Book review

Engineering geomorphology: Theory and practice. P. G. Fookes, E. M. Lee and J. S. Griffiths. Dunbeath: Whittles Publishing, 2007. 279 pp. ISBN 978-1-904445-38-8. £40

Over the past two decades a number of the large engineering consultancies have built up small, but not insignificant, teams of engineering geomorphologists. It is also notable that over the same period the Glossop Lecture – the keynote lecture of the Engineering Group of the Geological Society – has had a very strong emphasis on engineering geomorphology, notably through the lectures of Professors John Hutchinson, Denys Brunson and Peter Fookes. Taken together, this would seem to indicate that engineering geomorphology is maturing as a discipline, and that it has found a role. In that context, the publication of a large and detailed text that aims to ‘set out the general principles that underpin the application of geomorphology’ is both welcome and timely. The authors, who are indisputably the leading practitioners in the field, with a diverse range of experience and knowledge, have been ambitious in their aims in writing this text.

This book effectively has two key constituencies of readers. First, there are students of the subject – perhaps undergraduates, but usually postgraduates, who are undertaking applied geomorphology course components within geography or geology (but unfortunately not, to my knowledge, engineering) degrees. The second group consists of practising engineers, who perhaps wish to explore how engineering geomorphology might help them in their work. The needs of these two constituencies clearly overlap, but they are different in a number of key ways. Producing a single text that fulfils the needs of both, which is the aim of this book, is a real challenge, and one that is fraught with difficulties. Unfortunately the text does not really seem to meet the requirements of either.

The authors have divided the book into three key sections. In the first, the basic principles of geomorphology are introduced. This includes a brief introduction to tectonics, climate, soils, system behaviour, events, hazard/risk and environmental change. There is little that is inherently wrong with any of the sections – indeed each presents a coherent description of the basic concepts underpinning the theme. However, because the scope of the text is so wide ranging in what is only a small part of the book, the level is somewhat superficial. Undergraduate or, in particular, postgraduate students studying geomorphology are likely to have been introduced to many if not all of these concepts at A-level or early in their undergraduate programmes. Thus for them the chapters are likely to be redundant. For practising engineers one would think that the concepts introduced are also for the most part rather basic, and are unlikely to inspire. All of the material covered in this section is well addressed in the multitude of undergraduate geomorphology textbooks; the value of duplicating it here is unclear.

The second part of the book looks at the behaviour of

separate parts of the geomorphological system through 22 short chapters. So, for example, there are seven chapters on slopes, including one on the supply of water and sediment, one on the role of water, two on soil erosion, one on landslides, and so on. In each case the chapters are short – typically five to eight pages – and succinct. Thus, again, there is space for little more than a very general overview of the topic. In the case of landslides, which are so often the subject of engineering geomorphological analyses, the eight pages includes types of landslide, triggers, soil behaviour, landslide behaviour, landslide potential and stability analysis, plus of course references. The other chapters cover a similar range of material. Inevitably the level of detail is minimal. In one or two cases the chapters almost feel unfinished: the river form chapter, for example, has only about a single page of text, but finishes with five pages of diagrams and equations. There are one or two genuinely useful chapters: the landslide hazard and risk chapter, for example, is slightly longer than the norm, and contains some genuinely interesting examples of hazard and risk assessments, clearly reflecting the world-leading expertise of the authors in this particular area.

In the third section of the book the authors introduce key ways in which geomorphologists can investigate the landscape. After a general introduction, this includes chapters on desk studies and initial terrain models; satellite imagery and aerial photographs; change analysis; terrain evaluation; and geomorphological mapping. Again the chapters are short and concise, suffering from the familiar problems of trying to cover too much ground and thus lacking depth. The final section also includes 13 rather attractive colour block diagrams illustrating the features of a range of landscapes. These are rather nice, and would make great teaching tools, but as they are in a single section at the rear of the book it is difficult to see what their purpose actually is. Strangely, in my review copy they have been bound into the middle of chapter 38, which rather breaks up the flow of the chapter.

Overall the authors have produced a reasonable introductory geomorphology textbook, with a few additional chapters describing the techniques that geomorphologists use. I am unconvinced that it is really a book on engineering geomorphology – and I cannot really say that I would recommend it to my students, as almost all of the material is likely to have been covered in other books they have used. I remain to be convinced that it will be particularly useful to geotechnical engineers either, and indeed I worry that the basic nature of the contents of the book will give some the impression that geomorphology is so basic and straightforward that it can easily be handled by non-specialists. This attitude has plagued infrastructure development in many hazardous terrains, with unfortunate consequences. The authors have made a brave attempt to address an important field; sadly in my opinion they have not quite pulled it off.

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