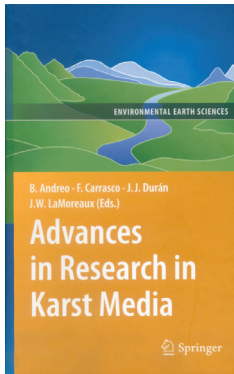


**Andreo B., Carrasco F., Durán J.J., Lamoreaux J.W. 2010.**

## **Advances in Research in Karst Media.**

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This book is the result of the 4th International Symposium on Karst (ISKA-2010), held in Málaga (Spain), organized by the Centre of Hydrogeology at the University of Málaga (CEHIUMA) and the Spanish Geological Survey (IGME), in the framework of their “Advanced Hydrogeological Studies” partnership, with the cooperation of UNESCO, Nerja Cave Foundation and IAH Karst Commission.

The book contains 80 peer review contributions, which have been accepted by the scientific committee. These contributions have been grouped into four sections:

- Karst Hydrogeology
- Karst Geomorphology
- Engineering Geology in Karst
- Research on Caves

Most contributions are on Karst Hydrogeology, more than 60%, in connection with various topics: methods for groundwater recharge assessment, impact of climate change on karst aquifers, coastal aquifers, floods, karst groundwater flow, protection of karst aquifers, pollution and vulnerability in karst, thermal anomalies in carbonate aquifers, time series analysis, hydrochemistry, dye tracer and stable isotope applications, numerical modelling in karst, etc. The advances presented in Karst Hydrogeology demonstrate that investigations are necessary not only on groundwater resources assessment but also in the characterization of the hydrogeological functioning of the aquifers to exploit and manage the aquifer in a sustainable way. At the same time advances on protection zoning and particularly on the validation of these protection zones are included. Mapping is the best preventive tool for land use management and this is a particularly relevant domain in which further improvement must go on. Karst water resources should be exploited in a sustainable way and, for that, relevant tools for characterization and modelling of karst aquifers functioning must be pursued. Otherwise negative effects will appear as overexploitation, marine intrusion, contamination, etc.

Concerning Karst Geomorphology (approximately 15% of total papers), the contributions deal with karst development in gypsum, wetlands, hypogene speleogenesis, sinkholes, travertines, fluviokarstic canyons and karst geosites. This topic seems to be one major topic to be investigated and developed in the future, because karst landscapes are a resource that can be exploited in a sustainable way. There are some areas where proposals of karst geosites are potentially suitable.

Engineering Geology in Karst group contains about 10% of the published papers, concerning the following topics: motorways, dams, reservoirs, quarrying and mining, geophysical technical for mapping buried karst, karst risk assessment, and properties of the aeration zone in karst. The specific characteristics of karst media should be taken into account in the various engineering projects. There are many examples in the world, some of them presented in this Symposium, which clearly demonstrate the importance of taking into account the hydrologic–hydrogeologic and geomorphological aspects of karst before construction of structures.

Finally, Research on Caves papers constitute the remaining 15% of the works, related overall with mixing corrosion and speleogenetic processes, CO<sub>2</sub> sources and global carbon cycle in endokarst, speleothems and other deposits in caves, condensation and corrosion in caves, underground atmosphere and the colour in caves. In many cases, caves are a natural heritage but also an economical resource that should be exploited in a sustainable way. Thus, monitoring of the visited caves and analysis of the data to improve the management are necessary.

The number of authors involved in this issue (about 250) indicates the wide variety and representation of the selected papers from four continents (Europe, America, Asia and Africa) and over 20 countries.

The present book may be considered an update of karst hydrogeology landforms and cavities, described by numerous specialists who have investigated various aspects of these topics. It is a good example of investigations on karst systems in the last few years, and at the same time it provides an illustrative synthesis of the research tasks being carried out, among others, as part of the IGCP 513 project of the UNESCO, and IAH Karst Commission. This Project has been useful as a forum for the exchange of results and experience accumulated by researchers over recent years concerning karst-related issues. The result is a more integrated vision on karst, taking into account the diversity of geological and climatic contexts in the world. We hope this publication will be an interesting reference for all studying the karst medium.

This book was made possible thanks to the dedicated, combined effort of the authors and members of the Scientific Committee as reviewers. The editors of this book offer to all of them our sincere gratitude.

**Bartolomé Andreo Navarro**