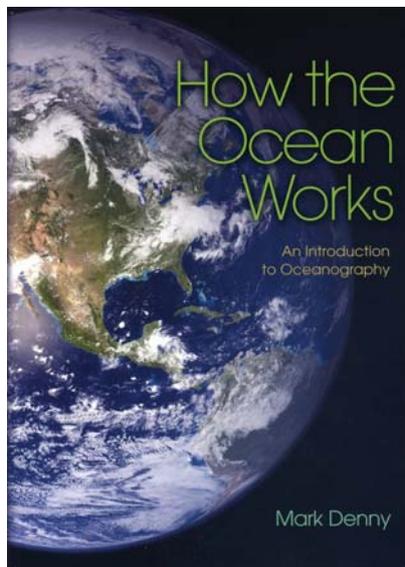




## BOOK REVIEWS

**Denny, M. 2008.** How the Ocean Works. An Introduction to Oceanography. - Princeton, Princeton University Press

*A. Dooley Jr.*



As palaeontologists, more often than not we end up making a living by doing things other than palaeontological research. This frequently includes teaching introductory-level courses on a variety of topics that are not necessarily in our exact areas of expertise, including in my case oceanography.

"How the Ocean Works" by Mark Denny is an introductory textbook for Oceanography students. I was pleasantly surprised when I initially thumbed through the book at the lack of photographs. Rather than the rather gaudy appearance of most current textbooks, this one is rather minimalist, heavy on text and diagrams. Even though it is an introductory text, it has the feel of a more specialized, upper-level text.

The text of this book reads more like a lecture transcript than a traditional textbook. As a result even relatively dry topics are easy to read and often entertaining. The diagrams complement the text nicely, and serve well to clarify and emphasize important concepts. The trend in textbooks seems to be away from presenting graphical data, and when they are used they often are dimensionless, but Denny has included numerous graphs with scaled axes to show relationships between variables.

Perhaps the most unusual aspect of this book is the general layout. There is a very heavy emphasis on ocean chemistry and circulation, to the exclusion of almost all other aspects of oceanography. Biological oceanography is es-

essentially limited to two chapters. Even then, it is largely limited to a discussion of energy flow and chemical interactions between organisms and seawater. Different marine groups are mentioned only to introduce the players; there is no discussions of details such as habitats and distributions. There is no geology at all, other than a brief (and somewhat dated) description of plate tectonics in Chapter 2. Even a discussion of tides is absent. As such, traditionalists will have serious doubts about the utility of this book.

Where “How the Oceans Work” shines is in the depth of detail on the topics it does cover. All of Chapter 7 is devoted to Coriolis effects and their consequences, while Chapter 6 is strictly about the two-layered ocean. The detailed mathematics for major concepts are included in appendices at the end of each chapter. These are not necessary for understanding the text, but they are available for students who want to go deeper into the explanations for the described processes.

Overall the book adheres strongly to its underlying themes of understanding the motion and chemical properties of water masses. The only chapters that break this trend are Chapter 1, which reviews the history of oceanography, and Chapter 11, which examines fisheries (although the fisheries analysis draws heavily on the concepts introduced in the rest of the book).

It took me some time to warm to this book, as I was expecting a traditional oceanography text. As I examined it more closely I began to appreciate that it actually contains a great depth of useful information about the physical ocean. The last part of the book I read was the Preface (which I perhaps should have read first, as intended). Denny goes to some length to explain why this book is organized the way it is, and why some topics are absent. For example, on page xvi: “[The story of how the ocean works] need not be a complete story—to hew to the story line, some facts would have to be left out—but it would need to provide a solid basis on which someone could build. It would need to teach someone how to think about the ocean, leaving the details for desert.”

And this brings me back to where I started, with teaching topics outside one’s speciality. Perhaps the most valuable use of this book is

not as a textbook for introductory students; certainly it would require completely rewriting the introductory curriculum in most cases (although I suspect Denny would find this to be desirable). Rather, this book might be most useful as a review for people like me, specialists in other fields who find themselves teaching oceanography.

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