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A Primer Of Ecological Statistics

A Primer of
Ecological Statistics
Second Edition

NEW CHAPTERS
Estimating Species Diversity
Estimating Species Abundance

NICHOLAS J. GOTELLI · AARON M. ELLISON
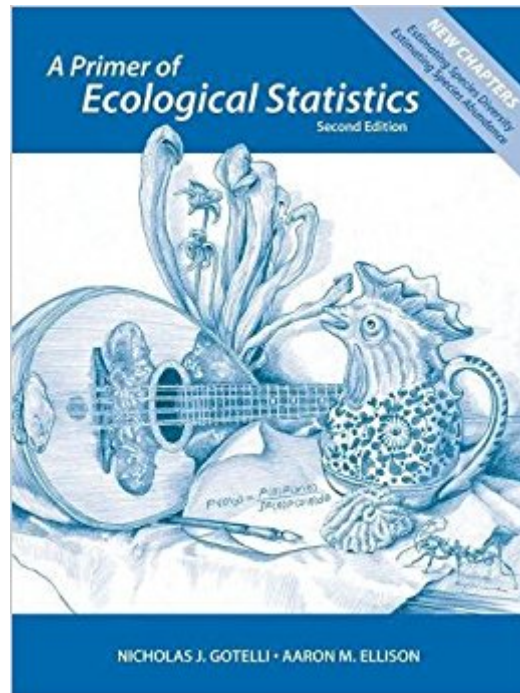
Synopsis

A Primer of Ecological Statistics, Second Edition, explains fundamental material in probability theory, experimental design, and parameter estimation for ecologists and environmental scientists. The book emphasizes a general introduction to probability theory and provides a detailed discussion of specific designs and analyses that are typically encountered in ecology and environmental science. Appropriate for use as either a stand-alone or supplementary text for upper-division undergraduate or graduate courses in ecological and environmental statistics, ecology, environmental science, environmental studies, or experimental design, the Primer also serves as a resource for environmental professionals who need to use and interpret statistics daily but have little or no formal training in the subject.The book is divided into four parts. Part I discusses the fundamentals of probability and statistical thinking. It introduces the logic and language of probability (Chapter 1), explains common statistical distributions used in ecology (Chapter 2) and important measures of central tendency and spread (Chapter 3), explains P-values, hypothesis testing, and statistical errors (Chapter 4), and introduces frequentist, Bayesian, and Monte Carlo methods of analysis (Chapter 5).Part II discusses how to successfully design and execute field experiments and sampling studies. Topics include design strategies (Chapter 6), a "bestiary" of experimental designs (Chapter 7), and transformations and data management (Chapter 8).Part III discusses specific analyses, and covers the material that is the main core of most statistics texts. Topics include regression (Chapter 9), analysis of variance (Chapter 10), categorical data analysis (Chapter 11), and multivariate analysis (Chapter 12).Part IV--new to this edition--discusses two central topics in estimating important ecological metrics. Topics include quantification of biological diversity (Chapter 13) and estimating occupancy, detection probability, and population sizes from marked and unmarked populations (Chapter 14).The book includes a comprehensive glossary, a mathematical appendix on matrix algebra, and extensively annotated tables and figures. Footnotes introduce advanced and ancillary material: some are purely historical, others cover mathematical/statistical proofs or details, and still others address current topics in the ecological literature.For StudentsData files and code used for some of the examples are available on the companion website.For InstructorsInstructor's Resource LibraryThis resource includes all figures (line-art illustrations and photographs) and tables from the textbook, provided as both high- and low-resolution JPEGs. All have been formatted and optimized for excellent projection quality. Also included are ready-to-use PowerPoint slides of all figures and tables.

