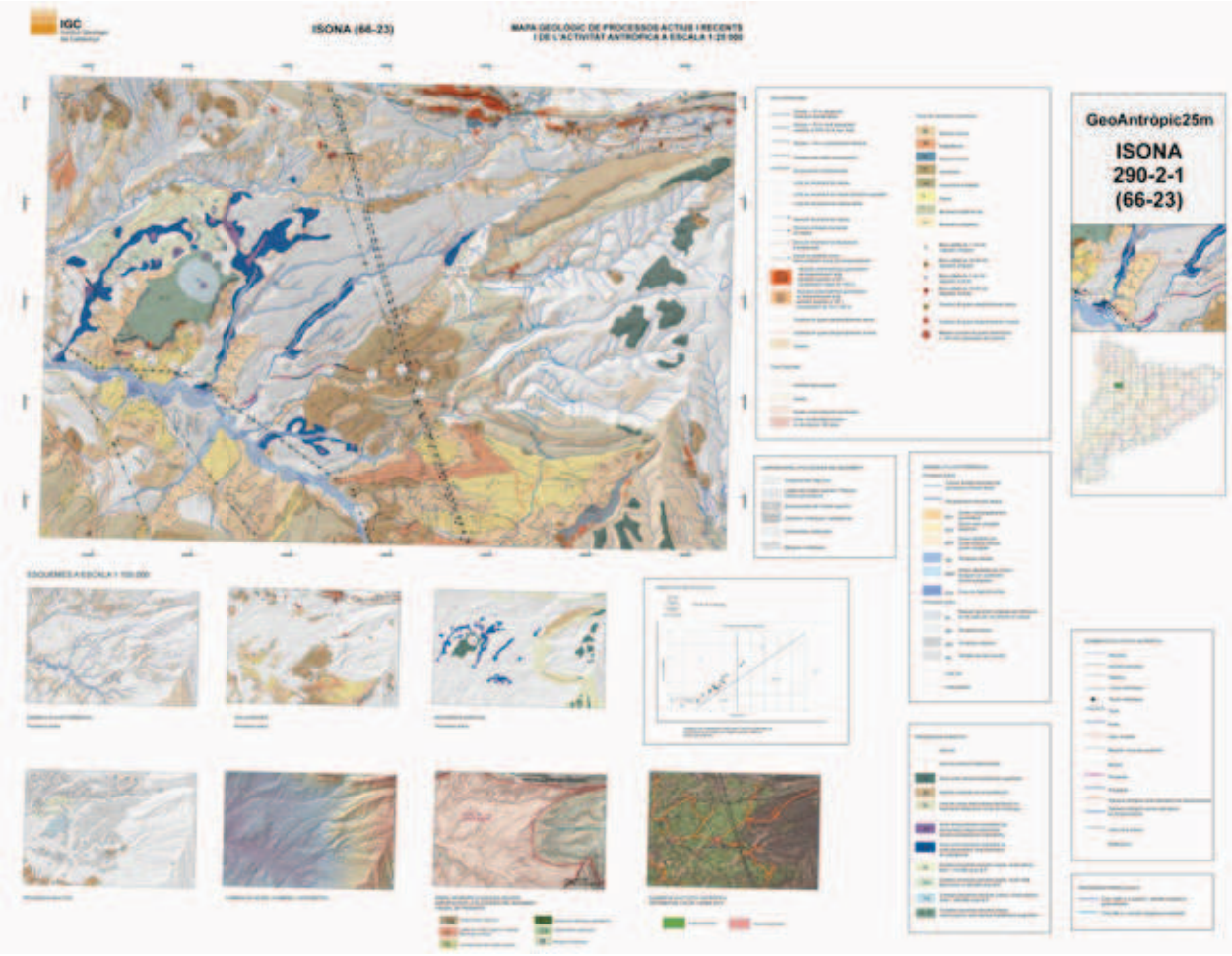

Fig.1- Example of a GeoAnthropic map

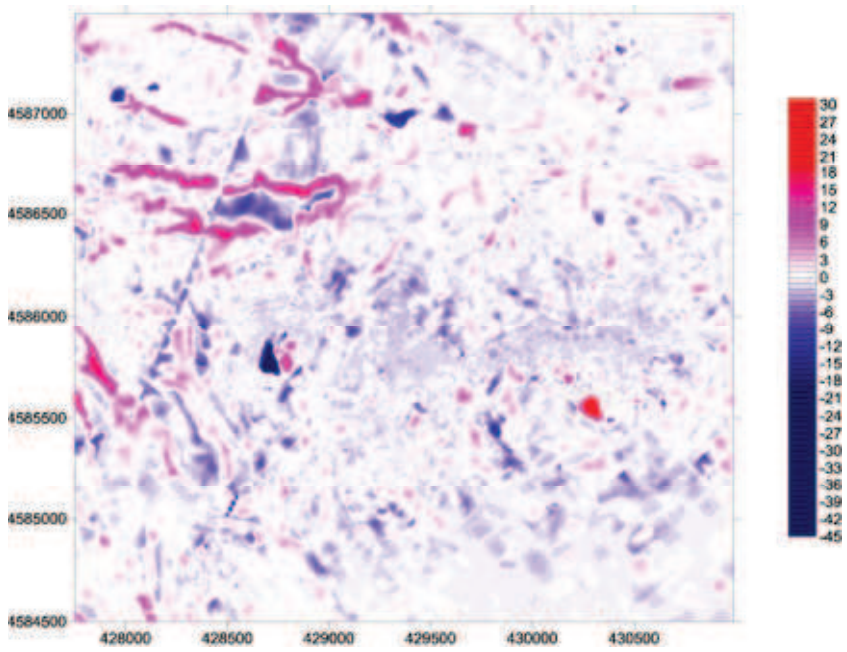

Fig.2. Model of infill and excavation obtained