



## BOOK REVIEWS

Davis, R.A. Jr., 1994. **The Evolving Coast**. New York: Scientific American Library, 231 p., ISSN 1040-3213, \$32.95 (HC)

It is rare to find a book where the presentation of the material greatly enhances the content. This is one of those cases. Davis explains that his objective is to examine how variations in geology and physical processes led to an evolving coast. He acknowledges a focus on geological controls on the formation of specific landforms, with limited discussion of biological systems. The author aims to provide a better understanding of the factors which contribute to the dynamic changes that characterize the coast; many of which are under threat from increasing human impacts. The text is written in such a manner to introduce many of the complex natural processes to a general audience. What it lacks in technical and scientific detail it makes up for in imagery and simplicity.

The text begins with a discussion of the role of plate tectonics and the coast. An interesting decision as although the tectonic classification of coasts by Inman is a standard approach, I have always questioned its universal application and utility in describing all coastal landscapes. However, Davis does provide the reader with an excellent summary of the concept of plate tectonics and the resulting landforms created. In Chapter 2, the role of sea level rise is outlined, including tectonic activity, climate fluctuations, regional subsidence, isostasy, eustatic changes, and impact of ice sheet changes. Again clear and concise illustrations, including examples of sea level curves, assist the novice reader through the discussion. The range of processes that shape the coast is presented in Chapter 3, with descriptions that are accompanied by some of the most outstanding photographs and illustrations which I have ever seen presented in a single book.

Specific coastal environments are the focus of Chapters 4 to 7. Estuaries, salt marshes, and tidal flats are presented in Chapter 4, with a focus on the role of sediment transport in forming these features. Chapter 5 highlights the formation of deltas with the Mississippi provided as a case study. The role of human activities leading to increased erosion, sedimentation, and subsidence in this environment could have received greater attention. Beaches, dune and barriers are discussed in Chapter 6, with much of the chapter providing basic information with limited details on the mechanisms of fluvial and aeolian sediment transport. Barrier systems are also given little attention and could have been a stronger focus. Rocky coasts are described in Chapter 7 with the discussion highlighting physical, biological, and chemical processes. The role of geomorphology, specifically sediment types and lithology should have been explained further, with a discussion of the role of material strength in cliff formation.

The text concludes with an examination of the impact of human activities on the coastal environment. The use of hard

coastal protection, such as seawalls, breakwaters, groins, and jetties, are provided as examples. The discussion is limited and a better use of examples could have been made to highlight the potential interference that these structures have on natural processes that are essential for coastal evolution. Beach nourishment, dune stabilization, dredging, and fill construction are also described. The chapter ends with the statement that building along the coast has interfered with natural processes, but as we understand more then we will be able to modify our activities. I am not sure that understanding is the barrier, but perhaps education and communication, which may lead to modified behavior and rationalization of economic activity along the coast.

The book is supported by an outstanding set of color photographs and illustrations of the highest quality. The difficulty in recommending this book is identifying the audience that the author is attempting to reach. The general level of information and format of presentation means that it would be limited use in course instruction and for professionals working in the field of geology, marine science, and biology. However, I do not feel that this should distract from the utility of preparing such a book and the need to provide information to assist individuals, communities, and management agencies in decision-making along the coast. The beautiful presentation and style of writing make this a highly recommended reference document to begin educating the uninformed about the complexity of the evolving coast. On this basis alone, I would encourage anyone with a strong personal or professional interest in coastal regions to consider this a fine addition to any collection. It would also make a wonderful gift to present to someone with similar interests and motivations. I plan to order an additional copy myself just for that purpose.

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Viles H. and Spencer T., 1995. **Coastal Problems: Geomorphology, Ecology, and Society at the Coast**. London: Edward Arnold, 350p., Softcover. ISBN 0 340 53197 5.

What are coastal problems? The authors define them as natural and/or human-induced events or processes that affect environment and society at the coast. This publication describes the range of concerns that face attempts at coastal management around the world. The focus is on environmental problems that have ecological, economic, and social di-

mensions, including pollution, erosion hazards, loss of biodiversity, and sea level rise. The authors have selected a biogeomorphological perspective and present an understanding of coastal ecological and geomorphological systems in order to improve management and solve coastal problems.

