

B. Andrew, in: Lawson, Ken Kleinman (Eds.), *Spatial and Syndromic Surveillance for Public Health*, John Wiley & Sons Ltd., Chichester, West Sussex, England, 2005, 283 Pages, US\$ 120.00 ISBN: 0-470-09248-3.

In the preface to this book, the editors write: "The field of syndromic surveillance now attracts a wide audience due to the perceived need to implement wide-ranging monitoring systems to detect possible health-related bioterrorism activity." Later in this section, they describe their hopes for use of this book:

"We hope that this book may serve a dual purpose. First, we hope that the potential users of spatial surveillance – the public health authorities – will use it as an introduction to the value of spatial data and as guide to analytic methods competing for scarce resources. Second, we hope that the statistical community will use it as a spur to further development of techniques and to resolution of questions unanswered by the chapters which follow."

The goal of this analysis is "...to correctly sound health alarms when needed. ..."

Quoting extensively from the book's introduction, I will paraphrase the editors' description of the topic. Part I, they write, contains an introduction to traditional temporal surveillance. It has two chapters whose goal is to bring the reader "up to speed" on surveillance as well as surveying typical methods.

In Chapter 2, the authors discuss temporal surveillance, which is commonly used in many public health departments. This chapter is followed by one that treats optimality in surveillance and how detection methods might be designed with optimality in mind.

In Part II, entitled "Basic Methods for Spatial and Syndromic Surveillance," the contributors provide a summary and some development of statistical approaches currently applied to optimal surveillance. Chapter 4 "...provides an overview of spatial spatio-temporal health analysis outside of surveillance." Chapter 5 contains "...a summary of generalized linear models and generalized linear mixed models, including the use of binomial and Poisson models. ..." Chapter 6 addresses how CUSUM methods can be adapted to spatial surveillance. Chapter 7 discusses how statistics can be used in the field. Chapter 8 discusses distance methods for cluster detection and identification. Finally, Chapter 9 considers multivariate surveillance.

The final section of the book is entitled "Database Mining and Bayesian Methods." It contains the following four chapters:

- Bayesian network approaches to detection;
- Efficient scan statistic computations;
- Bayesian data mining for health surveillance;
- Advanced modeling for surveillance clustering of relative risk changes.

The book ends with an extensive (more than 400) reference citations.

Given the world concern for the potential for bioterrorism and other threats of disease outbreaks, the early detection of these threats is an important tool for public health operations. This volume and the methods described in it will help in that process.

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Nicholas P. Cheremisinoff (Ed.), *Environmental Technologies Handbook, Government Institutes/The Rowman & Littlefield Publishing Group, Lanham, MD, 2005, 322 pp., Price: US\$ 95.00, ISBN 0 86587 980 X.*

According to the editor, "This book is intended as a general reference for industry, with the focus on some of the newer technologies and emerging concepts. ... Each chapter has been written by an expert in his or her respective field." That may be so, but with no biographical sketches given for any contributor except for the editor, it is hard to discern the backgrounds of the contributors.

There are seven chapters in the book. The first (and longest) chapter is entitled "Human Health Risk Assessment." Given the enormous scope of this field, the authors decided to focus their discussion on "... the risk assessment of nonradiological chemicals and to target this review to environmental practitioners who may need to decide whether the use of risk assessment is appropriate or who need to understand the outcome of the assessment but are not risk assessment specialists per se." Authoritative sources such as the U.S. EPA, WHO, European Commission, and governmental sources in Australia and Canada are cited. To the extent that I understand the topic, the authors appear to have covered it well.

The second chapter, entitled "Air Quality Monitoring and Associated Instrumentation," is also well-done (I must note here that the senior author is a close personal friend and chair of the Civil Engineering Department at the university from which I retired). This relatively short chapter contains four well-illustrated sections entitled: (1) Design of air quality monitoring networks, (2) Types of air quality monitoring networks, (3) Descriptions of air quality monitoring networks, and (4) Air monitoring instrumentation.

