

Applied Fluvial Geomorphology For River Engineering And Management

David Knighton's best-selling book looks at the wide range of forms developed by natural rivers and the processes responsible for that development. The book combines empirical and theoretical approaches, and provides a critical assessment of the many schools of thought which have emerged for dealing with adjustment in the fluvial system. It is fully illustrated throughout by a superb range of figures, photographs and tables. Starting with the network scale, the book examines the interaction of hillslopes, drainage networks and channels, and goes on to considerations of catchment hydrology and catchment denudation. Fluvial processes are analysed in detail, from the mechanics of flow to sediment transport and deposition. Detailing the major components of river channels, the book examines the nature of river adjustment, particularly with respect to equilibrium concepts, and concludes with a look at channel changes through time, affected by flood discharges, climatic change and human activities.

Large Rivers: Geomorphology and Management explores an important topic in geomorphology and sedimentology: the form and function of major rivers. Our knowledge of the big rivers of the world is limited. It is currently difficult to recognise large rivers of the past from relict sedimentary deposits or to structure management policies for long international rivers. This exciting book brings together a set of papers on large rivers of the world, as a unique introduction to a demanding subject. The book includes thirty chapters and is organised into three sections. The first part is on the environmental requirements for creating and maintaining a major river system. The second is a collection of case studies on 14 large rivers from different continents, covering a range of physical environments. The third section includes chapters on the measurement and management of large rivers. First book to offer in a single volume state-of-the-art knowledge on management and geomorphology of large rivers of the world A pioneering study, pushing the boundaries of our knowledge related to big rivers Includes comprehensive case studies covering the major large rivers of the world including Amazon, Mississippi, Nile, Congo, Indus, and Mekong Written by a leading team of distinguished, international contributors Large Rivers: Geomorphology and Management is essential reading for postgraduate students and researchers in fluvial geomorphology, hydrology, sedimentary geology, and river management. It is also of relevance to engineers and environmental consultants in the private and public sectors working on major rivers of the world.

Rivers are significant geomorphological agents, they show an 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.

This volume presents a description of the river (a natural watercourse, usually freshwater, flowing towards an ocean, a lake, a sea, or another river), including its shape, size, organization, and action, along with a consistent theory that explains much of the observed character of channels.

Fundamentals of Geomorphology

Fluvial Processes in Geomorphology

Flooding and Management of Large Fluvial Lowlands

Structure and function of running waters

A View of the River

This extensively revised 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 reflects on the latest developments in the field and includes new chapters on geomorphic materials and processes, hillslopes and changing landscapes. Fundamentals of Geomorphology is an engaging and comprehensive introduction. Starting with a consideration of the nature of geomorphology and the geomorphic system, geomorphic materials and processes, and the quest of process and historical geomorphologists, it moves on to discuss: structure: landforms resulting from, or influenced by, the endogenic agencies of tectonic and volcanic processes, geological structures and rock types 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 history: earth surface history, giving a discussion of Quaternary landforms and ancient landforms, including the origin of old plains, relict, exhumed, and stagnant landscape features and evolutionary aspects of landscape change. 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 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, including a colour plate section.

Geomorphological Fieldwork addresses a topic that always remains popular within the geosciences and environmental science. More specifically, the volume conveys a growing legacy of field-based learning for young geomorphologists that can be used as a student book for field-based university courses and postgraduate research requiring fieldwork or field schools. The editors have much experience of field-based learning within geomorphology and extend this to physical geography. The topics covered are relevant to basic geomorphology as well as applied approaches in environmental and cultural geomorphology. The book integrates a physical-human approach to geography, but focuses on physical geography and geomorphology from an integrated field-based geoscience perspective. Addresses fluvial and karst landscapes in depth Focuses on field-based learning as well as educational geomorphology Conveys experiential knowledge in international contexts

This book outlines a generic set of procedures, termed the River Styles Framework, which provides a set of tools for interpreting river character, behavior, condition, and recovery potential. Applications of the framework generate a coherent package of geomorphic information, providing a physical template for river rehabilitation activities. management and restoration of rivers is a rapidly growing topic for environmental scientists, geologists and ecologists – this book provides a learning tool with which to approach geomorphic applications to river management describes the essential geomorphological principles underlying river behaviour and evolution demonstrates how the River Styles Framework can turn geomorphic theory into practice, to develop workable strategies for restoration and management based on real case studies and authors extensive experience applicable to river systems worldwide synthesises fluvial geomorphology, ecology and management Examines interrelations between flood management, flooding, and environmental change, for advanced students, researchers, and practitioners.

