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**Analyzing Ecological Data** - Alain Zuur - 2007-08-29
This book provides a practical introduction to analyzing ecological data using real data sets. The first part gives a largely non-mathematical introduction to data exploration, univariate methods (including GAM and mixed modeling techniques), multivariate analysis, time series analysis, and spatial statistics. The second part provides 17 case studies. The case studies include topics ranging from terrestrial ecology to marine biology and can be used as a template for a reader’s own data analysis. Data from all case studies are available from www.highstat.com. Guidance on software is provided in the book.

**Ecological Models and Data in R** - Benjamin M. Bolker - 2008-07-21
Introduction and background; Exploratory data analysis and graphics; Deterministic functions for ecological modeling; Probability and stochastic distributions for ecological modeling; Stochastic simulation and power analysis; Likelihood and all that; Optimization and all that; Likelihood examples; Standar statistics revisited; Modeling variance; Dynamic models.

**Animal Biometrics** - Santosh Kumar - 2018-03-16
This book presents state-of-the-art methodologies and a comprehensive introduction to the recognition and representation of species and individual animals based on their physiological and phenotypic appearances, biometric characteristics, and morphological image patterns. It provides in-depth coverage of this emerging area, with an emphasis on the design and analysis techniques used in visual animal biometrics-based recognition systems. The book offers a comprehensive introduction to visual animal biometrics, addressing a range of recent advances and practices like sensing, feature extraction, feature selection and representation, matching, indexing of feature sets, and animal biometrics-based multimodal systems. It provides authoritative information on all the major concepts, as well as highly specific topics, e.g. the identification of cattle based on their muzzle point image pattern and face images to prevent false insurance claims, or the monitoring and registration of animals based on their biometric features. As such, the book provides a sound platform for understanding the Visual Animal Biometrics paradigm, a vital catalyst for researchers in the field, and a valuable guide for professionals. In addition, it can help both private and public organizations adapt and enhance their classical animal recognition systems.

**Biometrics - Volume II** - Susan R. Wilson - 2009-02-18
Biometrics is a component of Encyclopedia of Mathematical Sciences in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. Biometry is a broad discipline covering all applications of statistics and mathematics to biology. The Theme Biometrics is divided into areas of expertise essential for a proper application of statistical and mathematical methods to contemporary biological problems. These volumes cover four main topics: Data Collection and Analysis, Statistical Methodology, Computation, Biostatistical Methods and Research Design and Selected Topics. These volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

**Biometry for Forestry and Environmental Data** - Lauri Mehtatalo - 2020-05-27
Biometry for Forestry and Environmental Data with Examples in R focuses on statistical methods that are widely applicable in forestry and environmental sciences, but it also includes material that is of wider interest. Features: Describes the theory and applications of selected statistical methods and illustrates their use and basic concepts.

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Biometrical and Ecological Data from a Netherlands Population of Anguis fragilis Reptilia - Sauria - Anguidae

Environmental data analysis will find this invaluable as will practicing data analysts and environmental scientists. Computer code, and additional material. Serves as an overview of methods for analyzing environmental data, examples. Features extensive exercises, enabling use as a course text. Includes examples of SAS computer code.

Takes a data-oriented approach to describing the various methods. Illustrates the methods with real-world examples through exercises, enabling use as a course text. Creative use of examples allows readers to understand the concepts and apply the methods with their own data. Lot of additional material is available at www.biobook.org. The book is aimed at students and researchers in forestry and environmental studies, but it will also be of interest to statisticians and researchers in other fields as well.

