

Fundamentals Of Hydrology

Routledge Fundamentals Of Physical Geography

This publication presents, in a simple, but scientifically rigorous manner, the consequences of natural processes to stable isotope concentrations and radioactivities, and discusses the implications of these processes.

Climate Change is geared toward a variety of students and general readers who seek the real science behind global warming. Exquisitely illustrated, the text introduces the basic science underlying both the natural progress of climate change and the effect of human activity on the deteriorating health of our planet. Noted expert and author Edmond A. Mathez synthesizes the work of leading scholars in climatology and related fields, and he concludes with an extensive chapter on energy production, anchoring this volume in economic and technological realities and suggesting ways to reduce greenhouse-gas emissions.

Climate Change opens with the climate system fundamentals: the workings of the atmosphere and ocean, their chemical interactions via the carbon cycle, and the scientific framework for understanding climate change. Mathez then brings the climate of the past to bear on our present predicament, highlighting the importance of paleoclimatology in understanding the current climate system. Subsequent chapters explore the changes already occurring around us and their implications for the future. In a special feature, Jason E. Smerdon, associate research scientist at Lamont-Doherty Earth Observatory of Columbia University, provides an innovative appendix for students.

Examining the current literature, research, and relevant case

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studies, presented by a team of international experts, the Urban Water Reuse Handbook discusses the pros and cons of water reuse and explores new and alternative methods for obtaining a sustainable water supply. The book defines water reuse guidelines, describes the historical and current This extensively revised, restructured, and updated edition continues to present an engaging and comprehensive introduction to the subject, exploring the world's landforms from a broad systems perspective. It covers the basics of Earth surface forms and processes, while reflecting on the latest developments in the field. Fundamentals of Geomorphology begins with a consideration of the nature of geomorphology, process and form, history, and geomorphic systems, and moves on to discuss: structure: structural landforms associated with plate tectonics and those associated with volcanoes, impact craters, and folds, faults, and joints process and form: landforms resulting from, or influenced by, the exogenic agencies of weathering, running water, flowing ice and meltwater, ground ice and frost, the wind, and the sea; landforms developed on limestone; and landscape evolution, a discussion of ancient landforms, including palaeosurfaces, stagnant landscape features, and evolutionary aspects of landscape change. This third edition has been fully updated to include a clearer initial explanation of the nature of geomorphology, of land surface process and form, and of land-surface change over different timescales. The text has been restructured to incorporate information on geomorphic materials and processes at more suitable points in the book. Finally, historical geomorphology has been integrated throughout the text to reflect the importance of history in all aspects of geomorphology. Fundamentals of Geomorphology provides a stimulating and innovative perspective on the key topics and debates within the field of geomorphology. Written in an accessible and lively manner, it

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includes guides to further reading, chapter summaries, and an extensive glossary of key terms. The book is also illustrated throughout with over 200 informative diagrams and attractive photographs, all in colour.

This new edition is a major revision of the popular introductory reference on hydrology and watershed management principles, methods, and applications. The book's content and scope have been improved and condensed, with updated chapters on the management of forest, woodland, rangeland, agricultural urban, and mixed land use watersheds. Case studies and examples throughout the book show practical ways to use web sites and the Internet to acquire data, update methods and models, and apply the latest technologies to issues of land and water use and climate variability and change.

Natural Hazards: Earth Processes as Hazards, Disasters and Catastrophes, Fourth Edition, is an introductory-level survey intended for university and college courses that are concerned with earth processes that have direct, and often sudden and violent, impacts on human society. The text integrates principles of geology, hydrology, meteorology, climatology, oceanography, soil science, ecology and solar system astronomy. The book is designed for a course in natural hazards for non-science majors, and a primary goal of the text is to assist instructors in guiding students who may have little background in science to understand physical earth processes as natural hazards and their consequences to society. Natural Hazards uses historical to recent examples of hazards and disasters to explore how and why they happen and what we can do to limit their effects. The text's up-to-date coverage of recent disasters brings a fresh perspective to the material. The Fourth Edition continues our new active learning approach that includes reinforcement of learning objective with a fully updated visual program and pedagogical

