

that I can easily take to sea and consult as an authoritative reference. This book is not just an updated version of the Clay and Medwin predecessor—it is much more comprehensive, containing a good blend of theory and hard-won data from measurements made at sea and in the lab. The fact that its list price is less than the current price of the earlier book is an unexpected bonus! I strongly recommend it to acousticians, geophysicists, and physical and biological oceanographers.

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BLACK, K. S., D. M. PATERSON, AND A. CRAMP [EDS.]. 1998. **Sedimentary processes in the intertidal zone.** Geol. Soc. Spec. Pub. 139. The Geological Society of London. ix + 409 p. \$132.00. ISBN 1-86239-013-4.

In recent times, interest in the intertidal zone has grown sharply in response to two forces. The first is the development of ports, marine industries, and human habitations in coastal and estuarine areas dominated by tidal flats; prime examples are the economic development of the vast flats in China and Korea, especially those bordering the Yellow Sea. The second force is the desire to understand and preserve valuable ecosystems, especially those that characteristically have high primary productivity; given the continuing rise of sea level in urbanized coastal regions of the midlatitudes and increasing contamination resulting from the previously mentioned economic developments, this is a daunting task. Together, these disparate forces have generated an urgent need to increase our understanding of intertidal flat dynamics.

In response to this need, the United Kingdom and several other countries are devoting substantial resources to the study of tidal flat ecosystems. This volume summarizes the results of the Littoral Investigation of Sediment Properties (LISP-UK) project, a multiinstitutional study of the intertidal mud flats seaward of the village of Skeffling in the Humber Estuary, United Kingdom. The papers are based on a meeting held in London in 1997; participants included people who worked under the LISP umbrella as well as others whose studies were thematically related to the LISP objectives. The editors have divided the book into two parts: "LISP-UK Studies" and "Generic Studies"; both, however, relate to the same set of scientific topics, and it would have been equally logical to group the contributions according to these topics. I suspect that the editors settled on the present organization to demonstrate that LISP is meeting the needs of the National Environment Research Council of the United Kingdom, the principal funding agency for LISP studies.

Although a wide range of disciplines is covered in this volume (geophysics, chemistry, biology, soil science, and hydrodynamics), the overall focus is on erosion. This reflects both LISP-UK objectives and the personal interests of the editors. Significant new information about mud flat erosion processes is presented, including the results of several LISP-UK experiments conducted along the Humber as well as other field, laboratory, and analytical studies.

A noteworthy contribution is the inclusion of both biological and soil strength parameters in mud erosion formulas, particularly those for calculating the critical shear stress of erosion. Biology is given special prominence, perhaps rightly so because the United Kingdom is a good example of a region where biological processing of mud

flat sediments has wide-ranging effects. The significance of biological control in mud flat erosion depends on the fluid environment. In high-energy areas, including large parts of the Severn Estuary, physical forces dominate the erosion process. But in comparatively low-energy environments, the need to include the effect of biological parameters or their surrogates is demonstrated by the observed variability in the critical shear stress with these parameters.

Another noteworthy feature of the volume is that several papers allude to the role of rheology (the deformation and flow of matter) in governing erosion. An advantage of rheological measurements, especially if they can be done in situ, is that the effects of all parameters, organic and inorganic, are incorporated in the rheometric coefficients. If this approach succeeds, it could solve a long-standing problem in regard to erosion, namely, the need to account for the vast number of factors that influence the rate of erosion. I hope this will be the subject of a subsequent volume.

The editors have taken great pains to ensure a high-quality product, for which they as well as the Geological Society of London are to be congratulated. The fact that the process of collecting the papers and publishing the treatise was completed in just over a year is highly commendable.

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FORSBERG, C., AND K. PETERSSON [EDS.]. 1998. **Lake Erken: 50 years of limnological research.** Archiv für Hydrobiologie, Advances in Limnology 51. E Schweizerbart'sche Verlagsbuchhandlung. 222 p. + vi. DM 130. ISBN 3-510-47053-2.

Very few ecosystems receive long-term analyses of changes in biota and their productivities that are coupled with evaluations of the dominant physical, chemical, and biological properties that influence changes to or consistency of spatial and temporal patterns. Despite widespread proclivity and lip service to the importance of detailed long-term analyses of ecosystems, in reality, most "long-term" studies are incomplete examinations of specific ecosystem components (e.g., pelagic plankton). Ecosystem evaluations of long-term patterns gain further value when coupled with detailed experimental analyses of controlling mechanisms. The best of these experimental manipulations are performed within the ecosystem or immediately adjacent in experimental laboratory facilities.

A number of individual ecosystems have emerged as habitats for ecological and particularly limnological study. Such foci often resulted from fortuitous events, particularly the donation of adjacent land and properties to a university or the sustained interest of individual scientists in a specific environment. Study of the biota and dynamics of controlling environmental factors of individual ecosystems can be extensive. However, as changes in the interests and leadership or circumstances within sponsoring institutions occur, growth in understanding of the complexities of such ecosystems often wanes. To remain effective, such programs require sustained intellectual and physical subventions. These two essential ingredients came together in Sweden during the middle of this century, when Uppsala University provided the venue, and the late Wilhelm Rodhe (died August 1998) provided the leadership. The result was the world-recognized Institute of Limnology.

Much of the Uppsala program focused on Lake Erken, a 24-km<sup>2</sup> mesotrophic lake in eastern central Sweden, to which access was

gained via a large property donation to the University. Studies on Lake Erken began in 1946 and have continued since, aided markedly by progressively improved laboratory facilities at the site. A 2-d seminar was held in October 1996 to mark 50 yr of limnological research on Lake Erken. Some of the contributions presented there are collected in this issue of *Advances of Limnology*.

Sixteen generally excellent peer-reviewed scientific articles are presented in this volume. Although almost all of the studies address communities within Lake Erken, in nearly every case, the conclusions can be extrapolated to other lakes in a generic manner. Several papers on integrated topics provide appreciable insights on common problems. Phosphorus and nitrogen cycling and recycling were approached from several directions: bacterial and algal uptake rates, enzyme activities for organic substrates, and recycling by microbes and by protistan utilization of microbial biomass. Experimental bioassays of nutrient additions were coupled with extensive evaluations of population and community fluctuations and provide good insights on interactions among seasonal shifts in phosphorus and nitrogen limitations, nitrogen-fixing cyanobacteria, and protistan mixotrophy.

Particular emphasis was given to understanding the dynamics of the pelagic microbial community. Various studies describe the links between this community and other ecosystem components (nutrient

regeneration and release from sediments, transport to the pelagic of particulate organic matter and nutrients from the littoral and profundal sediments, and migrations of key phytoplankters and dinoflagellates from littoral sources and sediments to the pelagic zone). Details of the seasonal dynamics of sedimentation of algae and nutrients and resuspension of sediments are coupled to the nutrient dynamics of the pelagic. Nutrient relationships were also extended to benthic algae in separate analyses. In a number of cases, the subjects studied in Lake Erken, particularly on phosphorus dynamics and their couplings with microbial migrations between the pelagic and sediments, are among the best existing.

There is a danger in these times of rapidly expanding publications that important, peer-reviewed contributions published in such compendium book volumes, rather than in regular journals, are missed or ignored. In this case, in particular, such omission would be unfortunate. The information of this volume is highly relevant and recommended.

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