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Analyzing Environmental Data - Walter W. Piegonor - 2005-03-04
Environmental statistics is a rapidly growing field, supported by advances in digital computing power, automated data collection systems, and interactive, linkable Internet software. Concerns over public and ecological health and the continuing need to support environmental policy-making and regulation have driven a concurrent explosion in environmental data analysis. This textbook is designed to address the need for trained professionals in this area. The book is based on a course which the authors have taught for many years, and prepares students for careers in environmental data analysis centered on statistics and allied quantitative methods of data evaluation. The text extends beyond the introductory level, allowing students and environmental science practitioners to develop the expertise to design and perform sophisticated environmental data analyses. In particular, it: Provides a coherent introduction to intermediate and advanced methods for modeling and analyzing environmental data. Takes a data-oriented approach to describing the various methods. Illustrates the methods with real-world examples through exercises, enabling use as a course text. Creative use of examples allows readers to understand the concepts and apply the methods with their own data. Lot of additional material is available at www.biobook.org. The book is aimed at students and researchers in forestry and environmental studies, but it will also be of interest to statisticians and researchers in other fields as well.

Multivariate Analysis of Ecological Data using CANOCO 5 - Petr Šmilauer - 2014-04-17
This revised and updated edition focuses on constrained ordination (RDA, CCA), variation partitioning and the use of permutation tests of statistical hypotheses about multivariate data. Both classification and modern regression methods (CLM, GAM, loess) are reviewed and species functional traits and spatial structures analysed. Nine case studies of varying difficulty help to illustrate the suggested analytical methods, using the latest version of Canoco 5. All studies utilise descriptive and manipulative approaches, and are supported by data sets and project files available from the book website: http://regent.prf.jcu.cz/maed2/. Written primarily for community ecologists needing to analyze data resulting from field observations and experiments, this book is a valuable resource to students and researchers dealing with both simple and complex ecological problems, such as the variation of biotic communities with environmental conditions or their response to experimental manipulation.

Handbook of Environmental and Ecological Statistics - Alan E. Gelfand - 2017-09-15
This handbook focuses on the enormous literature applying statistical methodology and modelling to environmental processes. The 21st century statistics community has become increasingly interdisciplinary, bringing a large collection of modern tools to all areas of application in environmental processes. In addition, the environmental community has substantially increased its scope of data collection including observational data, satellite-derived data, and computer model output. The resultant impact in this latter community has been substantial; no longer are simple regression and analysis of variance methods adequate. The contribution of this handbook is to assemble a state-of-the-art view of this interface. Features: An internationally regarded editorial team. A distinguished collection of contributors. A thoroughly contemporary treatment of a substantial interdisciplinary interface. Written to engage both statisticians as well as quantitative environmental researchers. 34 chapters covering methodology, ecological processes, environmental exposure, and statistical methods in climate science.

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Handbook of Spatial Point-Pattern Analysis in Ecology - Thorsten Wiegand - 2013-12-20
Understand How to Analyze and Interpret Information in Ecological Point PatternsAlthough numerous statistical methods for analyzing spatial point patterns have been available for several decades, they haven’t been extensively applied in the ecological context. Addressing this gap, Handbook of Spatial Point-Pattern Analysis in Ecology shows how the t
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Camera Traps in Animal Ecology - Allan F. O’Connell - 2010-10-05
Remote photography and infrared sensors are widely used in the sampling of wildlife populations worldwide, especially for cryptic or elusive species. Guiding the practitioner through the entire process of using camera traps, this book is the first to compile state-of-the-art sampling techniques for the purpose of conducting high-quality science or effective management. Chapters on the evaluation of equipment, field sampling designs, and data analysis methods provide a coherent framework for making inferences about the abundance, species richness, and occupancy of sampled animals. The book introduces new models that will revolutionize use of camera data to estimate population density, such as the newly developed spatial capture-recapture models. It also includes richly detailed case studies of camera trap work on some of the world’s most charismatic, elusive, and endangered wildlife species. Indispensable to wildlife conservationists, ecologists, biologists, and conservation agencies around the world, the text provides a thorough review of the subject as well as a forecast for the use of remote photography in natural resource conservation over the next few decades.

