

# Book Reviews

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## LANDSCAPE ECOLOGY: A HOW-TO GUIDE

Gergel, Sarah E., and Monica G. Turner, editors. 2002. **Learning landscape ecology: a practical guide to concepts and techniques.** Springer-Verlag, New York. xix + 316 p. \$39.95 (w/CD-ROM), ISBN: 0-387-95254-3 (acid-free paper).

*Learning landscape ecology: a practical guide to concepts and techniques* (edited by Sarah Gergel and Monica Turner) is a companion volume to *Landscape ecology in theory and practice: pattern and process* (Turner, M. G., R. H. Gardner, and R. V. O'Neill. 2001. Springer-Verlag, New York). Whereas the Turner et al. volume is a textbook that discusses the origins and focus of landscape ecology, the Gergel and Turner is a lab manual that illustrates through hands-on exercises how spatial patterns are quantified and how pattern-process relationships are analyzed. Although designed to be partnered with the Turner et al. text to form a comprehensive guide to landscape ecology, the Gergel and Turner volume can stand alone.

There is currently no lab manual of landscape ecology that covers the breadth of topics of this book. Comprised of 20 chapters grouped into seven sections, each chapter is written by people who have not only conducted the exercises presented as part of their own research but who have also had classroom experience teaching the exercises to others. The seven sections of the book cover the importance of scale; how spatial pattern is created and modeled; how pattern is quantified; the role of disturbance in pattern formation; how organisms respond to pattern; the linkages among pattern, organisms, and ecosystem processes; and applied aspects of landscape ecology pertaining to conservation biology. Specific topics include a basic introduction to GIS, various kinds of models (including first-order Markov, individual-based, and neutral landscape models), landscape metrics, spatial statistics, landscape connectivity, metapopulation dynamics, disturbance, the importance of taking an organism-based perspective, feedbacks between organisms and ecosystem processes, and conservation reserve design.

This book is written for advanced undergraduates or graduate students (and their professors!). There is also a website for instructors, but it merely restates information presented in an introductory "Suggestions for instructors" portion of the book. A tabular overview in the "Suggestions for instructors" section rates each chapter's difficulty, recommending whether each is most appropriate for undergraduates, graduate students, or advanced graduate students. The overview also mentions which chapters from the Turner et al. textbook are associated with each lab chapter.

User-friendly, step-by-step exercises are the heart of this book. Most of the book's seven sections include both under-

graduate- and graduate-level exercises. The first chapter's exercises are thought-based, and the second chapter involves data collection in the field. All of the remaining exercises are computer-based but do not require computing hardware, software, or skills that are outside the realm of most colleges, although access to and basic familiarity with computers are necessary prerequisites. An accompanying CD-ROM contains necessary program and data files. The exercises are presented clearly, and most are amenable to additions of complexity for more advanced students. Most exercises can be completed in less than an hour, although a longer lab period is needed to introduce the lab's topic and for discussion and questions after the exercise is completed. The objectives of each lab exercise are stated at the beginning of each chapter, and each chapter concludes with an annotated bibliography. Some chapters also include questions for discussion. Almost all of the chapters' activities lend themselves well to lab write-ups or reports.

Unlike many edited volumes, the chapters here are very consistent in layout and tone. The writing is clear throughout, the importance of each exercise is explained beforehand, and the context of each technique within the field of landscape ecology is given. Each step in each exercise is laid out explicitly, making the exercises practically foolproof. That is not to say that they are laid out trivially, however—there are steps in most exercises where the student is required to make a calculation or decision that is then used in further steps.

For the majority of exercises, students are provided with data but are not given a true appreciation for how those data were collected and inputted. Experimental design and data collection are not the primary subjects of this book (the primary subject is data analysis), although the implications of design scale and changing that scale on the structure of the resultant data are discussed. Although landscape ecology is the study of the interplay between spatial patterns and ecological processes, the main focus of this book is on pattern. This is not exactly a weakness per se, however, for pattern assessment is a necessary first step in any ecological endeavor, and process is context-dependent.

Landscape ecology, like many things, is best learned "hands-on," and a volume like this facilitates the learning process greatly. For a highly applied discipline like landscape ecology, a book like this is a valuable resource and should appeal to conservation biologists, ecological modelers, land managers, and landscape ecologists alike.

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