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Environmental Monitoring of Fresh Waters

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BOOK REVIEW

ENVIRONMENTAL MONITORING OF FRESH WATERS

UN (Unesco, WHO and UNEP) WATER QUALITY ASSESSMENTS: A GUIDE TO THE USE OF BIOTA, SEDIMENTS AND WATER IN ENVIRONMENTAL MONITORING, ed. D. Chapman, publ. E. & F. N. Spon, London, ISBN 0-419-21600-6, price £22.95. pp. xxi + 626, figures and tables ; index.

SIMPLE GUIDE ON MANAGEMENT AND CONTROL OF WASTES, Royal Society of Chemistry, publ. Royal Society of Chemistry, Letchworth, Herts, UK, price £9.95, ISBN 0-85404-990-8, pp. xii + 61, 6 figures, 13 tables, index.

The first book is a second edition of an earlier work published in 1991; this new version covers a great deal of needed work, including that reported in a International Conference held in 1992 in Dublin. The conference confirmed that some better water quality assessments were needed, to include:

- purpose oriented water assessments and predictions (both surface and groundwaters)
- assessments harmonised for natural basins or catchments
- new appropriate assessments and prediction techniques.

This was followed in June 1992 by a statement in “Agenda 21” at the Brazil 1992 conference, asking for the countries concerned to establish the availability of data, and to establish better collection, storage and dissemination of catchment and groundwater integration.

A major change over the first edition is a new chapter on reservoirs, which are critical to current aquatic survey, because of their hydrodynamic features. These are a considerable, frequently undervalued, water resource; about 25% of water reaching the oceans comes from reservoirs. In general, they provide management retention and often misleading so that general statements are difficult to make. Another major development concerns the production of a companion handbook

“Water Quality Monitoring: a Practical Guide to the Design and Freshwater Quality” parallel with this second edition of *Water Quality Assessments*.

The book concentrates on the probability of setting up monitoring programmes for assessments. The variables monitored are covered in Chapters 3–4 dealing with water, sediments and biota, with procedures for data measurements are presented in Chapter 10. In addition there are accounts of problems on rivers, lakes, reservoirs and groundwaters collected in Chapters 6–9, covers various water bodies:

- rivers and streams from source to tidal limit
- lakes of all sizes and types
- reservoirs, especially river impoundments
- groundwaters of various types.

The water resources of estuaries, coastal lagoons, salt and other saline waters are not included.

Attempts have been made to include water bodies from most parts of the world, but unfortunately more information is collected from the developed world. Various water problems (organic pollution, eutrophication, acidification, and toxic pollution) are included, but thermal problems and radioactivity discharges are scarcely reported, perhaps less of current issue. There is also a growing literature on various diseases, only covered when water quality monitoring deals with some problems.

Much of the work highlights the value of monitoring exercises in various ways; however, no quality is available of best methods for groundwater monitoring. Biota measurements are often not available, being dependent on site-specific conditions. Hydrological measurements are usually provided and an indispensable component of monitoring, even of groundwaters; the need is made for a soundly based worldwide scheme.

After a general “Introduction”, the following chapters on “Strategies for Water Assessment”, “Selection of Water Quality”, “Particulates” and “Biological Material” cover a wide range of variables, water quality and a range of pollutants in the different categories of waters. Chapters 6–9 include work on rivers, lakes, reservoirs and groundwaters covering a wide range of specific examples and conditions. The final chapter (Chapter 10) covers the wide need for assessments to cover a wide range of interest following monitoring, employing a manual assessment to a highly computerized system to a wide variety of information. This covers many ways of looking at data-normal/non-normal data, probability distribution, errors and confidence

limits, hypothesis testing, graphic presentation, data correlations, and trends and principal components analysis.

Overall, I found it hard not to read the whole book thoroughly with so many useful examples to cover. I think the collaborating institutions have given much time to the exercise and I hope that this will fulfill most of their objectives. The book is a most revealing source, and at £ 22.95 it can be on everyone's desk. I hope that it will deserve a good future as a review of available techniques, measurements and methods in a wide variety of water bodies.

The second book provides an assessment of what to do with "wastes", most delivered to water bodies or to landfill. It is a helpful book for those in UK, since it covers their scope of commitment to the European Union of "Good Environmental Practice".

The book is divided into sections as "Introduction", "Technical Aspects", and "Legal/Administrative, Economic Aspects". The Introduction identifies threats from waste problems, and comes to the agreed conclusion that waste production can be avoided by design or where recycling systems are possible, it is achieved in environmentally acceptable manner. The Technical Aspects cover most of the book, covering alternatives of waste management, water handling, transboundary movements, waste treatment, and waste disposal aspects. The industrial or commercial waste producer is often able to have the details of the waste materials, from which general considerations are obtained. However, sometimes this is missing if ecologically correct procedures are defined. Details are provided of the Basel Convention, formulated to produce indiscriminate export of wastes to other countries which are not prepared to handle it. The book presents this issue as it occurs, but doesn't spell out the details.

The processes by which waste treatments are proposed, often treatment is incineration, or also long-term land-based storage. Other methods for disposal to water bodies are well covered in a section on waste treatment.

The final section deals with legal and administrative aspects, including management aspects which cover "waste audits" and life cycle analysis.

The lack of specific analyses of waste problems mean that this book provides a useful knowledge for the administrator, but nothing there has much sense to the researcher who might need better insight into the problems raised. No doubt the book will be useful (all the correct EU statements are available) but it is not really useful to the research faculty or readers of this journal, perhaps brought into help decide the

correct way to deal with wastes. Overall, I think it has a limited view of the problem of wastes disposal proposals. Its usefulness is directed to UK, but other European countries may find it useful if they have not got much work in dealing with treating wastes.

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