

Contents

Part I Physical Processes

1	Basic Physical Processes in Rivers	3
	John D. Fenton	
2	Turbulence in Rivers	51
	Mário J. Franca and Maurizio Brocchini	
3	Principles of Mechanics of Bedforms	79
	Domenico Ferraro and Subhasish Dey	
4	Scour Problems Downstream of Low-Head Hydraulic Structures	99
	Stefano Pagliara and Michele Palermo	
5	Current Research and Challenges Related to Shallow Flows	121
	Wim Uijttewaai	
6	One-Dimensional Modeling of Flows in Open Channels	137
	Dariusz Gąsiorowski, Jarosław J. Napiórkowski and Romuald Szymkiewicz	
7	Modeling of Floods—State of the Art and Research Challenges	169
	Roger Moussa and Bruno Cheviron	
8	Numerical Modeling of Free-Surface Flows in Practical Applications	193
	Mario Oertel	

9	Laboratory Models of Free-Surface Flows	213
	Daniel B. Bung	
10	Measurements of Turbulence Structure in a Compound Channel	229
	Adam Paweł Koziol and Janusz Kubrak	
11	Uncertainty Analysis in River Modelling	255
	Jord J. Warmink and Martijn J. Booij	

Part II Fluvial Processes

12	Channel Stability: Morphodynamics and the Morphology of Rivers	281
	Michael Church	
13	Principles of Bedload Transport of Non-cohesive Sediment in Open-Channels	323
	Rui M.L. Ferreira, Marwan A. Hassan and Carles Ferrer-Boix	
14	Recent Advances from Research on Meandering and Directions for Future Work	373
	Ana Maria Ferreira da Silva	
15	Fluvial Processes in Braided Rivers	403
	Nicola Surian	
16	Lagrangian Modelling of Saltating Sediment Transport: A Review	427
	Robert J. Bialik	
17	Runoff Generation and Soil Erosion After Forest Fires from the Slopes to the Rivers at a Basin Scale	443
	Antonio Velasco and Xavier Úbeda	

Part III Environmental Processes

18	Ecological Thresholds and Resilience in Streams	461
	Robert H. Hilderbrand and Ryan M. Utz	

19	Coupling Biological and Physical Processes: The Ecological Significance of River Channel Hydraulics and Fluvial Dynamics	479
	Chris Gibbins	
20	Why Do We Need Bankfull and Dominant Discharges?	497
	Artur Radecki-Pawlik	
21	Hydrodynamics of Vegetated Channels	519
	Jochen Aberle and Juha Järvelä	
22	Hydraulic Influences on Dispersion and Reaeration in Rivers	543
	J. Russell Manson and Steve G. Wallis	
23	Exchange of Pollutants Between Rivers and the Surrounding Environment: Physical Processes, Modelling Approaches and Experimental Methods	567
	M. Zaramella, A. Bottacin-Busolin, M. Tregnaghi and A. Marion	
24	Thermal Pollution in Rivers—Modelling of the Spread of Thermal Plumes	591
	Monika B. Kalinowska and Paweł M. Rowiński	

Rivers – Physical, Fluvial and Environmental Processes

Rowinski, P.; Radecki-Pawlik, A. (Eds.)

2015, XXXI, 613 p. 216 illus., 75 illus. in color.,

Hardcover

ISBN: 978-3-319-17718-2