Models for Ecological Data - James S. Clark - 2020-10-06
The environmental sciences are undergoing a revolution in the use of models and data. Facing ecological data sets of unprecedented size and complexity, environmental scientists are struggling to understand and exploit powerful new statistical tools for making sense of ecological processes. In Models for Ecological Data, James Clark introduces ecologists to these modern methods in modeling and computation. Assuming only basic courses in calculus and statistics, the text introduces readers to basic maximum likelihood and then works up to more advanced Bayesian modeling and computation. Clark covers both classical statistical approaches and powerful new computational tools and describes how complexity can motivate a shift from classical to Bayesian methods. Through an available lab manual, the book introduces readers to the practical work of data modeling and computation in the language R. Based on a successful course at Duke University and National Science Foundation-funded institutes on hierarchical modeling, Models for Ecological Data will enable ecologists and other environmental scientists to develop useful models that make sense of ecological data. Consistent treatment from classical to modern Bayesian Underlying distribution theory to algorithm development Many examples and applications Does not assume statistical background Extensive supporting appendices Lab manual in R is available separately

Population Ecology in Practice - Brett K. Sandercock - 2020-02-10
A synthesis of contemporary analytical and modeling approaches in population ecology The book provides an overview of the key analytical approaches that are currently used in demographic, genetic, and spatial analyses in population ecology. The chapters present current problems, introduce advances in analytical methods and models, and demonstrate the applications of quantitative methods to ecological data. The book covers new tools for designing robust field studies; estimation of abundance and demographic rates; matrix population models and analyses of population dynamics; and current approaches for genetic and spatial analysis. Each chapter is illustrated by empirical examples based on real datasets, with a companion website that offers online exercises and examples of computer code in the R statistical software platform. Fills a niche for a book that emphasizes applied aspects of population analysis Covers many of the current methods being used to analyse population dynamics and structure Illustrates the application of specific analytical methods through worked examples based on real datasets Offers readers the opportunity to work through examples or adapt the routines to their own datasets using computer code in the R statistical platform Population Ecology in Practice is an excellent book for upper-level undergraduate and graduate students taking courses in population ecology or ecological statistics, as well as established researchers needing a desktop reference for contemporary methods used to develop robust population assessments.

Bringing Bayesian Models to Life - Mevin B. Hooten - 2019-05-15
Bringing Bayesian Models to Life empowers the reader to extend, enhance, and implement statistical models for ecological and environmental data analysis. We open the black box and show the reader how to connect modern statistical models to computer algorithms. These algorithms allow the user to fit models that answer their scientific questions without needing to rely on automated Bayesian software. We show how to handcraft statistical models that are useful in ecological and environmental science including: linear and generalized linear models, spatial and time series models, occupancy and capture-recapture models, animal movement models, spatio-temporal models, and integrated population-models. Features: R code implementing algorithms to fit Bayesian models using real and simulated data examples. A comprehensive review of statistical models commonly used in ecological and environmental science. Overview of Bayesian computational methods such as importance sampling, MCMC, and HMC. Derivations of the necessary components to construct statistical algorithms from scratch. Bringing Bayesian Models to Life contains a comprehensive treatment of models and associated algorithms for fitting the models to data. We provide detailed and annotated R code in each chapter and apply it to fit each model we present to either real or simulated data for instructional purposes. Our code shows how to create every result that we demonstrate and the user should be able to use the code to test or modify the analyses on their own. We provide all code and data in an organized set of directories available at the authors’ websites.
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Bayesian Data Analysis in Ecology Using Linear Models with R, BUGS, and Stan examines the Bayesian and frequentist methods of conducting data analyses. The book provides the theoretical background in an easy-to-understand approach, encouraging readers to examine the processes that generated their data. Including discussions of model selection, model checking, and multi-model inference, the book also uses effect plots that allow us to interpret probabilities from data. Bayesian Data Analysis in Ecology Using Linear Models with R, BUGS, and Stan introduces Bayesian software, using R for the simple models, and flexible Bayesian software (BUGS and Stan) for the more complicated ones. Guiding the reader from easy toward more complex (real) data analyses in a step-by-step manner, the book presents problems and solutions—including all R codes—that are most often applicable to other data and questions, making it an invaluable resource for analyzing a variety of data types. Introduces Bayesian data analysis, allowing users to obtain uncertainty measurements easily for any derived parameter of interest within a step-by-step approach that allows for eased understanding by non-statisticians. Includes a companion website containing R-code to help users conduct Bayesian data analyses on their own data, all example data as well as additional functions are provided in the R-package brmco.

