

concept is dangerously flawed under conditions where possible outcomes are ill-defined, their relative probabilities are defined only subjectively, and the parties concerned have conflicting objectives. An alternative model is proposed that defines "decision" as a process of building commitment to one of a number of possible actions in the face of empirical problems, particularly where complex situations, major differences in strategies, data needs, and the degree of alienation between experts and laity become involved. Three examples are dealt with in detail: that of staff selection, decisions regarding the manufacturing of new products, and that of making highly uncertain decisions on the large scale application of novel technologies. While the article might be categorized as a theoretical or semantic discourse about risk assessment concepts, it basically attempts to define a more secure foundation for increasing the real-world effectiveness of disaster-related decision making.

KEYWORDS Decision making, risk assessment, emergency management, disaster assistance, emergency planning, risk management.

232. Snyder, Pamela R. and Michele Kelly. *A Validation Study of the Hazard Identification, Capability Assessment and Multi-Year Development Plan (HICA/MYDP)*. University of Pittsburgh. University Center for Social & Urban Research (UCSUR). Pittsburgh, Pa. 1990. 78 pp.

This report compares the results of questions asked on two surveys of emergency management officials. One survey—the HICA/MYDP—was conducted by FEMA, while the other was conducted by the UCSUR at the University of Pittsburgh. The FEMA instrument was distributed in October 1987 to all local jurisdictions receiving FEMA emergency management assistance financial support through state emergency management agencies. The Emergency Management Officials (PITTSBURGH) survey conducted by the UCSUR was mailed in May 1988 to the same population. Objectives of the analytical comparison were to validate and test the reliability of certain items from the HICA/MYDP instrument and to obtain a more detailed understanding of selected survey items. Report findings are discussed under six headings: emergency operation centers, resource management, communications and warning, population protection, contamination monitoring, and disaster recovery.

KEYWORDS Emergency management, emergency planning, civil defense, state planning, emergency operations center, toxic chemicals, emergency communications, warning responses, comparative analysis, FEMA.

233. Society for Computer Simulation. *Emergency Planning*—special issue. *Simulation* 53, no. 3 (1989): 92-128. Single copies of the journal are available for \$10.00 postpaid from the Society for Computer Simulation, Circulation Office, P.O. Box 17900, San Diego, CA 92117.

This theme issue addresses computer simulation as a tool for emergency management. Articles include "Simulation for Emergency Management: Taking Advantage of Automation in Emergency Preparedness," an introduction to the tools and capabilities that need to be added to those already used in emergency management; "Automated Decision Support Systems for Hurricane Mitigation Planning"; "A Model for the Management of Building Evacuation"; and "Law Enforcement Simulation," a discussion of simulation for emergency vehicle scheduling and allocation.

KEYWORDS Emergency planning, emergency management, simulation, computer application, hurricane, evacuation, public safety.

234. Solomon, Susan D., Darrel A. Regier and Jack D. Burke. "Role of perceived control in coping with disaster." *Journal of Social and Clinical Psychology* 8, no. 4 (1989): 376-392.

This article reports the results of a survey of 543 adults who were exposed to a series of traumatic events involving severe flooding and/or dioxin contamination. The events occurred during December 1982 in a suburban area of St. Louis, Missouri. One of the worst floods in Missouri history struck the area at a time when flooding was unexpected and few of the usual community flood preparations were in place. The situation was exacerbated

for one community, Times Beach, when the EPA announced that dioxin levels in the town were 300 times higher than the level identified by the Centers for Disease Control (CDC) as a potential health risk. Fearing that the recent flood had swept dioxin-laced sediment into homes, the CDC recommended that residents abandon all cleanup attempts and relocate elsewhere. This study examines the role of perceived control both in the development of symptoms of mental illness and in decisions to seek different types of formal assistance following exposure to disaster. Also investigated were victim responses to either natural or technological disaster, as they vary by attributions of control. Findings indicated that flood victims and/or dioxin contamination had greater levels of depression, somatization, posttraumatic stress, and anxiety than did the unexposed respondents. Victims who blamed flood damage on themselves were particularly high in somatization, while victims who assigned blame to others for the dioxin damage recorded lower anxiety levels.

KEYWORDS Riverine flood, toxic chemicals, technological hazards, comparative analysis, psychological impact, relocation.