Beyond Restoration and Management

A Global Environmental Perspective

Applications of the River Styles Framework

Guidebook of Applied Fluvial Geomorphology for River Studies in Engineering and Environmental Management

Applied Fluvial Geomorphology

This extensively revised and updated third edition of Fundamentals of Geomorphology presents an engaging and comprehensive introduction to geomorphology, exploring the world's landforms from a broad systems perspective. It reflects the latest developments in the field and includes new chapters on geomorphic materials and processes, hillslopes and changing landscapes.

Few plant species have had as much combined scientific, public, and political attention as exotic Tamarix spp (tamarisk, saltcedar). 24 essays by 44 authors explore its biology, ecology, politics, history, and management, reflecting the controversy that has arisen around its "invasion" and what should (or should not) be done.

Rivers are important agents of change that shape the Earth's surface and evolve through time in response to fluctuations in climate and other environmental conditions. They are fundamental in landscape development, and essential for water supply, irrigation, and transportation. This book provides a comprehensive overview of the geomorphological processes that shape rivers and that produce change in the form of rivers. It explores how the dynamics of rivers are being affected by anthropogenic change, including climate change, dam construction, and modification of rivers for flood control and land drainage. It discusses how concern about environmental degradation of rivers has led to the emergence of management strategies to restore and naturalize these systems, and how river management techniques work best when coordinated with the natural dynamics of rivers. This textbook provides an excellent resource for students, researchers, and professionals in fluvial geomorphology, hydrology, river science, and environmental policy.

Running waters are enormously diverse, ranging from torrential mountain brooks, to large lowland rivers, to great river systems whose basins occupy subcontinents. While this diversity makes river ecosystems seem overwhelmingly complex, a central theme of this volume is that the processes acting in running waters are general, although the settings are often unique. The past two decades have seen major advances in our knowledge of the ecology of streams and rivers. New paradigms have emerged, such as the river continuum and nutrient spiraling. Community ecologists have made impressive advances in documenting the occurrence of species interactions. The importance of physical processes in rivers has attracted increased attention, particularly the areas of hydrology and geomorphology, and the inter-relationships between physical and biological factors have become better understood. And as is true for every area of ecology during the closing years of the twentieth century it has become apparent that the study of streams and rivers cannot be carried out by excluding the role of human activities, nor can we ignore the urgency of the need for conservation. These developments are brought together in Stream Ecology: Structure and function of running waters, designed to serve as a text for advanced undergraduate and graduate students, and as a reference book for specialists in stream ecology and related fields.

Geoinformatics in Applied Geomorphology

Geomorphology to Support Management

Geomorphology in the Anthropocene

Finding the Voice of the River

Guidebook of Applied Fluvial Geomorphology for River Engineering and Management

A pioneering study that encompasses both field and laboratory research, this text explores the landscapes of mountains, rivers, and seacoasts. Topics include weathering, climate, and erosion. New Foreword. 1964 edition.

Geomorphology is the study of the Earth's diverse physical land-surface features and the dynamic processes that shape these features. Examining natural and anthropogenic processes, The SAGE Handbook of Geomorphology is a comprehensive exposition of the fundamentals of geomorphology that examines form, process, and applications of the discipline. Organized into five substantive sections, the Handbook is an overview of:
• Foundations and Relevance: including the nature and scope of geomorphology; the origins and development of geomorphology; the role and character of theory in geomorphology; geomorphology and environmental management; and geomorphology and society
• Techniques and Approaches: including observations and experiments; geomorphological mapping; the significance of models; process and form; dating surfaces and sediment; remote sensing in geomorphology; GIS in geomorphology; biogeomorphology; human activity
• Process and Environment: including the evolution of regolith; weathering; fluids, flows and fluxes; sediment transport and deposition; hill slopes; riverine environments; glacial geomorphology; periglacial environments; coastal environments; aeolian environments; tropical environments; karst and karst processes
• Environmental Change: including landscape evolution and tectonics; interpreting quaternary environments; environmental change; disturbance and responses to geomorphic systems
• Conclusion: including challenges and perspectives; and a concluding review
The Handbook has contributions from 48 international authors and was initially organized by the International Association of Geomorphologists. This will be a much-used and much-cited reference for researchers in Geomorphology, Physical Geography and the Environmental Sciences.

