A Computational Approach to Statistical Arguments in Ecology and Evolution by George F. Estabrook
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Review by: Simone Vincenzi
The Quarterly Review of Biology, Vol. 88, No. 4 (December 2013), p. 329
Published by: The University of Chicago Press
Stable URL: http://www.jstor.org/stable/10.1086/673768
Accessed: 06/12/2013 17:33

GENERAL BIOLOGY

A Computational Approach to Statistical Arguments in Ecology and Evolution.

By George F. Estabrook. Cambridge and New York: Cambridge University Press. $65.00. viii + 257 p.; ill.; index. ISBN: 978-1-107-00430-6. 2011.

The goal of this volume is to teach students and research scientists how to make statistical arguments using computational approaches. With the computational approach, predicted probability distributions are calculated via simulations, which according to Estabrook should allow readers to "make inferences from data, free of the burden of unwanted mathematical assumptions" (p. 3).

After a brief introduction to the history of statistical concepts and computer programming, readers are introduced to the Microsoft Excel macro programming language Visual Basic for Applications, the software and language chosen by Estabrook to implement computational approaches in this book. Then follows an example-driven introduction to hypothesis testing using computations and brief chapters that describe the most common statistical distributions emerging in ecology and evolution, the linear model, how to analyze non-independent data, and contingencies. Almost every chapter starts with a (fully reproducible) empirical example that is analyzed using computational approaches. I particularly enjoyed the chapter on random variables and statistical distribution, where Poisson and Normal distributions are introduced starting from natural phenomena.

I consider the use of Excel to be a weak point of the volume. Although it is probably true that most students without previous exposure to coding and programming concepts and practices would be more comfortable using Excel and macro programming than other more powerful (but with longer learning time) software/languages, for ambitious students or researchers the possibilities (libraries, communities of users) offered by tools like R or MATLAB/Octave far outweigh the initial struggle.

The book is, however, much more about statistical arguments, and how to develop them using a computational approach, than about computer programming. I recommend this volume to students and researchers looking for an easy, interesting, and condensed introduction to a computational approach to statistics.

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Bioinformatics for Biologists.

Edited by Pavel Pevzner and Ron Shamir. Cambridge and New York: Cambridge University Press. $150.00 (hardcover); $60.00 (paper). xxix + 362 p.; ill.; index. ISBN: 978-1-107-01146-5 (hc); 978-1-107-64887-6 (pb). 2011.

Biological Science. *Fifth Edition. Volume 1: The Cell, Genetics, and Development.*

By Scott Freeman, Lizabeth Allison, Michael Black, Greg Podgorski, Kim Quillin, Jon Monroe, and Emily Taylor. Boston (Massachusetts): Pearson. $85.20 (paper). xxxi + 443 p.; ill.; A:1–A:52; B:1–B:30; C:1; G:1–G:39; Cr:1–Cr:9; I:1–I:42 (index). ISBN: 978-0-321-84180-3. 2014.

Biological Science. *Fifth Edition. Volume 2: Evolution, Diversity, and Ecology.*

By Scott Freeman, Lizabeth Allison, Michael Black, Greg Podgorski, Kim Quillin, Jon Monroe, and Emily Taylor. Boston (Massachusetts): Pearson. $76.40 (paper). xxxi + pp. 444–1197; ill.; A:1–A:52; B:1–B:30; C:1; G:1–G:39; Cr:1–Cr:9; I:1–I:42 (index). ISBN: 978-0-321-84181-0. 2014.

Biological Science. *Fifth Edition. Volume 3: How Plants and Animals Work.*

By Scott Freeman, Lizabeth Allison, Michael Black, Greg Podgorski, Kim Quillin, Jon Monroe, and Emily Taylor. Boston (Massachusetts): Pearson. $72.00 (paper). xxxi + pp. 731–1058; ill.; A:1–A:52; B:1–B:30; C:1; G:1–G:39; Cr:1–Cr:9; I:1–I:42 (index). ISBN: 978-0-321-84182-7. 2014.

PALEONTOLOGY

Rereading the Fossil Record: The Growth of Paleobiology as an Evolutionary Discipline.

By David Sepkoski. Chicago (Illinois): University of Chicago Press. $55.00. vii + 432 p.; ill.; index. ISBN: 978-0-226-74855-9. 2012.

This volume offers an historical account of the emergence of paleobiology and the complex relationship between paleontology and evolution, beginning with Darwin whose lamentations on the "incompleteness" of the fossil record did much to downgrade it as a reliable source for subsequent evolutionary theory. It quickly moves to the period of the modern synthesis, which saw the beginnings of the formal integration of evolutionary theory with paleontology, to the 1950s and 1960s, which saw a burgeoning interest in understanding broad