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## LARGE MARINE ECOSYSTEMS

*Variability and Management of Large Marine Ecosystems.* K. Sherman and L.M. Alexander (Editors). AAAS Selected Symposia Series, 99. Westview Press, Boulder, CO, 1986. xxvi + 319 pp., US\$41.00. ISBN 0-8133-7145-7.

The book is based on the proceedings of the first symposium on the Variability and Management of Large Marine Ecosystems (LMEs) convened at the 1984 Annual Meeting of the American Association for the Advancement of Science. The participants were encouraged to synthesize the growing body of information concerned with means for measuring ecological changes and developing management options for LMEs, which were defined as regions with unique hydrographic regimes, submarine topography and trophically dependent populations. The papers brought together in this volume are mostly reviews supplied by extensive bibliographies.

The volume is arranged in three parts. The first two, introduced and concluded by K. Sherman, are ecological: one deals with the impacts of perturbations on the productivity of renewable resources in LMEs, the other one focusses on measuring variability in LMEs. The papers, which are mostly descriptive, contain a quantity of results of experimental research and case studies of marine ecosystems all over the world. There is some theorizing by J. Beddington, who discusses the extent to which changes produced by exploitation of ecosystems are reversible and suggests the multispecies mesoscale level of ecological modelling rather than the total-ecosystem or single-species models, and by A. Bakun, who treats the crucial time and space scales and advocates interregional comparative studies, observations of vertical distributions and application of statistical techniques.

The shorter third part, introduced by L. Alexander, considers the legal, economic, and strategic framework for managing LMEs. While the authors of the first two parts are mostly natural scientists — fishery biologists, oceanographers — the papers of the third part are by social scientists — specialists in law, economy, management. The interregional transnational aspects of LME's management are stressed. Discussing the question 'Can LMEs be managed for optimum yield?', F. Christy proves that the chief impediment to management is the political one of making decisions on the distribution of wealth. The book is closed by J. Byrne who surveys the perspective of LMEs and the future of ocean studies.

On the whole the volume will hardly be encouraging for environmental modellers. However, it gives a vivid outlook of natural variability of LMEs against a background of increasing anthropogenically induced perturbations

from overexploitation and pollution and might be really stimulative for fishery students and decision makers.

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## WETLAND MODELLING

*Wetland Modelling.* W.J. Mitsch, M. Straškraba and S.E. Jørgensen (Editors). *Developments in Environmental Modelling*, 12. Elsevier, Amsterdam, 1988. ix + 227 pp., Dfl. 185.00. ISBN 0-444-42936-0.

Until recently wetlands were treated by public opinion and decision-makers as waste territories needing radical transformation and reclamation. But, as increasing attention is being paid to nature, there has come the recognition of the ecological value of bogs, marshes, swamps and other types of wetlands. Rational management (in contrast to total annihilation) is not a simple problem. It needs a fine mathematical tool to make sure that the results will not be opposite to the ones desired. Wetland modelling is now in the stage of formation. Therefore, the attempts of the editors to make the first overview of the state of the art in modelling approaches and to elaborate principles of quantitative study of wetlands seem to be so important; in a sense they have succeeded in both.

The volume includes models for a wide variety of wetlands: northern bogs, coastal marshes, forested swamps, freshwater marshes and wet meadows, shallow reservoirs and lakes. This volume also presents several different approaches to modelling of wetlands, with emphasis on models focussed on wetland hydrology, models of biological productivity and biogeochemical cycles, models used to design and summarise large-scale research projects, and models used in wetland management.

Hydrology plays a leading role in functioning of wetlands; correspondingly, several chapters contain hydrological submodels, reflecting special features of case-study. A general conceptual model and process detail review is presented in Chapter 2 (M. Duever), which may be considered as a brief compact introduction to wetland hydrology. In Chapter 3 (G. Alexandrov) it is shown that hydrology can explain relations between a raised bog's relief and its diameter. Reproducing this effect within the framework of a mathematical model, the author reveals the self-organization processes leading to appearance of the 'dissipative structures' in raised mires.