It is revealing when the greatest criticism of a book you can muster is that the title seems not quite appropriate—a short review might then be expected. However, when the authors attempt such a grand synthesis (labor of love?), as have Landsberg and Gower in their book, and have such lofty aspirations in terms of its use, they deserve more.

First, the title: there is actually little in terms of the application of physiological principles to forest management in this book. For instance, there is no mention of management applications of the “3/2 self-thinning law” and mahogany is not mentioned once in the discussion on tropical forest management. Rather, what the authors offer is a comprehensive synthesis of ecophysiology in the context of understanding the functioning of forest ecosystems with implications for forest management. The guts of the book reside in chapters 3–7 (Canopy Architecture and Microclimate, Forest Hydrology and Tree-Water Relations, Carbon Balance of Forests, Soil Organic Matter and Decomposition, and Nutrient Distribution and Cycling). There are also two introductory chapters (Forests of the Modern World, Forest Biomes of the World), and a transitional chapter discussing Changes in Ecosystem Structure and Function during Stand Development, and two concluding chapters, one on Ecosystem Process Models and one on Applications of Modern Technology and Ecophysiology to Forest Management (the latter discusses GIS and remote sensing, although without providing much illustration of their application to forest management).

Beyond the title and perhaps questionable audience, the authors take the high road when it comes to topical coverage, focusing on the dynamics of carbon, water and nutrients, with hardly a mention, for example, of biochemistry, genetics, biodiversity or dynamics at the population or community levels. Definitions of key terms, such as community, ecosystem, or forest, are often implied rather than stated (or included only upon subsequent mention), and the book contains only a few figures and is without photographs. All these points limit the usefulness of the book for most broader undergraduate courses, but make it possible for the authors to achieve their objectives within a modest and readable 300 pages of text.

In their attempt to synthesize within their well-stated scope, the authors are very successful, and in fact most of what they discuss would be useful for most practicing foresters and land managers to know and understand. But most practicing foresters have Bachelor-level degrees and, although the authors have ostensibly aimed the book at senior undergraduate and post-graduate students, there are few undergraduates that I have been exposed to who would find the book entirely comprehensible, largely because of some overhanded quantitative exactitude (e.g., Canopy Architecture and Microclimate) and some highly conceptual presentations.

I do admire the forceful and unambiguous definitions of sustainability, conservation and management, and the discussion of the related issues as presented in Chapter 1; these concepts are revisited throughout the book and provide a central theme. There is also a healthy balance in the book of natural and plantation forest management considerations. I was surprised that the authors chose to use eight climate diagrams for the major biomes rather than discussing global climate patterns in a more synthetic and dynamic manner, which would have been more appropriate to their emphasis elsewhere on modeling.

The authors emphasize modeling throughout the book, focusing on the derivation of “simple models,” although this at times seems like an end in itself and gets a bit distracting (not to mention that the modeling is not always so simple!). In fact, with all the mention of models, there are relatively few specific examples of simulations. The current use of biologically-based models in forest management is not highly developed, which the authors use as the justification for eventually presenting a range of “process-based” models and discussing their preferred approach: the (energy efficiency) model.

In terms of format, the book is very nicely constructed. I especially enjoyed the succinct introductions and sections entitled “Concluding Remarks,” in each chapter. The authors obviously spent considerable time thinking about not only the presentation of factual material, but also the contexts and larger implications of the material. The assembled Concluding Remarks would even make a nice collection of essays regarding the various subjects covered. There are some errors (e.g., Manaus is not in the temperate zone [p. 29], there is no “former Russia” [p. 36], the Table 7.5 caption is undecipherable and Equation 4.11 is missing parentheses), and a few more grievous misrepresentations (e.g., the fire frequency for natural pinelands in the southeastern U.S. is far higher than every 30–70 years; wildfires in tropical forests are ignored). Perhaps most problematic is that, in spite of the authors’ attempts to be clear, Box 3.1 calls for the use of “total needle surface areas” while the accompanying text on pages 55–56 states that “single-sided or projected foliage surface area—not total surface area” will be used throughout the book—the resulting ambiguities should be obvious and dogged me throughout the remaining discussions. But in terms of content, although I might disagree with some of the specifics, I can’t argue at all with Landsberg and Gowers’ overall thoroughness and rigor.

I do agree that this book is appropriate for graduate students, and in fact, after evaluation, I have decided to use the book for my own forest ecosystems (graduate) course next year, and have already used it successfully in a “reading and conference” format. The minor editorial distractions should be taken care of in subsequent revisions, which will be necessary if this is to continue to be useful as a reference and textbook. Overall, I highly recommend the book as a focused, conceptual, compre-
hensive synthesis of process-level ecology within strong ecosystem and forest management contexts.

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