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Tracking Environmental Change Using Lake Sediments. Vol. 1: Basin Analysis, Coring and Chronological Techniques, edited by William M. Last and John P. Smol, first printed in 2002, and reprinted with corrections in 2004, Kluwer Academic Publishers, P.O.Box 17, 3300 AA Dordrecht, The Netherlands; 576 pages, hardbound; price USD 132.00; EUR 120.00; GBP 83.00; ISBN 0-7923-6482-1. As e-book: price USD 165.00; EUR 180.00; ISBN 0-306-47669-X.



The study of the lacustrine record of recent and ancient basins has notably increased during the last two decades, particularly because lacustrine sediments are good archives of paleoenvironmental changes, and because they contain clear paleoclimatic signals. Paleolimnology has become an exciting field of multidisciplinary research that tries to reconstruct the lake histories. Sedimentologists, geomorphologists, paleontologists, hydrologists, and many others scientists need to be involved in order to unravel a lake's evolution. The increase in the variety of techniques available to study lakes or any other depositional setting makes it necessary to have comprehensive texts explaining them.

Tracking Environmental Change Using Lake Sediments, Volume 1, presents a complete overview on how to study lake deposits. The volume provides a summary of the main concepts used for large-scale lacustrine basin analyses. These concepts are especially well developed in the initial four chapters, but are also referred to throughout the volume, even in the more specific and technical chapters.

Chapter 1, an introductory chapter not belonging to Part I of the book, provides an overview of the analytical methods for lacustrine basins, and also outlines the contents of the book. It contains a figure (Fig. 2) that is of special interest, showing how to approach the main aspects and scales of paleolimnology. The possible approaches range from analysis from aerial satellite photos and remote sensing (useful to determine large-scale features such as basin configuration) to very detailed and sophisticated geochemical tools (allowing to establish the detailed composition of the lake filling).

Part I describes, in Chapters 2-4, the main techniques of basin analysis in paleolimnology: seismic sequence stratigraphy, ground-penetrating radar, and shoreline and basin configuration techniques. Apart from the description of the instruments, these chapters contain valuable information on how lacustrine basins work, and on the main concepts of sequence stratigraphy, comparing the marine with the lacustrine realm.

Part II deals with the techniques commonly used in sampling and in archiving Quaternary lacustrine deposits. Its four chapters focus on: sediment core collection and extrusion (Ch. 5), coring and drilling equipment, and procedures for recovery of long-term sequences (Ch. 6), sediment logging techniques (Ch. 7), and logging of magnetic susceptibility (Ch. 8).

Part III is the longest of this volume. It analyses the main dating techniques used in lacustrine environments: ^{210}Pb , ^{14}C , varve chronology, luminescence, electron spin resonance, paleomagnetism, aminoacid racemization (AAR) and tephrochronology. The precision with

which each technique is described makes this entire part interesting, not only for lacustrine studies but for the study of many more types of sediment. This part is to be continued through the methods described in the following volumes of this book (Volumes 3, 4 and 5), which provide a complete overview of lake processes and studies (see earlier 2005 reviews on the JSR website).

Several aspects of the volume as a whole are worth mentioning. One is that the descriptions of the instruments, the possible problems with equipment, and possible pitfalls are presented clearly in most of the chapters. The main value of this volume, however, is the large number of graphics intended to explain the main applications of the various techniques, as well as the methods to be used and the results that can be obtained. In addition, lists of web pages and contact persons are provided, which makes this part really useful and practice-oriented. All chapters include a precise introduction and summary/conclusion sections, which allows the reader to focus without problems on any of the methods presented in the volume.

The last part includes a glossary and an acronyms and abbreviation list, which facilitate the understanding of the techniques, methods, sediments and lake processes. The reader can thus look and learn quickly what is, for example, AES, or what are drilling muds or tomographic images.

The figures in the book are generally clear and useful, particularly those that show how specific equipment works. Tables with references and references to the application of the various methods of lake research allow also to get insight into the possibilities and use of each individual method. Most figures are fairly simple, which in general is fine, but in cases some more data are badly needed. The photographs are all in black and white, and not always of good quality. This is the main shortcoming of the book.

Taking all together, the conclusion is that the book is extremely well organized, and the same is true for all chapters. The book thus is a really useful tool for learning how to carry out research into lacustrine environments; it also shows how to study any type of recent or ancient sedimentary environment and its evolution in time.

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