

Physical Hydrology Dingman 2nd Edition

Bridging the Disciplinary Divides brings together some of the world's leading environmental researchers in the life sciences, physical sciences, social sciences and humanities to bridge the disciplinary divides in understanding the environment.

"This is the urban century in which, for the first time, the majority of people live in towns and cities. Understanding how people influence, and are influenced by, the 'green' component of these environments is therefore of enormous significance. Providing an overview of the essentials of urban ecology, the book begins by covering the vital background concepts of the urbanisation process and the effect that it can have on ecosystem functions and services. Later sections are devoted to examining how species respond to urbanisation, the many facets of human-ecology interactions, and the issues surrounding urban planning and the provision of urban green spaces. Drawing on examples from urban settlements around the world, it highlights the progress to date in this burgeoning field, as well as the challenges that lie ahead"--Provided by publisher.

This fully-revised comprehensive fourth edition covers the whole field of physical geography including climate and atmosphere, geomorphology, biogeography, hydrology, oceans, Quaternary, environmental change, soils, remote sensing and GIS. This new edition reflects developments in the discipline during the last decade, with the expert advisory group providing an international perspective on the discipline of physical geography. Over 2000 entries that are self-contained or cross-referenced include 200 that are new to this edition, over 400 that are rewritten and updated, and new supporting references and additional recommended reading in many others. Entries removed from the last edition are available in the online resource. This volume is the essential reference point for students of physical geography and related environmental disciplines, lecturers and interested individuals alike.

This textbook provides a modern, quantitative and process-oriented approach to equip students with the tools to understand geomorphology. Insight into the interpretation of landscapes is developed from basic principles and simple models, and by stepping through the equations that capture the essence of the mechanics and chemistry of landscapes. Boxed worked examples and real-world applications bring the subject to life for students, allowing them to apply the theory to their own experience. The book covers cutting edge topics, including the revolutionary cosmogenic nuclide dating methods and modeling, highlights links to other Earth sciences through up-to-date summaries of current research, and illustrates the importance of geomorphology in understanding environmental changes. Setting up problems as a conservation of mass, ice, soil, or heat, this book arms students with tools to fully explore processes, understand landscapes, and to participate in this rapidly evolving field.

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

In recent years, significant advances have been made in the development and application of software tools for predicting the flow, water quality, sediment transport and ecological processes in river systems. Since 2001, the Wessex Institute of Technology has organized a biennial conference to facilitate the sharing of these advances. This book contains the papers presented at the latest conference in the series. The papers presented at the Conference cover Water resources management; Flood studies; Ecological and environmental impact; Erosion and sediment transport; Hydrological modelling; Eco-hydraulics; River restoration and rehabilitation; Hydropower production; River and watershed management; Water quality issues; Trans-boundary river issues; Estuaries and deltas; Changing Climate; Droughts and desertification; Water and health; and Socio-economic and political issues.

For twenty years, Lawrence Dingman's well-written, comprehensive Physical Hydrology has set standards for balancing theoretical depth and breadth of applications. Rich in substance and written to meet the needs of future researchers and experts in the field, Dingman treats hydrology as a distinct geoscience that is continually expanding to deal with large-scale changes in land use and climate. The third edition provides a solid conceptual basis of the subject and introduces the quantitative relations involved in answering scientific and management questions about water resources. The text is organized around three principal themes: the basic concepts underlying the science of hydrology; the exchange of water and energy between the atmosphere and the earth's surface; and the land phase of the hydrologic cycle. Dingman supplies the basic physical principles necessary for developing a sound, instructive sense of the way in which water moves on and through the land; in addition, he describes the assumptions behind each analytical approach and identifies the limitations of each.