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tools that highlight fundamental concepts of the text. This program will provide an interactive and engaging learning experience for your students. Here's how: Provide a balanced approach to the study of natural hazards: Focus on the basic earth science of hazards as well as roles of human processes and effects on our planet in a broader, more balanced approach to the study of natural hazards. Enhance understanding and comprehension of natural hazards: Newly revised stories and case studies give students a behind the scenes glimpse into how hazards are evaluated from a scientific and human perspective; the stories of real people who survive natural hazards, and the lives and research of professionals who have contributed significantly to the research of hazardous events. Strong pedagogical tools reinforce the text's core features: Chapter structure and design organizes the material into three major sections to help students learn, digest, and review learning objectives. Soils and sediments influence current processes, preserve evidence of past processes, indicate evolutionary phases in landscapes and provide a basis for relative and absolute chronologies. They provide an important key to the integration of short-term process studies and investigation of longer-term landform evolution. This book, first published in 1985, has been arranged to provide wide temporal and spatial coverage, with studies ranging from historic to geologic time scales and micro- to macro-spatial scales. The interdisciplinary nature of the subject is reflected in contributions from soil scientists, engineering geologists, hydrologists and geomorphologists.

Exposes You to Current Industry-Standard Tools Open channel flow is covered in essentially all civil and environmental engineering programs, usually by final-year undergraduate or graduate students studying water resources. Fundamentals of Open Channel Flow outlines

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current theory along with clear and fully solved examples that illustrate the concepts and are geared to a first course in open channel flow. It highlights the practical computational tools students can use to solve problems, such as spreadsheet applications and the HEC-RAS program. It assumes a foundation in fluid mechanics, then adopts a deliberately logical sequence through energy, momentum, friction, gradually varied flow (first qualitative, then quantitative), and the basics of sediment transport. Taps into Your Innate Ability to Understand Complex Concepts Visually Open channel flow can be understood through just a few simple equations, graphs, and computational tools. For students, the book comes with downloadable animations that illustrate basic concepts visually with synchronous graphical presentation of fundamental relationships. For instructors, PowerPoint slides and solutions to end-of-chapter problems are provided. Delivers simple but powerful software animations Conveys material in three ways (analytical, graphical, computational/empirical) to aid multiple types of learners and improve overall accessibility Includes new fundamental equation for alternate depths Discusses flow transients supported by animations and calculations Emphasizes applications of common and useful computational tools Developed by an author who has been teaching open channel flow to university students for the past fifteen years, Fundamentals of Open Channel Flow provides you with a detailed explanation of the basics of open channel flow using examples and animation, and offers expert guidance on the practical application of graphical and computational tools.

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

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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.

This book presents a systematic approach to understanding and applying the principles of hydrology and hydroclimatology, examining the interactions among different components of the water cycle. It takes a fresh look at the fundamentals and challenges in hydrologic and hydroclimatic systems as well as climate change. The author describes the application of nontraditional data sets and new investigation techniques to water-related problems. He also examines long lead forecasting and simulation, time series analysis, and risk and uncertainty in hydrologic design.

This book provides an introduction to the scientific fundamentals of groundwater and geothermal systems. In a simple and didactic manner the different water and energy problems existing in deformable porous rocks are explained as well as the corresponding theories and the mathematical and numerical tools that lead to modeling and solving them. This

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.

Walter A. Rosenbaum's classic Environmental Politics and Policy, Tenth Edition once again provides definitive coverage of environmental politics and policy, lively case material, and

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a balanced assessment of current environmental issues. The first half of the book sets needed context and describes the policy process while the second half covers specific environmental issues such as air and water; toxic and hazardous substances; energy; and a global policymaking chapter focused on climate change and transboundary politics. Covering major environmental policy initiatives and controversies during President Obama's two terms and capturing the sudden and radical changes occurring in the American energy economy, this Tenth Edition offers the needed currency and relevancy for any environmental politics course.

