

BOOK REVIEW

JULIEN, P. Y. 2010. *Erosion and Sedimentation*, 2nd ed. xviii + 371 pp. Cambridge University Press. Price £80.00, US\$ 140.00 (HB); £35.00, US\$ 60.00 (PB). ISBN 978 0 521 83038 (HB); 978 0 521 53737 7 (PB). doi:10.1017/S0016756811000215

The second edition of Pierre Julien's *Erosion and Sedimentation* is a generally useful text for hydraulics and sedimentation engineers, as well as a good reference for geomorphologists grappling with applied sediment problems. Although the content is not noticeably different from that of the first edition, some sections are expanded for clarity, additional examples and problems are included, and there has been some effort made to update the material to account for recent advances in the field. The quality of the print and the graphics is much improved, so the book looks and feels more professional than the first edition. The text is organized logically, building from physical principles and properties of water and sediment, to dimensional analysis (Ch. 2), momentum and continuity (Ch. 3), particle motion in fluids (Chs 4 & 5), velocity and resistance (Ch. 6), incipient motion of sediment (Ch. 7), bedforms (Ch. 8), bedload transport and measurement (Ch. 9), suspended load transport and measurement (Ch. 10), total load and sediment yield (Ch. 11), and reservoir sedimentation (Ch. 12).

The strengths of this text lie in detailed derivation and presentation of equations of flow, which are fundamental to sediment transport theory, and empirical exploration of their application in field and laboratory problems. I am particularly impressed with the thorough explanations of drag, moment stability, and bedforms. The section on reservoir sedimentation is very detailed and helpful, as is the range of worked examples and practical problems provided

to elaborate the presented concepts. The problems become more 'applied' as the book progresses.

However, the book exhibits an uneven treatment of material. For example, concepts of sediment mixtures and active layers, which are important frontier subjects in sediment transport theory, are given scant attention, while Julien devotes 15 pages to hyperconcentrated flows. There is limited exploration of concepts such as fractional sediment transport, the difference between surface-based and substrate-based equations, or the impact of particle shape on settling velocity, and the discussion of sediment yield is woefully out of date. The real-world context for sediment transport theory is also lacking in many sections, such that the book reads dryly and lacks a modern perspective. The particular selections of sediment transport equations, for example, are apparently based on the author's own experience, rather than on efforts to explain the range of equations of various types and their limitations of application. My primary criticism is that the book reads as if the field of erosion and sedimentation is a collection of 'settled law', rather than an active area of research with many uncertainties and inadequacies. For example, there is no mention of the limited ability of sediment transport equations to accurately predict measured rates or an evaluation of the strength of the science.

Despite my criticism, I believe Julien's new edition is an improved and very useful reference text for research and teaching, although it lacks a strong foundation in some recent advances in sediment transport and fluvial geomorphology.

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