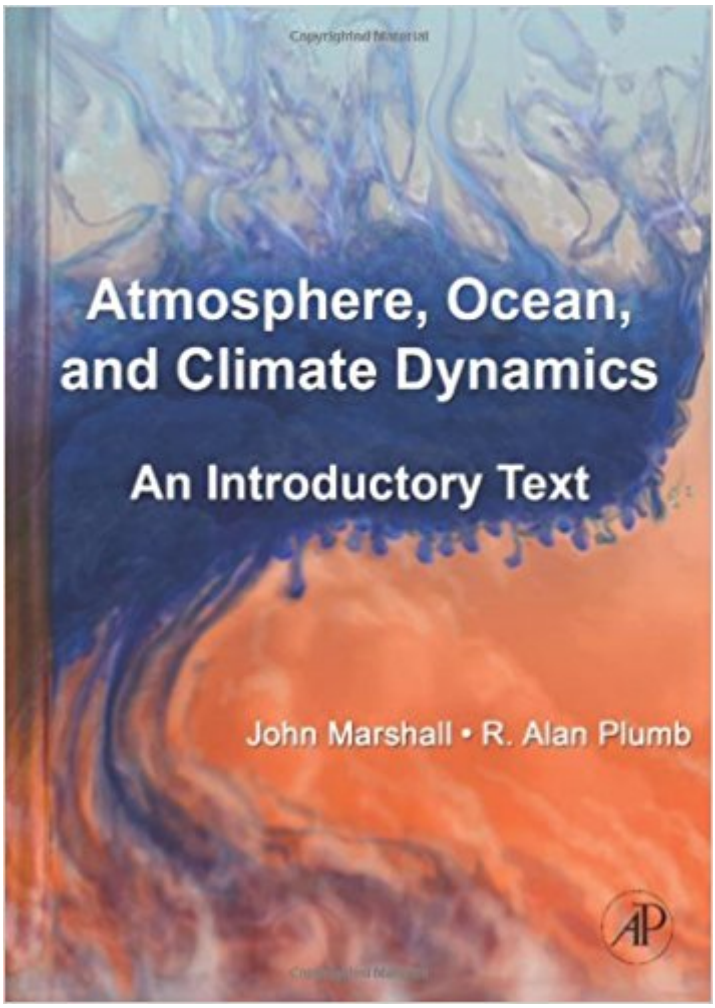
Atmosphere, Ocean And Climate Dynamics: An Introductory Text (International Geophysics)



Synopsis

For advanced undergraduate and beginning graduate students in atmospheric, oceanic, and climate science, Atmosphere, Ocean and Climate Dynamics is an introductory textbook on the circulations of the atmosphere and ocean and their interaction, with an emphasis on global scales. It will give students a good grasp of what the atmosphere and oceans look like on the large-scale and why they look that way. The role of the oceans in climate and paleoclimate is also discussed. The combination of observations, theory and accompanying illustrative laboratory experiments sets this text apart by making it accessible to students with no prior training in meteorology or oceanography. * Written at a mathematical level that is appealing for undergraduates andbeginning graduate students* Provides a useful educational tool through a combination of observations andlaboratory demonstrations which can be viewed over the web* Contains instructions on how to reproduce the simple but informativelaboratory experiments* Includes copious problems (with sample answers) to help students learn thematerial.

Book Information

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Customer Reviews

"Marshall and Plumb have nicely presented the basics of both meteorology and oceanography in this work. The book begins with a discusssion of atmospheric characteristics; the final chapter on climate and climatic variability nicely leads into the subject of global warming, and should be read by anyone with an interest in the future of the planet. . . . Highly recommended." -- A.E. Staver, Northern Illinois University, in CHOICE, June 2008

I own a ton of books on dynamic meteorology and geophysical fluid dynamics and this one is a breakthrough in my opinion because of how the theory (that is otherwise very difficult to grasp with traditional mathematical explanations) is linked to observations in the real atmosphere (and ocean) and particularly in rotating tank experiments. It is full of excellent diagrams and photos of the rotating tank experiments that could be reproduced in a course laboratory with the same set up. It is also clearly written and not as dry as most books on dynamics.From the perspective of an instructor, this is the book that I very much want to use for the course that I teach in dynamics at a California State University. However, my first attempt at adopting it did not go so well and I ended up reverting back to Holton & Hakim. This was entirely due to my comfort level with H&H. So, my conclusion is that using this book effectively in a course will take some extra effort on the part of the instructor to "do things differently".

