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D28 - RODERICK FARMER

The book contains a lot of basic knowledge in the field of hydrology and contains valuable research in the area of water resources evaluation, development and management. The book will help students in the streams of meteorology, forestry, environmental engineering, geology and earth sciences and also persons dealing in the areas of agriculture and agricultural & civil engineering. Please note: This volume is Co-published with New India Publishing Agency, New Delhi. Taylor & Francis does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka

Introduction to Physical Hydrology explores the principal rules that govern the flow of water by considering the four major types of water: atmospheric, ground, soil, and surface. It gives insights into the major hydrological processes, and shows how the principles of physical hydrology inform our understanding of climate and global hydrology.

This book describes the ecosystem of the Andean watersheds, covering the Californian valley, tropical Andes, and southern Andes. Case studies of the new methods and techniques used for hydrological research in the Andes are provided, and sustainability issues pertaining to Andean water resources are discussed in the context of climate change, social and economic issues, and public policy. Furthermore, the impact of economic development on the Andean ecosystem, specifically the effect on the water cycle and the water-energy--food nexus, are examined.

An all-inclusive reference covering all practical aspects of hydrology. Twenty-nine chapters in four major sections: I. Hydrologic Cycle; II. Hydrologic Transport; III. Hydrologic Statistics; IV. Hydrologic Technology. 500 illustrations.

Comprehensive account of some of the most popular models of small watershed hydrology and application ~~ of interest to all hydrologic modelers and model users and a welcome and timely edition to any modeling library

The book comprises nine chapters, with

seven core chapters dealing in detail with the basic principles and processes of the main hydrological components of the water cycle: precipitation, interception, evaporation, soil water, groundwater, streamflow and water quality. It takes a broadly non-mathematical approach, although some numeracy is assumed particularly in the treatment of evaporation and soil water. The introductory and concluding chapters show the relations and interactions between these components, and also put the importance of water into a wider human context – its significant role in human history, its key role today, and potential role in future in the light of climate change and increasing global population pressures. The book is thoroughly up--to-date, contains over 100 diagrams and photographs to explain and amplify the concepts described, and contains over 750 references for further study.

Increasing demand for water, higher standards of living, depletion of resources of acceptable quality, and excessive water pollution due to urban, agricultural, and industrial expansions have caused intense environmental, social, economic, and political predicaments. More frequent and severe floods and droughts have changed the resiliency and ability of water infrastructure systems to operate and provide services to the public. These concerns and issues have also changed the way we plan and manage our surface and groundwater resources. Groundwater Hydrology: Engineering, Planning, and Management, Second Edition presents a compilation of the state-of-the-art subjects and techniques in the education and practice of groundwater and describes them in a systematic and integrated fashion useful for undergraduate and graduate students and practitioners. This new edition features updated materials, computer codes, and case studies throughout. Features: Discusses groundwater hydrology, hydraulics, and basic laws of groundwater movement Describes environmental water quality issues related to groundwater, aquifer restoration, and remediation techniques, as well as the impacts of climate change \ Examines the details of groundwater modeling and simulation of conceptual models Applies systems analysis techniques in groundwater planning and management Delineates the modeling and downscaling of climate change impacts on groundwater under the latest IPCC climate scenarios Written for students as well as practicing water resource engineers, the book develops a system view of groundwater fundamentals and model-making techniques through the application of science, engineering, planning, and management principles. It discusses the classical issues in groundwater hydrology and hydraulics followed by coverage of water quality issues. It also introduces basic tools and decision-making techniques for future groundwater development activities, taking into account regional sustainability issues. The combined coverage of engineering and planning tools and techniques, as well as specific challenges for restoration and remediation of polluted aquifers sets this book apart.

This book provides an updated discussion of snow and glacier hydrology, drawing on the results of recent investigations. It serves as a source of reference at the senior undergraduate or beginning graduate level and stimulates further interest in this important part of the hydrologic cycle.

A prime concern in contemporary environmental science is the proper management of water supply and usage. It is critical to

develop effective processes to manage these resources and decrease negative impacts on the ecosystem. Hydrology and Water Resource Management: Breakthroughs in Research and Practice is an innovative source of scholarly research on the latest technologies and techniques in optimizing current processes in managing water resources. Highlighting a range of pertinent topics such as climate change, sustainability, and water treatment, this book is an ideal reference source for engineers, professionals, researchers, students, and academics interested in emerging trends within environmental science.