Integrating decades of research conducted by leading scientists in the field, Remote Sensing of Energy Fluxes and Soil Moisture Content provides an overview of state-of-the-art methods and modeling techniques employed for deriving spatio-temporal estimates of energy fluxes and soil surface moisture from remote sensing. It also underscores the range of such techniques available nowadays as well as the operationally distributed networks that provide today in-situ validated relevant observations. The book brings together three types of articles: Comprehensive reviews that examine the developments in concepts, methods, and techniques employed in deriving land surface heat fluxes as well as soil surface moisture on field, regional, and large scales, paying particular emphasis to the techniques exploiting Earth Observation (EO) technology Detailed insights into the principles and operation of the most widely applied approaches for the quantification and analysis of surface fluxes and soil moisture with case studies that directly show the great applicability of remote sensing in this field, or articles discussing specific issues in the retrievals of those parameters from space Focused articles integrating current knowledge and scientific understanding in the remote sensing of energy fluxes and soil moisture, that are highlighting the main issues, challenges, and future prospects of this emerging technology. Designed with different users in mind, the book is organized in four more or less independent units that make specific information easy to find. It presents a discussion on the future trends and prospects, underlying the scientific challenges that need to be addressed adequately in order to derive more accurate estimates of those parameters from space.

Hydrological drought is a textbook for university students, practising hydrologists and researchers. The main scope of this book is to provide the reader with a comprehensive review of processes and estimation methods for streamflow and groundwater drought. It includes a qualitative conceptual understanding of drought features and processes, a detailed presentation of estimation methods and tools, practical examples and key aspects of operational practice. The methods are demonstrated using sample data sets and tools that are provided on the accompanying CD. The drought phenomenon and its diversity across the world are illustrated using a global set of daily streamflow series, whereas regional and local aspects of drought are studied using a combination of hydrological time series and catchment information. The book concludes with human impacts, ecological issues and examples of procedures for designing and operating water resources schemes. The majority of the examples are taken from regions where the rivers run most of the year. The material presented ranges from well established knowledge and analysing methods to recent developments in drought research. Its nature varies accordingly, from a more traditional textbook with its clear overview to that of a research paper, which introduces new approaches and methodologies for drought analysis. Also available in paperback, ISBN 0-444-51767-7.

Why is groundwater the predominant drinking water source in Hawaii? Why are groundwater sources susceptible to pesticide contamination? How long does it take for water in the mountains to journey by land and underground passages to reach the coast? Answers to questions such as these are essential to understanding the principles of hydrology—the science of the movement, distribution, and quality of water—in Hawaii. Due to the humid tropical climate, surrounding ocean, volcanic earth, and high mountains, many hydrologic processes in the Islands

are profoundly different from those of large continents and other climatic zones. Management of water, land, and environment must be informed by appropriate analyses, or communities and ecosystems face great uncertainty and may be at risk. The protection of groundwater, coastal waters, and streams from pollution and the management of flood hazards are also significant. This volume presents applications of hydrology to these critical issues. The authors begin by outlining fundamental hydrologic theories and the current general knowledge then expand into a formal discussion specific to Hawaii and the distinctive elements and their interrelations under natural and human-influenced conditions. They include chapters on rainfall and climate, evaporation, groundwater, and surface runoff. Details on the quantification of hydrologic processes are available to those with more technical knowledge, but general readers with an interest in the topic—one of singular importance for the Hawaiian Islands—will find much in the volume that is timely and accessible.

Emphasis is placed on intuitively based mathematical models for chemical transport and transformations. Although developed for a one-semester graduate course, *Chemical Fate and Transport in the Environment, Second Edition*, is also an essential reference for environmental practitioners in industry, consulting, and government agencies."--BOOK JACKET.

The study of water resources crosses disciplinary boundaries, from geography and natural resources, to Earth sciences, environmental studies, and engineering. Since not all students come to the water-resources course with the same mathematical background, Clausen's effective, practical presentation integrates topics related to water quantity and water quality. He emphasizes fundamental concepts throughout: the qualitative foundations of hydrology needed to understand the hydrologic cycle and water availability, as well as the physical, chemical, and biological principles underlying water quality. Important social-science issues, including water law and regulations, the economic principles of water supply and demand, and sustainable water management, contextualize the material. Abundant illustrations and purposeful examples reinforce chapter content. End-of-chapter problems provide opportunities for readers to practice the calculations needed for real-world applications.

