

The section titles are found below with the number of chapters (papers) in each section listed in parentheses:

- Section 1: Overview of science and applications (3).
- Section 2: Fundamentals of phytotransformation and control of contaminants (5).
- Section 3: Science and practice for aromatic, phenolic, and hydrocarbon contaminants (3).
- Section 4: Transformation and control of explosives (4).
- Section 5: Fate and control of chlorinated solvents and other halogenated compounds (5).
- Section 6: Modeling, design, and field pilot testing (5).
- Section 7: Latest advances (7).

A review of the titles of the papers in the book reveals a plethora of contaminants susceptible to phytobiodegradation: heavy metals (Pb, Cu, Fe, Cd, Hg, etc.), phenols, chlorinated solvents, MTBE, explosives, oil field brines, petroleum hydrocarbons, DDT, and atrazine. The benefits of phytoremediation are summed up in the paper dealing with MTBE: “phytoremediation provides an inexpensive, esthetically pleasing, and effective alternative for treating numerous organic contaminants”.

In my opinion, this is an excellent, comprehensive, well-reviewed and written text on the topic that will be consulted for many years to come by researchers in the field.

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doi:10.1016/j.jhazmat.2004.01.008

Environmental Compliance Made Easy, Second Edition

Andre R. Cooper Sr., Government Institutes, Rockville, MD, 2003, 440 pp., US\$ 95.00, 8.5 × 11 Soft Cover Format, ISBN 0-86587-952-4

Making compliance with US environmental laws may not be easy (as indicated by the title of this book), but at the very least, use of the material in this book will lessen the industrial environmental engineer’s task of complying with the numerous laws and almost infinite number of pages of regulations promulgated by government agencies.

This book is:

Intended as both a beginner’s guide and as a veteran’s reference, the second edition provides readers with a concise summary of the major environmental programs. The author introduces readers to the programs, laws, and regulations that support the programs; key requirements of these laws and regulations; responsibilities of regulated parties; compliance and auditing processes; and contact information.

Readers will emerge with the fundamental understanding of which environmental management programs they should consider and how to implement them when de-

veloping proactive, successful, and reliable regulatory compliance programs. Key compliance sections include applicable methods, strategies for reviewing compliance status and implementing environmental programs, and checklists based on actual agency protocols. Readers can use the checklists to complete portions of their company’s overall compliance program.

Environmental Compliance Made Easy includes a new section on Homeland Security and Emergency Response as well as new sections on Compliance Audits, Environmental Management Systems, Information Technology Initiatives and Innovation, Pesticide Management, Property Transfer and Due Diligence, Solid Waste Management, Toxic Substance Management, Training, and Water Quality Management.

I turned to the chapter on Homeland Security and Emergency Response because it was new (as indicated above) as well as my personal interest in the topic. Following the title was this brief introductory comment:

Homeland security is a concerted national effort to prevent terrorist attack within the United States, reduce America’s vulnerability to terrorism, and minimize the damage and recover from attacks that do occur.

The National Strategy for Homeland Security aligns and focuses homeland security functions into six critical mission areas: (1) intelligence and warning, (2) border and transportation security, (3) domestic counter-terrorism, (4) protecting critical infrastructure, (5) defending against catastrophic terrorism, and (6) emergency preparedness and response.

Notable in this section (in common with the other sections in the book) are numerous Checklists. Indeed, in my opinion, it is these Checklists that make the book so valuable.

To say the least, the coverage of US environmental laws in this book is comprehensive. The 21 chapters are as follows:

1. Environmental Compliance Overview
2. Suite of Environmental Laws
3. Compliance Audits
4. Air Quality Management
5. Environmental Management Systems
6. Hazardous Materials Management
7. Hazardous Waste Management
8. Impact Assessments
9. Impact Assessments
10. Information Technology Initiatives and Innovation
11. Multimedia
12. Public Participation and Partnerships
13. Pesticide Management
14. Property Transfers and Due Diligence
15. Solid waste Management
16. Special and Cultural Resource Management
17. Toxic Substance Management

18. Training
19. Underground Storage Tank Management
20. Wastewater Management
21. Water Quality Management

The book ends with three appendices: (1) EPA Contacts and Web References (80 selected environmentally-related web pages are reported here); (2) Environmental Hotlines; (3) Glossary.

