Recknagel, F. (ed.): **Ecological Informatics.** – Springer-Verlag, Berlin 2003. ISBN 3540434550. 397 pp., € 89.95, sFr 149.50, GBP 69.50 (Hardcover).

During the past ten years, the availability of new and powerful tools has had a significant impact on the field of ecological modelling. Among these, the availability of high performance computers and new approaches in computation is in the first place. Ecological modelling today covers a broad range of techniques, concepts, and fields of study, including for example models incorporating algal photosynthesis for prediction of chlorophyll and algal species succession in aquatic ecosystems. The book "Ecological Informatics" focuses on the computational approach for ecosystems analysis, synthesis, and forecasting. This interdisciplinary framework is sometimes called “biologically-inspired computation” and uses advanced computational technology for elucidation of principles of information processing at all levels of complexity of ecosystems and their dynamics. The rapid progress in computation techniques allows analysis of complex multivariate databases, improves ecosystem theory, and provides support for decisions targeting ecological sustainability, biodiversity, and global warming.

The book is an outcome of the International Conference on Applications of Machine Learning to Ecological Modelling held in Australia in 2000. The text of the book is divided into five parts that provide an overview of the theory of ecological informatics together with detailed examples of case studies applying such theory to a variety of areas in ecology. Each part consists of several chapters that are based on selected papers of the conference; in total there are twenty chapters. The first part provides introduction to the computational methodology. Five chapters provide introduction to theory of fuzzy logic, knowledge-based modelling, artificial neural networks, genetic algorithms, evolutionary computation, and adaptive agents. The principles of these complex methods are well explained using very little mathematics. The application of these methods is demonstrated in ecotoxicology, population dynamics, analysis of multivariate data, and development of behaviour and prey-predator algorithms. The second part provides case studies for application of machine learning techniques to prediction of dynamics of stream ecosystems. Part three deals with analysis and prediction of riverine ecosystems. Here, examples of time series analysis of river quality by artificial neural networks and prediction of seasonal abundance and succession of different algal species are given. Part four deals with prediction of lake and marine ecosystems. Of particular interest to reader interested in algal photosynthesis are case studies comparing models of chlorophyll *a* estimation based on neural networks or multiple regression models, chapter describing generic artificial neural network model for dynamic predictions of algal abundance in freshwater lakes, and chapter describing predictive rules for phytoplankton dynamics in freshwater lakes by evolutionary algorithms. The final part of the book deals with classification of ecological images at micro and macro scales: here of interest is chapter on identification of marine microalgae in pulse cytometers by neural network analysis.

The book should be of appeal to audience who wishes to learn about modern modelling approaches in ecology and biology without going into detailed mathematics or computer code. It should not be missed by those interested in practical applications of ecological modelling in limnology or hydrology. Since the book is based on conference papers and because it lacks subject index, it cannot substitute exhaustive reference book or textbook of contemporary ecological informatics.

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