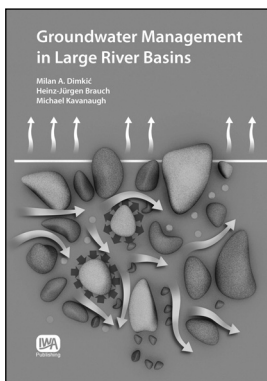


# Reviews and resources



## Groundwater Management in Large River Basins

Edited by: Milan Dimkic, Heinz-Jürgen Brauch and Michael Kavanaugh

2008, IWA Publishing, London, ISBN: 9781843391906, 728pp hardback, £100/US\$200/€ 150; IWA members price: £75/US\$150/€112.50

Many books which address groundwater processes and groundwater treatment have been published but there are relatively few that provide an overview of groundwater management at the scale of large river basins. This book was conceived following the June 2007 Regional IWA conference on 'Groundwater Management in the Danube River Basin and Other Large River Basins' held in Belgrade to address this need, and includes contributions from more than 20 authors.

The book focuses on the experience of groundwater management in Europe and the US. The importance of groundwater is emphasized by some revealing statistics: in Europe approximately 75 per cent of the population rely upon groundwater for public water supply and in the US approximately 37 per cent. In addition groundwater plays a

vital role in providing base flow to rivers in dry periods and in supporting ecologically important areas such as wetlands.

Following an introductory chapter, Chapter 2 aims to provide an overview of the basic elements of groundwater management in large river basins. There are useful sections on socio-economic considerations and legislation and the principles of water quality management. These provide an overview of groundwater protection policies in different countries and details of the WHO water safety framework. Groundwater quantity protection and monitoring are also touched upon, though in limited detail, and the chapter concludes with examples from Austria, Serbia and Libya as well as the transboundary river basins of the Danube and the Nile.

The theory of how physical and biochemical processes in aquifers 'self-purify' groundwater and reduce the levels of pollutants from recharge zones to abstraction is explained in Chapter 3. This chapter is quite heavy on theory whereas more practical guidance on how to integrate pollution attenuation processes in planning and groundwater management is more difficult to extract.

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Chapter 4 is the centre of gravity of the book and is over 200 pages long. It covers a spectrum of topics relevant to large-scale groundwater management. The origins of groundwater and factors controlling natural groundwater quality in different settings are explained. For example, there is an excellent overview of the use and benefits of river bank well-fields in Germany. With the Rhine being described as 'Europe's biggest sewer' by the 1950s, the resilience of these riverbank well fields to pollution compared with surface water systems explains why they now provide 16 per cent of public water supply for the country. Mechanisms of pollution attenuation are explained well and the information could easily be transferred to water resource management in other countries. The section on nitrates in groundwater is also excellent, providing useful background on legislation, controlling processes, approaches to modelling and assessment and management measures.

Groundwater modelling and water quality management in large urban basins are covered in the final two chapters. The former is not very comprehensive and lacks, for example, any overview of the modelling tools that are currently

available. By contrast, the final chapter includes a comprehensive overview of the historical development of groundwater and contamination in the US including well-structured sections on groundwater remediation and restoration.

The book is meant to offer planners an overview and insight into groundwater management issues as well as being of interest to academics and engineers who wish to delve deeper into hydrogeology. Within the 700 pages there is something for everyone in this target audience. However, with the focus on Europe and the US, there are no contributions in the book from the southern hemisphere or Asia and there is very little discussion of groundwater use in developing countries or regions of water scarcity.

Overall, the book contains a lot of valuable information and some particularly good chapters. However, there are lengthy sections which are predominantly theoretical or philosophical rather than practical and the book is more likely to be of interest to those already involved in large-scale groundwater management rather than those in search of an introduction to the subject.

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