In common with almost all of the Government Institutes books I have reviewed, this volume is well-constructed, well-written, easy-to-use, and full of useful information and guidelines.

Gary F. Bennett

doi:10.1016/j.jhazmat.2004.01.009

Computer-Based Environmental Management

Ralf Seppelt, Wiley-Verlag GmbH & Company KgaA, Weinheim, Germany, 2003, 305 pp., US\$ 110.00, ISBN: 1-527-30732-X

Given the complexity and interaction of environmental processes, using the computer to describe, model, and simulate them is a logical development in our attempt to understand what is happening in nature. This book is a giant step forward in describing the development and use of environmental models, thus, significantly enhancing the interdisciplinary field of environmental science. The author notes at the very beginning of his book:

Environmental models are tools which help us understand how ecological processes work and allow us to best hypotheses about ecological processes in a systematic matter. Setting up an ecological model requires detailed system analysis of the processes of interest. After this translation into mathematical equations is performed. Recent development of ecological and ecosystem models has provided a multitude of possible approaches and theories.

The author describes (in his introduction) the book's initial contents:

The first part of the book (Chapters 1 to 3) gives a synthesis of model development concepts. Compiling mathematical equations and setting up simulation models is a complex and challenging task. Setting up ecological models requires a detailed system analysis of the processes of interest. A systematic way to achieve a concise and valid simulation model is to start with a conceptual model, which every scientist usually has in mind when investigating a process. Chapter 1 traces the path from conceptual models to validated regionalized environmental simulation models. The step of translating conceptual models into computer models is assisted by several development platforms. These platforms translate conceptual

models into mathematical equations of a certain mathematical 'dialect'.

Focusing on processes of the abiotic environment as well as the first two trophic levels of the biotic environment, several different translations of conceptual diagrams into mathematical models are studied in Chapters 2 and 3. The first focuses on the dynamic patterns on different temporal scales such as nutrient flow, water transport, growth of crops and week, population dynamics, competition, etc. Migration of species, vertical and horizontal fluxes of matter and information through a landscape are the characteristic properties of ecosystems. In Chapter 3 spatial interactions are discussed and the possible mathematical modeling concepts are presented, starting from highly aggregated mathematical models given by partial differential equation systems, we end up with a discussion of cellular automata. For comparison, different mathematical 'dialects' are used for modeling the same process to analyze and compare different methodologies.

While the foregoing chapters are under the general heading of Setting the Scene: Diversity of Environmental Modeling, the second section of the book is entitled Integrated Models (Chapters 4–7). In Chapter 4 of this section, Seppelt discusses "... the results obtained in the context of metamodeling and scientific theory. Further applications of hybrid models in biology as well as in environmental assessment are recorded in Chapters 6 and 7. The focus in Chapters 5 and 9 is on the mathematical foundation of the integrating modeling concept as well as the application of environmental models in optimization.

Part 3 contains the final six chapters (comprising over half of the book's pages). Its title is The Big Picture: Environmental Management. The chapter titles are as follows: Scenario analysis and Optimization, Prerequisites: temporal hierarchies and spatial scales, Optimum agroecosystem management: temporal patterns, Optimum agrosystem management: spatial patterns, Changing landscapes: optimum landscape patterns, and Conclusions, perspectives and research demands.

Most of the models deal with the natural environmental systems (insects, crops, etc.). Of more interest to readers of this journal was the, albeit limited, development of models dealing with life cycle analysis, environmental fate of NOx emissions, soil acidification, and eutrophication.

The final section of the book, entitled Additional References to Web Resources, gives the reader additional information on material in the book, Animation and Video Files which illustrate the spatially explicit simulations discussed in Chapters 3 and 6, and a final reference to Software and Libraries.

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doi:10.1016/j.hazmat.2004.01.010