APPLIED MATHEMATICAL ECOLOGY

Applied Mathematical Ecology. Simon A. Levin, Thomas G. Hallam and Louis J. Gross (Editors). Biomathematics, Vol. 18. Springer, Berlin, 1989, 491 pp. ISBN 3-540-19465-7.

What can mathematical ecology do for developing countries? This volume offers broad surveys of mathematical tools for understanding, prediction and control in the areas of resource management, epidemiology, ecotoxicology and population biology.

Resource management includes bioeconomics (Colin W. Clark), the conservation of natural resources (Robert McKelvey), and agricultural ecology (Marc Mangel). The basic models of mathematical epidemiology (Herbert W. Hethcote and Simon A. Levin) apply to measles (Joan L. Aron), parasitic helminths (Andrew P. Dobson), rubella (Herbert W. Hethcote), influenza (Wei-min Liu and Simon A. Levin), and human immunodeficiency virus (Carlos Castillo-Chavez, Robert M. May and Roy M. Anderson). Ecotoxicology models the fate of chemicals in aquatic environments (Robert V. Thomann) and aquatic populations (Thomas G. Hallam, Ray R. Lassiter and S.A.L.M. Kooijman), as well as in other environments. In population biology, structured models (Carlos Castillo-Chavez) apply to plant biology (Louis J. Gross), collective annuity funds like the Social Security system (John Impagliazzo), and laboratory populations of sheep blowfly (R.M. Nisbet, W.S.C. Gurney and J.A.J. Metz).

The surveys in this volume were presented in 1986 at the Second Autumn Course on Mathematical Ecology held at the International Centre for Theoretical Physics in Trieste. Almost all of the material in the book is available elsewhere, often in multiple places. This expository volume, well illustrated and with ample references, may be valuable for students who want to see concrete applications of mathematical ecology, as well as for research workers seeking surveys outside of their own speciality. Many of

the research papers that followed these introductory surveys at the Trieste meeting were published separately in *Mathematical Ecology: Proceedings Trieste 1986* (World Scientific Press, Singapore, 1988).

Among the 114 figures in the book, at least four compare directly quantitative observations with quantitative predictions of some mathematical model. Such figures are signs of real scientific and practical progress.

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