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Ecodical Models and Data in R - Benjamin M. Bolker - 2008-07-01
Ecodical Models and Data in R is the first truly practical introduction to modern statistical methods for ecology. In step-by-step detail, the book teaches ecology graduate students and researchers everything they need to know in order to use maximum likelihood, information-theoretic, and Bayesian techniques to analyze their own data using the programming language R. Drawing on extensive experience teaching these techniques to graduate students in ecology, Benjamin Bolker shows how to choose among and construct statistical models for data, estimate their parameters and confidence limits, and interpret the results. The book also covers statistical frameworks, the philosophy of statistical modeling, and critical mathematical functions and probability distributions. It requires no programming background—only basic calculus and statistics. Practical, beginner-friendly introduction to modern statistical techniques for ecology using the programming language R Step-by-step instructions for fitting models to messy, real-world data Balanced view of different statistical approaches Wide coverage of techniques—from simple (distribution fitting) to complex (state-space modeling) Techniques for data manipulation and graphical display Companion Web site with data and R code for all examples

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Spatial Analysis - Marie-Josée Fortin - 2005-04-21
The spatial and temporal dimensions of ecological phenomena have always been inherent in the conceptual framework of ecology, but only recently have they been incorporated explicitly into ecological theory, sampling design, experimental design and models. Statistical techniques for spatial analysis of ecological data are burgeoning and many ecologists are unfamiliar with what is available and how the techniques should be used correctly. This book gives an overview of the wide range of spatial statistics available to analyze ecological data, and provides advice and guidance for graduate students and practising researchers who are either about to embark on spatial analysis in ecological studies or who have started but are unsure how to proceed. Only a basic understanding of statistics is assumed and many schematic illustrations are given to complement or replace mathematical technicalities, making the book accessible to ecologists wishing to enter this important and fast-growing field for the first time.

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Ecological Statistics - Gordon A. Fox - 2015-01-29
The application and interpretation of statistics are central to ecological study and practice. Ecologists are now asking more sophisticated questions than in the past. These new questions, together with the continued growth of computing power and the availability of new software, have created a new generation of statistical techniques. These have resulted in major recent developments in both our understanding and practice of ecological statistics. This novel book synthesizes a number of these changes, addressing key approaches and issues that tend to be overlooked in other books such as missing/censored data, correlation structure of data, heterogeneous data, and complex causal relationships. These issues characterize a large proportion of ecological data, but most ecologists' training in traditional statistics simply does not provide them with adequate preparation to handle the associated challenges. Uniquely, Ecological Statistics highlights the underlying links among many statistical approaches that attempt to tackle these in particular, it gives readers an introduction to approaches to inference, likelihoods, generalized linear (mixed) models, spatially or phylogenetically-structured data, and data synthesis, with a strong emphasis on conceptual understanding and subsequent application to data analysis. Written by a
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Introduction to Ecological Sampling - Bryan F.J. Manly - 2014-10-20

An Easy-to-Understand Treatment of Ecological Sampling Methods and Data Analysis Including only the necessary mathematical derivations, Introduction to Ecological Sampling shows how to use sampling procedures for ecological and environmental studies. It incorporates both traditional sampling methods and recent developments in environmental and ecological sampling methods. After an introduction, the book presents standard sampling methods and analyses. Subsequent chapters delve into specialized topics written by well-known researchers. These chapters cover adaptive sampling methods, line transect sampling, removal and change-in-ratio methods, plotless sampling, mark-recapture sampling of closed and open populations, occupancy models, sampling designs for environmental modeling, and trend analysis. The book explains the methods as simply as possible, keeping equations and their derivations to a minimum. It provides references to important, more advanced sampling methods and analyses that directs readers to computer programs that can be used to perform the analyses. Accessible to biologists, the text only assumes a basic knowledge of statistical methods. It is suitable for an introductory course on methods for collecting and analyzing ecological and environmental data.