The practical application of geomorphological science now forms a regular part of any project involving flood protection, fisheries, conservation, recreation, environmental protection and river restoration. The responsibilities now placed upon organisations by the EU Water Framework Directive to assess river morphology will ensure that the uptake of geomorphology continues and expands. Topics featured include: Channel form and change, sediment systems, and catchment issues Example applications from flood control projects, bank erosion problems, and rehabilitation and restoration schemes A range of site-specific applications of geomorphology In this book the authors use their extensive experience gained through fieldwork, analysis, and input to the design process to: Provide a thorough understanding of geomorphology in the river environment; Demonstrate the significance of considering geomorphological processes in river management projects; Describe effective ways to incorporate geomorphological science into river engineering and management; Indicate when to seek expert advice This guidebook will prove a valuable source of information on the principles and application of fluvial geomorphology for anyone involved in river engineering and management, including flood management, fisheries, conservation, ecology, recreation, hydrometry, environmental assessment, landscape architecture and water quality.

This book addresses societal relationships to river systems, highlighting many unexplored possibilities in how we know and manage our rivers. Brierley contends that although we have good scientific understanding of rivers, with remarkable prospect for profound improvements to river condition, management applications greatly under-deliver. He conceptualizes approaches to river repair in two very different ways: Medean (competitive) and Gaian (cooperative). Rather than ‘managing’ rivers to achieve particular anthropogenic goals (the former option), this book adopts a more-than-human approach to ‘living with living rivers’ (the latter option), applying a river rights framework that conceptualizes rivers as sentient entities. Chapters build on significant experience across many parts of the world, emphasizing the diverse array of river attributes and relationships to be protected and the wide range of problems to be addressed. Although the book has an environmental focus, it is framed as an argument in popular philosophy, contemplating the agency of rivers as place-beings. It will be of great value to academics, students and general readers interested in protecting river systems.

Tools in Fluvial Geomorphology

River Dynamics

Stream Ecology

Fundamentals of Fluvial Geomorphology

Mountain Rivers

*Applied Fluvial Geomorphology for River Engineering and Management*John Wiley & Sons Incorporated

This text presents an overview of fluvial geomorphology (how water movement effects the surface features of the Earth), and aims to provide river engineers and managers with an understanding of natural channel forms and fluvial processes.

Filling a niche in the geomorphology teaching market, this introductory book is built around a 12 week course in fluvial geomorphology. ‘Reading the landscape’ entails making sense of what a riverscape looks like, how it works, how it has evolved over time, and how alterations to one part of a catchment may have secondary consequences elsewhere, over different timeframes. These place-based field analyses are framed within their topographic, climatic and environmental context. Issues and principles presented in the first part of this book provide foundational understanding that underpin the approach to reading the landscape that is presented in the second half of the book. In reading the landscape, detective-style investigations and interpretations are tied to theoretical and conceptual principles to generate catchment-specific analyses of river character, behaviour and evolution, including responses to human disturbance. This book has been constructed as an introductory text on river landscapes, providing a bridge and/or companion to quantitatively-framed or modelled approaches to landscape analysis that are addressed elsewhere. Key principles outlined in the book emphasise the importance of complexity, contingency and emergence in interpreting the character, behaviour and evolution of any given system. The target audience is second and third year undergraduate students in geomorphology, hydrology, earth science and environmental science, as well as river practitioners who use geomorphic understandings to guide scientific and/or management applications. The primary focus of Kirstie and Gary’s research and teaching entails the use of geomorphic principles as a tool with which to develop coherent scientific understandings of river systems, and the application of these understandings in management practice. Kirstie and Gary are co-developers of the River Styles® Framework and Short Course that is widely used in river management, decision-making and training. Additional resources for this book can be found at:

ahref="http://www.wiley.com/go/fryirs/riversystems"www.wiley.com/go/fryirs/riversystems/

This book, first published in 1979, collects together a key set of papers from the 10th Binghamton Geomorphology Symposium. They analyse fluvial theory, channel processes, stream adjustments, paleo-adjustments and channel adjustments.

The Conflict Between Fluvial Process and Land Use

Fluvial Processes in River Engineering

An Approach to Reading the Landscape

Applied Fluvial Geomorphology for River Engineering and Management

An introduction to fluvial dynamics

A comprehensive treatment of the human role in modifying geomorphological forms and processes and their influence on the Earth's systems.