Book Information

Paperback: 614 pages

Publisher: Sinauer Associates is an imprint of Oxford University Press; 2 edition (November 15, 2012)

Language: English

ISBN-10: 1605350648

ISBN-13: 978-1605350646

Product Dimensions: 9.2 x 0.9 x 7 inches

Shipping Weight: 1.9 pounds (View shipping rates and policies)

Average Customer Review: 4.0 out of 5 stars   15 customer reviews

Best Sellers Rank: #39,115 in Books (See Top 100 in Books)   #13 inÃ Â Books > Textbooks > Medicine & Health Sciences > Research > Biostatistics   #19 inÃ Â Books > Medical Books > Basic Sciences > Biostatistics   #23 inÃ Â Books > Textbooks > Science & Mathematics > Biology & Life Sciences > Ecology

Customer Reviews

"Things that set this volume apart from the ordinary include short discussions of more advanced methods at the end of most chapters, a full chapter on data management, two chapters on study design, and wonderful footnotes with historical notes and short biographies."--Philip Dixon, The Quarterly Review of Biology"Many ecology-related degrees require only a single statistics course, leaving a wide gap between students' knowledge and what they need to know. Gotelli and Ellison's book--written by ecologists with extensive experience teaching graduate and undergraduate statistics courses--helps fill this gap. I have found this book, aided by the very easy writing style of the authors, is equally well received by graduate and undergraduate students as a textbook in courses on ecological analyses, particularly when used as a bridge to more advanced books on specific topics. The book uses ecological data throughout, much of it collected by the authors, and all data are available on the book's web site, making it easy to use those data in labs."--Michael Gillingham, The American Statistician

Nicholas J. Gotelli is Professor in the Department of Biology at the University of Vermont. He graduated with a B.A. from the University of California, Berkeley in 1980, and earned his Ph.D. at Florida State University in 1985. He is also the author of A Primer of Ecology, Fourth Edition (2008), Null Models in Ecology (with Gary R. Graves; 1996), A Field Guide to the Ants of New England (with Aaron M. Ellison, Elizabeth J. Farnsworth, and Gary D. Alpert; 2012), and EcoSim, an ecological

software package. His research interests include: the evolutionary ecology of carnivorous plants, heat shock proteins and the responses of ant assemblages to climate change, environmental proteomics, biogeography, and statistical ecology. Dr. Gotelli currently serves on the editorial boards of Ecology, The Journal of Biogeography, Scientific Reports, and Myrmecological News.Aaron M. Ellison is Senior Research Fellow in Ecology at the Harvard Forest, and Adjunct Professor in the Graduate Program in Organismic and Evolutionary Biology at the University of Massachusetts at Amherst. He received a B.A. in 1982 from Yale University and a Ph.D. from Brown University in 1986. Dr. Ellison received the National Science Foundation's Presidential Faculty Fellow award in 1992 for "demonstrated excellence and continued promise both in scientific and engineering research and in teaching future generations of students to extend and apply human knowledge." He is also the author of A Field Guide to the Ants of New England (with Nicholas J. Gotelli, Elizabeth J. Farnsworth, and Gary D. Alpert; 2012). His research foci include: food web dynamics, community ecology of wetlands and forests, evolutionary ecology of carnivorous plants, and the application of Bayesian inference to ecological research and environmental decision-making. Dr. Ellison is the Editor-in-Chief of Ecological Monographs.

This is a great review of statistics for ecologists. It's not as detailed as some of my other statistics books but it's got a much more approachable style and for basic concepts it's helpful.

Nice and clean introductory text about statistics on ecology. I recommend it for everyone interested in learning the basics.

Industry standard. Enough said.

Excellent way to learn statistics, especially in regards to an ecological framework. This book is teaching me more about stats than my actual class, so I owe it any success I have in the field.

This book starts with the basics, but introduces ideas about data management. The authors often get into the mathematical details about the statistical methods. Yet, the style of writing makes it a relatively easy read. If you are looking for details on a special case of a particular method or information about using statistical programs this isn't the right book. I highly recommend it, especially for a new ecologist.

There are examples to explain different statistic concepts, that make me more easy to understand.This book is helpful to learn about basic statistic.

Fast shipping and book is in perfect shape. This book is the best for ecological statistics. A must read.

good

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