

Carmen Chica

Robert G. Wetzel, Gene E. Likens: *Limnological analyses*, 3rd edn

Springer, New York, 2000. 429 pp. 26 × 18 cm (ISBN 0-387-98928-5)

Published online: 17 November 2001
© Springer-Verlag and SEM 2001

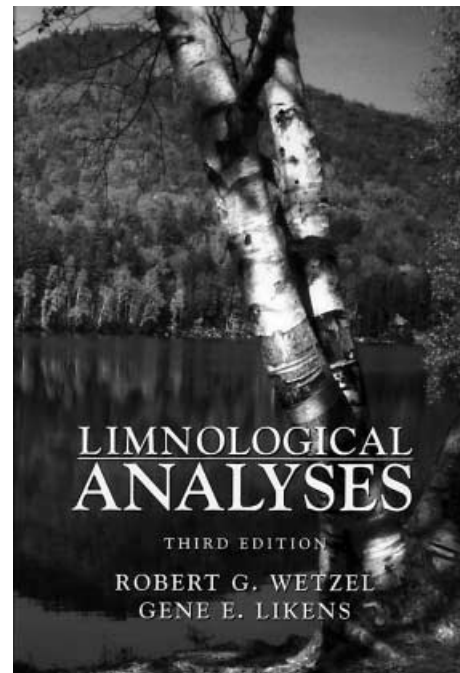
Robert G. Wetzel and Gene E. Likens have updated their classical text on limnological analyses. Since the release of that first edition, limnology has greatly taken advantage of the technological advances that have allowed accurate measurements to be readily obtained. This is crucial to developing the fundamentals of limnology in a practical text like this, completely based on practical exercises and interpretation of results.

Limnology, which, in the words of J. R. Vallentyne, renowned freshwater ecologist, originally developed in a sort of isolation from its surroundings, has gradually looked for methods to evaluate the extent of pollution and its impact on the biota of natural waters. Biota are a crucial aspect of limnology, providing evidence of the astonishingly complex interrelationships – planktonic, littoral and benthic – with producer, consumer and decomposer organisms.

Limnology studies inland waters in a multidisciplinary approach because it involves all sciences related to nature, such as physics, chemistry, mathematics, and biological and Earth sciences. Initially focused on lakes, it has broadened to incorporate running waters and wetlands.

Water is a very specific substance. Its properties, in terms of thermal density, high specific heat and liquid-solid characteristics, greatly influence freshwater ecosystems. Although the amount of freshwater is very small when compared to seawater, its renewal rates are much more rapid. The distribution of water over continental land masses depends on the global hydrological cycle. Excessive oceanic evaporation is compensated by greater precipitation over land. The hydrological cycle, which can be altered by human activities, determines the distribution of lakes. The hydrological cycle on the Earth reflects the cyclical budgetary processes involved in water movement.

Limnology, ecology and environment management are concepts widely related to economics and politics. This is due to the urgent need to balance the control of



pollution and biodegradation of the environment on the one hand, with the utilization of natural resources for industrial and leisure activities on the other. In this sense, it is of critical importance to understand the structure and function of freshwater ecosystems in order to assess their capacity to change in response to human activities. This, in turn, will help to confront and control the effects of alterations produced by human (leisure) and industrial activities to achieve optimal management of freshwaters resources.

The authors state that, to understand ecological matters, it is necessary to learn and experiment with routine and advanced techniques to analyze the properties of ecosystems and the responses of organisms within them. So, in this 3rd edition, as in the previous one, the text provides a series of interrelated field and laboratory exercises on basic subjects of limnology.

Limnological analyses is one of those textbooks we can consider to be a classic. Bearing precise and definite goals, its authors have worked accurately to achieve them with rigor and simplicity. As in the first edition, the concise clear style is another major characteristic of the text.

The book comprises 29 chapter-exercises (the same number as the 2nd edition) in which the methods are functionally presented for instruction and problem-solving – unlike the style and presentation of many limnology manuals. Several possibilities for doing the exercises are presented in this edition, which is clearly an attempt to accommodate time and equipment limitations. But it is indeed this variety of options that allows each student to go further and extend his or her inquiries.

All chapters have the same structure: (1) a short introduction to the topic (e.g. light and temperature), (2) a brief but precise description of the elements to work with (e.g. light, surface irradiance, underwater irradiance, turbidity), (3) the exercises, (4) questions and problems,

(5) apparatus and supplies, and (6) references. This 3rd edition includes an appendix of SI conversion factors, without doubt a useful reference for students, teachers and researchers.

Robert G. Wetzel and Gene E. Likens, reputed authors and vocational limnologists, strongly believe that knowledge about water, geomorphology, light, thermal properties and hydrodynamics, jointly with an understanding of economic relations, is essential to undertaking effective discussions on biochemical cycling, population dynamics and metabolism. Knowledge of those topics is also critical to finding control measures to prevent human activities from becoming a permanently negative influence on ecosystems. The authors also maintain their consideration of the fundamental role of dissolved and particulate detritus as the overall stabilizer in the metabolism of ecosystems. In the essence of their message is the conviction of the importance of treatment of the inorganic carbon cycle in freshwater.