

GIS applications in territorial and environmental planning: evaluation of ambits and levels of criticality in terms of ecosystemic connectivity

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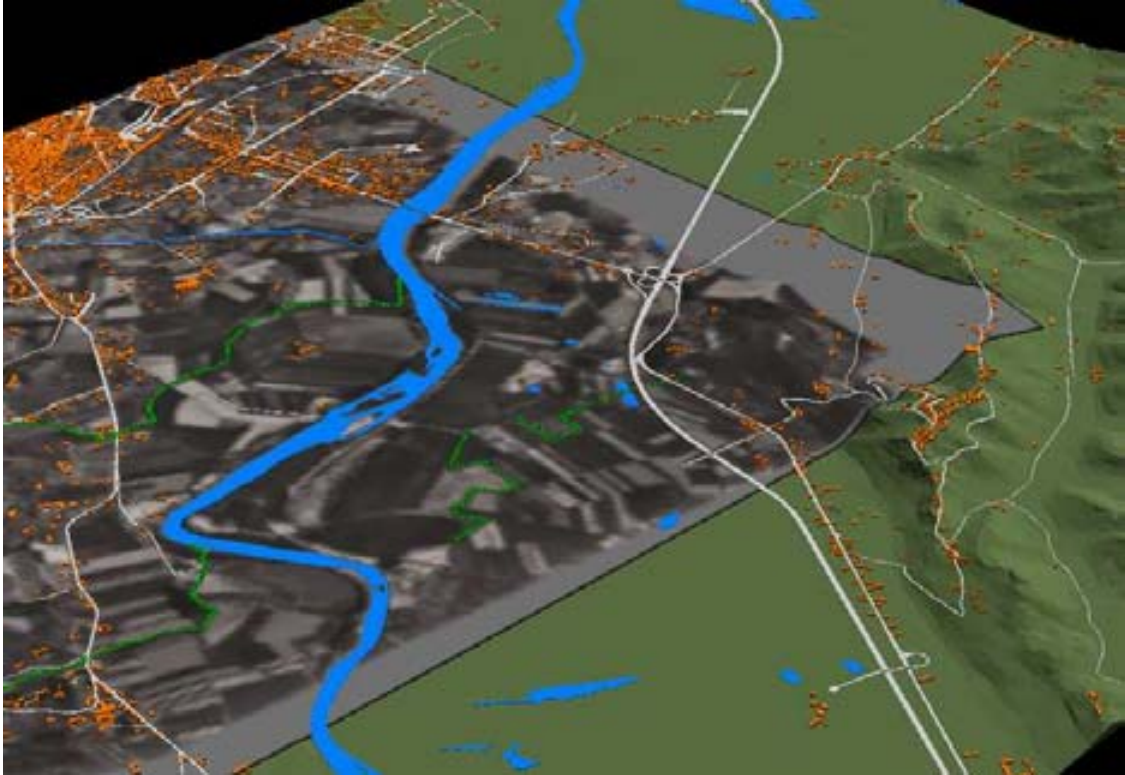
Modern GIS applications provide a considerable degree of support for geographic decision-making processes, and find their application in the analysis of both socio-economic as well as environmental and urban matters. The possibility of using and managing information from diverse sources (satellite images, aerial photographs, vectors, rasters, *etc.*), as well as the various possibilities for representing research results in the form of thematic maps, 3D models, *etc.*, are among the key elements that have contributed to the rapid circulation of GIS applications. Indeed, the introduction of 3D models allows for a much greater amount of information to be incorporated in a map and greatly increases the potential for analysis. Furthermore, the improved readability of the distinctive elements of graphic representations has a particularly positive effect on the manner in which research results may be circulated through the use of GIS applications.

The object of the present study is to investigate and demonstrate the extent to which it is possible to analyse a given territory using the resources of GIS applications. In addition, the study will seek to identify the potential for maximising these GIS resources through the use of 3D extensions by an analytical process which is appropriate to a field such as the study of the living environment. In particular, two aspects are of particular importance; the capacity to provide a territorial analysis in a short time and the possibility of using the data which are available today at a relatively low cost, with the precise aim of checking availability and increasing potential integration.

From an operational point of view, ecology of environmental systems considers the territory a holistic unity including both biotic and a-biotic components, in which man is a determining factor. This means that he modifies the environment in which he lives in accordance with his own requirements, changing it and eventually increasing the degree of instability. Considering an environmental systems as a unified structure of indicators provides the opportunity to make a series of analysis by picking out visual images (such as morphology, hydrography, use of the soil, *etc.*).

GIS systems correspond perfectly to this kind of approach, because they combine the possibility to carry out an analysis at a number of overlapping levels with the possibility of matching a series of characteristics to each discrete element of the territory and providing a picture which includes both image and analysis.

This case-study focuses on the valley of the River Tanaro from the border of the province of Cuneo to the town of Asti. This territory has been studied in order to understand how the construction of the new motorway Asti-Cuneo will affect the dynamic of interaction between the different ecosystems there, and to see if it is possible to restore any links which may have been broken by identifying and establishing a series of appropriate ecological corridors.



Overlay of informational levels – the 3D model has been used to analyse and increase the interpretation of different sets of spatial and geographic data

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