

IBM/ABM's, and may be considered to represent the more scientific part of testing this type of model – namely an investigation of its ability to reproduce the patterns actually observed in nature. This way of testing differs from the more technical approaches which occupy a major part of the last section. Here one is presented with those parts of the IBM/ABM working procedures that link directly to the investigations normally carried out in connection with more traditional dynamic modelling, such as verification, statistical tests to estimate the predictive quality, sensitivity analysis, as well as calibration. The chapter ends with recommendations for further developments and evolution.

I have often been asked about the actual difference between IBM's and ABM's. According to the authors there is in fact little difference if any. This might well be true, as I have the impression that a lot of application papers use the two terms as though they were fully interchangeable, i.e. homologous terms. However, it seems fair to raise the question whether the two authors in taking this stance – and as the prominent researchers in the area that they are – are in fact missing an excellent opportunity to actually (re-)introduce such a distinction. For example all models of a certain type (concentrated on and dealing with individuals) can be said to be individual-based if that is literally the case, but they need to perform with a certain level of agency of the “actors” in the model before it is correct also to refer to them as agent-based.

I do not hesitate to recommend the use of this book for establishing specific student classes on IBM/ABM's within the syllabus of any university, since the book includes insights into a high variety of disciplines in science that makes it useful and applicable to many study directions. I am sure that almost everybody will find that the examples quickly guide them in the direction they need, making it possible to address more scientific questions and to attempt to solve them by the use of IBM/ABM's – using either the book itself or the web-pages established to support it. However, NetLogo seems to have a steep learning curve, in particular as one also needs to understand its limitations and pitfalls. To use the book for the first time can present quite a challenge, even for an experienced teacher. In such cases, I would suggest the formation of a study group around it before actual implementation and involvement of students at more basic level. After this, the road to the world of IBM/ABM's will have been paved and will lie open to new investigations and challenges.

## References

- Grimm, V., & Railsback, S. F. (2005). *Individual-based modeling and ecology*. Princeton, NJ: Princeton University Press., 428 pp.
- Grimm, G., Berger, U., Bastiansen, F., Eliassen, S., Ginot, V., Giske, J., et al. (2006). A standard protocol for describing individual-based and agent-based models. *Ecological Modelling*, 198(1–2), 115–126.

- Grimm, V., Berger, U., DeAngelis, D. L., Polhill, J. G., Giske, J., & Railsback, S. F. (2010). The ODD protocol: A review and first update. *Ecological Modelling*, 221(23), 2760–2768.

Søren Nors Nielsen  
*Energy Academy, Samsø, Denmark*  
*E-mail address: soerennorsnielsen@gmail.com*

doi:10.1016/j.baee.2012.07.001

**The Biology of Disturbed Habitats, L.R. Walker. Oxford University Press, Oxford (2012). 319 pp. £29.95 (paperback), £65.00 (hardback), ISBN: 978-0-19-957530-5 (paperback), 978-0-19-957529-9 (hardback)**

This book is a new volume of Oxford's high-standard *Biology of Habitats Series*. In contrast to many other volumes in the series, the scope of this book is broader, since disturbance is not restricted to a certain habitat. Natural (e.g., volcanic eruptions, floods, storms or natural fires) and anthropogenic disturbances (e.g., grazing of domestic animals, mowing, and forest clearings) are an integral part of our environment. Although ecologists have always been aware of the importance of disturbance in influencing ecosystems and communities, modern disturbance ecology is a relatively young discipline. In the past the focus has been on successional development of equilibrium communities. Since the 1970s disturbance has increasingly been considered as a determinant of changes in community composition and biodiversity.

The book can be divided in five parts consisting of ten chapters. The introduction gives an overview why it is important to study disturbance and describes briefly the types, causes, characteristics and benefits of disturbance as well as the responses to disturbance. In addition, it presents the theoretical background of disturbance ecology. The three following chapters deal with characteristic disturbances and their influence on biota in different habitats: terrestrial (chapter 2), aquatic (chapter 3) and anthropogenic habitats (chapter 4). While chapters 2 and 3 focus on natural disturbances the latter addresses human-made disturbances. The chapters 5–9 examine general patterns and processes that are altered by disturbance. Chapter 5 addresses changes in ecosystem processes such as light and temperature regimes, carbon dioxide and nutrient cycles, and productivity. Chapter 6 looks at the effects on biodiversity in space and time and how invasive species affect wild biota. Chapter 7 considers the influence on distribution patterns, spatial heterogeneity and patch dynamics. The following chapter 8 addresses successional responses in time. It discusses the rich body of theory (holism vs. reductionism), methods to study succession, the establishment and persistence of species after disturbance, the role of species interactions during succession and successional pathways. The last two chapters have a more applied character addressing how to manage disturbances through appropriate

conservation and restoration measures (chapter 9) and how to deal with the challenges arising from future disturbances due to global change (chapter 10).

Lawrence R. Walker is a well-respected plant ecologist mainly focusing in his research on the mechanisms that drive plant succession. The author's vast experience shines through in *The Biology of Disturbed Habitats*. It is the first comprehensive textbook on disturbed habitats covering all relevant biomes and topics of disturbance ecology. The text is easy to read, nicely illustrated and well-documented, with a reference list including more than 50 pages. Everyone will find something new or better explained in this book.

In conclusion, this book is a straightforward synthesis of current scientific knowledge of disturbed habitats. It is a must

for everyone who is interested in disturbance ecology. Since land use and climate are changing dramatically, disturbance frequency and intensity are assumed to increase strongly having severe influences on wild biota. Consequently, understanding the impacts of disturbance on ecosystems and how to manage disturbance will be one of the most challenging tasks for ecologists and conservationists in the 21st century. This book is a first step to cope with this challenge.

Thomas Fartmann  
Münster, Germany

*E-mail address:* [fartmann@uni-muenster.de](mailto:fartmann@uni-muenster.de)

doi:10.1016/j.baae.2012.08.006