After publishing the famous "Fluvial Processes in Geomorphology" in the early 1960s, the work of Luna Leopold, Gordon Wolman, and John Miller became a key for opening the door to understanding rivers and streams. They first illustrated the problem to geomorphologists and geographers. Later, Chang, in his "Fluvial Processes in River Engineering", provided a basis for engineers, showing this group of professionals how to deal with rivers and how to understand them. Since then, more informative studies have been published. Many of the authors started to combine fluvial geomorphology knowledge and river engineering needs, such as "Tools in Fluvial Geomorphology" by G. Mathias Kondolf and Hervé Piégay, or focused more on river engineering tasks, such as "Stream Restoration in Dynamic Fluvial Systems: Scientific Approaches" by Andrew Simon, Sean Bennett, and Janine Castro. Finally, Luna Leopold summarized river and stream morphologies in the beautiful "A view of the river". It appears that we continue to explore this subject in the right direction. We better understand rivers and streams, and as engineers and fluvial geomorphologists, we can establish tools to help bring rivers alive. However, there is still a hunger for more scientific tools that we could use to further understand rivers and to support the development of healthy streams and rivers with high biodiversity in the present world, which has started to face water scarcity.

From the symposium to honor Dr. Stanley Schumm, a pioneer in the field of fluvial geomorphology. Included are topics that address primary fluvial processes, extreme events, anthropogenic effects on fluvial systems, applied fluvial geomorphology, and engineering geomorphology.

In recent years there has been a marked increase in funding and employment in river restoration. Methods in Fluvial Geomorphology provides an integrated approach to the interdisciplinary nature of the subject and offers guidance for researchers and professionals on the tools available to answer questions on river management on very difference scales. * Each chapter is organised to cover everything from general concepts to specific techniques * Topics covered include evolution of methods, guiding concepts, a framework for deciding when to apply specific tools, advantages and limitation of the tools, sources of data, equipment and supplies needed, and a summary table * Provides the professional with a useful handbook covering all tools used in fluvial geomorphology * Also provides valuable information on the advantages and limitations of the tools * All chapters include case studies to give examples of the applications of the tools discussed

Tamarix

Adjustments of the Fluvial System

For Engineers, Geomorphologists and Physical Geographers

Watershed Assessment of River Stability and Sediment Supply (WARSSS)

With recent innovations in the arena of remote sensing and geographic information systems, the use of geoinformatics in applied geomorphology is receiving more attention than ever. Geoinformatics in Applied Geomorphology examines how modern concepts, technologies, and methods in geoinformatics can be used to solve a wide variety of applied geomorphologic problems, such as characterization of arid, coastal, fluvial, aeolian, glacial, karst, and tectonic landforms; natural hazard zoning and mitigations; petroleum exploration; and groundwater exploration and management. Using case studies to illustrate concepts and methods, this book covers: Arid environments, such as the Thar desert, West Texas, the Qatar Peninsula, and the Dead Sea areas Coastal shoreline changes in Kuwait Coastal zone management in India Estuarine bathymetric study of Tampa Bay, Florida Fluvial landforms of the Elbe river basin, Germany Subsurface coastal geomorphology and coastal morphological changes due to tsunamis in the East coast of India The Himalayas, Jammu & Kashmir, Western Ghats, and Precambrian terrain of South India The result of extensive research by an interdisciplinary team of contributors, Geoinformatics in Applied Geomorphology is designed for students, researchers, and professionals in the areas of geomorphology, geological engineering, geography, remote sensing, and geographic information systems.

This book presents practical hydraulic and river engineering research along with fluvial geomorphological concepts, and links the theoretical and practical knowledge of people working every day with rivers, streams, and hydraulic structures to fluvial geomorphology. Besides providing a guide for professionals, this book also provides material for students to acquire the knowledge and skills to rehabilitate rivers, streams, and waterways.

Fluvial Hydrosystems provides a unified approach to the study of running waters and aims to provide a scientific basis for sustainable management of rivers. It differs from traditional texts in viewing rivers as structured, four-dimensional systems and integrating ecological and geomorphological approaches to provide a holistic perspective on river dynamics. Advanced students of geomorphology, ecology, environmental science, land use and civil engineering will all benefit from this wide-ranging and stimulating textbook.

California Rivers and Streams provides a clear and informative overview of the physical and biological processes that shape California's rivers and watersheds. Jeffrey Mount introduces relevant basic principles of hydrology and geomorphology and applies them to an understanding of the differences in character of the state's many rivers. He then builds on this foundation by evaluating the impact on waterways of different land use practices—logging, mining, agriculture, flood control, urbanization, and water supply development. Water may be one of California's most valuable resources, but it is far from being one we control. In spite of channels, levees, lines and dams, the state's rivers still frequently flood, with devastating results. Almost all the rivers in California are dammed or diverted; with the booming population, there will be pressure for more intervention. Mount argues that Californians know little about how their rivers work and, more importantly, how and why land-use practices impact rivers. The forceful reconfiguration and redistribution of the rivers has already brought the state to a critical crossroads. California Rivers and Streams forces us to reevaluate our use of the state's rivers and offers a foundation for participating in the heated debates about their future.