Bird Ecology and Conservation - William J. Sutherland - 2004-06-17

The aim of this book is to outline the main methods and techniques available to ornithologists. A general shortage of information about available techniques is greatly hindering progress in avian ecology and conservation. Currently, this sort of information is disparate and difficult to locate with much of it widely dispersed in books, journals and grey literature. Sutherland and his editorial team bring together in a single authoritative source all the ornithological techniques the avian community will ever need. For use by graduate students, researchers and practising conservationists worldwide. Bird Ecology and Conservation is the first title in a new series of practical handbooks which include titles focusing on specific taxonomic groups as well as those describing broader themes and subjects. The series editor is William J. Sutherland.

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Handbook of Spatial Epidemiology - Andrew B. Lawson - 2016-04-06

Handbook of Spatial Epidemiology explains how to model epidemiological problems and improve inference about disease etiology from a geographical perspective. Top epidemiologists, geographers, and statisticians share interdisciplinary viewpoints on analyzing spatial data and spatial–time variations in disease incidences. These analyses can provide important information that leads to better decision making in public health. The first part of the book addresses general issues related to epidemiology, GIS, environmental studies, clustering, and ecological analysis. The second part presents basic statistical methods used in spatial epidemiology, including fundamental likelihood principles, Bayesian methods, and testing and nonparametric approaches. With a focus on special methods, the third part describes geostatistical models, spatial, point process, regression, focused clustering, mixtures, multivariate methods, and much more. The final part examines special problems and application areas, such as residential history analysis, segregation, health services research, health surveys, infectious disease, veterinary topics, and health surveillance and clustering. Spatial epidemiology, also known as disease mapping, studies the geographical or spatial distribution of health outcomes. This handbook offers a wide-ranging overview of state-of-the-art approaches to determine the relationships between health and various risk factors, empowering researchers and policy makers to tackle public health problems.

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Biometrics - Midori Albert - 2011-04-04

Biometrics-Unique and Diverse Applications in Nature, Science, and Technology provides a unique sampling of the diverse ways in which biometrics is integrated into our lives and our technology. From time immemorial, we as humans have been intrigued by, perplexed by, and entertained by observing and analyzing ourselves and the natural world around us. Science and technology have evolved to a point where we can empirically record a measure of a biological or behavioral feature and use it for recognizing patterns, trends, and or discrete phenomena, such as individuals' and this is what biometrics is all about. Understanding some of the ways in which we use biometrics and for what specific purposes is what this book is all about.

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**Statistical Ecology** - Linda J. Young - 2013-04-17
Covers a wide range of disciplines, this book explains the formulae, techniques, and methods used in field ecology. By providing an awareness of the statistical foundation for existing methods, the book will make biologists more aware of the strengths and possible weaknesses of procedures employed, and statisticians more appreciative of the needs of the field ecologist. Unique to this book is a focus on ecological data for single-species populations, from sampling through modeling. Examples come from real situations in pest management, forestry, wildlife biology, plant protection, and environmental studies, as well as from classical ecology. All those using this book will acquire a strong foundation in the statistical methods of modern ecological research. This textbook is for late undergraduate and graduate students, and for professionals.

**Hierarchical Modeling and Inference in Ecology** - J. Andrew Royle - 2008-10-15
A guide to data collection, modeling and inference strategies for biological survey data using Bayesian and classical statistical methods. This book describes a general and flexible framework for modeling and inference in ecological systems based on hierarchical models, with a strict focus on the use of probability models and parametric inference. Hierarchical models represent a paradigm shift in the application of statistics to ecological inference problems because they combine explicit models of ecological system structure or dynamics with models of how ecological systems are observed. The principles of hierarchical modeling are developed and applied to problems in population, metapopulation, community, and metacommunity systems. The book provides the first synthetic treatment of many recent methodological advances in ecological modeling and unifies disparate methods and procedures. The authors apply principles of hierarchical modeling to ecological problems, including * occurrence or occupancy models for estimating species distribution * abundance models based on many sampling protocols, including distance sampling * capture-recapture models with individual effects * regression capture-recapture models based on camera trapping and related methods * population and metapopulation dynamic models * models of biodiversity, community structure and dynamics * Wide variety of examples involving many taxa (birds, amphibians, mammals, insects, plants) * Development of classical, likelihood-based procedures for inference, as well as Bayesian methods of analysis * Detailed explanations describing the implementation of hierarchical models using freely available software such as R and WinBUGS * Computing support in technical appendices in an online companion web site

