

Book Reviews

DEVELOPMENTS AND APPLICATIONS OF GEOMORPHOLOGY. (Editors). John E. Costa and P. Jay Fleisher (1984). Publishers: Springer - Verlag, Berlin, Heidelberg, New York, Tokyo. pp. 372 with 120 figures.

Geomorphology is emerging as one of the most sought after applied sciences in view of its multifarious applications to society. The editors of this volume representing a rare blend of a professional and an academician have judiciously chosen themes that have direct relevance and immediate consequence to society.

The volume is a collection of eleven chapters. Some of the key concepts and principles, sensors and techniques of remote sensing and how geomorphology is benefitted by them are the main aspects dealt with in Chapter 1 entitled 'Remote sensing techniques for geomorphologists' by Ch. L. Rosenfeld. The relevance of geomorphological studies in terrain intelligence is yet another interesting and important aspect incorporated in considerable detail in this chapter. Now-a-days computer has almost become an indispensable tool wherever there is quantitative data processing. Geomorphological data is no exception. J. Richard Jones in Chapter 2 on 'Computer applications in coastal geomorphology' describes and discusses with case studies textural analysis of subsurface coastal sediments, subsurface contouring, trend surface analysis, point-pattern analysis and coastal management. Regional short-term and long-term inventories are useful in providing baseline inventory data for coastal management and environmental impact studies. The 30 km long Rhode island barrier beach coast-line has been studied in considerable detail and John J. Fisher presents a synthesis in Chapter 3 on 'Regional long-term and localized short-term coastal environmental geomorphology inventories'.

Human activities inevitably produce changes in the land-water ecosystem. Mankind is the main Physical force for topographic metamorphism along with other agents that alter terrain. Geomorphologists provide data and advice on a large range of land use decisions like those that involve natural resources, hazards and urban development. Donald R. Coates reviews these aspects with six case histories in 'Geomorphology and Public Policy' (Chapter 4). Surface mining results in drastic alteration of natural site conditions. Protective vegetation cover is removed. Soils and profiles are removed. Steep hill slopes of 'spoils' are created. Drainage network and stream channels are obliterated. Terrence J. Toy presents an excellent and lucid account on the 'Geomorphology of surface mined lands in the Western United States' (Chapter 5) under three major time periods, viz, (1) pre-mining, (2) active-mining and (3) post-mining periods. Mitigation of on-site and off-site environmental impacts through control of geomorphic processes is the ultimate goal.

Chapter 6 captioned 'Maps in Applied Geomorphology' by P. Jay Fleisher gives a succinct account of the commonly used maps, map legend, scale and different types of maps for specific purposes including Quaternary maps for land-use decisions. 'Tectonic geomorphology, Quaternary chronology and Paleoseismicity' is the subject matter of Chapter 7 authored by E. H. Keller and T.K. Rockwell. These are relatively new fields in applied geomorphology. Quaternary chronology methods of

relative and absolute dating and time scales useful in tectonic geomorphology, geomorphic indicators of tectonic activity and paleoseismicity and neotectonics and earthquake hazards are discussed in detail. Physical environment gets modified with urbanisation. The linkage between these two is discussed with a case study from Singapore in 'Urban Hydrology and Sedimentation' by Avjit Gupta in Chapter 8. Debris flow claiming hundreds of lives and causing extensive damage to property is a very common feature in many parts of the world. Debris flow is gravity-induced mass movement intermediate between landsliding and water flooding. Origin and type of debris flows, failure mechanism, characteristics of flowing debris, physics of debris flows, vegetational damages etc., coupled with mitigation of debris flow hazards are some of the aspects covered in Chapter 9 entitled 'Physical geomorphology of debris flows' by John. E. Costa. How climate influences the recurrence intervals of hydrologic event that control fluvial geomorphic processes and landform sensitivity varies significantly between various physical environments is the theme of Chapter 10 entitled 'Fluvial response to small scale climate changes' authored by J. C. Knox. Paleohydrology has become popular during the past two decades and geomorphologists are becoming increasingly active in reconstructing the activities of ancient rivers through application of many equations. Garnett P. Williams reviews the state-of-art data in his Chapter 11 on 'Paleohydrologic equations for rivers'. The existing Paleohydrologic equations and methods are summarised briefly and succinctly in Table 1.

In conclusion, it must be emphasised that this volume is an invaluable asset to geologists, geomorphologists, environmental specialists and town planners. The data presentation with case studies in each chapter has given the volume an added credence. The overall get up of the volume is simple, decent and handy. Those pursuing studies in geomorphology, Quaternary geology and environmental geology cannot afford to miss perusing this volume. The volume, in essence, is a masterpiece.

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