through a digitations and restitution process of present and ancient aerial photography.

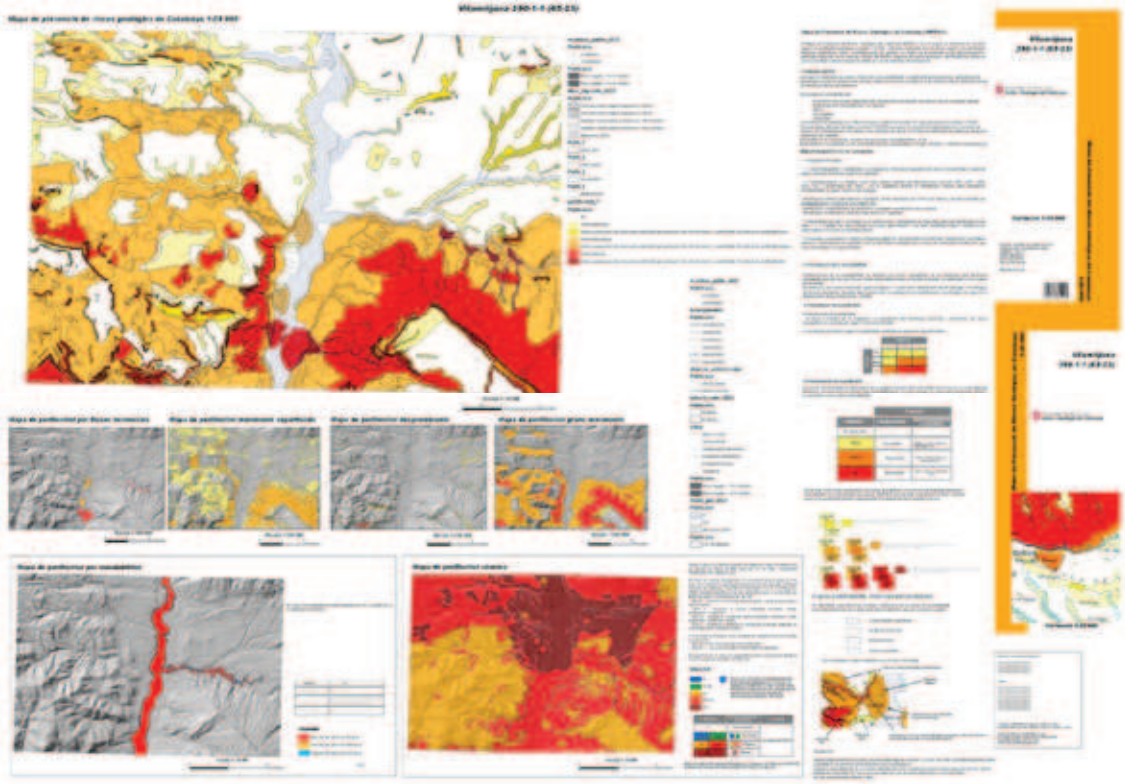

Figure 3 – Example of a geological hazar map.