I first read it in my school's library. It is a classic textbook, nothing to comment. Now I buy one for personal study. To make the best use of this book, I recommend it only to those who have some backgrounds in fluid dynamics.

I purchased Marshall and Plumb's book in order to give me a bit more quantitative information on the subject than I had gotten from the IPCC and the U.S. Global Change Research Project reports, among others. It had been many years since I last had an in-depth exposure to physics and advanced math (late 1950s, earl;y 1960s), so I spent several weeks reviewing, mostly differential equations. A good grounding in physics and calculus through diff. eq. is really necessary to get the best benefit from this book, but having achieved that, the book is an oustanding introduction to the topics implied in the title. There is enough informaton, presented in an extremely readable format, that I have been driven back to my computer to develop simple models from the book's content. I would heartily recommend this book to anyone willing to put forth a modicum of effort to become much better informed about the science.

This book comprises a great INTRODUCTION to the study of the atmosphere-ocean-climate system. I'd suggest for anyone with a sprouting interest in the subject to start off with this book and then move on to Benoit Cushman-Roisin, which in my opinion is one of the best in terms of exposition and clarity, although it requires a bit of mathematical maturity. Finally, one could begin to grasp the more intimidating texts, such as Gill or Pedlosky.The GFD labs in this book offer decent

physical insight. Also, this text is good for a beginning student since it will expose them to observations of the atmosphere and ocean, in turn allowing them to gain an understanding of the averaged large scale structure. Obtaining such a solid basis is important for one to successfully continue in the subject. However, my biggest problem with this text is it's neglect to cover material pertaining to vorticity dynamics, although I suppose one could find such material in the more advanced texts.

I think this is a good introduction to the dynamics of the atmosphere and ocean. By studying the atmosphere and ocean together, one gains a deeper understanding of both and how they interact to form the climate system. I believe the book is intended for upper-level undergraduates majoring in the earth sciences (based on a class that Professors Marshall and Plumb taught at MIT?). So it uses calculus to explain physical principles but does not go into as much detail as graduate texts by Vallis, Pedlosky, etc.The real strength of this book is how it allows the reader to visualize phenomena through its outstanding figures, accompanying lab experiments, and web site [...]. My department bought the rotating tank so we can perform the experiments described in the book. Nothing beats seeing Ekman pumping, a Hadley cell, wind-driven gyres, etc. with your own eyes, but the book has figures showing the experiments if you don't have access to a rotating tank.

There's nothing introductory about it! It's A great book for garnering general information on the atmosphere and ocean, but terrible for ascertaining an understanding of the mathematics behind it. While there are a plethora of problems that the reader can work his or her way through, answers are not provided and you have to be a lecturer (or know someone who is) to gain access to those materials. I purchased this book for heuristic learning, but the way the quantitative information is presented is confusing. Many equations utilized in later chapters are derived from equations introduced in previous chapters and I suppose the authors expect you to have memorized those equations, because if you haven't prepare to flip all the way back to the two or three previous chapters to understand what's going on (is it really that costly to just print the equation you're deriving from again?).To be completely honest, my biggest qualm with the book is that the problems have no solutions or examples completed to use as a reference. I understand this is an MIT book for MIT kids who have MIT brain cells, but for the rest of us plebeians math isn't a primary language. I've taken Calc 1 & 2 and General Physics 1 & 2, and I'm still at a loss with some of these problems. Am I just supposed to be a chicken with his head cut off?

I believe this book is being overrated. This is a decent book but my complain is that the contents are fragmentary at the best. The authors used so many lab examples to "illuminate" the basic concepts and the understanding of equations to such a degree that these labs distract the true understanding of contents. The way the authors try to explain all the dynamics using taylor columns is very confusing. Although T-P theorem is fundamental, the excessive employment of it obscures the different assumptions behind the equations and makes it very easy for inexperienced reader to mistake one for another.

Admittedly we didn’t use it much in our class. However, we also didn’t refer to it when studying or answering homework problems. Too short, maybe.