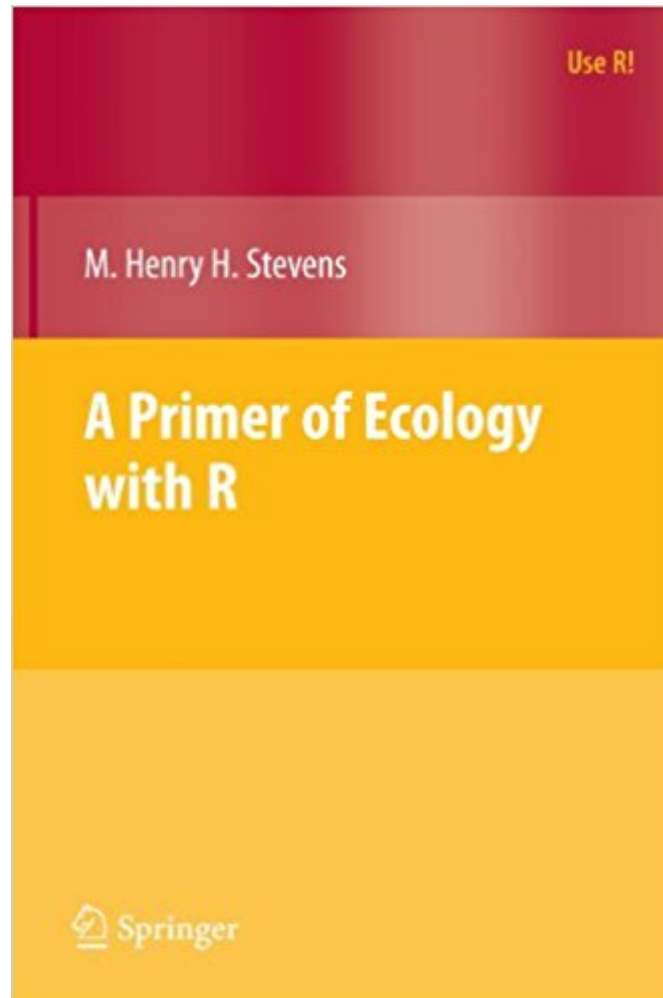




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A Primer Of Ecology With R (Use R!)



Synopsis

Provides simple explanations of the important concepts in population and community ecology.
Provides R code throughout, to illustrate model development and analysis, as well as appendix introducing the R language. Interweaves ecological content and code so that either stands alone.
Supplemental web site for additional code.

Book Information

Series: Use R!

Paperback: 388 pages

Publisher: Springer; 1st ed. 2009 edition (October 8, 2010)

Language: English

ISBN-10: 0387898816

ISBN-13: 978-0387898810

Product Dimensions: 6.1 x 1 x 9.2 inches

Shipping Weight: 1.6 pounds (View shipping rates and policies)

Average Customer Review: 4.0 out of 5 stars 3 customer reviews

Best Sellers Rank: #371,120 in Books (See Top 100 in Books) #77 in Books > Computers & Technology > Computer Science > Computer Simulation #111 in Books > Textbooks > Medicine & Health Sciences > Research > Biostatistics #188 in Books > Medical Books > Basic Sciences > Biostatistics

Customer Reviews

From the reviews: "I found the text to be an excellent foray into ecological models using R. I plan to use this book in my upcoming modeling course for upper-level undergraduates, a course cross-listed in the math and biology departments. The models will present some challenges for my students but I think the pace of the text will work for them. In addition, many of my students will be new to R, and to programming, but the text does a great job of integrating an introduction to R with the models. I can see this book being valuable to graduate students and research ecologists wishing to work with these foundational models in R. It is now time to jump into R!" (Ecology, 91(4), 2010) "Ecology is a complex discipline that can best be understood by making suitable abstractions, or models. The simplest mathematical models are composed of general rules and rarely require more than two equations. These models have the advantage that they apply to a variety of systems. The book primarily focuses on population dynamics, a field where such simple models are commonly used. The novelty lies in the tools that are used to make the theory work