**Applied Hierarchical Modeling in Ecology: Analysis of Distribution, Abundance and Species Richness in R and BUGS** - Marc Kery - 2020-10-10
Applied Hierarchical Modeling in Ecology: Analysis of Distribution, Abundance and Species Richness in R and BUGS, Volume Two: Dynamic and Advanced Models provides a synthesis of the state-of-the-art in hierarchical models for plant and animal distribution, also focusing on the complex and more advanced models currently available. The book explains all procedures in the context of hierarchical models that represent a unified approach to ecological research, from calculating the reader through design, through data collection, and into analyses using a very powerful way of synthesizing data. Makes ecological modeling accessible to people who are struggling to use complex or advanced modeling programs Synthesizes current ecological models and explains how they are interconnected Contains numerous examples throughout the book, walking the reader through scenarios with both real and simulated data Provides an ideal resource for ecologists working in R software and in BUGS software for more flexible Bayesian analyses

**Spatial Data Analysis in Ecology and Agriculture Using R** - Richard E. Plant - 2018-12-07
Key features: Unique in its combination of serving as an introduction to spatial statistics and to modeling agricultural and ecological data using R Provides exercises in each chapter to facilitate the book's use as a course textbook or for self-study Adds new material on generalized additive models, point pattern analysis, and new methods of Bayesian analysis of spatial data. Includes a completely revised chapter on the analysis of spatiotemporal data featuring new and introduced software and methods Updates its coverage of R software including newly introduced packages Spatial Data Analysis in Ecology and Agriculture Using R, 2nd Edition provides practical instruction on the use of the R programming language to analyze spatial data arising from research in ecology, agriculture, and environmental science. Readers have praised the book's practical coverage of spatial statistics, real-world examples, and user-friendly approach in presenting and explaining R code, aspects maintained in this updated edition. Using data sets from cultivated and uncultivated ecosystems, the book guides the reader through the analysis of each data set, including setting research objectives, designing the sampling plan, data quality control, exploratory and confirmatory data analysis, and drawing scientific conclusions. Additional material to accompany the book, on both analyzing satellite data and on multivariate analysis, can be accessed at https://www.plantsciences.ucdavis.edu/plant/additionaltips.htm.

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Biometry for Forestry and Environmental Data - Lauri Mehtatalo - 2020-05-27
Biometry for Forestry and Environmental Data with Examples in R focuses on statistical methods that are widely applicable in forestry and environmental sciences, but it also includes material that is of wider interest. Features: describes the theory and applications of selected statistical methods and illustrates their use and basic concepts through examples with forestry and environmental data in R. Rigorous but easily accessible presentation of the linear, nonlinear, generalized linear and multivariate models, and their mixed-effects counterparts. Chapters on tree size, tree taper, measurement errors, and forest experiments are also included. - Necessary statistical theory about random variables, estimation and prediction is included. The wide applicability of the linear prediction theory is emphasized. - The hands-on examples with implementations using R make it easier for non-statisticians to understand the concepts and apply the methods with their own data. Lot of additional material is available at www.biombook.org. The book is aimed at students and researchers in forestry and environmental studies, but it will also be of interest to statisticians and researchers in other fields as well.

