

on survey procedures, especially for rocky shores. Little and Hiscock describe the difficulties in establishing an acceptable monitoring routine, and the practicalities (and implicitly, tedium) of conducting statistically-valid repeat surveys.

The early widespread advocacy of dispersants as a panacea for oil spills (especially by the chemical industry) is addressed in several contributions, but most notably those by Howard, Baker and Hiscock and Little and Baker. OPRU had to devise field and laboratory experiments to examine the efficacy of dispersants, which, as it transpires, are not universally appropriate, as they often lead to accumulations within the sediment, rather than on the surface. What becomes very clear, in several chapters (especially that by Howells, Dodd and Turner) is that almost every type of oil, and even different fractions, behave differently, and thus, at least in theory, lead to a spectrum of impacts depending on community structure, environmental constraints and species type.

The OPRU has worked far and wide, but its most renowned studies have been in Milford Haven in South Wales, Sullom Voe in Shetland, (both major oil transshipment sites) and in the North Sea around oil rigs. Many of the case studies deal with these areas, and perhaps it is here that the generally unobtrusive editing could have been a little sharper. Milford Haven, in particular, is the subject of numerous maps, although it is page 38 (after two maps of the site) before we actually see where it is, even then on a rather bleak map of England and Wales. (Many of the figures could have been reduced, saving space, while others, clearly lifted out of context, could have done with far more explanation.)

Yet, overall this is an interesting and valuable book. It details a corpus of research not widely available before, and in so doing, chronicles a success story in applied coastal and marine research. The book also 'works' at another, perhaps more prosaic level, in that it provides some useful teaching material, particularly from the clear presentation and tabulation of raw data. There is a wealth of knowledge in some chapters, and it is probable that many undergraduate projects may start from here. The volume price is too high. Presumably this reflects oil industry-pricing standards, but at £0.25 (c.\$0.40) a page it promotes a strong

incitement to use a photocopier, especially as there are virtually no half-tones. In short a good book, well presented but poorly priced for academic purposes. Based on this standard the OPRU should have no trouble making the next 20 years, given a little help from wayward tanker captains!

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Ecology of Mangroves Patricia Hutchings and Peter Saenger, 1987. University of Queensland Press, Queensland, Australia, 388p. Aus. \$39.95. ISBN 0-7022-2015-9.

This paperback edition forms another title in the Australian Ecology Series edited by Harold Heatwole. The authors bring together expertise in both animal and plant ecology. Dr. Patricia Hutchings is an animal ecologist interested in; the taxonomy and ecology of polychete worms, the fauna of mangroves and seagrass beds, and the conservation of wetlands. Dr. Peter Saenger is a plant scientist with particular interests in the ecology of mangrove communities. Together, they have made a competent team in writing this book. The book contains 9 chapters that constitute major aspects of the ecology of mangroves. The main object of the book is to synthesize information on the flora and fauna of Australian Mangrove species. They not only present material on the work done by them in Australia but review relevant literature on mangroves from other areas of the world.

In Chapter 1 the authors give mangrove biogeographic regions with emphasis on the distribution of major mangrove species in Australia. It is interesting to learn why the mangroves and associated species occur only on the northern and northeastern coastlines of Australia. Chapter 2 deals with basic data on adaptations of mangroves to cope with high salt concentrations, to conserve desalinated water within their tissues, to overcome problems of water logging, low oxygen content and semi-fluid substrate, and to tolerate other physical factors such as light, wind, waves and frost. The authors present diagrams of leaf sections, micrographs of leaf hairs and scales and morphology of root types. The last part of this chap-

ter contains data on flowering and fruiting times, reproductive units, propagule dispersal and plant establishment, of mangroves. There is a lot of useful information but the criticism of Rabinowitz (1978b) on page 44 may not be justified on the basis of data in Table 5. The authors say, "The mortality rates from Queensland (Table 5) show trends different from those reported by Rabinowitz (1978b) who found that mortality rate was inversely correlated with initial propagule weight." Table 5 does not present any data on relationship between propagule weight and percent mortality.

Chapter 3 presents information on relationship between mangroves and their environment. Three types of interaction have been presented: the effect of physical factors, *e.g.* temperature isolation, wind, drainage, salinity, watertable, soil type, proximity to freshwater; plant-plant interactions, *e.g.* parasitism, antagonism, mutualism, competition; plant-animal interaction, *e.g.* sediment turnover, grazing and trampling; interactions expressed as structure, *e.g.* parallel shoreline zonation, longitudinal upriver zonation, and unifying both zonation types and lastly classification of mangrove communities on the bases of structural, physiographic and structural and geomorphological attributes. This is the longest (84 pages) chapter in this book and packed full of data even though a large proportion of graphs and tables are either from unpublished data or the source is not given. I have nothing against unpublished data but in many cases the reader is left wondering about the methods used in obtaining the results. There are several typographical errors. In Chapter 4 the authors present a basic taxonomic and ecological outline of various associated plant groups such as bacteria, fungi, algae, lichens, eiphytes, mistletoes, salt marsh plants and vascular plants at the margins of mangroves.

The fauna of mangroves and their adaptations to live in this habitat are given in Chapters 5 and 6. The chapters are well written and contain valuable information on the composition, distribution and adaptations of vertebrate and invertebrate fauna of terrestrial, marine and freshwater habitats, within the mangrove communities. The conclusions are amply supported by tables and graphs from the literature. Each table and graph is referenced and few typographical errors are present.

Ecologists interested in primary production and energy flow in ecosystems may find Chapters 7 and 8 useful. Most of the data comes from studies done in southern Florida where only four mangrove species are found. The authors have cautioned, and rightly so, that extrapolation to Australian conditions may be risky but the material presented here may form a useful introduction to students for starting studies on primary production of mangroves in Australia. A basic detritus cycle, decomposition of leaf litter, total litter fall and nitrogen content are presented along with life cycles of some commercially important animals.

The authors as expressed in the preface have many years research experience in taxonomy, ecology, conservation and environmental biology of mangrove communities. I found the last chapter extremely valuable because it clearly points out the specific problems of mangrove ecosystems in Australia. These problems are not unique to Australia. The exploitation, conversion, management, and drainage of mangrove communities continues at an unprecedented rate in the developing world. Without proper planning, legislation and management, the increase in human populations and our insatiable desire for better quality of life would destroy another diverse ecosystem. The authors emphasize the need for more research, and greater protection of mangrove communities in Australia.

The text is well illustrated with diagrams and plates of 43 photographs, and contains numerous tables, a glossary and a large reference list. The price of the book is within reach and should be of general interest to graduate students, biology teachers and mangrove specialists particularly in Australia.

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Les Littoraux: Journées en l'honneur d'Andre Guilcher, Bulletin No. 36, 1989. Centre National de la Recherche Scientifique, Centre de Géomorphologie de Caen. No Price, No ISBN, 262p.

This publication in honour of France's most eminent coastal geomorphologist Andre