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I wish I were there... a review of tropical ecosystems and ecological concepts

Tropical Ecosystems and Ecological Concepts, 2nd edition. Patrick L. Osborne, 2012, Cambridge University Press. 536 pp. £35 (paperback) ISBN: 9780521177344; <http://www.cambridge.org>

I confess to missing the first edition of this book, but luckily I got the chance to review the recent second edition, which I enjoyed reading very much. There are many general ecology textbooks and quite a few books on tropical ecology. What sets this book apart from others is the integration of exposition of traditional topics and concepts featured in every ecology textbook (e.g. physiological/organismal ecology, population dynamics, community ecology, photosynthesis and productivity, nutrient cycling) with a focus on specific tropical ecosystems, which is what lends the book utility for a biogeographic audience. Major strengths of the book include the diversity of ecosystems considered, the equal weight given to terrestrial and aquatic habitats and the integration of literature from the Asian tropics, Africa and the Neotropics. Most chapters begin by introducing a particular habitat or ecosystem (deserts, grasslands, savannas, lakes, rivers, wetlands, rain forests, montane gradients, mangroves, coral reefs, islands and cities), then provide a detailed description of that habitat in a particular geographic location, and finally interweave ecological concepts by illustrating how they play out in that particular habitat. In some chapters, this hybrid approach works very well, while other chapters cover too much ground conceptually and are not as cohesive.

For example, Chapter 4 focuses on population dynamics in the savannas of Africa and is a particularly nice example of the strengths of integrating an ecological topic with a focus on a geographical location or ecosystem type. It effectively summarises the rich literature on the animals of the Serengeti-Mara ecosystem and uses these relationships as a springboard for discussing population growth equations, mechanisms of population regulation, predator-prey dynamics, life tables and life-history strategies. While reading this chapter, I felt the African savanna unroll-

ing before me, and I could visualise generations of wildebeest, gazelles and zebras unfolding, their numbers shrinking and swelling as a result of inter-annual variation in plant productivity and rainfall, predation and disease. By contrast, Chapter 2 starts out by describing the natural history of three deserts, explaining why we find the deserts where we do, segues to physiological adaptations to water shortage and high or fluctuating temperatures, then moves to soil, weathering processes and nutrients as abiotic factors that also constrain organism function. A sidebar box contains a discussion of salinity as a consequence of land-use change and agriculture, and fits well into the section on salinity and soil water potential. But overall I felt my attention pivoting from topic to topic in this chapter.

Moreover, because the chapters each focus on a particular ecosystem, some ecological concepts are split among chapters. For example, succession, which is such a well-developed research topic in tropical rain forest ecology, first appears in a chapter on wetlands and then reappears in a discussion of gap theory in the chapter on tropical rain forests and biodiversity. Similarly, because the treatment of biogeochemistry appears in the chapter on lakes, the large role that tropical forests play in the global carbon and nitrogen cycles (Townsend et al. 2011) is not fully developed. This is a potential drawback for instructors wishing to use this book as a text in a modular way (e.g. "read the chapter on community ecology").

Aside from such issues, as a textbook *Tropical Ecosystems* functions very well. The prose is clear and straightforward. The book contains the features you would hope for in a textbook: a good glossary, a thorough index and brief but complete chapter overviews and summaries. There are interesting and relevant boxes containing digressions that focus on interactions between human socio-economic systems and tropical ecosystems

or highlight natural history stories. Most chapters also include tables or lists of traits, features, adaptations, etc., which I found very useful (for example, the chapter on drought contains a table listing adaptations that plants and animals living in arid areas display). Osborne strikes a good balance between describing and incorporating classic and new literature, and between incorporating both plant and animal natural history stories or anecdotes. My only complaints about the style of the book are that sometimes the detailed descriptions of different ecosystems seem tedious, especially when one is unfamiliar with the species or genus names (family names, especially for plants, might have been more helpful). Also, while most but not all of the photos were lovely, it would have been nice if at least some of them were in colour. There is a balance between keeping the price of a book down and visual excitement. Part of the splendour of tropical rain forests, savannas or coral reefs is the dizzying variety of colour, and having at least a few colour pictures would add visual interest to each chapter. Some of the black-and-white photos are too grey to be able to discern what is in them. Also, in some cases, such as descriptions of soil profiles, colour plates are really essential.

Overall, my criticisms are minor. This book is exhaustive in its descriptions of tropical ecosystems. The hybrid nature of the book means that it will be perfect for some courses (in particular for biogeography), but less so for others (straight-up ecology). It is clear that Osborne has been to many of the places he describes and I found myself wishing I were there too. When is the last time a textbook made you think that?

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Reference

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