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Biometric Recognition - National Research Council - 2010-12-12
Biometric recognition--the automated recognition of individuals based on their behavioral and biological characteristics--is promoted as a way to help identify terrorists, provide better control of access to physical facilities and financial accounts, and increase the efficiency of access to services and their utilization. Biometric recognition has been applied to identification of criminals, patient tracking in medical informatics, and the personalization of social services, among other things. In spite of substantial effort, however, there remain unresolved questions about the effectiveness and management of systems for biometric recognition, as well as the appropriateness and societal impact of their use. Moreover, the potential public has been exposed to biometrics mainly as high-technology gadgets in spy thrillers or as fear-instilling instruments of state or corporate surveillance in speculative fiction. Now, as biometric technologies appear poised for broader use, increased concerns about national security and the tracking of individuals as they cross borders have caused passports, visas, and border-crossing records to be linked to biometric data. A focus on fighting insurgencies and terrorism has led to the military deployment of biometric tools to enable recognition of individuals as friend or foe. Commercially, finger-image-sensing devices, whose cost and physical size have been reduced, now appear on many laptop personal computers, handheld devices, mobile phones, and other consumer devices. Biometric Recognition: Challenges and Opportunities addresses the issues surrounding broader implementation of this technology, making two main points: first, biometric recognition systems are incredibly complex, and need to be addressed as such. Second, biometric recognition is an inherently probabilistic endeavor. Consequently, even when the technology and the system in which it is embedded are behaving as designed, there is inevitable uncertainty and risk of error. This book elaborates on these themes in detail to provide policy makers, developers, and researchers a comprehensive assessment of biometric recognition that examines current capabilities, future possibilities, and the role of government in technology and system development.

Biometrics in a Data Driven World - Sinjini Mitra - 2016-12-01
Biometrics in a Data Driven World: Trends, Technologies, and Challenges aims to inform readers about the modern applications of biometrics in the context of a data-driven society, to familiarize them with the rich history of biometrics, and to provide them with a glimpse into the future of biometrics. The first section of the book discusses the fundamentals of biometrics and provides an overview of common biometric modalities, namely face, fingerprints, iris, and voice. It also discusses the history of the field, and provides an overview of emerging trends and new introductions to the way biometric data is acquired and used. The next part of the book is dedicated to the discussion of case studies of biometric modalities currently used on mobile applications. As smartphones and tablet computers are rapidly becoming the dominant consumer computer platforms, biometric-based authentication is emerging as an integral part of protecting mobile devices against unauthorized access, while enabling new and highly popular applications, such as secure online payment authorization. The book concludes with a discussion of future trends and advances, theories in the field of biometrics, which will pave the way for advancing research in the area of biometrics, and for the deployment of biometric technologies in real-world applications. The book is designed for individuals interested in exploring the contemporary applications of biometrics, from students to researchers and practitioners working in this field. Both undergraduate and graduate students enrolled in college-level security courses will also find this book to be an especially useful companion.

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**Quantitative Analyses in Wildlife Science** - Leonard A. Brennan - 2019-09-10

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**Introduction to Hierarchical Bayesian Modeling for Ecological Data** - Eric Parent - 2012-08-21

Making statistical modeling and inference more accessible to ecologists and related scientists, Introduction to Hierarchical Bayesian Modeling for Ecological Data gives readers a flexible and effective framework to learn about complex ecological processes from various sources of data. It also helps readers get started on building their own models.

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**Population Ecology of the Mallard** - 1976

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**Second Workshop on Enhancement Capacity in Applied Biometrics in East and Southern Africa** -

**Analyzing Environmental Data** - Walter W. Piegrorsch - 2003-06-10

Environmental statistics is a rapidly growing field, supported by advances in digital computing power, automated data collection systems, and interactive, linkable Internet software. Concerns over public and ecological health and the continuing need to support environmental policy-making and regulation have driven a concurrent explosion in environmental data analysis. This textbook is designed to address the need for trained professionals in this area. The book is based on a course which the authors have taught for many years, and prepares students for careers in environmental analysis centered on statistics and allied quantitative methods of data evaluation. The text extends beyond the introductory level, allowing students and environmental science practitioners to develop the expertise to design and perform sophisticated environmental data analyses. In particular, it: Provides a coherent introduction to intermediate and advanced methods for modeling and analyzing environmental data. Takes a data-oriented approach to describing the various methods. Illustrates the methods with real-world examples. Features extensive exercises, enabling use as a course text. Includes examples of SAS computer code for implementation of the statistical methods. Connects to a Web site featuring solutions to exercises, extra computer code, and additional material. Serves as an overview of methods for analyzing environmental data, enabling use as a reference text for environmental science professionals. Graduate students of statistics studying environmental data analysis will find this invaluable as will practicing data analysts and environmental scientists including specialists in atmospheric science, biology and biomedicine, chemistry, ecology, environmental health, geography, and geology.

