

R. Costanza, A. Voinov (Eds.), *Landscape Simulation Modeling: A Spatially Explicit, Dynamic Approach*, Series: Modeling Dynamic Systems, Springer-Verlag, New York, ISBN: 0387008357 2004 330 pages+XIII; 116 illustrations with CD-ROM.

Ecological and economic systems are characterized by complex and nonlinear dynamics making our ability to understand and manage them a tough challenge. As such, spatial models as simplified abstractions of reality provide powerful means to understand, describe, and support the management of these systems. With the use of models, issues such as scale, time, errors, uncertainty, fluxes, and the model building process itself are necessary considerations for a comprehensive understanding of complex ecological and economic systems. It is in this context, and from an integrated perspective, that *Landscape Simulation Modeling: A Spatially Explicit, Dynamic Approach* makes a significant contribution by directly incorporating space into existing simulation modeling approaches for a greater understanding of landscape systems.

Landscape Simulation Modeling: A Spatially Explicit, Dynamic Approach is an edited collection of 12 chapters arranged into two Parts. The Parts divide the book into two sections: Theory and Methods, and Case Studies. A common thread through all the chapters is the use of the open-source Spatial Modeling Environment (SME) software to bridge the gap between a non-spatial front-end model (constructed mostly in the STELLA software) and its implementation across cellular geographic space with cell linkages. The SME software together with additional graphics and useful website links are included in a CD-ROM that is packaged with the book.

In the introductory chapter, the editors immediately define the challenges confronting research and application efforts in spatial simulation modeling. Landscape complexity, fluxes, scaling, aggregation, resolution, and hierarchical relationships are reviewed and the ways they have been dealt with in existing research is brought to light to inform spatial simulation modeling research. In addition, selecting and assembling the components of spatial models can be strongly influenced by researcher biases. In this regard, the strategy of bounding the spatial simulation modeling process by highlighting technical and

methodological limitations in the early chapters is good because it encourages critical thinking in model building at an early stage in the book.

The second chapter about the SME software is one of the most important because the software forms the core of all the spatial applications presented. The degree of detail in the chapter explanations and the demonstration project to illustrate the hands-on will surely be a great plus for those who attempt implementations on UNIX systems. However, Windows PC users will face a time-consuming challenge to get the SME to work on their computer systems as there is little or no instruction on how to proceed with a windows-based installation. This is an important consideration given that one of the future prospects and challenges outlined by the editors is: "Using the modeling process to build a broad consensus among stakeholders (p. 16)".

The third chapter introduces the paradigm of modular ecosystem modeling and its benefits for model re-configurations, interoperability, documentation, and adaptability among others. Inherent in the discussion is the notion of comparisons across models, which at present are unreliable because of the different assumptions and configurations that researchers unknowingly introduce into customized models they build. Increasingly, this modular paradigm is also making an impact in other areas such as geographic information systems modeling of the environment. Comparisons of models across disciplinary boundaries will benefit greatly from the modular modeling approach elaborated in this chapter.

The last chapter of Part I brings into focus the challenges of model calibration. How does one deal with the computer processing demands for calibrating large spatial ecological models? Additionally, both qualitative and quantitative factors impact the perceived adequacy of the calibration process. The authors propose a model performance index based on multi-criteria principles and evolutionary algorithms to optimize the index. The knowledge learnt from this process can then be applied in trial-error approaches towards calibrating larger spatial models.

The four chapters of Part I give a comprehensive overview of the essential theory, methods, and challenges of building spatial models. Part II follows with eight chapters covering a range of case studies that illustrate in great depth the concepts of the first

Part. In each of the case studies, the entire spatial model building process from conceptualization to results interpretation is presented clearly and efficiently. This linking of the theory and the case studies makes it easy for the reader to navigate through the many case studies and come away with a sense of the general patterns that permeate the spatial simulation modeling process.

Overall, this is an excellent book. The content is comprehensive and the text written in a simple and clear style that justifies the editors' claims that the book would be useful for students and researchers. The editors have done an excellent job to ensure consistency in content and the level of clarity across the chapters further enhancing the book's value as a teaching and learning resource. Each chapter is indicative of careful research and analysis together with enough background explanations to ensure the average reader is able to follow along in the model building and result interpretation process. Given the breadth of the chapters, the book will also appeal to many multidisciplinary practitioners who will find links to their own research work.

This book should be a required reading for anyone interested either casually or deeply in the design and implementation of spatial simulation models for understanding complex ecological and economic systems.

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Robert C. Paehlke, 2003 *Democracy's Dilemma: Environment, Social Equity and the Global Economy*, MIT Press, ISBN: 0-262-16215-6, 316 pp.

Robert Paehlke's *Democracy's Dilemma* is a well-structured eight-chapter outline of the origins, flaws,

and consequences of today's globally integrated economy. In a detailed but succinct overview that encompasses nearly every spectrum of society, Paehlke offers the numerous negative impacts of globalization and describes how democracy has failed in this context, such as with the breakdown of family and community, an excessive reliance on media, a lack of global governance, and a consistent lowering in standards of social policy, environment and wages. These are the effects of "electronic capitalism" and "economism", the main concepts characterizing contemporary society, an era that should be headed instead towards the "Three Bottom Line Perspective."

Democracy's Dilemma follows a basic straightforward structure that presents the critiques to globalization, followed by how society has gotten there, and the means it can take to improve its current state. Paehlke argues that while the economic benefits of an integrated international economy are irrefutable, inequality and inequity have both risen in the transition from a mass industrial society to today's age of "electronic capitalism", a digital revolution characterized by trade negotiations, widespread cynicism towards politics, and monopolization of communication networks. Nevertheless, this evolution from an isolated domestic economy to an integrated global economy has failed to adopt effective national standards to global problems. This is where democracy has failed. Furthermore, the management of this global economy is restricted to a few, closing out a mass public that does not think it can make a difference and does not try. In a world looking towards "economism", "a systematic and continuous dominance of social, cultural, and environmental concerns by narrowly defined economic objectives" (16) and the progression of free trade and competition, the inevitable race towards the lowest-common denominator of socioeconomic policies has taken priority to long-term human well-being.

Paehlke traces the changes of socioeconomic factors through the three stages of industrial society. Elements that were once rising between early and mass industrialization, such as wages, are now deteriorating, while others like inequity that were decreasing, are now on the rise with the transition to the age of electronic capitalism. *Democracy's Dilemma* illustrates the rise of environmentalism, overshadowed by a one-dimensional media dominated society, in the

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