



Book Reviews:

The following book review was extracted from EOS in March 1999. An additional review follows the EOS review by university professor Dr. Stephen Anderson, as well as comments from editor for the geology division of Prentice Hall.

Book Review - EOS, Transactions, American Geophysical Union Volume 80, Number 11, March 16, 1999. EOS review by Gary Parkin

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A thin layer of soil at the surface of the unsaturated zone supports much of the life on Earth. Processes occurring in the unsaturated zone affect the environment on a global scale. For

instance, modifications to the soil nitrogen and carbon cycles may contribute to global climatic change. Characterizing flow and transport in the unsaturated zone is vital to understanding the hydrologic cycle.

A wide variety of scientists and engineers ply their trades within the unsaturated zone. Interests range from studying agricultural sustainability to bioremediation of contaminated soils. Regardless of their discipline, all workers in this field require a solid background in the physical, chemical, and biological aspects of unsaturated zone hydrology.

Unsaturated Zone Hydrology for Scientists and Engineers was written from a multidisciplinary perspective. It was designed for upper-level undergraduate and beginning graduate students with a wide range of backgrounds and interests. The book could be used in an introductory course that teaches the major processes in the unsaturated zone and the design of field experiments. It is also suitable for a more advanced course on modeling transport of water, air, solute, and heat in the unsaturated zone.

The book has an attractive cover with an artist's rendition of the major processes that occur in the unsaturated zone beneath urban and rural areas. The images on the cover depict well the topics covered. The table of contents is easy to follow and quickly reveals that the book's subject matter is presented in a logical order. Following the introduction, which includes a brief history of unsaturated zone hydrology, are chapters on the physical properties and characteristics of soils, the behavior of clay water-systems, and the energy status and chemical properties of water. These first few chapters provide an excellent foundation for subsequent ones on water flow (including both unsaturated and saturated zones) and the transport of heat, gas, and contaminants. The book contains another six chapters on topics ranging from soil remediation techniques to spatial variability, scaling, and fractals. A list of symbols is given in one of the appendices, which readers will find helpful.

Three aspects of the book I particularly like. *First*, questions are given at the end of many sections to test the student's understanding of the material. Detailed answers to these questions are given at the end of each chapter, as well as additional questions that could be assigned to the students. *Second*, the book covers a wide range of topics, yet discusses them in sufficient detail to be useful as both a teaching aid and a reference book. *Third*, the book contains a pleasant blend of theoretical and practical information.

This book is a well-prepared and well-presented summary of unsaturated zone hydrology. It covers a fairly broad range of topics and will be of interest to scientists and engineers engaged in a wide variety of unsaturated zone studies. Even the price is quite reasonable!

Review by Dr. Stephen Anderson (Soil Physicist), University of Missouri, Columbia:

...I can state that these authors did an excellent job in presenting the concepts and principles necessary for learning soil physics....Previous texts dealing with soil physics have primarily used an agricultural or soils approach and rehashed the same old topics....Rather than a simple reiteration of old subject material, Tindall and Kunkel have written their text using a new approach. The text includes new material and chapters not found in previous texts including, hazardous waste site characterization and case studies, use of fractals in unsaturated zone science, bioremediation of the unsaturated zone, LNAPLs and DNAPLs, an excellent treatment of modeling water, solute, and vapor movement in the unsaturated zone, and many other topics. Not only are the topics covered in detail, but questions and answers are given so that the student obtains a firm grasp of both the subject material and confidence in their ability to solve problems....This has been a boon to my students....Quite simply, the authors of this text have done an outstanding job in presentation in covering the types of application of the problems presented in this field. ...The authors have also streamlined use of the text for instructors such as me who are extremely pressed for time....If you have been using the previous texts on soil physics that are on the market today, including those of recent release, a review of this new book would be well worth your investment in time and money. Not only did I like the book, but my students enjoyed it as well....I heartily recommend this text to my colleagues who teach soil physics at various universities around the world as well as those in the environmental industry who require a good reference text...

Comments on book reception and sales by Patrick Lynch, editor Geology Division, Prentice Hall:

... Regarding the success at the conventions, as we told our reps at the sales meetings, we didn't have to ship back a single copy of your book from neither the GSA nor AGU conventions. I'm not exaggerating when I say we couldn't keep it on the shelf! Clearly, the reception in the professional community has been very warm and also in the academic market as well ... The fact it has sold out within 5 years (8,000 copies first printing) is testimony of its market acceptance and success.