



PROJECT MUSE®

---

## Fundamentals of Hydrology (review)

Matthew R. Zorn

Southeastern Geographer, Volume 44, Number 1, May 2004, pp.  
124-126 (Review)

Published by The University of North Carolina Press

DOI: <https://doi.org/10.1353/sgo.2004.0016>



➔ *For additional information about this article*

<https://muse.jhu.edu/article/169753>

quence of the erosion of loess soil found in this section of Louisiana” (p. 343). Contrast that with a geologic measured section of the bluffs about two miles away, where less than 12 feet of loess and mixed loess overlies 65 feet of very light-colored late Pleistocene ancestral Mississippi River deposits including silts, clays and loams (Autin et al. 1988). Both sources may be correct about elevation if the Mississippi River water levels were lower originally or if the original land surface was higher prior to slope failure or bank erosion. However, is it colluvium from loess at higher elevations or the gleyed ancestral Mississippi River deposits that gives the cliffs a white color? More citations would make it easier to distinguish fact from interpretation and to accurately attribute various comments.

All in all, *An Outdoor Guide to Guide*

*to Bartram’s Travels* is a useful resource for people planning to visit a few or many of Bartram’s sites. The authors have made a valuable contribution by discussing and illustrating the trail’s components with maps and photographs and giving accounts of what Bartram saw and did. Although some might prefer that more synthesis and citations were added, many academics interested in the southeast and its changes will find this book to be a nice addition to their collection.

#### LITERATURE CITED

Autin, W.J., A.T. Davison, B.J. Miller, W.J. Day, and B.A. Schumacher. 1988. Exposure of late Pleistocene meander belt facies at Mt. Pleasant, Louisiana. *Transactions of the Gulf Coast Association of Geological Societies* 38: 375–383.

### Fundamentals of Hydrology

Tim Davie. Routledge, New York, 2003. xii and 169 pp., illustrations, maps. \$100.00 cloth (ISBN 0-415-220-289); \$31.95 paper (ISBN 0-415-22029-7)

MATTHEW R. ZORN

*Carthage College*

Tim Davie has written a good introductory text on hydrology. It is one of five texts in the Routledge *Fundamentals of Physical Geography* series. Although it is relatively short (169 pages, nine chapters), it provides a solid overview of the sub-discipline of hydrology, addressing a wide variety of issues. Equally important is the fact that the author, a geographer by training, maintains a solid geographic perspective throughout the text, as there are numerous references to issues of both temporal and spatial scales. Davie makes clear at

the outset that this book is aimed at university freshmen and sophomores, and I agree. The book can be used effectively as either a sole text or as a supplement to a second text. (If the former is chosen, then an instructor will need to incorporate other material in order to provide sufficient depth.)

In the obligatory introductory chapter, Davie discusses the historical role of hydrology within the scientific community. Readers will develop a basic appreciation for the role of hydrology within science

in general, and geography in particular. Davie presents the drainage basin or “catchment” as the fundamental spatial scale of analysis for most hydrological work. He examines both its strengths and weaknesses as a basic geographical unit of analysis in hydrology. For example, he warns the reader that there is wide variability associated within any catchment, observing that “A river basin may range in size from a matter of hectares to millions of square kilometers (p. 5).” Finally, Davie introduces the basic water balance equation () to provide the point of departure for future discussions on the major hydrological processes in subsequent chapters. Again, he makes sure to highlight the importance of geography to these processes, arguing that “. . . all of the processes occur at a spatial and temporal scale . . . that may not coincide with the scale at which we make our measurement or estimation (p. 9).”

