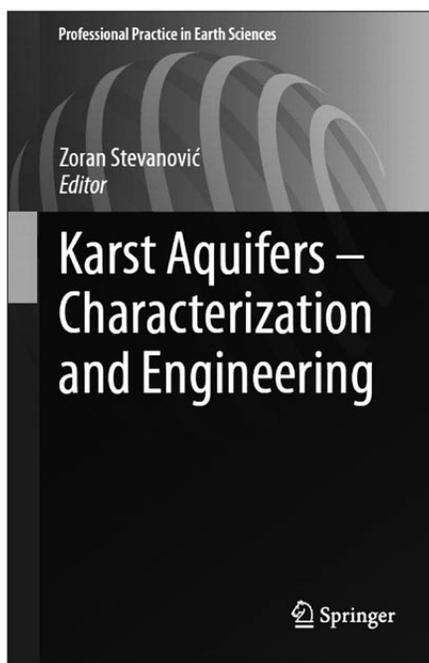


KARST AQUIFERS – CHARACTERISATION AND ENGINEERING

Zoran Stevanović (Editor), Springer Series Professional Practice in Earth Science, 2015, 692 pp, Hardcover,
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First of all Zoran Stevanovic has to be congratulated that he tackles this comprehensive and complicated task. To find the red line throughout the whole book it requires an excellent overview in all karsthydrogeological fields since every author is interested to introduce his specific competence, his scientific in and his global experiences. Therefore it is practically impossible to avoid slight overlapping of some chapters, on the other hand this might be also understood as an expression to highlight topics from different points of view. The editor - also contributing to almost all sections of the book - found a way how to integrate all inputs of authors in a synoptic matter, to place himself in the back, but to focus the authors articles towards the goals of the entire book. It has to be announced that the publisher's conditions of professional practice is not exclusively science oriented, but should show also practical approaches.

For understanding karst evolution the infiltration-exfiltration relationship is a crucial factor resulting the lowering down of karstification base level in relation to the surface drainage downwards. This is evident to characterize karst aquifers as mentioned in the book.

With regard to the karst environment the classification of karst is clearly focused on regional distribution, e.g. the Alpine karst represents a plateau type due to uplifting of carbonate mountainous blocks (especially Northern Limestone Alps). Referring to quality of karst groundwater the hydrogeochemistry reflects more to the rock-water interactions with the solubility of rocks and the water agent to dissolve carbonates.

Since the book is aligned to professional practice, karst methods are described only in an overview, nevertheless it must be highlighted that the investigations of discharge regimes are based on the MAILLET function (old but still valid), especially interpreting the recession curves and considering that the calculation of the flow component volumes is only representing the free and gravity related outflow. It is also shown that whenever an upwards movement of water portions in the karst system becomes significant the use of dissolved solids or water molecule elements is essential to determine the whole water volume which is passing through the aquifer.

The description of vulnerability methods provides a good insight to European approaches mentioned in

ZWAHLEN 2004 (COST 620), all are applying the infiltration conditions. Physical and mathematical models are presented in an excellent way, they show also the limits of modeling in karst due to DARCY law.

There is no doubt that pumping is the most utilized well testing approach for the detection of the yield described in an adequate extent, in this respect geophysical well logging can be announced as a supplement, especially in the open borehole in order to define sections of preferred water inflow to the well. For monitoring purposes excellent specifications are given, incorporating hydrogeochemistry and environmental isotopes for long term observations.

The relation between surface and subsurface karst water is described with high accuracy and completeness. One of the most important karst water problems originates from the utilization of submarine springs, which arises to a global challenge. It is an incredible fact, that the area around Kotor Bay/Montenegro, with the highest precipitation in Europe, is suffering on water scarcity in summer time, because most of the infiltrated karst water discharges directly to the sea. With regard to the droughts one has to consider artificial recharge

of groundwater (MAR) using submarine springs, when they are of fresh water type during the rainy season and whenever a recharged aquifer is not connected directly to the sea. This is sufficiently described in the chapter of karst water mixture.

Reservoirs in karst are documented completely and individually described. It might be stated that reservoirs in carbonates located below the karst basis will not be leaky because karstification has not been affected so far. An excellent characterization of case studies is certainly given including problem solutions.

The topic of transboundary karst aquifers is handled in a very sensitive way, it has definitely a strong social component for water distribution on both sides of borders.

The publication "Karst Aquifers – Characterization and Engineering" provides an excellent view on karst water resources in a global scale, arranged with interesting and informative case studies as well as with brilliant illustrations.

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