Fundamentals of Biogeography presents an accessible, engaging and comprehensive introduction to biogeography, explaining the ecology, geography, history and conservation of animals and plants. Starting with an outline of how species arise, disperse, diversify and become extinct, the book examines: how environmental factors (climate, substrate, topography, and disturbance) influence animals and plants; investigates how populations grow, interact and survive; how communities form and change; and explores the connections between biogeography and conservation. The second edition has been extensively revised and expanded throughout to cover new topics and revisit themes from the first edition in more depth. Illustrated throughout with informative diagrams and attractive photos and including guides to further reading, chapter summaries and an extensive glossary of key terms, Fundamentals of Biogeography clearly explains key concepts in the history, geography and ecology of life systems. In doing so, it tackles some of the most topical and controversial environmental and ethical concerns including species over-exploitation, the impacts of global warming, habitat fragmentation, biodiversity loss and ecosystem restoration. Rivers are significant geomorphological agents, they show an

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amazing diversity of form and behaviour and transfer water and sediment from the land surface to the oceans. This book examines how river systems respond to environmental change and why this understanding is needed for successful river management. Highly dynamic in nature, river channels adjust and evolve over timescales that range from hours to tens of thousands of years or more, and are found in a wide range of environments. This book provides a comprehensive overview of recent developments in river channel management, clearly illustrating why an understanding of fluvial geomorphology is vital in channel preservation, environmentally sensitive design and the restoration of degraded river channels. It covers: flow and sediment regimes: flow generation; flow regimes; sediment sources, transfer and yield channel processes: flow characteristics; processes of erosion and sediment transport; interactions between flow and the channel boundary; deposition channel form and behaviour: controls on channel form; channel adjustments; floodplain development; form and behaviour of alluvial and bedrock channels response to change: how channels have responded to past environmental change; impacts of human activity; reconstructing past changes river management: the fluvial hydrosystem; environmental degradation; environmentally sensitive engineering techniques; river restoration; the role of the fluvial geomorphologist. Fundamentals of Fluvial Geomorphology is an indispensable text for undergraduate students. It provides straightforward explanations for important concepts and mathematical formulae, backed up with conceptual diagrams and appropriate examples from around the world to show what they actually mean and why they are important. A colour plate section also shows spectacular examples of fluvial diversity.

Thoroughly revised and up-dated edition of a highly

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successful textbook.

Fundamentals of Soil provides a comprehensive and engaging introduction to soils and the workings of soil systems. This text is the only one of its kind to provide an attractive, lively and accessible introduction to this topic. Featuring learning tools within each chapter, such as summaries, essay questions and guides for further reading, the text is also highly illustrated with useful tables, boxes and figures. Covering all key areas of study at an introductory level, subjects covered include: · Soil properties · Soil processes · Controls on soil formation · Soil classification · World soils · Soil patterns · Soil degradation.

Unmanned aircraft systems (UAS) are rapidly emerging as flexible platforms for capturing imagery and other data across the sciences. Many colleges and universities are developing courses on UAS-based data acquisition. Fundamentals of Capturing and Processing Drone Imagery and Data is a comprehensive, introductory text on how to use unmanned aircraft systems for data capture and analysis. It provides best practices for planning data capture missions and hands-on learning modules geared toward UAS data collection, processing, and applications. FEATURES Lays out a step-by-step approach to identify relevant tools and methods for UAS data/image acquisition and processing Provides practical hands-on knowledge with visual interpretation, well-organized and designed for a typical 16-week UAS course offered on college and university campuses Suitable for all levels of readers and does not require prior knowledge of UAS, remote sensing, digital image processing, or geospatial analytics Includes real-world environmental applications along with data interpretations and software used, often nonproprietary Combines the expertise of a wide range of UAS researchers and practitioners across the geospatial sciences This book provides a general introduction to drones along with a series

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of hands-on exercises that students and researchers can engage with to learn to integrate drone data into real-world applications. No prior background in remote sensing, GIS, or drone knowledge is needed to use this book. Readers will learn to process different types of UAS imagery for applications (such as precision agriculture, forestry, urban landscapes) and apply this knowledge in environmental monitoring and land-use studies.

