

Book review

Risk-Based Contaminated Land Investigation and Land Assessment. By J. Petts, T. Cairney and M. Smith. John Wiley and Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England, Price US\$ 65.00, 334 pp. ISBN 0-0471-96608-8.

The concept of risk assessment is central to the evolution of environmental policy from local to international scales. As our communities and societies wrestle with the environmental legacy of the industrial and post-industrial ages, we face a self-evident challenge: we do not have enough fiscal resources to address all the past damage and current stresses imposed on our environment. Allocation of scarce resources requires weighing remedial or prevention costs against realistic social benefits in a risk-based scientific framework. In 'Risk-Based Contaminated Land Investigation and Assessment', Petts et al. synthesize the broad literature of risk assessment in the context of land investigations and modern environmental policy.

This text consists of four main sections. In the first section comprising of Chapters 1–3, the authors present the societal and theoretical basis for risk assessment, relying heavily on case studies, first in the United Kingdom and Europe, then in the United States. This section is a comprehensive glossary of the key words, phrases and concepts that comprise the vocabulary of risk assessment providing an excellent background against which the technical details of subsequent chapters can be clearly understood. Readers new to risk-based analysis will find the first few chapters of the text enlightening and will be comforted by the authors' methodical, pragmatic approach to the hazard-exposure-dose-response continuum.

The second section, Chapters 4–7, continues the methodical treatment of risk analysis with a thorough examination of the process of site investigation, the cornerstone of risk assessment. The authors begin with preliminary investigations: information requirements, hazard identification, the value of historical records and site reconnaissance. Chapter 5 tackles the vagaries of detailed soil investigations, emphasizing good strategy and resisting the temptation to offer a prescriptive approach to the evaluation of complex soil systems. Chapters 6 and 7 address aqueous and gaseous contamination, again avoiding prescription in favor of well-considered strategic principles. The authors spend considerable time in all four chapters on the need to match appropriate sampling methods with clearly stated objectives to ensure that useful information is derived from sampling data at a minimal cost. Throughout this section, the authors use case studies to illustrate the broad principles and the maddening subtleties of site investigation, always returning to the central virtue of pragmatic strategy and its methodical implementation.

The synthesis of accumulated data is the focus of the third section. In these three chapters, the authors give an overview of qualitative (Chapter 8), semi-quantitative (Chapter 9) and site-specific, quantitative (Chapter 10) risk assessments. The authors approach all three outcomes cautiously, with a clear sense of the pitfalls and limitations of each. The focus of Chapter 8 is the use of screening levels in qualitative risk assessment, in which environmental sampling data are compared with threshold levels to provide a modest sense of potentially significant risks that are present. In Chapter 9, the authors consider risk ranking as a means of evaluating the relative risks posed by the various contaminants and exposure pathways on a particular site. In Chapter 10, the authors explain the familiar but widely misunderstood concept of quantitative risk assessment in which an investigator meshes epidemiology and/or toxicology with the physical sciences to infer significant risks and to assign a numerical probability to the risk posed by each exposure pathway.

This text is valuable principally for its breadth of scope and its essential pragmatism. The authors' often turbid prose, persistent redundancies (e.g., 'potential risks'), unnecessary distinctions (e.g., 'intentional and non-intentional') and laborious use of the passive voice (e.g., 'it is hoped that...') call loudly for more aggressive editorial attention in subsequent editions. Still, the book is a solid, thorough synthesis of scientific knowledge, illuminating both the promises and the uncertainties that are inherent in risk assessment as a policy tool and as a way to assign economic value to environmental protection in the marketplace.

B. Auvermann
*Texas A & M University, Agricultural Research and
Extension Center, 6500 Amarillo Blvd. West
Amarillo, TX 79106, USA*