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Ecology of Marine Sediments: From Science to Management, 2nd ed.,
by John S. Gray and Michael Elliot, 2009, Oxford University Press,
hardback, 225 p., ISBN 13: 978-0-19-856901-5, USD130.00

The Ecology of Marine Sediments is a personal accounting of marine ecological research in soft sediments (sand and mud) by two biologists, the late John S. Gray and Michael Elliot. The book is targeted at upper-level biological sciences students and researchers focused on seafloor management and benthic ecology. This text is a valuable contribution to the biological literature, in that it addresses many old concepts and introduces new concepts in marine ecology. The reader is quickly pointed in the right direction on a myriad of topics ranging from sampling bias and spacing, to methods of field-data acquisition, and its statistical treatment. For students and researchers unfamiliar with the marine ecological literature or needing a quick refresher, a book such as this constitutes a great reference.

For the paleontological community, the utility of this text is limited. No attempt is made to bridge the gap between biological studies of dynamic marine benthic ecosystems and geological studies of biological activity preserved in sedimentary rock. This apparent shortcoming merely reflects the authors' biological focus, and much of the literature linking modern and ancient ecosystems is not addressed. For example, in chapter 6, which discusses the burrowing activity of infauna (neoichnology), most of the references and examples are drawn from relatively recent biological studies (1990s and younger). Unfortunately, no mention is made of the extensive ichnological literature that exists on the same subject, which dates back to the 1940s. Nevertheless, ichnologists and paleontologists studying the dynamics of marine benthic communities would find portions of this text both useful and interesting.

Of the eleven chapters, chapters 1 to 3 focus on the acquisition and treatment of field data, chapters 4 to 7 deal with variations in marine benthos as a function of depositional parameters, and chapters 8 to 11 focus on human impacts on the marine realm and on ocean management. Chapters 4, 6, and 7 are, perhaps, the most useful for paleontologists. Chapter 4 focuses on the diversity of marine assemblages and the environmental factors that impact these communities. It is particularly interesting to read about the variability in macrobenthos diversity as a function of environmental stress and the corresponding response(s) of benthic communities. These relationships provide an understanding of community response to the environment that may aid in paleoecological studies. Chapter 6—spatial variations in sediment systems—discusses the impacts of competition and predation on benthic communities, and sediment disturbance resulting from infaunal burrowing activity (bioturbation). Additionally, larval colonization of seafloor sediments and community recovery following sediment disturbance are discussed. The concepts of competition and predation, larval colonization, and community recovery provide an interesting modern perspective on the potential expression of biological activity in the rock record. Chapter 7 addresses temporal changes in benthic assemblages both at an annual (seasonal) scale, as well as longer term variations. The stability of benthic communities is also discussed.

Overall, the Ecology of Marine Sediments is a useful addition to the literature. Data and concepts are presented in a compact manner (the book is only 225 pages), and the focus on the acquisition and treatment of field data will help guide researchers and students involved in field-based seafloor research. Although the biological perspective taken in this book limits its use for researchers in other disciplines, paleontologists, ichnologists, and geoscientists concerned with ocean management will undoubtedly find portions of this text interesting.

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