The next five chapters are concerned with the major processes in hydrological analyses (precipitation, evaporation, interception, storage and runoff). Each of these chapters begins with standard, but useful, “Learning Objectives,” and ends with a brief summary. It is the inclusion of “Case Studies” in each chapter that provides the best synthesis of the material. In addition, Davie includes nearly 200 helpful and reasonably current references to the scientific literature, both within chapter discussions and in case studies. For example, he cites two articles (Hedstrom and Pomeroy 1998; Lundberg and Halldin 2001) in a one-quarter page discussion of snowfall interception. In another example, Davie utilizes Christie and Hanlon’s (2001) paper as the foundation of a case study on the 2000 flooding in Mozambique. The review of literature throughout

the text provides the reader with an excellent body of work from which to acquire more extensive knowledge on a variety of topics.

Davie begins each of these chapters with detailed discussions on the mechanisms by which these processes operate. He then takes the reader through an examination of how the hydrological variables in question (e.g., evaporation, soil moisture, throughfall, stemflow, and so forth) are measured and/or estimated. (An excellent glossary is presented, as it clarifies many of the concepts and terms that will likely not be familiar to introductory students.) Each chapter concludes with a few potential essay questions for use in the classroom. The majority of them are well-written and suited to the intended audience of this book. Additionally, these questions incorporate the inherent importance of geography to the field.

Chapters seven and eight are devoted to the analysis of streamflow data and salient issues within water quality. Davie provides a good discussion of streamflow data acquisition, its subsequent analysis and the interpretation of results. He emphasizes the major points by providing detailed and practical examples within the chapter. A solid overview of the important water quality parameters, both physical and chemical (e.g., temperature, suspended solids, dissolved solids, and so forth), is presented. This is followed by a review of techniques used to measure and estimate these parameters. The final chapter is a nice overview of some important real-world issues within the science of hydrology. Concerning water resource management, Davie acknowledges that “Almost all of the processes found in the hydrological cycle can be manipulated in

some way (p. 131)" and he goes on to explain the mechanisms by which humans intervene (land use changes, legislation, and so forth).

If there is a shortcoming to this text, it is that there is heavy emphasis on breadth relative to depth. For example, Davie engages in a discussion of water quality and begins with a fair treatment of waste water treatment, which is certainly very important. However, it would be useful to see equal space devoted to other forms of water quality control, such as the major technologies being used for the purification of drinking water. Additionally, only one paragraph is devoted to point-source pollution and little more attention is given to diffuse or non-point source pollution. To his credit, though, Davie does cover some of these issues in a case study on the control of water quality within the Nashua River in New Hampshire and Massachusetts.

Davie's text accomplishes its mission. He touches on many important issues in hydrology, from the current understand-

ing within the scientific community of the major hydrological processes, to data and their acquisition and analysis, to important geographical issues regarding scale. There are few errors within this text, which certainly adds to its appeal. For introductory courses in hydrology, I certainly recommend its use because of its breadth in content.

#### LITERATURE CITED

- Christie, F., and J. Hanlon. 2001. *Mozambique and the great flood of 2000*. Oxford: The International African Institute in association with James Currey, and Bloomington: Indiana University Press.
- Hedstrom, N.R., and J.W. Pomeroy. 1998. Measurements and modeling of snow interception in the boreal forest. *Hydrological Processes* 12: 1611–1625.
- Lundberg, A., and S. Halldin. 2001. Snow interception evaporation. Review of measurement techniques, processes and models. *Theoretical and Applied Climatology* 70: 117–133.

### Natural Disasters and Development in a Globalizing World

Mark Pelling (editor). Routledge, London, 2003. xv and 250 pp., illustrations, maps. \$31.95 paper (ISBN 0-415-27958-5)

DAANISH MUSTAFA

*University of South Florida*

There are generally two types of edited volumes in academic literature. The first type articulates a very clear theoretical position based on a detailed literature review and gaps within the existing literature. The contributions in this type of volume typically use case studies or theoretical reflections related to the central

thesis to build a case for why the central theoretical position of the volume is relevant and useful. The second, and the more prolific, type of edited volume tends to be wide ranging surveys related to a particular theme, say environment and development, globalization, and so forth. The volume under review falls within the second