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Gravel-Bed Rivers

Fluvial Processes, Engineering and Management

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Preface

The natural physical character of many alluvial channels has been significantly affected by river and catchment development projects. In the utilization of river systems for water resources, navigation, flood control and power generation, channels have been straightened, flows regulated and banks stabilized and raised. Similarly, catchment development related to such activities as agriculture, forestry, recreation, highway and pipeline construction and urban growth has considerably altered the quantity and quality of the sediment and water carried into rivers. Many of these changes have had serious effects on rivers, either by promoting instability at, for example, meander cut-offs, downstream from dams and in the vicinity of river intakes and outfalls, or by adversely affecting ecological habitats and recreational potential through unsympathetic management practices. Such repercussions are economically expensive and aesthetically unpleasant. Future developments should therefore ensure that the natural character of river channels is preserved, but for this to be possible improved design and modelling techniques need to be developed to predict and minimize the consequences of any proposed engineering works. This aim can be achieved only through a basic understanding of channel processes.

To date there is a lack of knowledge regarding these processes and new design and modelling methods are continually being developed. In the past the emphasis of research and development has been on rivers with fine alluvial beds and it is only recently that attention has been focused on flow in gravel-bed channels.

Clearly there is an urgent need for the development of sound engineering principles which can be applied to the management of gravel-bed rivers. This book, which is a record of the proceedings of the International Workshop on 'Engineering Problems in the Management of Gravel-bed Rivers' held at Gregynog, Newtown, UK, between 23 and 27 June 1980, clarifies understanding of the physical processes operating in gravel-bed rivers, promotes improved design and modelling methods, establishes better guidelines for river management and identifies future research requirements.

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of the workshop and the preparation of the papers for publication. Finally we would like to record our appreciation to all the participants at the workshop for making the meeting such a success. Without their help this volume would not have materialized.

14 July 1981

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Gravel-Bed Rivers: Processes, Tools, Environments presents a definitive review of current knowledge of gravel-bed rivers, derived from the 7th International Gravel-bed Rivers Workshop, the 5-yearly meeting of the world's leading authorities in the field. Each chapter in the book has been specifically commissioned to represent areas in which recent progress has been made in Gravel-Bed Rivers: Processes