This book presents the main hydrological methods and techniques used in the design and operation of hydraulic projects and the management of water resources and associated natural risks. It covers the key topics of water resources engineering, from the estimation of runoff volumes and unit hydrographs to the routing of flows along a river and throu

With an emphasis on methodology, this reference provides a comprehensive examination of water movement as well as the movement of various pollutants in the earth's subsurface. The multidisciplinary approach integrates earth science, fluid mechanics, mathematics, statistics, and chemistry. Ideal for both professionals and students, this is a practical guide to the practices, procedures, and rules for dealing with groundwater.

The material of this book will derive its scientific under-pinning from basics of mathematics, physics, chemistry, geology, meteorology, engineering, soil science, and related disciplines and will provide sufficient breadth and depth of understanding in each sub-section of hydrology. It will start with basic concepts: Water, its properties, its movement, modelling and quality The distribution of water in space and time Water resource sustainability Chapters on ‘global change’ and ‘water and ethics’ aim respectively to emphasize the central role of hydrological cycle and its quantitative understanding and monitoring for human well being and to familiarize the readers with complex issues of equity and justice in large scale water resource development process. Modern Hydrology for Sustainable Development is intended not only as a textbook for students in earth and environmental science and civil engineering degree courses, but also as a reference for professionals in fields as diverse as environmental planning, civil engineering, municipal and industrial water supply, irrigation and catchment management.

The fifth edition of 'Introduction to Hydrology' has been redesigned to better acquaint future water engineers, scientists and managers with the basic elements of the hydrologic cycle. Its focus is on presenting the principles of hydrology in the context of their application to real-world problems. The book identifies data sources, introduces statistical analyses in the context of hydrologic problem-solving, covers the components of the hydrologic budget, discusses hydrograph analysis and routing, and introduces groundwater hydrology, urban hydrology, hydrologic models and hydrologic design. Many solved examples and problems serve to amplify the concepts presented in the text. Computer applications are discussed and appropriate Web addresses are provided.

Hydrology and water resources analysis can be looked at together, but this is the only book which presents the relevant material and which bridges the gap between scientific processes and applications in

one text. New methods and programs for solving hydrological problems are outlined in a concise and readily accessible form. Hydrology and Water Resource Systems Analysis includes a number of illustrations and tables, with fully solved example problems integrated within the text. It describes a systematic treatment of various surface water estimation techniques; and provides detailed treatment of theory and applications of groundwater flow for both steady-state and unsteady-state conditions; time series analysis and hydrological simulation; floodplain management; reservoir and stream flow routing; sedimentation and erosion hydraulics; urban hydrology; the hydrological design of basic hydraulic structures; storage spillways and energy dissipation for flood control, optimization techniques for water management projects; and methods for uncertainty analysis. It is written for advanced undergraduate and graduate students and for practitioners. Hydrologists and water-related professionals will be helped with an unfamiliar term or a new subject area, or be given a formula, the procedure for solving a problem, or guidance on the computer packages which are available, or shown how to obtain values from a table of data. For them it is a compendium of hydrological practice rather than science, but sufficient scientific background is provided to enable them to understand the hydrological processes in a given problem, and to appreciate the limitations of the methods presented for solving it.

Fourth international conference on FRIEND, Cape Town, March 2002.

With "integrated water resources management" (IWRM) the current buzzword in international circles, the real question is: how to operationalise a truly multidisciplinary approach to the effective management of shared watercourses. Based largely on the actual experience of HELP (Hydrology for the Environment, Life and Policy), the overall aim of the book is to produce a series of case studies from around the world (from the Aral Sea to Zimbabwe) that demonstrate how the "gaps" between hydrology, water law and management are actually bridged in practice. Is hydrological data relevant and used in the formulation of national and international water law and policy? Cases cited include examples of where this has happened and been successful or unsuccessful and where this has not happened and led to problems. This will act as a guide to how future water laws and polices can be made more effective via the use of accurate and up to date hydrological information.

Global Hydrology illustrates in detail the growing importance of understanding hydrological processes and pathways as a means of effective and safe management of water resources. It describes current management practices and past environmental impact. It analyses the options for improving water supply and protecting the environment, emphasizing the need for international collaboration in a changing societal and environmental context

Accurate prediction of hydrological variables is essential for efficient water resources planning and management. Proper understanding of the characteristics of the time series may help in improving the simulation and forecasting accuracy of hydrological variables. This book presents a detailed description and application of multiscale time-frequency characterization tool for the spectral analysis of hydrological time series. It presents spectral analysis methods for hydrological applications

through a wide variety of illustrative case studies including Wavelet transforms, Hilbert Huang Transform and their extensions.