"Bridging the gap between qualitative and quantitative descriptions of natural rivers, *Fluvial Hydraulics* provides a sound understanding of water and sediment flows in natural rivers. This understanding is essential for modeling and predicting hydrologic and geomorphologic processes, erosion, sediment transport, water supply and quality, habitat management, flood hazards, and river restoration. The book will be especially valuable in providing a firm scientific basis for the growing field of river restoration. It bridges the gap between the highly quantitative mechanics-based civil-engineering approach to stream hydraulics and the more qualitative treatments of fluvial geomorphology typical of earth sciences and natural resources curricula. Many concepts are illustrated using measurements of natural river flows." "The book is specifically designed for upper-level students and practitioners who want to gain a better understanding of river behavior. The bases of the equations that are used to describe and predict river flows are systematically presented, including dimensional analysis."--BOOK JACKET.

Our rivers are in crisis and the need for river restoration has never been more urgent. Water security and biodiversity indices for all of the world's major rivers have declined due to pollution, diversions, impoundments, fragmented flows, introduced and invasive species, and many other abuses. Developing successful restoration responses are essential. *Renewing Our Rivers* addresses this need head on with examples of how to design and implement stream-corridor restoration projects. Based on the experiences of seasoned professionals, *Renewing Our Rivers* provides stream restoration practitioners the main steps to develop successful and viable stream restoration projects that last.

Ecologists, geomorphologists, and hydrologists from dryland regions of Australia, Mexico, and the United States share case studies and key lessons learned for successful restoration and renewal of our most vital resource. The aim of this guidebook is to offer essential restoration guidance that allows a start-to-finish overview of what it takes to bring back a damaged stream corridor. Chapters cover planning, such emerging themes as climate change and environmental flow, the nuances of implementing restoration tactics, and monitoring restoration results. *Renewing Our Rivers* provides community members, educators, students, natural resource practitioners, experts, and scientists broader perspectives on how to move the science of restoration to practical success.

Watershed modeling is at the heart of modern hydrology, supplying rich information that is vital to addressing resource planning, environmental, and social problems. Even in light of this important role, many books relegate the subject to a single chapter while books devoted to modeling focus only on a specific area of application. Recognizing the

Urbanization is a global phenomenon that is increasingly challenging human society. It is therefore crucially important to ensure that the relentless expansion of cities and towns proceeds sustainably. Urban ecology, the interdisciplinary study of ecological patterns and processes in towns and cities, is a rapidly developing field that can provide a scientific basis for the informed decision-making and planning needed to create both viable and sustainable cities. *Urban Ecology* brings together an international team of leading scientists to discuss our current understanding of all aspects of urban environments, from the biology of the organisms that inhabit them to the diversity of ecosystem services and human social issues encountered within urban landscapes. The book is divided into five sections with the first describing the physical urban environment. Subsequent sections examine ecological patterns and processes within the urban setting, followed by the integration of ecology with social issues. The book concludes with a discussion of the applications of urban ecology to land-use planning. The emphasis throughout is on what we actually know (as well as what we should know) about the complexities of social-ecological systems in urban areas, in order to develop urban ecology as a rigorous scientific discipline.

Environmental isotope and nuclear techniques provide unmatched insights into the processes governing the water cycle and its variability. This monograph presents state of the art applications and new developments of isotopes in hydrology, environmental disciplines and climate change studies. Coverage ranges from the assessment of groundwater resources in terms of recharge and flow regime to studies of the past and present global environmental and climate changes.

Coupling the basics of hydrogeology with analytical and numerical modeling methods, *Hydrogeology and Groundwater Modeling, Second Edition* provides detailed coverage of both theory and practice. Written by a leading hydrogeologist who has consulted for industry and environmental agencies and taught at major universities around the world, this unique book fills a gap in the groundwater hydrogeology literature. With more than 40 real-world examples, the book is a source for clear, easy-to-understand, and step-by-step quantitative groundwater evaluation and contaminant fate and transport analysis, from basic laboratory determination to complex analytical calculations and computer modeling. It provides more than 400 drawings, graphs, and photographs, and a variety of useful tables of all key groundwater parameters, as well as lucid, straightforward answers to common hydrogeological problems. Reflecting nearly ten years of new scholarship since the publication of the bestselling first edition, this second edition is wider in focus with added and updated examples, figures, and problems, yet still provides information in the author's trademark, user-friendly style. No other book offers such carefully selected examples and clear, elegantly explained solutions. The inclusion of step-by-step solutions to real problems builds a knowledge base for understanding and solving groundwater issues.

