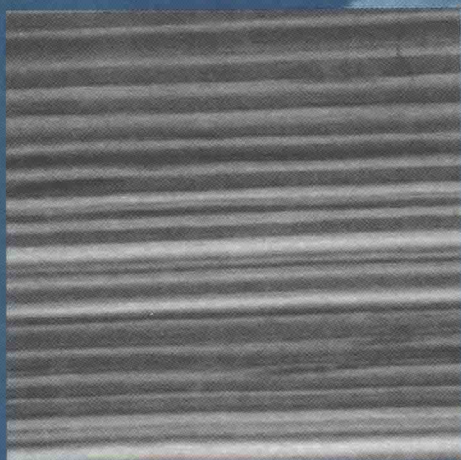


Tracking Environmental Change Using Lake Sediments

Volume 1

Basin Analysis, Coring, and
Chronological Techniques

Edited by
William M. Last and John P. Smol



Kluwer Academic Publishers

Tracking Environmental Change Using Lake Sediments Volume 1: Basin Analysis, Coring, and Chronological Techniques

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Tracking Environmental Change Using Lake Sediments.
Volume 1: Basin Analysis, Coring, and Chronological Techniques

Developments in Paleoenvironmental Research

VOLUME 1

DEDICATION

Dedicated to Prof. B. E. Berglund, whose edited volume *Handbook of Holocene Palaeoecology and Palaeohydrology* has guided researchers for over 15 years.

PREFACE

The explosive growth of paleolimnology over the past two decades has provided impetus for the publication of this series of monographs detailing the numerous advances and new techniques being applied to the interpretation of lake histories. This is the first volume in the series and deals mainly with the acquisition and archiving of cores, chronological techniques, and large-scale basin analysis methods. Volume 2 (Last & Smol, 2001) examines the physical and geochemical parameters and methods; Volumes 3 and 4 (Smol et al., 2001a, b) provide a comprehensive overview of the many biological techniques that are used in paleolimnology. A fifth volume that is currently being prepared (Birks et al., in preparation) examines statistical and data handling methods. It is our hope that these monographs will provide sufficient detail and breadth to be useful handbooks for both seasoned practitioners as well as newcomers to the area of paleolimnology. These books should also be useful to non-paleolimnologists (e.g., limnologists, environmental scientists, archeologists, palynologists, geographers, geologists, etc.) who continue to hear and read about paleolimnology, but have little chance to explore the vast and sometimes difficult to access journal-based reference material for this rapidly expanding field. Although the chapters in these volumes target mainly lacustrine settings, many of the techniques described can also be readily applied to fluvial, glacial, marine, estuarine, and peatland environments.

The 16 chapters in this volume are organized into three major parts. The four chapters in Part I provide an overview of the most common, large-scale basin analysis methods. Part II summarizes the suite of sample acquisition, archiving and logging techniques routinely used in paleolimnology. The third and largest part of this book includes eight chapters summarizing chronostratigraphic techniques. Following this is a comprehensive glossary and list of acronyms and abbreviations.

Many people have helped with the planning, development, and final production of this volume. In addition to the hard work provided by the authors of these contributions, this publication benefitted from the technical reviews furnished by our scientific colleagues, many of whom remain anonymous. Each chapter was critically examined by two external referees as well as the editors. In order to assure readability for the major target audience, we asked many of our graduate students to also examine selected chapters; their insight and questioning during the reviewing and editorial process are most gratefully acknowledged. The staff of the Environmental, Earth and Aquatic Sciences Division of Kluwer Academic Publishers are commended for their diligence in production of the final presentation. In particular, we would also like to thank Ad Plaizier, Anna Besse-Lototskaya (Publishing Editor, Aquatic Science Division), and Rene Mijs (former Publishing Editor, Biosciences Division) for their long-term support of this new series of monographs and their interest in paleoenvironmental research. Finally, we would like to thank our respective universities and colleagues for support and encouragement during this project.

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William M. Last is a professor in the Department of Geological Sciences at University of Manitoba (Winnipeg, Manitoba, Canada) and is co-editor of the *Journal of Paleolimnology*.

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SAFETY CONSIDERATIONS AND CAUTION

Paleolimnology has grown into a vast scientific pursuit with many branches and subdivisions. It should not be surprising, therefore, that the tools used by paleolimnologists are equally diverse. Virtually every one of the techniques described in this book requires some familiarity with standard laboratory or field safety procedures. In some of the chapters, the authors have made specific reference to appropriate safety precautions; others have not. The responsibility for safe and careful application of these methods is yours. Never underestimate the personal risk factor when undertaking either field or laboratory investigations. Researchers are strongly advised to obtain all safety information available for the techniques they will be using and to explicitly follow appropriate safety procedures. This is particularly important when using strong acids, alkalies, or oxidizing reagents in the laboratory or many of the analytical and sample collection/preparation instruments described in this volume. Most manufacturers of laboratory equipment and chemical supply companies provide this safety information, and many Internet and other library resources contain additional safety protocols. Researchers are also advised to discuss their procedures with colleagues who are familiar with these approaches, and so obtain further advice on safety and other considerations.

The editors and publisher do not necessarily endorse or recommend any specific product, procedure, or commercial service that may be cited in this publication.

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