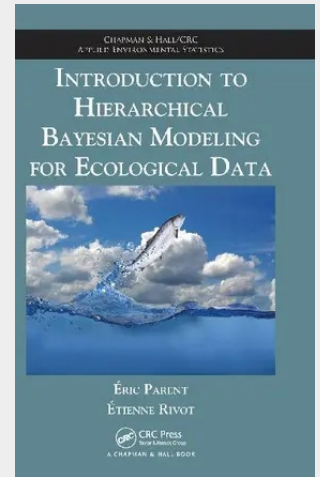


Introduction to Hierarchical Bayesian Modeling for Ecological Data

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 statistical models. The text begins with simple models that progressively become more complex and realistic through explanatory covariates and intermediate hidden states variables. When fitting the models to data, the authors gradually present the concepts and techniques of the Bayesian paradigm from a practical point of view using real case studies. They emphasize how hierarchical Bayesian modeling supports multidimensional models involving complex interactions between parameters and latent variables. Data sets, exercises, and R and WinBUGS codes are available on the authors' website. This book shows how Bayesian statistical modeling provides an intuitive way to organize data, test ideas, investigate competing hypotheses, and assess degrees of confidence of predictions. It also illustrates how conditional reasoning can dismantle a complex reality into more understandable pieces. As conditional reasoning is intimately linked with Bayesian thinking, considering hierarchical models within the Bayesian setting offers a unified and coherent framework for modeling, estimation, and prediction.

Bayesian statistics are becoming the contemporary standard for treating ecological data. This book is designed for readers who are interested in the quantitative analysis of environmental data yet reluctant to apply ready-made technical recipes without understanding how and why they work. It focuses on up-to-date ecological issues, including biodiversity, community behavior, and genomics, and shows how they could be revisited by using Bayesian modeling techniques. Highly practical, the text encourages readers to deal with advanced ecological issues in practice and to implement models of their own.



207,70 €

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Lieferfrist: bis zu 10 Tage

Artikelnummer: 9781584889199

Medium: Buch

ISBN: 978-1-58488-919-9

Verlag: Chapman and Hall/CRC

Erscheinungstermin: 21.08.2012

Sprache(n): Englisch

Auflage: 1. Auflage 2012

Serie: Chapman & Hall/CRC Applied Environmental Statistics

Produktform: Gebunden

Gewicht: 804 g

Seiten: 432

Format (B x H): 161 x 240 mm