This book explores the importance of soil health in croplands, rangelands, pasturelands, and gardens, and presents new methods and technologies for assessing soil dynamics and health in these different land types. Through perspectives of agriculture, soil management, and ecological sustainability, the book provides accurate and up-to-date information on soil

health assessment and maintenance that is often missing from current literature on conservation and environmental management and preservation. The book is written in a clear and concise format, and will appeal to non-scientists interested in soil health, as well as professional farmers, ranchers and gardeners. The book begins by discussing soil health from a historical perspective, and in terms of how it is covered in the news currently. Then the author addresses the ecological implications of soil health in farming, ranching and gardening, and comprehensively details the physical, chemical and biological properties of soil as they apply in various land types. The book then examines soil health assessment using new diagnostic and analytic technologies, and how these new innovations will be necessary going forward to maintain and improve soil health.

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. Acclaimed geologist Robert Thorson has been fascinated by kettle lakes ever since his youth in the upper Midwest. As with historic stone walls, each kettle lake has a story to tell, and each is emblematic of the interplay between geology and history. *Beyond Walden* covers the natural history of kettle lakes, a band of small lakes that extends from the prairie potholes of Montana to the cranberry bogs of Cape Cod. Kettle lakes were formed by glaciers and are recognizable by their round shape and deep waters. Kettles are the most common and widely distributed "species" of natural lake in the United States. They have no inlet or outlet streams so they are essentially natural wells tapping the groundwater. Isolated from one another, each lake has its own personality, and is vulnerable to pollution and climate warming. The most famous kettle lake is Walden Pond in Concord, Massachusetts; but northern Wisconsin, Michigan, and Minnesota are most closely associated with them. These lakes have had a tremendous impact on the livelihood and lifestyles of peoples of the area--Native Americans, early explorers and settlers, and the locals and tourists who now use the lakes for recreation. Thorson explores lake science: how kettle lakes are different from other lakes, what it takes to keep all lakes healthy, how global warming and other factors affect lakes. *Beyond Walden* has a strong environmental message, and will do for the kettle lakes of America's Heartland--and beyond--what *Stone by Stone* did for the historic stone walls of New England.

A comprehensive overview of interaction of the major hydrological and meteorological processes in mountain areas ie Cryosphere and Climatic Change, Snow Melt and Soil Water, Run-off and Floods, Water fluxes and Water Balance, Hydro-meteorological Coupling and Modelling. Each section will review recent research in the field and illustrate key interactions with case studies from mountainous regions in Europe, The Americas and Central Asia.

In the U.S., approximately two-thirds of the coastal rivers and bays are moderately to severely degraded from nutrient pollution. The contributors to this book use long-term data sets to discuss the interactions among biological, ecological, chemical, and physical processes, and discuss what is known about nutrient inputs to the bay ecosystem, the impacts related to nutrient inputs, and how the ecosystem might respond to a sudden reduction in these inputs.

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.

Features review questions at the end of each chapter; Includes suggestions for recommended reading; Provides a glossary of ecological terms; Has a wide audience as a textbook for advanced undergraduate students, graduate students and as a reference for practicing scientists from a wide array of disciplines

Revised edition of: *Natural hazards: explanation and integration* / Graham A. Tobin and Burrell E. Montz. c1997.

This book combines a qualitative, conceptual understanding of hydrologic processes, an introduction to the quantitative representation of those processes and an understanding of approaches to hydrological measurements and the uncertainties involved in those measurements. Numerous worked examples and exercises are included throughout to help assimilate concepts, consider implications of relations developed in the book, and apply concepts to local conditions. This book provides an introduction to hydrological science and its concepts including Climate, the Hydrologic Cycle, Soils and Vegetation, Precipitation, Snow and Snowmelt, Water in Soils: Infiltration and Redistribution, Evapotranspiration, Ground Water in the Hydrological Cycle, Stream Response to Water-Input Events, Hydrology and Water-Resource Management. Suitable as a reference work for professionals already working in the field. It can also serve as a comprehensive, readily understood introduction to hydrology for professionals in related fields.