Geomorphological Fieldwork

Geomorphology and River Management

The Fluvial System

Geomorphic Analysis of River Systems

Fluvial Hydrosystems

Fluvial Geomorphology studies the biophysical processes acting in rivers, and the sediment patterns and landforms resulting from them. It is a discipline of synthesis, with roots in geology, geography, and river engineering, and with strong interactions with allied fields such as ecology, engineering and landscape architecture. This book comprehensively reviews tools used in fluvial geomorphology, at a level suitable to guide the selection of research methods for a given question. Presenting an integrated approach to the interdisciplinary nature of the subject, it provides guidance for researchers and professionals on the tools available to answer questions on river restoration and management. Thoroughly updated since the first edition in 2003 by experts in their subfields, the book presents state-of-the-art tools that have revolutionized fluvial geomorphology in recent decades, such as physical and numerical modelling, remote sensing and GIS, new field techniques, advances in dating, tracking and sourcing, statistical approaches as well as more traditional methods such as the systems framework, stratigraphic analysis, form and flow characterisation and historical analysis. This book: Covers five main types of geomorphological questions and their associated tools: historical framework; spatial framework; chemical, physical and biological methods; analysis of processes and forms; and future understanding framework. Provides guidance on advantages and limitations of different tools for different applications, data sources, equipment and supplies needed, and case studies illustrating their application in an integrated perspective. It is an essential resource for researchers and professional geomorphologists, hydrologists, geologists, engineers, planners, and ecologists concerned with river management, conservation and restoration. It is a useful supplementary textbook for upper level undergraduate and graduate courses in Geography, Geology, Environmental Science, Civil and Environmental Engineering, and interdisciplinary courses in river management and restoration.

Originally published in 1977, this is a classic of the geomorphology literature. Erosion, transport, and deposition of sediment within river catchments concern a wide range of earth scientists and profoundly affect land management. Upland soil removal engages the attention of soil conservationists, hydraulic engineers deal with fluvial sediment transport and river channel morphology, and patterns of sediment deposition in riverine and coastal lowlands affect navigability, the habitability of valley floors and the distribution of groundwater and minerals. The author argues persuasively that fluvial geomorphology, sedimentology and stratigraphy provide insights into each of these components of the river basin. "This volume, with its generous illustrations will be welcomed by earth scientists generally. It fills an important niche in the fluvial literature and its lucid style and clear exposition place it well within the range of students in any form of higher education." Nature "As a synthesis of the fluvial system and its effects on the landscape, as a primer in fluvial geomorphology and sedimentation for the planner, engineer and economic geologist, and as a stimulator of geomorphic thought, this book is most valuable." American Scientist Dr. Schumm is an internationally recognized geomorphologist who has published 150 papers and authored and edited 11 books. His primary experience has been in the investigation and analysis of fluvial systems. He has applied the concepts of geomorphology, fluvial hydraulics and geology to analyze alluvial river form and shape, sediment transport and effects of man-induced changes on river systems throughout the United States and in numerous foreign countries. He has also been involved in the interpretation of lunar and Martian landforms. Dr. Schumm is a past Chairman of the Geomorphology Division of the Geological Society of America, has served on technical and committees of the National Research Council, the Geological Society of America, the American Geophysical Union, International Geographic Union, the National Science Foundation and NASA. He has performed research, lectured and advised government agencies around the world.

River Processes deals primarily with flow and sediment dynamics in alluvial channels. It emphasises water flows (basic principles and characterisation), fluvial sediment, processes of erosion and sediment transport, bedforms that result from flow-bed sediment interactions in sand and gravel, flow and sedimentary processes in curved, braided and confluent channels, as well as aquatic habits. River Processes provides a comprehensive synthesis of current knowledge about physical processes in alluvial channels, with an emphasis on the recent work on flow-bed-sediment transport interactions. It is intended primarily for undergraduate students interested in fluvial studies as part of physical geography, earth sciences, environmental sciences and ecology courses. The textbook is fully illustrated throughout with line drawings and photographs.

Geomorphology and Management

RIVER PROCESSES

Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts

A Case Study of Ecological Change in the American West

Applied River Morphology