The third edition of Fundamentals of Hydrology provides an absorbing and comprehensive introduction to the understanding of how fresh water moves on and around the planet and how humans affect and manage the freshwater resources available to them. The book consists of three parts, each of fundamental importance in the understanding of hydrology: The first section deals with processes within the hydrological cycle, our understanding of them, and how to measure and estimate the amount of water within each process. This also includes an analysis of how each process impacts upon water quality issues. The second section is concerned with the measurement and analytical assessment of important hydrological parameters such as streamflow and water quality. It describes analytical and modelling techniques used by practising hydrologists in the assessment of water resources. The final section of the book draws together the first two parts to discuss the management of freshwater with respect to both water quality and quantity in a changing world. Fundamentals of Hydrology is a lively and accessible introduction to the study of hydrology at university level. It gives undergraduates a thorough understanding of hydrological processes, knowledge of the techniques

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used to assess water resources, and an up-to-date overview of water resource management. Throughout the text, examples and case studies from all around the world are used to clearly explain ideas and techniques. Essay questions, guides to further reading, and website links are also included.

Positioned to become the foremost text on water resource issues, this companion to Hornberger's widely regarded *Elements of Physical Hydrology* reveals the enormity of the water crisis facing the planet while offering realistic hope.

Biochar is the carbon-rich product when biomass (such as wood, manure or crop residues) is heated in a closed container with little or no available air. It can be used to improve agriculture and the environment in several ways, and its stability in soil and superior nutrient-retention properties make it an ideal soil amendment to increase crop yields. In addition to this, biochar sequestration, in combination with sustainable biomass production, can be carbon-negative and therefore used to actively remove carbon dioxide from the atmosphere, with major implications for mitigation of climate change. Biochar production can also be combined with bioenergy production through the use of the gases that are given off in the pyrolysis process. This book is the first to synthesize the expanding research literature on this topic. The book's interdisciplinary approach, which covers engineering, environmental sciences, agricultural sciences, economics and policy, is a vital tool at this stage of biochar technology development. This comprehensive overview of current knowledge will be of

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interest to advanced students, researchers and professionals in a wide range of disciplines. Mapping closely to how ore deposit geology is now taught, this textbook systematically describes and illustrates the major ore deposit types, linking this to their settings in the crust and the geological factors behind their formation. Written for advanced undergraduate and graduate students with a basic background in the geosciences, it provides a balance of practical information and coverage of the relevant geological sciences, including petrological, geochemical, hydrological and tectonic processes. Important theory is summarized without unnecessary detail and integrated with students' learning in other topics, including magmatic processes and sedimentary geology, enabling students to make links across the geosciences. Students are supported by further reading, a comprehensive glossary, and problems and review questions that test the application of theoretical approaches and encourage students to use what they have learnt. A website includes visual resources and combines with the book to provide students and instructors with a complete learning package.

The world faces huge challenges for water as population continues to grow, as emerging economies develop and as climate change alters the global and local water cycle. There are major questions to be answered about how we supply water in a sustainable and safe manner to fulfil our needs, while at the same time protecting vulnerable ecosystems from disaster. *Water Resources: An Integrated Approach* provides students with a

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comprehensive overview of both natural and socio-economic processes associated with water. The book contains chapters written by 20 specialist contributors, providing expert depth of coverage to topics. The text guides the reader through the topic of water starting with its unique properties and moving through environmental processes and human impacts upon them including the changing water cycle, water movement in river basins, water quality, groundwater and aquatic ecosystems. The book then covers management strategies for water resources, water treatment and re-use, and the role of water in human health before covering water economics and water conflict. The text concludes with a chapter that examines new concepts such as virtual water that help us understand current and future water resource use and availability across interconnected local and global scales. This book provides a novel interdisciplinary approach to water in a changing world, from an environmental change perspective and inter-related social, political and economic dimensions. It includes global examples from both the developing and developed world. Each chapter is supplemented with boxed case studies, end of chapter questions, and further reading, as well as a glossary of terms. The text is richly illustrated throughout with over 150 full colour diagrams and photos.

