
Contents

Part I Integration Overview and Problem Settings

1	Integrated Groundwater Management: An Overview of Concepts and Challenges	3
	Anthony J. Jakeman, Olivier Barreteau, Randall J. Hunt, Jean-Daniel Rinaudo, Andrew Ross, Muhammad Arshad, and Serena Hamilton	
2	The International Scale of the Groundwater Issue	21
	Michael N. Fienen and Muhammad Arshad	
3	Disentangling the Complexity of Groundwater Dependent Social-ecological Systems	49
	Olivier Barreteau, Yvan Caballero, Serena Hamilton, Anthony J. Jakeman, and Jean-Daniel Rinaudo	
4	Groundwater Management Under Global Change: Sustaining Biodiversity, Energy and Food Supplies	75
	Jamie Pittock, Karen Hussey, and Andrew Stone	
5	Linking Climate Change and Groundwater	97
	Timothy Richard Green	

Part II Governance

6	Groundwater Governance in Australia, the European Union and the Western USA	145
	Andrew Ross	
7	Groundwater Law	173
	Rebecca Nelson and Philippe Quevauviller	
8	Groundwater Regulation and Integrated Water Planning	197
	Philippe Quevauviller, Okke Batelaan, and Randall J. Hunt	
9	Conjunctive Management Through Collective Action	229
	Cameron Holley, Darren Sinclair, Elena Lopez-Gunn, and Edella Schlager	

10	The Social-Environmental Justice of Groundwater Governance . . .	253
	Marian J. Neal (Patrick), Francesca Greco, Daniel Connell, and Julian Conrad	
11	Social Justice and Groundwater Allocation in Agriculture: A French Case Study	273
	Jean-Daniel Rinaudo, Clémence Moreau, and Patrice Garin	
Part III Biophysical Aspects		
12	Ecohydrology and Its Relation to Integrated Groundwater Management	297
	Randall J. Hunt, Masaki Hayashi, and Okke Batelaan	
13	Groundwater Dependent Ecosystems: Classification, Identification Techniques and Threats	313
	Derek Eamus, Baihua Fu, Abraham E. Springer, and Lawrence E. Stevens	
14	Interactions of Water Quality and Integrated Groundwater Management: Examples from the United States and Europe	347
	Kelly L. Warner, Fabienne Barataud, Randall J. Hunt, Marc Benoit, Juliette Anglade, and Mark A. Borchardt	
15	Soil and Aquifer Salinization: Toward an Integrated Approach for Salinity Management of Groundwater	377
	Richard Greene, Wendy Timms, Pichu Rengasamy, Muhammad Arshad, and Richard Cresswell	
16	Managed Aquifer Recharge: An Overview of Issues and Options	413
	Joël Casanova, Nicolas Devau, and Marie Pettenati	
17	Managed Aquifer Recharge in Integrated Water Resource Management	435
	Peter Dillon and Muhammad Arshad	
Part IV Socioeconomics		
18	Towards Integrated Groundwater Management in China	455
	Jie Liu and Chunmiao Zheng	
19	Social Science Contributions to Groundwater Governance	477
	Allan Curtis, Michael Mitchell, and Emily Mendham	
20	Lessons to Be Learned from Groundwater Trading in Australia and the United States	493
	Sarah Ann Wheeler, Karina Schoengold, and Henning Bjornlund	

21	Integrated Assessment of Economic Benefits of Groundwater Improvement with Contingent Valuation	519
	Cécile Hérivaux and Jean-Daniel Rinaudo	
22	Controlling Groundwater Exploitation Through Economic Instruments: Current Practices, Challenges and Innovative Approaches	551
	Marielle Montginoul, Jean-Daniel Rinaudo, Nicholas Brozović, and Guillermo Donoso	
23	Liberation or Anarchy? The Janus Nature of Groundwater Use on North Africa’s New Irrigation Frontiers	583
	Marcel Kuper, Nicolas Faysse, Ali Hammani, Tarik Hartani, Serge Marlet, Meriem Farah Hamamouche, and Fatah Ameur	
 Part V Modeling and Decision Support		
24	Incorporating Human Aspects into Groundwater Research and Policy Making: A Soft and Critical Systems Thinking Approach	619
	Sondoss Elsawah and Joseph H.A. Guillaume	
25	Decision Support Systems and Processes for Groundwater	639
	Suzanne A. Pierce, John M. Sharp Jr, and David J. Eaton	
26	Integrated Groundwater Data Management	667
	Peter Fitch, Boyan Brodaric, Matt Stenson, and Nate Booth	
27	Hydroeconomic Models as Decision Support Tools for Conjunctive Management of Surface and Groundwater	693
	Manuel Pulido-Velazquez, Guilherme F. Marques, Julien J. Harou, and Jay R. Lund	
28	Methods for Exploring Uncertainty in Groundwater Management Predictions	711
	Joseph H.A. Guillaume, Randall J. Hunt, Alessandro Comunian, Rachel S. Blakers, and Baihua Fu	
	Erratum to: Integrated Groundwater Management	E1
	IGM Author Biographies	739
	Index	749