and that will undoubtedly bring this type of analysis closer to the individual researcher and the students. Undoubtedly, this book will contribute to the further democratization of mathematical modeling and the use of R in this field. Given the variety of the topics covered, the highly readable text, and the ready-to-use code excerpts, I consider the book an absolute must for those who are active or intend to work in the field of population modeling. • (Journal of Statistical Software, January 2010, Vol. 32, Book Review 3) œThis volume fills an important niche in the ecology textbook community. Like other primers, this book covers many of the core concepts of ecology, particularly population ecology, but Stevens goes into greater depth, presenting many of the complexities of core ecological processes. • an excellent volume for graduate-level courses in ecology and will be useful to ecologists who desire to refamiliarize themselves with core ecological concepts while learning computational analysis and modeling techniques. • (Matthew Aiello-Lammens, The Quarterly Review of Biology, Vol. 85 (3), 2010)

Ecology is more quantitative and theory-driven than ever before, and *A Primer of Ecology with R* combines an introduction to the major theoretical concepts in general ecology with a cutting edge open source tool, the R programming language. Starting with geometric growth and proceeding through stability of multispecies interactions and species-abundance distributions, this book demystifies and explains fundamental ideas in population and community ecology. Graduate students in ecology, along with upper division undergraduates and faculty, will find this to be a useful overview of important topics. In addition to the most basic topics, this book includes construction and analysis of demographic matrix models, metapopulation and source-sink models, host-parasitoid and disease models, multiple basins of attraction, the storage effect, neutral theory, and diversity partitioning. Several sections include examples of confronting models with data. Chapter summaries and problem sets at the end of each chapter provide opportunities to evaluate and enrich one's understanding of the ecological ideas that each chapter introduces. R is rapidly becoming the lingua franca of quantitative sciences, and this text provides a tractable introduction to using the R programming environment in ecology. An appendix provides a general introduction, and examples of code throughout each chapter give readers the option to hone their growing R skills. M. Henry H. Stevens is an associate professor in the Department of Botany and the Ecology graduate program at Miami University in Oxford, Ohio, USA. He is the author or coauthor of the R packages "primer" and "vegan". "The distinctive strength of this book is that truths are mostly not revealed but discovered, in the way that R-savvy ecologists's empirical and theoretical work and think now. For readers still chained to spreadsheets, working through this book could be a revolution

in their approach to doing science." (Stephen P. Ellner, Cornell University) "One of the greatest strengths is the integration of ecological theory with examples ... pulled straight from the literature." (James R. Vonesh, Virginia Commonwealth University)

This is an excellent introduction to ecological modeling and to programming in R. Unlike most text books, even those that focus on modeling, Stevens provides both the equations and the code necessary to implement the models and graph the output. He also provides occasional asides on how models can be derived through numeric estimation or simulation. He has an expansive works cited and covers a broad range of ecology, from classic Lotka-Volterra to modern models in community ecology. I've gone through much of this book on my own and will probably read it from beginning to end before my comprehensive exams. The text is direct and the code often no-nonsense and sparsely annotated - this is not an introductory text for either ecology or programming. The goal appears to be to provide you with the essential code for creating graphs that you can examine closely yourself, fuss with the parameters to see what happens, and be able to explore graphically the logic and output of the models. He doesn't always walk you through every step of the derivation of the models or the logic behind the code, but does provide an intro to programming in R in the back and he employs several approaches to programming and templates for coding. In the end this book does make an excellent guide to programming because it provides numerous examples of different ways to solve programming and modeling problems. He also employs lots of code for adding text, arrows, and other tidbits to plot to make model output more readable - code that I am personally pilfering almost daily in my own work. This book does not focus on ecological statistics or using R as a statistics platform. Much of the code, however, is useful for manipulating data and creating functions that can extract information from data.

First of all, there is a free version of this available for download via .pdf. The .pdf has some minor clerical errors but is identical to the book. If you need this for a class and don't want to pay for something you might not use again, just search for it online. You could also download the .pdf and see what you are buying before you make the leap. I got the pdf and decided I wanted it in print so I could read the material prior to attempting the code. If you aren't familiar with R, then you may want to consider supplementing this book with some walk-throughs, available online as well. Good luck and have fun in R.

This primer provides an excellent, upper-level, introduction to theoretical and simulation ecology.

Working through the presented R code and exercises provides a deeper understanding of the thinking of many of the most famous theoretical ecologists, while also introducing the methods by which students can examine ecological questions through simulation.

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