

# **Hydrology and Water Resource Systems Analysis**



# Hydrology and Water Resource Systems Analysis

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# Preface

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The overall goal is to provide students and practitioners with a complete and comprehensive guidebook on hydrological and water resources issues by facilitating their understanding of basic and theoretical knowledge and concepts through a significant number of examples. We believe that this book will contribute to the education of undergraduate and graduate students who attend classes related to hydrology and water resources and will provide better insights to scientists, technicians, practitioners and professional engineers regarding integrated approaches in hydrological processes.



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## Authors

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**Dr. Maria A. Mimikou** is a professor in the School of Civil Engineering at the National Technical University of Athens (NTUA) and director of the Laboratory of Hydrology and Water Resources Management, Athens, Greece. She established the Center of Hydrology and Informatics (CHI) ([www.chi.civil.ntua.gr](http://www.chi.civil.ntua.gr)). She has vast experience (35 years) in the areas of water resources management; water resources systems planning and operation; urban, rural and coastal hydrology; stochastic hydrology; hydrological and water quality modeling; soil erosion and sediment transport; climate change and land use change at the catchment scale; flood forecasting; risk assessment and mapping and water scarcity and drought analysis. She has written several books and has authored or co-authored more than 80 papers in peer-reviewed scientific journals and has more than 100 peer-reviewed publications in national and international conferences, in addition to several scientific technical reports. Dr. Mimikou coordinates several undergraduate and postgraduate courses in the School of Civil Engineering (NTUA) and has supervised 90 graduate diplomas and postgraduate theses. She has vast academic and non-academic administrative experience. She has served as director of the Hydrology Section of the Public Power Corporation. She has served as dean of the School of Civil Engineering (NTUA) and director of the Department of Water Resources and Environmental Engineering. She is experienced in the management of research programs and has been scientifically responsible for and administrator of many European competitive research programs and has been a coordinator of and scientifically responsible for other International competitive programs (<http://mimikou.chi.civil.ntua.gr/>). Also, she has served as a member of the External Advisory Groups in DG Research, as chairman and member of steering and organizing committees in several conferences, as a member of different European scientific networks like EurAqua, EXCIFF, etc. and has contributed to position papers for the Water Framework Directive, Horizon 2020, Water Science – Policy Interfacing. She established the national academic network on hydrology and water resources ‘HYDROMEDON’.

**Dr. Evangelos A. Baltas** is a professor in the School of Civil Engineering at the National Technical University of Athens (NTUA), Athens, Greece. He actively participated in the establishment of the Center of Hydrology and Informatics (CHI) in Athens, which comprises the NTUA meteorological network, the database of the hydrological information and the experimental basin. He has more than 25 years experience in the areas of water resources management, water resources systems planning and operation, hydrometeorology, hydrological modelling, climate change and land use change at the catchment scale, flood forecasting, risk assessment and mapping analysis. He has written several books and has authored or co-authored more than 70 papers in peer-reviewed scientific journals and more than 100 peer-reviewed publications in national and international conferences, in addition to a number of technical reports. He has supervised more than 60 undergraduate and postgraduate theses and has extensive academic and non-academic administrative experience.

He has also offered engineering consultation services in the fields of his expertise to the EU, Greek ministries, public organizations and private companies in the United States and Europe. He has been the principal investigator or researcher in competitive EU (more than 30) and nationally funded programs related to integrated water resources management. He also served as a secretary general for the Ministry of Environment, Physical Planning and Public Works from 2006 to 2009. During that period, he was appointed as a Greek delegate to a number of councils at a ministerial level in the European Union, UNESCO, OECD and the United Nation for issues concerning environmental legislation, climate change, renewable energy water resources, etc.

**Dr. Vassilios A. Tsihrintzis** is a professor of ecological engineering and technology at the School of Rural and Surveying Engineering, National Technical University of Athens, Greece. His research interests concentrate, among others, on water resources engineering and management with an emphasis on urban and agricultural drainage and non-point source pollution, water quality of aquatic systems and pollution control, ecohydrology and ecohydraulics and the use of natural treatment systems (i.e. constructed wetlands and stabilization ponds) for runoff and wastewater treatment. His published research work includes more than 130 papers in peer-reviewed scientific journals, more than 250 papers in conference proceedings and more than 100 technical reports. He has also authored or co-authored books and book chapters on operations research, urban hydrology and runoff quality management and natural systems for wastewater and runoff treatment, among others. He has participated as a principal investigator/coordinator or a team member in various research projects in the United States, the EU and Greece. Dr. Tsihrintzis has supervised more than 80 undergraduate and postgraduate theses and 12 doctoral dissertations. He regularly teaches engineering hydrology, urban water management, fluid mechanics, groundwater, environmental engineering and natural wastewater treatment systems. He has also served as a professor and the head of the Department of Environmental Engineering, Democritus University of Thrace, Greece, for several years, and previously was an associate professor of water resources engineering at Florida International University, Miami, Florida. Dr. Tsihrintzis has extensive professional experience as a practicing civil and environmental engineer both in the United States (he was a registered professional engineer in California and a certified professional hydrologist by the American Institute of Hydrology) and in Greece, having been involved in several projects related to land development, drainage, urban hydrology, sediment transport and channel design, water resources management, wetlands restoration and constructed wetland.