Chapter 1 presents some fundamental characteristics and principles including coastal dynamics, linkages, and sensitivity as a basis for understanding how coastal ecosystems function. A review of human uses and management of the coast provides a context for approaches to the study and solution of coastal problems. In Chapter 2, the authors describe attempts to classify coastal environments and the role of plate tectonics, and Late Quaternary sea level changes. A general, but useful, review of wave dynamics is presented, providing the uninformed reader with an excellent initial exposure to the scientific understanding of these complex processes. The book provides a very limited review of coastal ecology, which would have been greatly improved with further descriptions of controlling factors and ecosystem types. A short discussion of physical disturbances such as storm surges, El Niño, and sea level rise is also provided.

Chapters 3 to 7, which comprise the majority of the book, describe individual coastal features, including sandy coastlines, rocky coasts, wetlands, reefs, and cold coasts. For each chapter the authors have attempted to describe the individual features in reference to geomorphological and biological conditions, significant processes and features, human induced impacts, and management approaches. An excellent feature is the presentation of a series of case studies within each chapter. Although one may question the selection and relevance of some of the case studies, in general they provide specific examples of the range of complex issues that face many coastal environments. A review of the information provided in each of these chapters reveals that for the most part they present a good summary of the current scientific understanding and are very complete.

This book concludes in Chapter 8 with a discussion on attempts to manage coastal problems. However, the topic is given very limited attention, covering only 24 pages (with over one-half for case studies of the Bay of Bengal and the Mediterranean) out of a total of 350 pages in the book. Given that the clear focus of this book on coastal problems is was disappointing to reach the end with a lack of discussion on management as a possible solution. The only management concept introduced is sustainable coastal zone use and management and even it is only given limited discussion. My main criticism of this book is although I was encouraged by the approach, in the end the reader is left unfulfilled. If the intention of the authors was to examine coastal problems then a more detailed review and recommendations concerning management initiatives should have been provided.

In general this book is well-organized and written in such a manner that individuals with limited scientific background will be able to begin to understand some of the basic principles that underlay coastal systems. The presentation could have been improved with the use of a standard format for chapters describing specific coastal systems. The text is supported by an outstanding set of photographs and illustrations which are clear and concise and add immensely to the

presentation. The authors and publisher are to be commended in this regard. The reference material is very complete, although I am sure many practitioners would point out important missing material, as I would in regards to rocky coasts. It would have also been very useful to list the references at the end of each chapter, reflecting subject matter, rather than simply at the back of the book. In conclusion, this book would be excellent addition to any undergraduate or introductory course related to coastal environments. The low cost and presentation of information all combine to create a fine introduction to the wide variety of problems that exist in many coastal regions.

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G.M. Friedman, J.E. Sanders and D.C. Kopaska-Merkel. 1992. **Principles of Sedimentary Deposits: Stratigraphy and Sedimentology**. New York: Macmillan 717p. ISBN 0-02-339359-9.

Coastal specialists who have used the earlier volume *Principles of Sedimentology* by Friedman and Sanders (1978) will need no urging to get this volume, a largely reworked update of the earlier one. It has been a time of rapid developments in geology. Plate tectonics, a totally new paradigm for earth science, has called for extensive new thinking in sedimentology. Seismic stratigraphy and the sequence-eustatic theory have revolutionized historical geology. The two together generate a base for a totally new approach to historical paleogeography, and thus to sedimentology. The reluctant acceptance (by the meteorological establishment) of the Milankovitch orbital control of insolation has created an atmosphere that makes the acceptance of extraterrestrial climatic forcing a logical necessity in historical Earth science. Both for convenient data handling and predictive modeling, the personal computer has revolutionized every sedimentological laboratory and office.

So, the time could not be more appropriate for the introduction of a serious top-level textbook, suitable for both advanced students and for every practitioner of the sedimentological disciplines. The authors retain a highly pragmatic classification of the field, partly paleogeographic, partly genetic: (a) intrabasinal, (b) extrabasinal, (c) carbonaceous, and (d) pyroclastic (as explained in chapter 4).

A high point of the volume is the authors' insistence on a historical and humanist approach to problems. The first (1978) version carried 4500 references requiring 200 pages (cited in full, not indecipherably truncated in the style of *Science* or *Nature*). This giant list has now been trimmed to somewhat over 1800, occupying 35 pages. The authors take some pride in attempting to adhere to rules of grammar and logic. They claim that sediments are made up of "particles," not necessarily "grains", and thus, for example, prefer a "fine-