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Extended Abstracts

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Groundwater mapping — approach and results

title: **Groundwater resource assessment in hard-rock systems (Central Portugal): coupling GIS mapping, hydrogeomorphology and hydrogeology aspects**

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Integrated studies were implemented for studying groundwater resources in Central Portugal. Understanding the role of geomorphology is essential to accurately assess hydrogeological systems and groundwater resources. Hard-rock watersheds provide a source of valuable water resources at a local level. They commonly exhibit complex geological bedrock and morphological features as well as distinctive gradients in rainfall and temperature. GIS tools provide an accurate way to improve the knowledge about groundwater and surface water circulation model and the overall functioning of the study aquifer system and can help the decision makers and managers to achieve a sustainable use of the groundwater resources of the a given area. This is particularly important regarding the existing hydromineral systems, a resource of high economical importance considering its utilization in the thermal spa and bottled water industry. Furthermore, groundwater from hard-rock aquifer systems is an important water source for several domestic, industrial and agricultural purposes, as well as for public supply for small communities.

A comprehensive integrated groundwater resources study has been carried out at *Cova da Beira* region (*Serra da Gardunha*) for some hydromineral systems in Central Portugal, coupling hydrogeomorphology, hydrogeology and GIS mapping techniques. Thematic maps were prepared from multi-source geodata namely satellite imagery, topographical and geological mapping and other hydrogeological field data. These maps were converted to GIS format and then integrated using GIS software with the purpose of elaborating a hydrogeomorphological map intended to delineate the infiltration and recharge potential areas.

This work highlights the importance of hydrogeomorphological cartography and groundwater GIS mapping as useful tools to support hydrogeological conceptualization, as well as for decision-making at a basin master plan level regarding land, water resources and sustainability.



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