Seuront, L., Strutton, P.G. (ed.): **Scaling Methods in Aquatic Ecology: Measurement, Analysis, Simulation.** – CRC Press, Boca Raton 2004. ISBN 0-8493-1344-9. 600 pp., USD 129.95, GBP 87.00 (hardcover).

Anyone who has ever tried to apply analytical methods that work so well in the laboratory to processes occurring in dynamic ecosystems such as marine or freshwater environment had to ask questions of proper scaling and sampling strategy, in general how to deal with space and time. Analysis of very complex biological systems that are often driven by dynamic, nonlinear physical processes can be very intriguing or seemingly almost impossible. When random or chaotic inputs have cumulative effects on biological processes it is very important to properly scale measurement and data analysis in terms of time and space. Examples familiar to the reader of this journal can be studies of plant physiology and photosynthetic processes in particular under variable and fluctuating environment such as naturally occurring sunflecks in tree canopies or in turbulent algal suspensions. Our ability to understand such complex systems is determined by availability of proper instrumentation, by the chosen sampling frequency and by suitable data analysis. In addition, although technological progress and cheaper computers have recently allowed us to measure and observe processes occurring on dynamic scales that were unthinkable only several decades ago, these experiments can also produce increasingly huge and complex data sets that are often very difficult to analyze and interpret.

The book edited by Seuront and Strutton compiles a selection of papers by about eighty experts from the field of aquatic ecology that illustrate some of the recent advances toward understanding physical, biological, and chemical processes across multiple time and space scales. The book presents a broad range of data collection, data analysis, and innovative computer modeling and simulation techniques. These include imaging systems of different kinds and scaling methods to asses a broad range of spatial and temporal patterns and processes. All contributions deal in some way with aquatic ecology, both marine and freshwater, although from highly variable perspective – starting on microscopic level, describing the use of synchrotron radiation for microscopy of single algal cells, continuing through zooplankton mating patterns up to large scale physical processes in ocean basins.

The book is divided into three sections that are focused on measurements, analysis, and process simulation. Sections contain several chapters that are on average each 10-20 pages long. Individual chapters provide general introduction to given subject that is followed by example field or laboratory study.

The first section on measurement includes 11 chapters. Several of these chapters are dealing with question of proper selection of measurement techniques when studying such phenomena like microscale variability or patchiness in biological processes or in phytoplankton distribution. I found interesting the fractal-like microscale planktonic layers that have been recently in the focus of intense research. Another interesting and novel application is chapter on infrared microscopy of single algal cells. This technique can provide spatial information about nutrient pools or saccharide allocation within single algal cell. The 12 chapters of the section on analysis deal with nonlinear analysis of time series data and scaling approach to spatial variability. Reader can find information about nonlinear mathematical and statistical tools such as wavelet analysis or fractal characterization. Here I found interesting the chapter relating the patchiness of several biogeochemical parameters to the response time of underlying biological processes, with case study on ocean sea surface. There is also chapter that provides tutorial on rank-size analysis of phytoplankton distribution patterns. The 13 chapters of the section on simulation deal with ecological modelling. The introductory chapter overviews the development of appropriate spatially explicit ecological models. Consecutive chapters then deal in more detail with models of plankton dynamics in a heterogeneous environment or with pattern modeling of aquatic systems. Reader might find interesting information about modelling the effects of wind driven Langmuir circulation in surface waters on phytoplankton and chapters about mathematical tools used for analysis of turbulent structures and their impact on energy cost of planktonic organisms. Finally, there is an interesting chapter on modelling the dinoflagellate cell physiology in terms of complex adaptive system.

The graphic design of the book is very pleasing and the book abounds with many high quality colour plates. The text is accompanied with references to recent literature and the book contains detailed subject index.

The book is not a textbook that would guide the reader in a systematic, linear way through the covered subjects. More often its structure resembles some of the phenomena it describes – it might seem chaotic and not focused, subjects of chapters suddenly jumping from phytoplankton through copepods to complex mathematics of nonlinear flow dynamics. However, the book can serve well as a reference volume for experienced investigators seeking insight into new experimental approaches and data analysis. The book contains a wealth of information and new concepts that make it of importance to advanced reader in the field of aquatic ecology, including primary photosynthetic production.

O. PRÁŠIL (*Třeboň)*