

# Erosion, Transport and Deposition Processes: Theories and Models

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## Erosion, Transport and Deposition Processes: Theories and Models

Edited by H.-R. Bork, J. de Ploey and A.P. Schick

Catena Verlag

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x+ 153 p., 86 fig., 17 tables, 1991, US \$75

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*Erosion, Transport and Deposition* is a collective work published by Catena Verlag, whose periodical bearing the same name is widely known and also happens to be the organ of the International Society of Soil Science. Catena hence publishes colloquium proceedings, and the papers presented here are derived from a symposium in memory of Heinrich Rohdenburg (1937-1982) of the Technical University of Braunschweig. The symposium, held in Königslutter in 1989, under the auspices of the International Geographical Union's Commission on Measurement, Theory and Application in Geomorphology, commemorated the pioneering and outstanding contribution of this German geomorphologist and geo-ecologist in the area of the analysis and simulation of recent and past processes at the soil surface and in the soil.

In addition to the preface by the editors and a review of the life of Heinrich Rohdenburg by H.-R. Bork, the book contains 11 papers selected from among the symposium's 42 oral presentations or posters, all under hard cover, solidly bound, and very well edited. The papers are, on the average, 14 pages, 8 figures and 2 tables. The papers follow the scientific method and are authored by a veritable league of nations: German, British, Belgian, Canadian, Spanish, American, Israeli, Italian and Dutch. References at the end of each of the articles also reflect this diversity, since titles in German, English and Spanish can be found. It is, however, unfortunate that the editors did not provide a list of figures and tables.

The first article (J. de Ploey) presents major contributions by Rohdenburg by putting the accent on the dichotomy

existing too often in geomorphology between the evolutionary models developed in the laboratory (*i.e.*, soil loss models) and field reality.

The five following papers present processes of splash erosion, sheet erosion, and gully erosion. J. Schmidt presents the impact of rainfall on sediment transport by sheetflow. H. Lavee, A.C. Imlison, S. Pariente and Y. Benyamini examine the response of semi-arid soils to simulated heavy rainfall. M. Cervera, N. Clotet, R. Guardia and L. Sole-Sugranes describe the processes of runoff generation and erosion under simulated heavy rainfall in scarcely vegetated and non-vegetated badlands. P.D. Jungerius and J.W. van den Brink study the formation of V-shaped gully walls. Lastly, D.J. Oostwoud Wijdenes and R.B. Bryan (U. of Toronto) examine the formation of gully networks.

The last five papers examine the modelling of water fluxes at the soil surface and in the soil. Y. Mualem and S. Assouline review the various approaches for modelling rainfall/runoff relationships of bare soils affected by surface sealing. J. Schmidt details a mathematical model that simulates rainfall erosion. M. Kirby estimates travel distances as a significant variable in particulate movement. D. Toni and L. Borselli discuss physically based equations which describe flow detachment, sediment transport, and interactions between flow characteristics and sediment load. Finally, B. Dieckrüger, R.E. Smith, D. Krug and R. Baumann examine the applicability and transferability of the OPUS process-based model, which simulates water fluxes at the soil surface and in the soil, and the erosion processes at slopes.

The book is a tribute to the ambition of the editors, who have sought to present the state of the art in the field of the diagnostic and modelling of relief evolution and associated processes at the levels of both the laboratory and field work. There are obviously certain omissions, but what is presented refers to the field of activities of Heinrich Rohdenburg. Based on the high price of the book, purchase of the work is recommended primarily for university libraries and research centres.

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