**Ecolgical Methods** - Peter A. Henderson - 2016-04-04

4th edition of this classic Eclogy text Computational methods have largely been replaced by descriptions of the available software. Includes procedure information for R software and other freely available software systems. Now includes web references for environment, software and detailed methodologies.

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**Ecological Census Techniques** - William J. Sutherland - 2006-08-03

This is an updated version of the best selling first edition, Ecological Census Techniques, with updating, some new chapters and authors. Almost all ecological and conservation work involves carrying out a census. This practically focussed book describes how to plan a census, the practical details and shows with worked examples how to analyse the results. The first three chapters describe planning, sampling and the basic theory necessary for carrying out a census. In the subsequent chapters international experts describe the appropriate methods for counting plants, insects, fish, amphibians, reptiles, mammals and birds. As many censuses also relate the results to environmental variability, there is a chapter explaining the main methods. Finally, there is a list of the most common mistakes encountered when carrying out a census.

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**Handbook of Markov Chain Monte Carlo** - Steve Brooks - 2011-05-10

Since their popularization in the 1990s, Markov chain Monte Carlo (MCMC) methods have revolutionized statistical computing and have had an especially profound impact on the practice of Bayesian statistics. Furthermore, MCMC methods have enabled the development and use of intricate models in an astonishing array of disciplines as diverse as fisherie.

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This book discusses advanced statistical methods that can be used to analyse ecological data. Most environmental collected data are measured repeatedly over time, or space and this requires the use of GLMM or GAMM methods. The book starts by revising regression, additive modelling, GAM and GLM, and then discusses dealing with spatial or temporal dependencies and nested data.

Mixed Effects Models and Extensions in Ecology with R - Alain Zuur - 2009-03-05

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Multivariate Analysis of Ecological Data with ade4 - Jean Thioulouse - 2018-11-08

This book introduces the ade4 package for R which provides multivariate methods for the analysis of ecological data. It is implemented around the mathematical concept of the duality diagram, and provides a unified framework for multivariate analysis. The authors offer a detailed presentation of the theoretical framework of the duality diagram and also of its application to real-world ecological problems. These two goals may seem contradictory, as they concern two separate groups of scientists, namely statisticians and ecologists. However, statistical ecology has become a scientific discipline of its own, and the good use of multivariate data analysis methods by ecologists implies a fair knowledge of the mathematical properties of these methods. The organization of the book is based on ecological questions, but these questions correspond to particular classes of data analysis methods. The first chapters present both usual and multiway data analysis methods. Further chapters are dedicated for example to the analysis of spatial data, of phylogenetic structures, and of biodiversity patterns. One chapter deals with multivariate data analysis graphs. In each chapter, the basic mathematical definitions of the methods and the outputs of the R functions available in ade4 are detailed in two different boxes. The text of the book itself can be read independently from these boxes. Thus the book offers the opportunity to find information about the ecological situation from which a question raises alongside the mathematical properties of methods that can be applied to answer this question, as well as the details of software outputs. Each example and all the graphs in this book come with executable R code.

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Security and authentication issues are surging to the forefront of the research realm in global society. As technology continues to evolve, individuals are finding it easier to infiltrate various forums and facilities where they can illegally obtain information and access. By implementing biometric authentications to these forums, users are able to prevent attacks on their privacy and security. Biometrics: Concepts, Methodologies, Tools, and Applications is a multi-volume publication highlighting critical topics related to access control, user identification, and surveillance technologies. Featuring emergent research on the issues and challenges in security and privacy, various forms of user authentication, biometric applications to image processing and computer vision, and security applications within the field, this publication is an ideal reference source for researchers, engineers, technology developers, students, and security specialists.


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