Designed for undergraduate and graduate students, this book covers important soil physical properties, critical physical processes involving energy and mass transport, movement and retention of water and solutes through soil profile, soil temperature regimes and aeration, and plant-water relations. It includes new concepts and

numerical examples fo

Water has become one of the most important issues of our time intertwined with global warming and population expansion. The management of water supplies and the conservation of water resources remains one of the most challenging yet exciting issues of our time. Water and wastewater treatment technologies are constantly evolving creating an increasingly sustainable industry that is one of the world's largest and most interdisciplinary sectors, employing chemists, microbiologists, botanists, zoologists as well as engineers, computer specialists and a range of different management professionals. This accessible student textbook introduces the reader to the key concepts of water science and technology by explaining the fundamentals of hydrobiology, aquatic ecosystems, water treatment and supply, wastewater treatment and integrated catchment management. This fourth edition is extensively changed throughout, with new coverage of the effects of climate change, environmental assessment, sustainability and the threat to biodiversity. The text serves as a primer for both undergraduate and graduate students in either science or engineering who have an interest in freshwater biology/hydrobiology or environmental engineering. It is also useful as a unified transitional course for those who want to span the traditional areas of engineering, biology, chemistry, microbiology or business. Professionals and consultants will also find the book a useful reference.

GIS for Environmental Applications provides a practical introduction to the principles, methods, techniques and

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tools in GIS for spatial data management, analysis, modelling and visualisation, and their applications in environmental problem solving and decision making. It covers the fundamental concepts, principles and techniques in spatial data, spatial data management, spatial analysis and modelling, spatial visualisation, spatial interpolation, spatial statistics, and remote sensing data analysis, as well as demonstrates the typical environmental applications of GIS, including terrain analysis, hydrological modelling, land use analysis and modelling, ecological modelling, and ecosystem service valuation. Case studies are used in the text to contextualise these subjects in the real world, examples and detailed tutorials are provided in each chapter to show how the GIS techniques and tools introduced in the chapter can be implemented using ESRI ArcGIS (a popular GIS software system for environmental applications) and other third party extensions to ArcGIS to address. The emphasis is placed on how to apply or implement the concepts and techniques of GIS through illustrative examples with step-by-step instructions and numerous annotated screen shots. The features include: Over 350 figures and tables illustrating how to apply or implement the concepts and techniques of GIS Learning objectives along with the end-of-chapter review questions Authoritative references at the end of each chapter GIS data files for all examples as well as PowerPoint presentations for each chapter downloadable from the companion website. GIS for Environmental Applications weaves theory and practice together, assimilates the most current GIS knowledge

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and tools relevant to environmental research, management and planning, and provides step-by-step tutorials with practical applications. This volume will be an indispensable resource for any students taking a module on GIS for the environment.

In order to manage the world's increasingly scarce water resources we must have a sound understanding of how water moves around the planet and what influences water quality. Fundamentals of Hydrology provides an engaging and comprehensive introduction to this subject and provides real-life examples of water resource management in a changing world. The second edition of this popular book brings the text up-to-date with additional case studies and diagrams and a greater synthesis of water quality with physical hydrology. The chapters on runoff and evaporation have been updated and the final chapter on hydrology in a changing world has more material on water resource management strategies. Additionally the chapter on streamflow analysis now includes a more in-depth section on modelling runoff. The book begins with a comprehensive coverage of precipitation, evaporation, water stored in the ground and as snow and ice, and runoff. These physical hydrological processes show with respect to the fundamental knowledge about the process, its measurement and estimation and how it ties in with water quality. Following this is a section on analyzing streamflow data, including using computer models and combining hydrology and ecology for in-stream flow assessment. A chapter on water quality shows how to measure and estimate it in a variable environment and

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finishes with a section on pollution treatment. The final chapter brings the text together to discuss water resource management and real-life issues that are faced by hydrologists in a constantly changing world.

