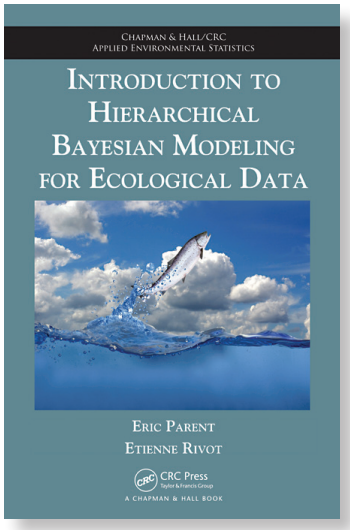
Introduction to Hierarchical Bayesian Modeling for Ecological Data



Making statistical modeling and inference more accessible to ecologists and related scientists, this book gives readers a flexible and effective framework to learn about complex ecological processes from various sources of data. It 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. Data sets, exercises, and R and WinBUGS codes are available on the authors' website.

Features

- Explains how to design models for analyzing ecological data
- Illustrates how the hierarchical Bayesian modeling framework can overcome difficulties associated with classical statistical modeling toolboxes
- Uses real data drawn from fish population studies
- Includes many data sets, exercises, and R and WinBUGS codes on the authors' website www.hbm-for-ecology.org

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I Basic Blocks of Bayesian Modeling: Bayesian Hierarchical Models in Statistical Ecology. The Beta-Binomial Model. The Basic Normal Model. Working with More Than One Beta-Binomial Element. Combining Various Sources of Information. The Normal Linear Model. Nonlinear Models for Stock-Recruitment Analysis. Getting beyond Regression Models. **II More Elaborate Hierarchical Structures:** HBM *I*: Borrowing Strength from Similar Units. HBM *II*: Piling up Simple Layers. HBM *III*: State-Space Modeling. Decision and Planning. Appendices. Bibliography. Index.

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