235. Sullivan, Jim and Ross T. Newkirk, eds. *Simulation in Emergency Management and Technology*. Society for Computer Simulation, Simulation Series Vol. 20, no. 2. San Diego, Calif. 1989. 126 pp. Order from the Society for Computer Simulation, P.O. Box 17900, San Diego, CA 92117-7900. Cost is \$48.00.

This volume, the proceedings of a Society for Computer Simulation conference held in January 1989, presents recent technological developments in emergency management computer simulation. Paper groupings include: vehicular emergency technology and engineering, microcomputers, emergency simulation in policy and planning, expert systems, and training in emergency simulation. Many of the papers are somewhat technical and of interest primarily to other researchers. However, a few, such as "Application of Computer Simulation Techniques to Flood Risk Mapping," by Daniel Cotter, and "Enhanced GDS: A Computerized Graphic Decision System for Hurricane Response," by Earl J. Baker and David McCulloch, will be of interest to practicing emergency managers. Other papers deal with network simulation software for emergency management, the simulation of fatalities and structures subjected to hurricane loading, and the future of computer simulation in emergency management. The editors maintain that the user community is gradually accepting simulation programs as a useful emergency management tool.

KEYWORDS Simulation, emergency planning, emergency management, computer application, risk assessment, mapping, damage assessment, hurricane, decision making, training, transportation accident, toxic chemicals, riverine flood.

236. Sylves, Richard T. and William L. Waugh, Jr. *Cities and Disaster: North American Studies in Emergency Management*. Springfield, Ill.: Charles C Thomas, Publisher. 1990. 278 pp. \$48.75.

This volume presents a collection of 11 original studies that analyze local emergency management capabilities and practices in Canada and the U.S. While the studies inspect some aspects of the national and state/provincial elements of disaster policy, the focus is always at the municipal level, particularly in the areas of public administration and emergency planning. Part I consists of two papers, the first of which examines how and why local officials often fail to plan effectively for community response to disaster. The second paper investigates why FEMA has failed to set forth a coherent set of criteria for the issuance of presidential disaster declarations, one that would replace the present arbitrary, politically subjective method. Disaster types and the effectiveness of emergency response are addressed in Part 2. Topics discussed in the section include intergovernmental conflicts in flood hazard management, a contrast of local government response efforts to a tornado disaster, and a comparison of aviation disaster responses in the U.S. and Canada. The remaining 5 papers deal with the perception of disaster preparedness by city managers, the role played by the local emergency services coordinator, the mayor's role in Canadian emergency planning, and emergency management capabilities at both the state and city level.

KEYWORDS Emergency management, emergency planning, local planning, FEMA, foreign planning, disaster declaration, transportation accident, comparative analysis, intergovernmental, public administration, emergency response, local response, riverine flood, tornado, disaster assistance.

237. Taylor, A.J.W. *Disasters and Disaster Stress*. New York: AMS Press. Stress in Modern Society Series no. 10. 1989. 229 pp. \$32.50.

Overpopulation, demographic movement to regions of greater hazard risk, the various forms that armed conflict take, and the proliferation of toxic industrial chemicals are but a few of the factors that can contribute to increased stress in an individual's everyday existence. In this book, the author draws upon his experience as a psychologist and psychotherapist to analyze how a person's conscious or unconscious perception of society's many hazards can influence how he or she will respond to these potential threats. Following an introductory essay on societal interpretations of disaster phenomena, the book sets out a taxonomy of disasters and the types of victims claimed by disasters. Subsequent chapters deal with stress reactions associated with natural, industrial, and human-caused disasters. Other topics explored in detail include stress reactions experienced by combat veterans and refugees, personal attitudes to nuclear war, positive psychological traits that can be gained from overcoming disaster-caused stress, disaster research, and the anxiety encountered when utilizing technological innovations that are not free from some degree of personal risk.

KEYWORDS Psychological impact, taxonomy, disaster studies, armed conflict, nuclear weapons, psychology, risk perception, sociology, refugees, multihazards, victims.

238. Tufty, Barbara. *1001 Questions Answered about Hurricanes, Tornadoes, and Other Natural Air Disasters*. New York: Dover Publications. 1987 (revised). 381 pp. \$7.95.