^iEco-Hydrology is the first book to offer an overview of the complex relationships between plants and water across a wide range of terrestrial and aquatic environments. Leading ecologists and hydrologists present reviews of the eco-hydrology of drylands, wetlands, temperate and tropical rain forests, streams, and rivers and lakes. Contents include: * background information on the water relations of plants, from individual cells to strands of plants * the role of mathematical models in eco-hydrology * explanations of how plants affect patterns and rates of water movement and storage in a range of terrestrial and aquatic ecosystems.

The most cogent textbook ever produced on the topic, this revised and expanded edition will be welcomed by students and professionals alike. Among the many diverse aspects of environmental science, none is more critical to the future of society and nature than water. Understanding the role of water on Earth and making good decisions regarding water conservation and hydrological hazards depends on learning the fundamentals of physical hydrology. This textbook, now in an expanded second edition, provides the clearest opportunity for students to absorb those fundamentals. Written at an introductory level, Elements of Physical Hydrology covers virtually every aspect of this subject, including: • The hydrological cycle • Water budgets at catchment to global scales • Spatial and temporal aspects of precipitation • Evapotranspiration • Fluid dynamics and the Bernoulli equation • Laminar and turbulent flows • Open channel flow • Flood movement through reservoirs and channels • Flood frequency analysis • Groundwater flow • Aquifer characterization • Land subsidence • Soil moisture dynamics • Flow in the unsaturated zone • Hydrologic controls on vegetation • Biotic controls on hydrological processes • Runoff generation from surface and subsurface sources • Catchment models • The water-food-energy nexus • The globalization of water • Impacts of changing climate Layering one topic upon the next, Elements of Physical Hydrology succeeds in moving from simple, easy-to-grasp explanations through equations and models in a manner that will leave students new to the topic eager to apply their knowledge. Professionals in related disciplines will also find this book ideal for self-study. Thoughtfully illustrated, carefully written, and covering a broad spectrum of topics, this classic text clarifies a subject that is often misunderstood and oversimplified.

Water is a precious natural resource, which is crucial to our survival. It needs to be used judiciously in the context of an increasing population not only to sustain essential requirements such as those for drinking and domestic usage, but also for increased food production, industrial usage, power generation, navigational requirements, pisciculture, recreation, landscaping etc. There are many books dealing with hydrology, hydraulics and hydraulic structures, which generally deal with larger problems of development, analysis, design and implementation of water resources. However, there are few books, which deal with small-scale development of water resources consistent with the environmental concerns as well as application of relevant eco-friendly technologies. This book provides both the perspectives.

There is a dearth of relevant books dealing with both theory and application of time series analysis techniques, particularly in the field of water resources engineering. Therefore, many hydrologists and hydrogeologists face difficulties in adopting time series analysis as one of the tools for their research. This book fills this gap by providing a proper blend of theoretical and practical aspects of time sereies analysis. It deals with a comprehensive overview of time series characteristics in hydrology/water resources engineering, various tools and techniques for analyzing time series data, theoretical details of 31 available statistical tests along with detailed procedures for applying them to real-world time series data, theory and methodology of stochastic modelling, and current status of time series analysis in hydrological sciences. In adition, it demonstrates the application of most time series tests through a case study as well as presents a comparative performance evaluation of various time series tests, together with four invited case studies from India and abroad. This book will not only serve as a textbook for the students and teachers in water resources engineering but will also serve as the most comprehensive reference to educate researchers/scientists about the theory and practice of time series analysis in hydrological sciences. This book will be very useful to the students, researchers, teachers and professionals involved in water resources, hydrology, ecology, climate change, earth science, and environmental studies.

The literature of hydrology abounds with texts on the hydrological and water resource problems in humid regions. However, this is not the case for the arid or semi arid regions. The situation is exemplified by the fact a concrete definition for the term “wadi”, as accepted by UNESCO for describing these areas, is difficult to find. Arguably the first book devoted entirely to examining this important resource, Wadi Hydrology presents methodologies for sustainable management of wadis and their water resources. Through unique physical approaches, field cases, sample interpretations, and various applications to different models, this book provides an in-depth understanding of these systems that illustrates the efficiency of harnessing water from wadis. The author compiles the most up-to-date information on arid region hydrology, including specific techniques for hydrological calculations and desertification assessments, and includes examples and solved problems in each chapter.

