

## *THEMATIC CARTOGRAPHY AS AN INTERPRETATIVE TOOL IN THE NATURTEJO GLOBAL GEOPARK (PORTUGAL)*

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The Naturtejo Geopark was the first Portuguese geopark to join the European and Global Geoparks Network, under the UNESCO auspices, in 2006. It is a 4617 km<sup>2</sup> territory which integrates 6 municipalities: Castelo Branco, Idanha-a-Nova, Nisa, Oleiros, Proença-a-Nova and Vila Velha de Ródão.

The goals of the Naturtejo Geopark are to investigate, protect, promote and disseminate the Geological Heritage through educational and tourism activities. Together with other scientific and cultural thematics, it also intends to manage the geodiversity, with the support of the public consciousness, such as the promotion of the science in the education. With such wide territory covered by Naturtejo, it is of the utmost importance to have not only strong scientific fundamentals, but also excellent interpretative and disseminative materials. Through the Geographic Information Systems (GIS), such as the ESRI ArcGIS software, digital thematic cartography material has been developed, based on the digital cartography available on the Environment Digital Atlas – Environment Institute (Portugal). This helped fulfilling the lack of support for territory interpretation, and can be used as a tool for educational programs and other science interpretation activities.

The work described in this paper is about the digital thematic cartography developed during an internship at Naturtejo Geopark, as a support tool for the formal and non-formal education in several thematics. When we are studying the thematic cartography, we are recurring to graphical representations of the distributions of features and properties of a particular area, which represent a tool that simplifies the interpretation, and if properly used can be excellent to better fit and explain the territory morphology. A thematic map is a map which represents the cartography of a particularly phenomenon (Leite *et al.*, 2010), such as the natural resources, protected areas, vegetation, soils, among others.

Based on the available digital information in the Environment Digital Atlas – Environment Institute, in Portugal, it was possible to build a cartographic database for the Naturtejo Geopark territory. Therefore, with the support of the EDRISI ArcGIS software, several thematic maps were developed, combining different information in several shapes: geological, tectonics, soils, hypsometric, hydrographic, geomonuments, protected areas and geomorphologic, the last was based on the Geomorphological Map of Portugal, in a 1:500 000 scale. This cartography was developed for all the Geopark territory, but also in particular for each one of the municipalities and some parish villages highlighting their Geological Heritage.

In the Educational Programs of the Geopark Naturtejo there are field trips to its geomonuments, which aims to use as educational tools the Geological Heritage and the geoconservation, performed by its specialized technicians. In these activities, didactic models are used to help to better understand the meaning of some features and processes. In this context, the use of thematic maps reveals itself as a favorable tool given all the didactic potential of using graphic representations of land surface.

To better fit any geosite, whether for a scholarly audience or for tourist one, with the appropriate approach, the analysis of thematic cartography helps reducing the level of abstraction inherent to geological themes, the reliefs according with the geodiversity, the landforms of the territory according with the geologic evolution, such as faults scarps or residual reliefs, the hydrographical net which carved the region and which respond to the geological discontinuities, or even the distribution of the classified areas through the Naturtejo Geopark, such as the

Protected Areas Network, Important Bird Areas (IBA's) or Natura 2000 sites. Specifically, in some levels of teaching, cartography integrates the programmatic contents, which means that the development of specific activities with cartography can be performed with specific material within the territory of the Naturtejo Geopark, including interpretation of topographic charts, scale exercises, making profiles, thematic maps interpretation, specifically reading geological maps and stratigraphic logs.

The geological cartography, although in a simplified scale, has an added importance due to its utility in the domains of the mining exploitation and other energy sources, aquifers, nature conservancy, and particularly of the Geological Heritage (Rebelo, 1999)

The utility of the thematic maps it is not only important to the educational programs of Primary, Elementary, Secondary, High School and University levels of the Naturtejo Geopark, but also to the scientific meetings, conferences and others, as a framework for the works in progress at the scientific or geotouristic levels.

Concerning the target audience, it is important to consider the sort of maps to use, based on the goals of the visit. The thematic cartography is also advantageous to include in leaflets (for instance "Geomining Heritage of Oleiros"), interpretative panels and field guides to contextualize the theme and the discussed area.

In the Educational Programs of Naturtejo Geopark interaction between the school groups and the Geological Heritage is highly important, and for this, it is important to have a good interpretation. This helps captivating and promoting the interests of all in the formal and non-formal education. One of the methods that can be used to explore the vast territory of geopark is through its thematic cartography, in the different scales, which comes to strengthen the diversity of supply issues for interpretation and territorial management. Posteriorly, and to get the most of the GIS, a more technical and detailed cartography can be developed, taking into account the fact that not all the territory the Naturtejo Geopark is charted in 1:50 000 scale, in particularly part of the regions of Castelo Branco, Idanha-a-Nova, Proença-a-Nova and all the Oleiros region; as well as 3D cartography, such as, Digital Elevation Models.

### **References**

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