

Stochastic and Statistical Methods in Hydrology and Environmental Engineering

Vol.1: Extreme Values: Floods and Droughts Vol.2: Stochastic and Statistical Modelling with Groundwater and Surface Water Applications Vol.3: Time Series Analysis in Hydrology and Environmental Engineering

Volume 1: (edited by **Keith W. Hipel**) In this landmark collection of papers, highly respected scientists and engineers from around the world present the latest research results in extreme value analyses for floods and droughts. Two approaches that are commonly employed in flood frequency analyses are the maximum annual flood and partial duration series or peak over threshold procedures. Recent theoretical advances as well as illustrative applications are described in detail for each of these approaches. Additionally, droughts and storms are systematically studied using appropriate probabilistic models. A major part of the volume is devoted to frequency analyses and fitting extreme value distributions to hydrological data. Other thought-provoking topics include regionalization techniques, distributed models, entropy and fractal analysis. is of interest to researchers, teachers, students and practitioners who wish to place themselves at the leading edge of flood frequency and drought analyses.

Volume 2: (edited by **Keith W. Hipel**) World renowned scientists present valuable contributions to stochastic and statistical modelling of groundwater and surface water systems. The philosophy of probabilistic modelling in the hydrological sciences is put into proper perspective and the importance of stochastic differential equations in the environmental sciences is explained and illustrated. The new research ideas put forward in groundwater modelling will assist decision makers in tackling challenging problems such as controlling pollution of underground aquifers and obtaining adequate water supplies. Additionally, different types of stochastic models are used in modelling a range of interesting surface water problems. Other topics covered in this landmark volume include stochastic optimization, moment analysis, carbon dioxide modelling and rainfall prediction. is of interest to researchers, teachers, students and practitioners who wish to be at the leading edge of stochastic and statistical modelling in the environmental sciences.

Volume 3: (edited by **Keith W. Hipel; A. Ian McLeod; U.S. Panu; VijayP. Singh**) International experts from around the globe present a rich variety of intriguing developments in time series analysis in hydrology and environmental engineering. Climatic change is of great concern to everyone and significant contributions to this challenging research topic are put forward by internationally renowned authors. A range of interesting applications in hydrological forecasting are given for case studies in reservoir operation in North America, Asia and South America. Additionally, progress in entropy research is described and entropy concepts are applied to various water resource systems problems. Neural networks are employed for forecasting runoff and water demand. Moreover, graphical, nonparametric and parametric trend analyses methods are compared and applied to water quality time series. Other topics covered in this landmark volume include spatial analyses, spectral analyses and different methods for stream-flow modelling. constitutes an invaluable resource for researchers, teachers, students and practitioners who wish to be at the forefront of time series analysis in the environmental sciences.

Volume 4: (edited by **Keith W. Hipel; Liping Fang**) In this landmark set of papers, experts from around the world present the latest and most promising approaches to both the theory and practice of effective environmental management. To achieve sustainable development, organizations and individual citizens must comply with environmental laws and regulations. Accordingly, a major contribution of this book is the presentation of original techniques for designing effective environmental policies, regulations, inspection

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