Three chapters were contributed by the editor, himself. They were entitled: (1) Selection criteria for air pollution control technologies, (2) Treatment technologies for suspended matter in wastewater, and (3) Financial tools for environmental technologies. Unfortunately, neither of the first two chapters is up-to-date

nor do they contain anything not published many times before in the literature. The latest reference is 5 years old (in the first two articles) while the third chapter lacks references. However, I found this last chapter most interesting as it was out of my normal area of reading.

Chapter 4 is entitled "Thermal Methods of Waste Treatment." In it, the author clearly, with the help of numerous diagrams and photographs, covers the topic within the limited span of 30 pages. He discusses, although briefly, equipment, costs, and emissions. Incineration devices described include furnaces for combustion, gasification, pyrolysis, waste treatment in melts, and plasma methods of waste treatment (of the combustion methods discussed in this chapter, plasma received the most detailed attention).

Lastly, I must mention a chapter entitled "Advanced Wastewater Treatment Technologies." While editor of this journal, I received numerous papers on emerging processes. The authors approach this topic with the following introductory sentences: "Research on the use of electrochemical methods for the treatment of industrial wastewater has demonstrated that many pollutants, organic and inorganic, can be effectively removed by anodic oxidation or cathodic reduction or in a bulk solution by electro-generated media. Electrochemical techniques are more reliable than many conventional processes and are gaining popularity for the treatment of industrial wastewater." The electrochemical processes discussed in this chapter include electro-oxidation (direct and indirect), electro-reduction, electro-coagulation, and Fenton and electro-Fenton processes. Discussions are given of current efficiency and energy consumption. The final part of the chapter discusses photocatalytic methods which are currently a "hot" research topic.

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Jay H. Lehr, Jack Keeley (Eds.), *Water Encyclopedia: Ground Water*, John Wiley, Hoboken, NJ, 2005 (US\$ 350 [this volume], US\$ 1250 [5-volume set], 8.5 in. × 11 in. format), 860 pages, ISBN 0-471-73637-2 [this volume], ISBN 0-471-44164-3 [complete set].

Without water there is no life. Given that statement, the importance of this book and its companion volumes is self-evident especially to readers of this journal. This volume, the first in a five-volume set, contains approximately 175 entries dealing solely with groundwater and all its aspects. Lehr notes

that groundwater "... accounts for 97% of the world's fresh-water and serves as the base flow for all streams, springs and rivers". He further notes that "in the United States, one half the population relies on groundwater for its drinking water and is the sole source of supply for 20 of the 100 largest cities". He goes on to note that "90% of rural America is totally dependent on groundwater".

Nowhere is the importance of groundwater more evident than where this review is being written—in Canada, not far from Walkerton, the scene of a major tragedy several years ago. In Walkerton, the town's well became contaminated with *E. coli* that resulted in several deaths and an untold number of sicknesses. The result was a major change in government regulations that affected water treatment plant design, operation and analysis.

The editors have assembled a broad list of contributors from around the world. They have presented a comprehensive coverage of the topic as evidenced by the following statement in the preface:

"Along with straightforward descriptions of basic groundwater concepts (drawdown around pumping wells, hydraulic head, field capacity, and flow), the reader is introduced to more complex subjects (isotope technologies, aquifer tests, in situ remediation, tritium dating, modeling, and geophysical properties). There are also articles for more practical applications (well maintenance, subsurface drainage, nitrate contamination, tracer tests, well yields, and drilling technologies)".

There is even a section on windmills.

Needless to say, groundwater contamination, its source, impact and transport are not ignored as evidenced by a selection of topics included in the book:

- Reactive transport in the saturated zone: case histories for permeable reactive barriers,
- Transport of reactive solute in soil and groundwater,
- Vapor transport in the unsaturated zone,
- Applications of soil vapor data to groundwater investigations,
- Groundwater vulnerability to pesticides: statistical approaches.

Finally, I note that this volume (the first in the series) has two indices. The first index is for this volume, while the second 136 pp. index is a cumulative index for the entire series of five volumes. Inclusion of this set in reference library collections is, in my opinion, almost mandatory.

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