Ecological Dynamics of Tropical Inland Waters

Lakes and rivers of the tropics are rich with variety and human relevance, yet do not figure prominently in surveys of general freshwater biology and limnology. The fruits of their scientific exploration are largely embodied in regional and specialist descriptions and analyses. In this book the authors take a generalized view, on a world-wide scale, that is dynamic and quantitative in outlook. They set out to integrate events and processes under tropical conditions, not only geographically but also within a continuum of physics, chemistry and biology. The volume contains numerous illustrations and detailed documentation of literature. Together the two authors have gathered experience from several tropical countries over three to four decades. They provide a foundation that will be of value to all who work with tropical inland waters, with interests ranging from water quality to fisheries. The volume will also have an appeal to those researchers, teachers and students in limnology and freshwater biology everywhere who are curious about the tropical implication and application of their subject.

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Preface

This book has its origin in several ventures involving Franco-British collaboration over the past 30 years. One main focus was African shallow lakes, with intensive fieldwork during the late 1960s and early 1970s within the International Biological Programme and – later – a pan-African overview. Our fascination with tropical freshwater science developed from this and other experience in Africa.

We have felt, however, that regional experience and regional description have most reward when integrated into a generalized science. The stage then becomes the entire tropics and the specific a special case of the general. Such integration we have tried to provide here. The subject is developed using comparative examples. It is founded upon a resolution into fluxes and flux-interactions, using quantities of energy, water and chemical elements as 'common currencies'. Biological activities fit within, and participate in, these circulations. We then take up the consequences of time-variability at different frequencies and at various levels of organization. In the background is the question of tropical distinctiveness.

The book, is, therefore, organized around dynamic themes. We hope that it will be of value to those in tropical countries with scientific and practical interests in inland waters; also to those working at higher latitudes who would like to obtain a fuller perspective of their subject. For reference by both groups we have provided a detailed biography of the rather scattered literature.

Our venture has received help from numerous sources. Much early inspiration came from co-workers in the field, including our late colleagues Julian Rzóska and Leonard Beadle. We are grateful to others who have offered valuable comments and advice. They include Eddie Allison, Mary Burgis, Rob Hart, Xavier Lazzaro, Stephen Maberly, Jean Pagès, and Ed Tipping. Most of all, we have benefited from constructive criticism of the entire text by Geoffrey Fryer, Rosemary Lowe-McConnell and Roger Pourriot. Our two parent organizations, the Freshwater Biological Association (FBA) at Windermere and ORSTOM at Montpellier, have provided crucial support throughout. We are indebted to the FBA for use of its fine library facilities; from these much of the literature cited here can be obtained at moderate cost, under some conditions (excluding entire books), by photocopies supplied by post (the Document Delivery Service). Jack Talling is grateful to ORSTOM for financial support that enabled him to work at Montpellier. Also impor-

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