Preface

Due to a growing awareness of the important role of fluvial sediment in a wide range of environmental problems, there is an increasing need for a better understanding of the processes of erosion and sedimentation, and their impact on the transport of sediment in rivers. Despite of the need for better and more consistent information, data collection in this field still lags behind other areas of hydrology. New problems also call for new approaches, new strategies and new methods, in order to develop an improved understanding of cause and effect relationships for different activities within a river basin.

Over the years, the IAHS International Commission on Continental Erosion (ICCE) has organized a number of symposia dealing with different aspects of erosion and sedimentation. Some of these have focused on measurement techniques within the field. These are the symposia held in Florence in 1981[1] on *Erosion and Sediment Transport Measurement*, and that held in Oslo in 1992[2] on *Erosion and Sediment Transport Monitoring Programmes in River Basins*.

The Workshop held in Oslo during 19–21 June 2002, on *Erosion and Sediment Transport Measurement: Technological and Methodological Advances*, followed up this focus on measurement techniques and directed particular attention to the development of new sediment measurement technologies. The 24 papers published in this volume are a selection of those presented at the Workshop. They provide both a synthesis of existing knowledge and a review of the status of current research and development in this field. The papers have been grouped under three main themes. The first group includes six papers that deal with suspended sediment. One introductory paper discusses a new definition of suspended sediment and its implication for the measurement and prediction of suspended sediment transport. The following five papers present valuable results from studies aimed at testing optical- and laser-based sensors for monitoring suspended sediment concentrations and grain size distributions, using turbidity meters to control suspended sediment sampling programmes, and collecting detailed information on flow velocities for use in modelling the suspended sediment dynamics of floodplain systems.

The five papers in the second group deal with erosion and sediment sources in catchments. One paper examines recent developments in the use of environmental radionuclides as tracers in the study of catchment sediment budgets. Another contribution explores the potential for identifying the possible sources and transfer pathways of the suspended sediment output from a small catchment, whilst a third focuses on a single sediment source and describes recent advances in the automated monitoring of bank retreat. The last two papers in this group discuss the development of a model for estimating suspended sediment yields and the monitoring of suspended sediment and bed load transport dynamics.

[1] *Erosion and Sediment Transport Measurement* (1981) (Proc. Symp., Florence, June 1981). IAHS Publ. 133.

[2] *Erosion and Sediment Transport Monitoring Programmes in River Basins* (1992) (ed. by J. Bogen, D. E. Walling & T. J. Day) (Proc. Symp, Oslo, August 1992). IAHS Publ. 210.

The 13 papers in the third group deal with bed load monitoring and associated transport processes. A review paper provides an overview of bed load measurements, and four further papers report recent developments in bed load sampling involving bed load traps and basket samplers, and in the continuous monitoring of bed load flux using load cells. Two papers discuss the use of tracing and radio tracking techniques and the final six papers report results from tests of various types of bed load sensors aimed at assessing their ability to measure bed load flux in rivers.

It is hoped that publication of these presentations from the Oslo Workshop will stimulate further discussion and draw attention to recent advances in erosion and sediment transport measurement involving new methods and new technologies.

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