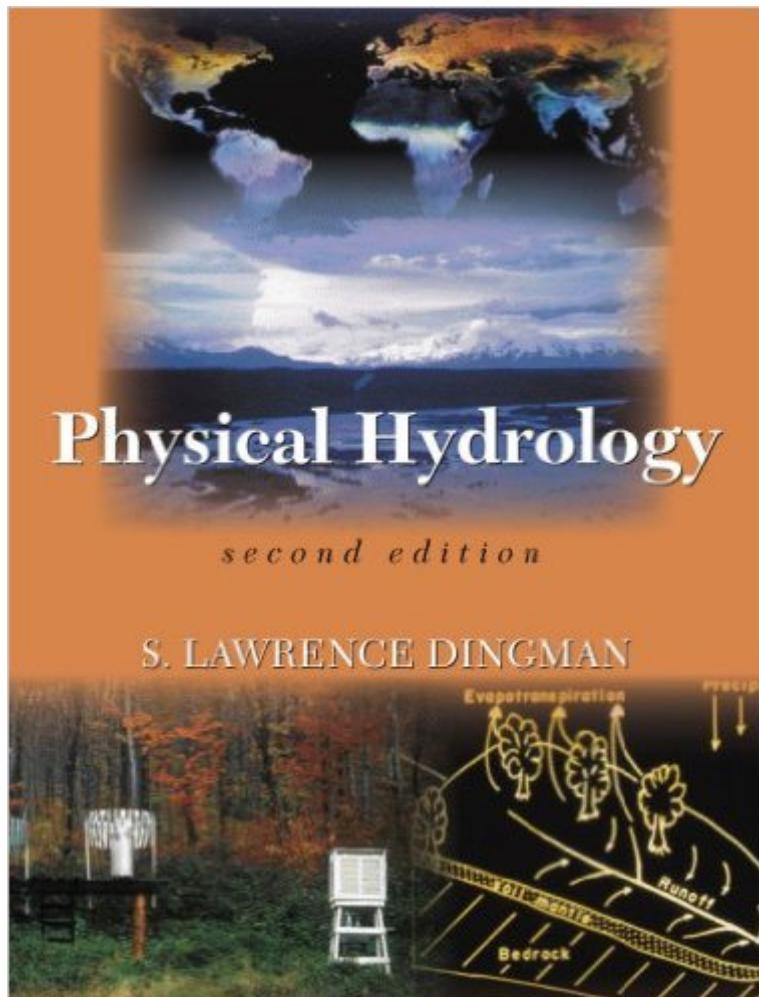


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# Physical Hydrology, Second Edition



## Synopsis

Dingman's goal throughout Physical Hydrology is to provide an understanding of the conceptual basis of the subject and introduce the quantitative relations involved in answering scientific and water-resources-management questions. The author supplies the basic physical principles necessary for developing a sound intuitive and quantitative sense of the way in which water moves through the land. He outlines the assumptions behind each conceptual approach but also identifies some of the limitations of each. Rich in substance and written to fulfill the needs of future researchers and experts in the field, Dingman treats hydrology as a distinct geoscience that is continually expanding to deal with large-scale changes in land use and climate. The text is organized around four principal themes: the basic concepts underlying the science of hydrology; the global climate, the global hydrologic cycle, and the relation of hydrology to soils and vegetation; the land phase of the hydrologic cycle; and water-resource-management principles and the ways in which hydrologic analysis is applied in that context. Coverage includes approaches for determining regional evapotranspiration rates, the movement of ground water in rock fractures, and the relation of hydrologic regimes to past and future climates. It offers in-depth discussions of hydrologic modeling--model use, modeling terminology, and the process of model development; water-resource-management goals and processes; water supply and demand; water-quality issues; floods and flood-frequency analysis; and drought and low-flow analysis. Outstanding features that facilitate learning include: A tabulation of documented trends in global change of climatic and hydrologic quantities; information on methods for handling missing data; discussions of the BROOK90 model and how it can be used with the text; Internet links to hydrologic information; exercises designed for student exploration; and Excel spreadsheets on the accompanying CD.

## Book Information

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## Customer Reviews

I'll echo others when I say first that this book has a lot of great information. However, it's difficult to actually learn from. It's very equation-based, which is good, but the equations are often simply presented without any discussion. The ambiguity of units is frustrating, and it's difficult to tell whether an equation has a typo or not. I really think it could be better organised. For my course, I ended up getting other textbooks on hydrology from the library and generally avoiding "Physical Hydrology."

Anyone that thinks hydrology is just "water flow" is wrong! This book introduces the reader to many different concepts and explains them from *\*both\** a mathematical and physical perspective.

Hydrology is not just water...it is soil, snow, evaporation, etc...you get the idea. In the first edition of his book (I have the old one), Dingman gives you all the tips and tricks that real-world hydrologists use and *\*explains\** them. Keep in mind, however--this topic is very math intensive and if you are weak on algebra, hydrology--and this book in particular--could be difficult to follow. Some equations have more than a dozen variables...watch out! I found the questions at the end of each chapter to be reasonably good, but I would like more thought questions. Sure, once you get the hang of it, anyone can crunch numbers to determine rainfall or snowmelt or whatever. But if you want to understand how/why things happen, you'll have to read the chapters--there is no way to gauge that aspect of learning. As a meteorologist, I sometimes find myself referring to *\*this\** book instead of my other textbooks--it is laid out well and I can quickly find what I need, when I need it. All in all, this is a very good book that I'll refer to again and again.

I'm currently a student using this book in a 400-level hydrology course. This is quite possibly the worst textbook I have encountered in my academic career. It somehow manages to make even simple material that I already kind of know very difficult to understand. The writing style is very pompous and generally otherwise inaccessible. Variables used in equations are either not well-defined or used inconsistently. Examples, for lack of a better word, suck. Figures are confusing rendered. Organization is terrible. All in all, a fairly good textbook example of how not to write a textbook.

I found the book extremely useful, not only as a text book, but as a reference. This book gives a good history of hydrology, what physical hydrology is, and the technical content ranges from basic to quite advanced. A good range of expertise levels, so it can be used by people at different stages of their career. Some very practical problems and solutions are highlighted in each chapter, in the form of boxes, which make them stand out. There are a number of appendices, which give details of derivations, tables of constants, and other useful facts. Overall, this is one of those books I'll keep on my shelf and reach for, for basic equations to specific methods of solution.

There is a lot of good information packed into this book but as a student, I have found it a very frustrating textbook to use. The reader is bombarded with equations without a good general overview first. A glossary would also be helpful. The units of many equations are left out. This is confusing since for many empirical equations, the units cannot be derived from dimensional analysis. Finally, like many hydrology textbooks, there are literally hundreds of Greek symbols used throughout. Without any glossary or table of symbols used in each chapter, it is very difficult to go back and find the original definition and derivation, should I forget what one of the symbols stands for.

This book does a very good job and explaining the math behind the concepts. It fails to explain the concepts. It comes with a CD that had a huge assortment of problems and examples, so I recommend getting the CD. Overall, I was impressed with the book, but keep your calculator handy.

I am a professional hydrologist and I keep Dingman as a reference. It's comprehensive and the appendices are useful. That said, I only consult it as a last resort-- it is poorly organized, overly dense, and the equations are typically poorly defined. If you are enrolled in a 'beginning' hydrology course that uses this text, I highly recommend supplementing it with something more accessible. Fetter's Applied Hydrogeology is an excellent book, and Freeze and Cherry's Groundwater (1979) can be hard to find but is both comprehensive AND understandable.

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