The fifth volume in the series Complexity in Ecological Systems, Ecology and Scale (Theory and Applications) is a proactive response to the confusion brought on by the emerging issue of scale-dependence in ecology. The book ably presents and formalizes how scale can contribute to complexity in ecological systems, and how this scale-dependency might be identified and dealt with.

Presently, most ecological studies address organismal-ecosystem interactions, which are studied over a broad range of temporal and spatial scales. Additionally, ecologists have found explanations for ecological patterns at spatial and temporal scales that range over several orders of magnitude in both aquatic and terrestrial systems. This suggests that scale is a new frontier in ecology, one which will force researchers to reexamine how scale-dependence may allow a reinterpretation of past results and influence the design of future ecological experiments.

In many ecological studies, the scale at which natural heterogeneity occurs is often overwhelmed or left underappreciated, because the study was conducted at an inappropriate scale. This can lead to conclusions that are specific to one site and offer little opportunity for further interpretation. Further, for ecological studies conducted at multiple scales, there are few formalized structures in place to separate out scale dependence into basic levels or mechanisms. Moreover, there is no way of proving that one separation or delineation of levels, based on differences in scale, is more valid than another. This leaves scientists to draw conclusions from plausible, though largely heuristic, explanatory models.

The editors have organized the chapters into four sections, each section built from chapters that draw on the expertise of workers who have much practical experience in their subject. Part 1 discusses the detection and analysis of spatial patterning and how it may be used to reveal underlying, scale-dependent processes. Part 2 offers models adaptable to the interpretation of multiple-scale ecological phenomena, concluding with an interesting chapter that addresses upscaling data over a scale continuum. A fairly rigorous treatment of inferential procedures is presented in Part 3. These chapters cover the adaptation and application of statistical procedures to interpretation of ecological phenomena over a scale continuum. The authors of Part 4 suggest approaches to how one might incorporate consideration of scale-dependence into the arena of developing policy and managing resources.

This book defines issues brought on by differences in scale and level and provides a general, though well-referenced, methodological basis for addressing both qualitative and quantitative approaches to the definition and interpretation of scale dependence in ecological systems. Some of the early chapters tend toward the abstract. However, solid examples are used throughout, illustrating points that are by nature subjectively defined. The organization of material in this book suggests reading the book as a whole. This volume is richly referenced, allowing readers to further investigate the material presented.

Maraca: The Biodiversity and Environment of an Amazon Rainforest

Several countries in the tropics have set up field stations within biologically diverse ecosystems and initiated efforts to study and inventory both flora and fauna. Brazil was the Ilha de Maraca, a reserve set up by the federal government of Brazil. Maraca, a riverine island of about 101,000 ha, is situated in the state of Roraima in the northern Brazilian border, in the Guiana Shield Basin, with a transitional climate that promotes a mosaic of rainforests and local variations in soil and topography. The island is a mix of riverine, wetland, and terra firme forests.

The island was set up as an ecological reserve by the environmental secretariat, SEMA (Secretaria de Meio Ambiente), which built a research station there. The island was chosen as an ecological reserve because it lacks the unique diversity and biogeography. It straddles the geographic regions of both the Guiana Shield and the Amazon Basin, with a transitional climate that promotes a mosaic of rainforests, and local variations in soil and topography promote a mix of riverine, wetland, and terra firme forests.

A comprehensive description for the Ilha de Maraca islands’ flora and fauna now exists because the book arose from a jointly sponsored project between the Instituto Nacional de Pesquisas da Amazônia and the environmental Society, London. The primary purpose of the project was to conduct a comprehensive ecological survey of the island.

The papers in the book are wide-ranging, with a concentration of topics on taxonomic surveys of both flora and fauna that were done by more than 101 scientists during a relatively brief time period from February 1987 until May 1988. The book is therefore precursory, hopefully setting up an information base for future, more comprehensive studies on the ecology of this area.

The introduction is informative, with strong accounts of the region’s geology, geomorphology, and climatology. The next section describes the vegetation. Both these sections provide nice overall accounts about the major variation across the island with useful maps depicting these variations. The following section provides a comprehensive list of faunal species, with maps and faunal descriptions. The book provides a laundry list of faunal descriptions, including bats, small mammals, birds, reptiles, and ending with the invertebrates (insects and non-insects). A noticeable absence in these accounts is any attempt at capturing the aquatic habitat and the fish.

The book is clearly suitable for the bookshelf of the special-interest, particularly those individuals interested in tropical science. It should be useful as a reference for scientists at the larger university libraries. But it is not a book that would be suitable for teaching, or even as a general reference. It is a book that is just too case specific.—M.S. ASHTON, Yale University, West Haven, CT 06511.