Fundamentals of Hydrology is a lively and accessible introduction to the study of hydrology at university level. This new edition continues to provide an understanding of hydrological processes, knowledge of the techniques used to assess water resources and an up-to-date overview of water resource management in a changing world. Throughout the text, wide-ranging examples and case studies are used to clearly explain ideas and methods. Short chapter summaries, essay questions, guides to further reading and a glossary are also included.

This new edition adds several new chapters and is thoroughly updated to include data on new topics such as hydraulic fracturing, CO₂ sequestration, sustainable groundwater management, and more. Providing a complete treatment of the theory and practice of groundwater engineering, this new handbook also presents a current and detailed review of how to model the flow of water and the transport of contaminants both in the unsaturated and saturated zones, covers the protection of groundwater, and the remediation of contaminated groundwater.

Principles of Hydrogeology, Third Edition presents important concepts of groundwater hydrology with a strong emphasis on problem-solving and field applications of hydrogeology. With newly added and revised content, this volume maintains a broad and

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current scope of topics, from the history of hydrogeology to the latest trends in managing groundwater contamination, arranged in the most compact and easy-to-use format available. Topics of interest include the role of groundwater in the hydrologic cycle; the nature of water-bearing formations; drilling boreholes and constructing monitoring wells; aquifers, well hydraulics, and aquifer tests; groundwater chemistry and flow; groundwater pollution, contaminant transport, remediation, and management. The author also provides the most current sources of hydrogeologic information, including professional societies, groundwater organizations, government agencies, industry publications, and Internet sites that provide data, software, techniques, protocols, standards, and training opportunities. Concise and informative, environmental regulators as well as groundwater and hydrology professionals will find *Principles of Hydrogeology, Third Edition* a handy and irreplaceable source for looking up definitions, tools, and equations while working on groundwater problems.

This introductory text explains the fundamentals of the chemistry of the natural environment and the effects of mankind's activities on the earth's chemical systems.

Retains an emphasis on describing how natural geochemical processes operate over a variety of scales in time and space, and how the effects of human perturbation can be measured. Topics range from familiar global issues such as atmospheric pollution and its effect on global warming and ozone destruction, to microbiological processes that cause pollution of drinking

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waterdeltas. Contains sections and information boxes that explain the basic chemistry underpinning the subject covered. Each chapter contains a list of further reading on the subject area. Updated case studies. No prior chemistry knowledge required. Suitable for introductory level courses.

This book is a unique integrated treatise, on the concepts of fractional calculus as models with applications in hydrology, soil science and geomechanics. The models are primarily fractional partial differential equations (fPDEs), and in limited cases, fractional differential equations (fDEs). It develops and applies relevant fPDEs and fDEs mainly to water flow and solute transport in porous media and overland, and in some cases, to concurrent flow and energy transfer. It is an integrated resource with theory and applications for those interested in hydrology, hydraulics and fluid mechanics. The self-contained book summarizes the fundamentals for porous media and essential mathematics with extensive references supporting the development of the model and applications.

The Hydrology of the UK assesses the changing hydrology of the UK, focusing on key issues that affect the fundamental hydrological processes and have important implications for water resource management, flood risk and environmental quality. The book is divided into 3 sections: Section 1 examines the causes of change to the hydrology of the UK, including the impact of climate change, land use and geomorphological change, and dam construction. Section 2 assesses the effects of these pressures on UK rivers, groundwater,

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lakes, ponds, reservoirs and wetlands, looking at water quality, degradation, pollution and protection. Section 3 examines the responses of government organisations responsible for planning and management of water, including Environment Agencies, British Hydrological Society and the growing urgency for a World Hydrology Initiative. Change will continue to be a major feature of UK hydrology in the future. This book provides an understanding of the changing hydrology of the UK and the international scene today and looks to the needs for the future.

