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BOOK REVIEWS

Freshwater mussel ecology: a multifactor approach to distribution and abundance. David L. Strayer. ISBN 978-0-520-25526-5. University of California Press, Berkeley, California. Freshwater Ecology Series, Volume 1, 2008. 204 pp. $45 (cloth).

The goal of this book is to determine whether a comprehensive model can be built to predict the distribution and abundance of freshwater mussels. The book is framed around the concept that such a model can be viewed as "Dr. Frankenstein's monster." To create his monster, Dr. Frankenstein had to "gather all the pieces necessary to build a living monster" and then "find some way to animate the collection of unliving body parts – he must make the monster walk" (p. 3). In the same vein, to build a predictive model of mussel distribution and abundance, mussel ecologists must first gather existing information, determine what is and is not useful, and then somehow combine this information in a mechanistic, quantitative model. The book is divided into 3 sections that address various aspects of this theme.

Part I, "The Laboratory," discusses the importance of predictive models in ecology and why freshwater mussels make a good case study for evaluating how to approach such models. Part II, "The Monster's Parts," contains 6 chapters, each of which addresses a potentially important constraint to mussel distribution and abundance. These are: dispersal, habitat, fish hosts, food, enemies, and human impacts. Part III, "Making the Monster Walk," proposes 3 alternative models for mussel ecology and concludes with a discussion of whether a comprehensive model is possible.

This engaging book provides a big-picture view of what we currently know about freshwater mussel ecology and the research directions we need to pursue to reach the point where we can understand what governs their distribution and abundance. The book is not (and is not meant to be) a comprehensive review or synthesis of the extensive literature on mussel ecology. Readers looking for such a review will need to supplement the book with other sources.

We read and discussed this book as a laboratory group with members that ranged in experience from beginning PhD students to almost 20 y of work with freshwater mussels. Thus, we represented a spectrum of the target audience for the book, which we think will be primarily students and researchers. The approach outlined in the book could be used for any group of organisms, and in that regard, the book should be of general interest to *Journal of the North American Benthological Society* readers and ecologists, and not just to mussel ecologists. The book is short, highly readable, thought-provoking, and relatively inexpensive. It would be a good choice for a senior undergraduate discussion course or a graduate seminar with accompanying papers from the primary literature. The book probably will be of less use or interest to resource managers looking for specific information, although they would benefit from using the approach outlined in the book.

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Stable isotopes in ecology and environmental science. 2nd edition. R. Michener and K. Lajtha (editors). ISBN 978-1-4051-2680-9. Ecological Methods and Concepts Series. Blackwell Publishing, Malden, Massachusetts 02148-5020. 2007. 566 pp. $42 (paper).

Stable isotopes have become increasingly popular as a tool for ecological investigations, and new applications appear constantly in the literature. This book is part of a series on ecological methods, and its objective is to update and expand upon the 1st edition published in 1994. This objective is accomplished thoroughly in 14 chapters that cover stable isotope concepts and methods in considerable detail. The chapters generally present sufficient conceptual orientation before plunging into the advanced methods and applications, and they provide many citations that include much recent work.

The multiauthored collection of chapters covers a lot of ground. It begins with a helpful primer by the late

Elizabeth Sulzman, and then presents topics organized somewhat by disciplines or research areas. *Journal of the North American Benthological Society* readers will particularly appreciate chapters on marine plankton (by Joseph Montoya), chemoautotrophic systems (Cindy Lee Van Dover), marine food webs (Robert Michener and Les Kaufman), organic matter sources in fresh waters with an emphasis on rivers (Jacques Finlay and Carol Kendall), and watershed hydrology (Kevin McGuire and Jeff McDonnell). In many respects the marine and freshwater titles represent an artificial dichotomy, and much of what is said about marine ecosystems applies as well to fresh waters. I found reading the book from cover to cover, rather than just focusing on the chapters on freshwater systems, worthwhile. The remaining chapters help the reader to understand the behavior of isotopes in aquatic environments and to think of new applications. These other chapters deal with terrestrial plants, terrestrial N and C cycling, the biology of extant and fossil vertebrates, tracking wildlife movements, tracing anthropogenic N sources, modeling, and compound-specific isotope analyses. Several of these applications were scarcely in existence when the 1st edition was published.

The book intentionally focuses on natural abundances of stable isotopes, as opposed to deliberate isotope tracer additions, which are barely mentioned. Stable isotope addition experiments have become increasingly popular in aquatic ecology, but perhaps an entire book would have to be devoted to those methods. Nonetheless, anyone contemplating isotope addition work should understand the stable isotope fundamentals covered in this book.

The book has been well edited and I noticed very few errors. One fault worth mentioning is that the chapters are not standardized in their use of terms, and this lack of standardization is particularly noticeable with respect to isotopic fractionation, a topic that can be especially confusing to novices. Within and among chapters, inconsistently used terms include fractionation factors, discrimination, enrichment factors, and in part, reflect different conventions among subdisciplines. Also, chapters are insufficiently cross-referenced. Authors of many chapters failed to acknowledge that their chapter is part of a collection, and coverage of some basic concepts is redundant among chapters. Last, the index is not as complete as it could be.

In summary, this book is an essential reference for ecologists and earth scientists who are using or plan to use stable isotopes. I strongly recommend it for novices who need to master the details, and for seasoned researchers who need to keep up on the latest developments in a rapidly evolving field.

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