Creating and Restoring Wetlands: From Theory to Practice, Second Edition describes the challenges and opportunities relating to the restoration of freshwater and estuarine wetlands in natural, agricultural, and urban environments in the coming century. This second edition is structured by clearly defined chapters based on specific wetland types (e.g. Peatlands, Mangroves) and with a consistent and coherent organization for ease of discoverability. The table of contents is divided into four main subjects: Foundations, Restoration of Freshwater Wetlands, Restoration of Estuarine Wetlands, and From Theory to Practice, each with multiple chapters. Part 1, Foundations, contains chapters describing definitions of wetlands, ecological theory used to guide restoration, and considerations on where to implement restoration on the landscape. In Parts 2 and 3, restoration of specific freshwater (marshes, forests, peatlands) and estuarine (tidal marshes, mangroves) wetlands are described. Part 4, From Theory to Practice,

contains chapters describing performance standards to gauge success of projects and case studies describing small-scale and large-scale restoration projects of various freshwater and estuarine wetlands. Each chapter contains clearly labeled sections which assist the reader to quickly and easily key in on the subject matter that they are seeking. The approach of Creating and Restoring Wetlands is unique in that, in each chapter, it links ecological theory important to ecosystem restoration with practical techniques to undertake and implement successful wetland restoration projects, including recommendations for performance standards to gauge success as well as realistic expectations and timescales for achieving success. Each chapter ends with a summary table describing keys to ensure success for a given wetland ecosystem. Each chapter ends with a summary table describing keys to ensure success for a given wetland ecosystem Written by a single author, providing a consistent structure that is coherent, cohesive and well referenced Contains case studies of small- and large-scale restoration activities ensuring relevance to individuals and organizations

Hydrology: Advances in Theory and Practice, brings together contributions to both the theory and practice of hydrology, including chapters on (amongst other topics) flood estimation methods and hydrological modelling. The book also looks forward with a global hydrology research agenda fit for the 2030s, and explores how to make advances in hydrological modelling – based on almost 50 years of modelling experience. In Focus – a book series that showcases the latest accomplishments in water research. Each book focuses on a specialist area with papers from top experts in the field. It aims to be a vehicle for in-depth understanding and inspire further conversations in the sector.

This Festschrift containing sixteen invited essays and papers is a tribute to the distinguished Irish hydrologist James Dooge on the occasion of his 70th birthday. His former students, colleagues and friends in fourteen countries, have provided a varied selection on his favourite topics: flow in open channels and unsaturated soil, and also from his major interest of recent years, large scale hydrology and global change. The book has three sections. The first section on hydrological processes contains six papers. The second section on large scale hydrology has four papers. Six historical, reflective and philosophical essays on the past and future of the hydrological sciences form the third section of the book.

The technological advances of recent years include the emergence of new remote sensing and geographic information systems that are invaluable for the study of wetlands, agricultural land, and land use change. Students, hydrologists, and environmental engineers are searching for a comprehensive hydrogeologic overview that supplements information on hydrologic processes with data on these new information technology tools. Environmental Hydrology, Second Edition builds upon the foundation of the bestselling first edition by providing a qualitative understanding of hydrologic processes while introducing new methods for quantifying hydrologic parameters and processes. Written by authors with extensive multidisciplinary experience, the text first discusses the components of the hydrologic cycle, then follows with chapters on precipitation, stream processes, human impacts, new information system applications, and numerous other methods and strategies. By updating this

thorough text with the newest analytical tools and measurement methodologies in the field, the authors provide an ideal reference for students and professionals in environmental science, hydrology, soil science, geology, ecological engineering, and countless other environmental fields.

Published by the American Geophysical Union as part of the Special Publications Series. In the early 1980s, the Department of Hydrology and Water Resources at the University of Arizona started a tradition: an annual public lecture to perpetuate the memory of one of its most original thinkers who passed away at an early age, Chester C. Kisiel. At that time, the department was quite young—a little over ten years old—and so was the University of Arizona, not quite a century old. The overall atmosphere was extremely stimulating, faculty members and students were curious and excited, wishing to learn and understand more about the natural phenomena that transform precipitation into water and the possible development of regional waters for human uses. The preparation and delivery of these lectures were entrusted by the department to outstanding scientists in the fields of hydrology and water resources, thus attaining a double objective. On the one hand, the lectures became salient points on a time trajectory when specific facets of the broad agenda of scientific issues studied in the department were brought to the limelight of a public discourse. On the other hand, the lectures also provided opportunities for reflection on contemporary problems and on the approaches for their study and analysis.

