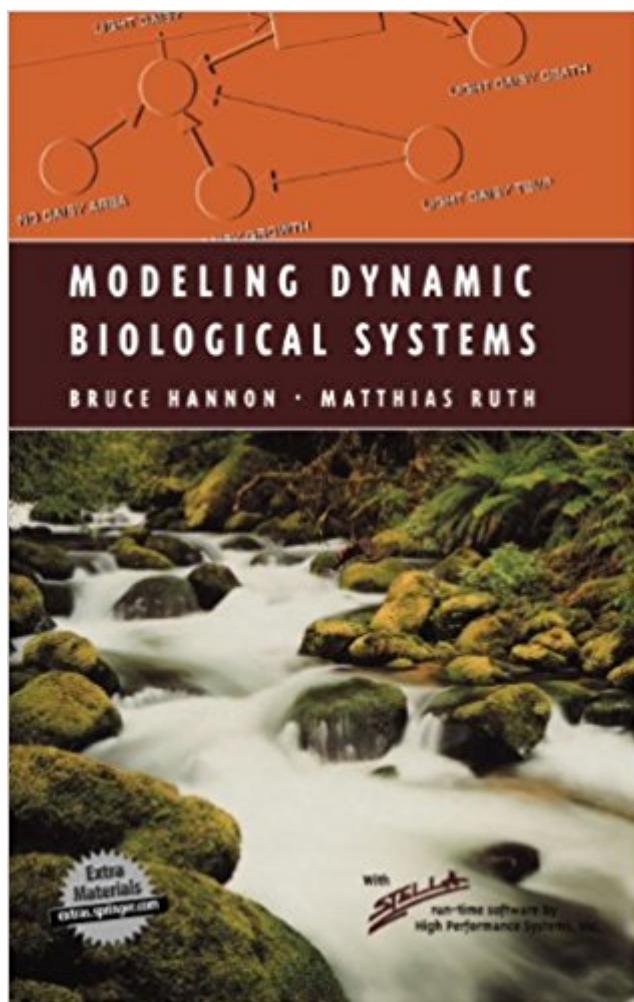


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# Modeling Dynamic Biological Systems (Modeling Dynamic Systems)



## Synopsis

Models help us understand the dynamics of real-world processes by using the computer to mimic the actual forces that are known or assumed to result in a system's behavior. This book does not require a substantial background in mathematics or computer science.

## Book Information

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## Customer Reviews

Excellence!

This sort of modeling really hasn't gotten anywhere, and sits around as an artifact of the effort to "tame complexity" without confronting complexity.

This book got no CD-ROM as mentioned in book. Furthermore, it does not even have any external link for reader to download the source of model in stella format. Is a shame that this book published by springer is deliver to buyer without CD, what a careless mistake they did.

Like Hannon and his book. And this used book is like new. Only minor marks on it. Disk runs well.

The increasing interconnectedness and complexity of ecological and biological systems is undoubtedly increasing the potential environmental consequences of our decisions. Thus the

growing importance of improving our understanding of the characteristics and internal relationships that govern the system's behavior. Hannon and Ruth clearly illustrate how we can think about problems from a 'dynamic systems' perspective, and how we can use technical programs to apply this new way of thinking as a tool to model biological systems. They present the means to build a greater understanding of the phenomena we see, the context of the problems that confront us, and the potential and expected effects of any interventions we may make. Like the book's theoretical foundations, the modeling software used is both user-friendly for easy up-take by beginners, and sufficiently powerful for those at a more advanced level needing a robust software package. The reader is actively guided through the model development, simulation and interpretation process. This learning by participation and experience increases the readers understanding of the wide variety of contexts in which modeling techniques can be applied, and how to apply them. Those interested in biological issues will find this valuable from the practical biological examples that are used, and the novel approach in which these issues are addressed. These range from spatial and population dynamics, to models of organisms, genetic movements and physical systems. Further, the clarity of writing, and the familiarity of the examples and problems addressed, makes this an enjoyable educational experience for all people interested in developing a new perspective of the environment in which they live and work. Perhaps most importantly, the analogical strength of the techniques used and models developed is such that researchers in all fields of academia, from economics to sociology, will benefit from it. It challenges us to re-examine how we define the problems we seek to solve, and to discipline our existing conceptualization of systems. It presents us with tools that challenge, yet compliment and strengthen traditional scientific approaches.

I have used this book to learn dynamic modeling both as part of a class and in research work. This is an excellent book for beginners and professional modelers alike. The book uses STELLA, an iconographic modeling software, as the platform for learning. However, the knowledge gained through the book and the software is based on more general modeling philosophies that can be applied using other modeling software or programming languages as well. The approach used here is to learn by hands-on training through examples. One does not need to study a lot of theories to start developing models; rather the theories and principles evolve through the modeling exercises. It is not required, though advisable, to purchase the software to go through the examples as the book comes with a run-time version of STELLA. Another aspect of the book that I found to be interesting is that after going through the initial few chapters, the rest of the book can be studied in any order. It includes a host of examples from various areas of biological sciences and it is possible to focus on

one's area of interest - be it population dynamics, genetics, environmental pollution or epidemics. It gives a fair introduction to spatially dynamic modeling as well. I must also mention that one does not need to be a biologist to use this book. I have had friends with economics and engineering backgrounds who used this book to learn dynamic modeling. One of the most important strengths of this book is that it is easy enough to be accessible to people from a wide range of disciplines and at the same time advanced enough to expose the user to moderate to highly complex modeling challenges. I strongly recommend this book to academics who are teaching dynamic modeling and anyone else who is involved in research that include dynamic processes and interactions. This book teaches dynamic modeling as a versatile tool - so much so that I even used it (for fun) to model my personal finances! I suggest that the reader take a systematic approach to study this book while sitting in front of the computer and doing the examples as you go along. This will maximize the learning from this book. This is certainly one of the most practical books on modeling that I have come across.

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