The author discusses a few of the many computer models available: AEIRS, AIR3D, AIRFLOW/SVE, AIRTOX, API DSS, GEMS, HELP, HSSM, IRIS, IRPTC, LEADSPREAD, MULTIMED, RAPS, RBCA, ReOpt, RISC, RISK * ASSISTANT, RISKPRO, SITES, SUTRA and WET.

Gary F. Bennett

PII S0304-3894(97)00084-8

Chemical Hazards, Mitigation and Preparedness in Areas of High Seismic Risk: A Methodology for Estimating the Risk of Post-Earthquake Hazardous Materials Release, by H.A. Seligson, R.T. Eguchi, K.J. Tierney and K. Richmond, National Center for Earthquake Engineering Research, Buffalo, NY, 1996, price unlisted, 144 pp. ISBN: none

One of the earthquake safety provisions that intrigued me was the use of shelf barriers to prevent chemical bottles from being shaken off the shelf and spilling. But earthquakes pose greater hazards, i.e., releases from large-scale storage of chemicals, both liquids and gases.

Although there has never been a major incident involving hazardous materials in a U.S. earthquake, smaller releases have occurred in events that were moderate in size. A recent example is an accident at a chlorine repackaging facility in the 1987 Whittier Narrows Earthquake, in which nearly one ton of chlorine gas was released. The research for this project combines seismic hazard analyses, findings from research on earthquake-related failures in industrial facilities, and data on airborne toxic releases to estimate the magnitude of the risk.

The study examined 22 sources within the city limits of Los Angeles, and from the impact of chlorine and ammonia releases as well.

"Based on the 22 sources identified for this study, the most serious releases would occur not in the largest postulated earthquake, but in the earthquake causing the strongest ground shaking at the hazardous materials sources. This earthquake, the Magnitude 7.0 Newport–Inglewood event, would cause ground shaking of at least intensity 8.0 at all but two of the studied sources. In contrast, the M 8.3 San Andreas event causes MMI 8.0 or more at only 4 sites."

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PII S0304-3894(97)00086-1

Environmental Modeling: Fate and Transport of Pollutants in Water, Air, and Soil, by J.L. Schnoor, Wiley Interscience, John Wiley & Sons, Inc., New York, NY, 1996, $69.95, 682 pp. ISBN: 0-471-12436-2

This book (according to the author) is an attempt to wed elementary concepts of pollutant fate and transport with chemical principles in order to assess environmental quality. Unlike most prior tests on environmental modeling that either emphasize engineering transport fundamentals or equilibrium aquatic chemistry, Schnoor considers both.

Schnoor wrote this book to be an introductory senior/graduate student text. The author's objective in writing was to demonstrate how to develop and solve mathematical models from a wide variety of chemical pollutants with the emphasis on natural waters (both surface and groundwater).

The author notes that the chapters follow a 'pedagogical' sequence: 1 - Introduction, 2 - Transport Phenomena, 3 - Chemical Reaction Kinetics, 4 - Equilibrium Chemical Modeling, 5 - Eutrophication of Lakes, 6 - Conventional Pollutants in Rivers, 7 - Toxic Organic Chemicals, 8 - Modeling Trace Metals, 9 - Groundwater Contamination, 10 - Atmospheric Deposition and Biogeochemistry, 11 - Global Change and Global Cycles

Unlike most (aqueous) modeling texts, this one has two chapters on the atmospheric problem.

Indeed, Schoor notes:

''A modern textbook on modeling of chemicals in the environment would be remiss without discussion of, potentially, our most serious environmental problem of the 21st century, that is, alteration of the atmosphere and global change. Chapter 10 seeks to lay a foundation for understanding these disturbances in out global cycles of oxidation and reduction from a chemical perspective. We seek to stretch the concepts of aquatic chemistry to the atmospheric aqueous phase (fogs and cloud waters) and to demonstrate its importance at the air--water interface, including deposition to water and land. Aquatic effects of acid deposition are one manifestation of disturbances in global cycles.

Chapter 11 concludes the book with a look at changes in global cycles of carbon, nitrogen, and sulfur in water, air, and soil. Time scales and remedies ar discussed for the accumulation of trace gases in the atmosphere. It will be difficult to stabilize these gases, considering the need for many countries to develop, but there are possibilities for sustainable development suggested in Chapter 11.''

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PII S0304-3894(97)00087-3