While most books examine only the classical aspects of hydrology, this three-volume set covers multiple aspects of hydrology, and includes contributions from experts from more than 30 countries. It examines new approaches, addresses growing concerns about hydrological and ecological connectivity, and considers the worldwide impact of climate change. It also provides updated material on hydrological science and engineering, discussing recent developments as well as classic approaches. Published in three books, Fundamentals and Applications; Modeling, Climate Change, and Variability; and Environmental Hydrology and Water Management, the entire set consists of 87 chapters, and contains 29 chapters in each book. Students, practitioners, policy makers, consultants and researchers can benefit from the use of this text.

Due to its height, density, and thickness of crown canopy; fluffy forest floor; large root system; and horizontal distribution; forest is the most distinguished type of vegetation on the earth. In the U.S., forests occupy about 30 percent of the total territory. Yet this 30 percent of land area produces about 60 percent of total surface runoff, the

Hydrology in Practice is an excellent and very successful introductory text for engineering hydrology students who go on to be practitioners in consultancies, the Environment Agency, and elsewhere. This fourth edition of Hydrology in Practice, while retaining all that is excellent about its predecessor, by Elizabeth M. Shaw, replaces the material on the Flood Studies Report with an equivalent section on the methods of the Flood Estimation Handbook and its revisions. Other completely revised sections on instrumentation and modelling reflect the many changes that have occurred over recent years. The updated text has taken advantage of the extensive practical experience of the staff of

JBA Consulting who use the methods described on a day-to-day basis. Topical case studies further enhance the text and the way in which students at undergraduate and MSc level can relate to it. The fourth edition will also have a wider appeal outside the UK by including new material on hydrological processes, which also relate to courses in geography and environmental science departments. In this respect the book draws on the expertise of Keith J. Beven and Nick A. Chappell, who have extensive experience of field hydrological studies in a variety of different environments, and have taught undergraduate hydrology courses for many years. Second- and final-year undergraduate (and MSc) students of hydrology in engineering, environmental science, and geography departments across the globe, as well as professionals in environmental protection agencies and consultancies, will find this book invaluable. It is likely to be the course text for every undergraduate/MSc hydrology course in the UK and in many cases overseas too.

This text presents a comprehensive introduction to hydrology and the processes at work in the different parts of the hydrological cycle.

This volume investigates the origin, development, role, application, and current status of the curve number method for estimating the runoff response from rainstorms.

This introduction to hydrology is essentially practical, emphasising the application of hydrological knowledge to the solution of engineering problems.

Hydrology covers the fundamentals of hydrology and hydrogeology, taking an environmental slant dictated by the emphasis in recent times for the remediation of contaminated aquifers and surface-water bodies as well as a demand for new designs that impose the least negative impact on the natural environment. Major topics covered include hydrological principles, groundwater flow, groundwater contamination and clean-up, groundwater applications to civil engineering, well hydraulics, and surface water. Additional topics addressed include flood analysis, flood control, and both ground-water and surface-water applications to civil engineering design.

For more than 25 years, the multiple editions of Hydrology & Hydraulic Systems have set the standard for a comprehensive, authoritative treatment of the quantitative elements of water resources development. The latest edition extends this tradition of excellence in a thoroughly revised volume that reflects the current state of practice in the field of hydrology. Widely praised for its direct and concise presentation, practical orientation, and wealth of example problems, Hydrology & Hydraulic Systems presents fundamental theories and concepts balanced with excellent coverage of engineering applications and design. The Fourth Edition features a major revision of the chapter on distribution systems, as well as a new chapter on the application of remote sensing and computer modeling to hydrology. Outstanding features of the Fourth Edition include . . . • More than 350 illustrations and 200 tables • More than 225 fully solved examples, both in FPS and SI units • Fully worked-out examples of design projects with realistic data • More than 500 end-of-chapter problems for assignment • Discussion of statistical procedures for groundwater monitoring in accordance with the EPA’s Unified Guidance • Detailed treatment of

hydrologic field investigations and analytical procedures for data assessment, including the USGS acoustic Doppler current profiler (ADCP) approach • Thorough coverage of theory and design of loose-boundary channels, including the latest concept of combining the regime theory and the power function laws

MOP 28 serves as a basic reference, providing a thorough, up-to-date guide for hydrologists.