Fundamentals of Environmental Site Assessment and Remediation examines all aspects of environmental site assessment and remediation and outlines the interdisciplinary skills needed to work in the field. It provides a comprehensive overview for students, environmental professionals, and real estate developers, and includes the latest environmental regulations, environmental site assessment and remediation practices, and industry standards. It examines pollution sources and the related impacts on drinking water supplies, the associated health risks, and how to protect water resources. The monitoring of surface water, groundwater, and soil is explained, as well as vapor intrusion. It will include several practical case studies throughout. Features Includes the latest and best practices for environmental site assessment and remediation procedures. Presents a multidisciplinary approach, including environmental forensics, nanotechnology, microbiology (DNA technology) and isotopes, etc. Examines various pollutants and their

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related impacts on drinking water supplies, the associated health risks, and how to protect water resources. Presents the best practices for the monitoring of surface water, groundwater, and soil. Covers the latest environmental regulations and industry standards.

Physical Geography: The Basics is a concise and engaging introduction to the interactions, systems and processes that have shaped, and continue to shape, the physical world around us. This book introduces five key aspects of the study of physical geography: atmosphere, weather and climate systems the carbon cycle and historic and contemporary climate change plate tectonics, weathering, erosion and soils the role of water and ice in shaping the landscape and impacting human activity the patterns of plant and animal life and human impacts upon them. The book features diagrams, maps and a glossary to aid understanding of key ideas and suggestions for further reading to allow readers to develop their interest in the subject – making **Physical Geography: The Basics** the ideal starting point for anyone new to the study of geography and the environment.

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Physical Geography: The Key Concepts is a thought-provoking and up-to-date introduction to the central ideas and debates within the field. It provides extended definitions of terms that are fundamental to physical geography and its many branches, covering topics such as: biogeography ecology climatology meteorology geomorphology hydrology pedology Complete with informative tables, diagrams, and suggestions for further

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reading, this is a highly accessible guide for those studying physical geography and related courses. 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.

Water is essential to sustain life on Earth and an understanding of water quantity and quality issues is vital for anyone involved in environmental management. Fundamentals of Hydrology provides an absorbing and comprehensive introduction to how fresh water moves on and around the planet and how humans affect the quantity and quality of water available to them. The book consists of three parts, each of fundamental importance to an understanding of hydrology: *The first section deals with processes

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within the hydrological cycle, our understanding of them, and how to measure and estimate the amount of water within each process. *The second section is concerned with the assessment of important hydrological parameters such as streamflow and water quality. It describes techniques used by practising hydrologists in the assessment of water resources. *The final section of the book draws together the first two parts to discuss how we can manage our water resources for the maximum benefit of humanity and the environment overall. Fundamentals of Hydrology is a lively and accessible introduction to the study of hydrology and will give undergraduates an understanding of hydrological processes, a knowledge of the techniques used to assess water resources and an up to date overview of hydrology in a changing world. Throughout the text examples and case studies from around the world are used to clearly explain ideas and techniques. Chapter summaries, essay questions, guides to further reading and a glossary are also included.

Providing an introduction to the crucially important topic of groundwater, this text covers all major fields of hydrogeology and includes outlines of the occurrence of groundwater in various rock types, the movement and storage of groundwater, the formulation of groundwater balances, the development of groundwater chemistry, as well as

the practical application of hydrogeology for groundwater development. Following a unique systems approach to describe and connect its various elements, the text also explores a large selection of examples of groundwater cases from various parts of the world. In addition, theoretical sections and examples are illustrated with a number of drawings, photos and computer printouts. Suitable for education in hydrogeology at postgraduate and graduate level, the text is also a useful reference tool for professionals and decision-makers involved in water or water-related activities. In the revised paperback edition of *Introduction to Hydrogeology* (February 2006), suggestions of reviewers, students and colleagues have been taken into account. This means that more attention is paid to the processes in the unsaturated zone, especially those relating to groundwater recharge. Also, in the revised edition, the investigation methods are highlighted in the sections where the related theory is dealt with, and they are not presented in the last chapter on groundwater management. Chapter titles are re-named and some definitions are adjusted. The References and Bibliography section is also extended, some figures are improved, and the inevitable 'typing errors' are corrected as well. While most books examine only the classical aspects of hydrology, this three-volume set covers multiple aspects of hydrology, and includes

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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. 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

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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.

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