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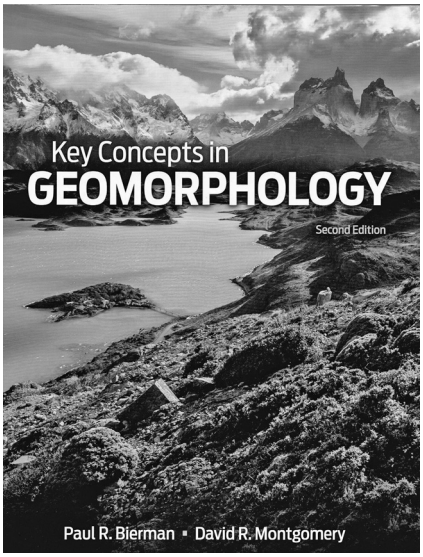
Book reviews

Key concepts in geomorphology (Second edition), by Paul R. Bierman and David R. Montgomery, 2019. Macmillan Learnnig, New York. 526 pages. Paperback: price $177.99, ISBN 9781319059804.



For the present volume, it would have been easy just to write that it is a new tome on the dynamics of the earth's surface, where lithosphere and atmosphere meet and life can flourish. But, in my humble opinion, this piece of work by two living legends in geomorphology cannot be classified simply as a novel textbook that teaches us about the mechanisms that shape the surface of our planet. Professors Bierman and Montgomery have created more than just a modern product of scholarship. I dare say that the authors have managed to grasp the beauty of the 'science of scenery' and explained what makes geomorphology so compelling and interesting. What is the key to this academic success? I believe this to be lodged in the design of the present book and in the creative process which involved dozens of world-class scientists. First, the structure and contents were established through a debate with more than 50 experts in a variety of scientific fields at a dedicated workshop of the National Academy of Sciences (USA). This was followed by a selection of concepts that were discussed during numerous meetings and conferences around the world. In the next phase, the authors were assisted by more than 40 reviewers in order to decide which research areas might be of key importance to aspiring geomorphologists. The draft of the book structure and the first sketches of chapters were reviewed by eight prominent geomorphologists at the National Science Foundation headquarters, followed by a 'brainstorm' of at least 60 leaders in the field; this knocked the chapter outlines into their present form. Finally, the authors' academic institutions, the universities of Vermont and Washington, provided time and space (sabbaticals) to the authors for perfecting the book. I must admit that I have never heard about making such an effort to educate future generations of geomorphologists. In addition, I am afraid that, due to recent restrictions in travelling and interpersonal contacts, associated with the COVID-19 pandemic, such a creative process through community interaction will not be possible for some time to come. Maybe the present tome is the last of its kind, as 'back to normal' in academia may never be possible.

The present tome is divided into four parts. The first provides insights into the fundamentals of the earth's surface, a brief history of the field of research and a review of the tool kits used by geomorphologists. Here I wish to mention in particular one paragraph in a concise summary of the discipline, which may be welcomed by Polish readers: Marie Skłodowska-Curie is presented as one of the most important scientists whose discovery of radioactivity revolutionised the earth sciences and geomorphology.

The second part, the richest in information, deals with the concept of 'Source and sink' and discusses mechanisms that control the movement of mass from uplands to lowlands, often ending with mass deposition along coasts and at sea floors. Special attention is paid to the role of hydrology, weathering and soil development in our understanding of geomorphic processes. Armed with this knowledge, the reader is acquainted with landforms and processes that operate in hillslopes, channels, drainage basins, as well as coastal and submarine environments. Part three, poetically entitled 'Wind, fire and ice',

includes a significant chapter on aeolian, volcanic, glacial and periglacial geomorphology. In the final part, the 'bigger picture' is presented, explaining how climate and tectonics control the development of surface morphologies, and summarising drivers, thresholds and models of landscape evolution.

In my opinion, the information contained in the various chapters is up to date and includes the majority of important terms, processes and landform characteristics to help us understand the evolution of landscapes over short and long timescales. I found the *Applications* sections at the end of each chapter really useful in that they provide evidence that geomorphology is crucial to assess, prevent and recover from natural hazards. In addition, each chapter is supplemented with four special sections, enabling the reader to address key questions related to the material in that particular chapter ('Digging deeper'), to summarise the most significant cases in which geomorphology was applied to help or interact with society ('Case study'), to use newly acquired knowledge by solving a chapter-linked problem or question ('Worked problem') and, finally, to assess how well he/she has understood and remembered the material presented ('Knowledge assessment'). The last matter that I like to point out is the graphical design. All figures are original, and their design was inspired or guided by a professional artist with a geomorphological background. The selection of field and landform images is also good and perfectly showcases the geomorphological wonders of the earth.

Overall, I enjoyed reading this book, and would love to study my geomorphology module once more. With this masterpiece of teaching, this would definitely be a great intellectual pleasure during this ongoing 'lockdown'.

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