Physical Hydrology

"Eighteen chapters address the complex yet critical aspects of the role of geosciences in military undertakings. The chapters cover a wide range of expertise drawn from the broad area of geology, geomorphology, geography, geophysics, engineering geology, hydrogeology, cartography, environmental science, remote sensing, soil science, geoinformatics, and related disciplines that reflect the multidisciplinary nature of military geology"--

This book offers a broad interdisciplinary overview of state-of-the-art research on landform related issues. It presents a selection of papers given at the International Symposium on "Landform – structure, evolution process control", Bonn, June 2007.

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Snow and Ice-Related Hazards, Risks, and Disasters provides you with the latest scientific developments in glacier surges and melting, ice shelf collapses, paleo-climate reconstruction, sea level rise, climate change implications, causality, impacts, preparedness, and mitigation. It takes a geo-scientific approach to the topic while also covering current thinking about directly related social scientific issues that can adversely affect ecosystems and global economies. Puts the contributions from expert oceanographers, geologists, geophysicists, environmental scientists, and climatologists selected by a world-renowned editorial board in your hands Presents the latest research on causality, glacial surges, ice-shelf collapses, sea level rise, climate change implications, and more Numerous tables, maps, diagrams, illustrations and photographs of hazardous processes will be included Features new insights into the implications of climate change on increased melting, collapsing, flooding, methane emissions, and sea level rise

Interdisciplinary volume considers how nine arid/semi-arid river basins with irrigated agriculture will survive future climate change, siltation, and decreased flow.

As sessile organisms, plants have to cope with a multitude of natural and anthropogenic forms of stress in their environment. Due to their longevity, this is of particular significance for trees. As a consequence, trees develop an orchestra of resilience and resistance mechanisms to biotic and abiotic stresses in order to support their growth and development in a constantly changing atmospheric and pedospheric environment. The objective of this Special Issue of Forests is to summarize state-of-art knowledge and report the current progress on the processes that determine the resilience and resistance of trees from different zoniomes as well as all forms of biotic and abiotic stress from the molecular to the whole tree level.

This book provides essential background knowledge on a wide range of hydrological processes governing contaminant transport from soil to surface water across a range of scales, from hillslope to watershed. The mathematical description of these processes is based on both well-known and unique analytical solutions of different initial and boundary problems (primarily using methods from the kinematic wave theory and the reservoir/lumped-parameter concept), supported by numerical modelling studies. Some research topics, in particular several case studies, are illustrated by monitoring and experimental data analysis to show the importance of the research's applications in environmental practice and environmental education. Specific results concern the recognition of: (a) the effect of transient rainfall–runoff–infiltration partitioning on the chemical response of drainage areas to excess precipitation under certain field conditions related to the soil, hillslope characteristics, and contaminant properties; (b) soil erosion as a key factor that enhances the potential of adsorbed chemical transport in runoff; and (c) common tendencies in radionuclide behaviour in the near-surface environment contaminated by radioactive fallout from the Chernobyl (1986), Fukushima (2011) and the less known Kyshtym (1957) accidents, as well as from nuclear weapon tests in the atmosphere since 1952. The book's goal is to provide a conceptual foundation enabling readers to apply scientific knowledge to solve practical problems in environmental hydrology and radiology. More specifically, the book presents the state-of-the-art approaches that scientists and natural resources experts need in order to significantly improve the prediction of changes in the soil–water system chemistry due to human activities.

Water resources are sources of water that are useful or potentially useful to humans. They are important because they are needed for life to exist. Many uses of water include agricultural, industrial, household, recreational and environmental activities. Virtually all of these human uses require fresh water. Only 2.7% of water on the Earth is fresh water, and over two thirds of this is frozen in glaciers and polar ice caps, leaving only 0.007% available for human use. Fresh water is a renewable resource, yet the world's supply of clean, fresh water is steadily decreasing. Water demand already exceeds supply in many parts of the world, and as world population continues to rise at an unprecedented rate, many more areas are expected to experience this imbalance in the near future. The framework for allocating water resources to water users (where such a framework exists) is known as water rights. This new book presents recent and important research in the field.

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.

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