The author has drawn upon expertise furnished by numerous scientists and U.S. agencies to write a book full of information about meteorological hazards and disasters. Besides basic information about the formation and global occurrence of these hazards, the book is useful for historical accounts of major global disasters and the mythology associated with meteorological hazards. Examples of questions answered in the book include: "How does crop hail insurance work?" "What is ball lightning?" "Why did people ring church bells during a storm?" And, "In what other countries do tornadoes hit?"

KEYWORDS Meteorological hazards, lightning, hurricane, tornado, hail, wind, fog, ice storm, winter storm, thunderstorm, heat, cold, emergency planning, historical survey, meteorology, damage assessment.

239. U.S. Dept. of State. *Proceedings of the International Collapsed Structure Search and Rescue Coordination Meeting*. U.S. Dept. of State, Agency for International Development, Office of Foreign Disaster Assistance (OFDA), Document no. PNABE-434. Washington, D.C. 1990. Approximately 200 pp. Available from User Services, AID Document and Information Handling Facility, 7222 47th Street, Suite 102, Chevy Chase, MD 20815. Paper copy: \$22.49; microfiche: \$2.16.

Under sponsorship of AID/OFDA, the National Association of Search and Rescue (NASAR), and the National Fire Protection Association (NFPA), a meeting was held in Washington, D.C. on May 8-9, 1989 to discuss the potential benefits that might be expected from better coordination among international search and rescue teams sent to major disasters. Drawing largely on experience gained from the 1985 Mexico City and the 1988 Soviet Armenia earthquakes, representatives from twelve nations and UNDRO discussed seven broad search and rescue issues: coordination, emergency communications, equipment, preparedness/training, research and development of rescue equipment, donations and commodities, and team management and support. Materials appearing in the proceedings deal with topics such as organizational structure of the SAR team, evaluations of actual disaster responses, and the utilization of dog rescue teams.

KEYWORDS Earthquake, search and rescue, international response, foreign response, emergency communications, training, disaster assistance.

240. U.S. Federal Emergency Management Agency. *Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments*. U.S. Federal Emergency Management Agency, FEMA Publication no. DAP-12. Washington, D.C. 1990. 158 pp. Single copies available free of charge upon written request from Publications, FEMA, P.O. Box 70274, Washington, DC 20024.

FEMA's Disaster Assistance Programs Division has published this handbook to explain how state and local governments can meet the requirements of Section 409 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act—a law requiring hazard mitigation planning following a presidentially declared disaster. The handbook discusses the planning process as well as the steps necessary to develop, implement, evaluate, and update the resulting hazard mitigation plan. The document provides detailed information about the disaster declaration process; federal disaster assistance programs; federal, state, and local responsibilities under Section 409 and Subpart M of the Stafford Act; the establishment of a state hazard mitigation team; the development of content and format of a hazard mitigation plan; and the implementation, monitoring, evaluation, and updating of a hazard mitigation plan. Appendices include a useful list of definitions, a list of commonly used hazard mitigation acronyms, and a sample capability assessment questionnaire.

KEYWORDS Disaster assistance, federal planning, state planning, local planning, recovery, legislation-regulation, recovery, disaster declaration, enforcement.

241. U.S. General Accounting Office. *Disaster Assistance: Crop Insurance Can Provide Assistance More Effectively Than Other Programs*. U.S. General Accounting Office, GAO/RCED-89-211. Washington, D.C. September 1989. 36 pp. Single copies available free of charge from the GAO, P.O. Box 6015, Gaithersburg, MD 20877.

Since 1980, the U.S. Dept. of Agriculture (USDA) has provided disaster assistance to farmers through direct cash payments, loans, and an insurance program. Each of these programs helps farmers deal with a loss of income if their crops are damaged or destroyed by natural causes. The U.S. GAO has considered eight criteria for assessing the disaster assistance policies of each program. Disaster assistance programs should 1) determine the amount of disaster assistance not by the severity of the disaster, but by the amount of a farmer's loss; 2) provide similar amounts of assistance to farmers suffering similar amounts of losses; 3) not provide farmers more assistance than the amount of their disaster losses; 4) not create incentives to encourage farming practices that increase the likelihood and extent of losses; 5) be consistently available over time to allow for long-range planning; 6) help farmers withstand and recover from the effects of natural disasters; 7) have predictable annual costs; and 8) meet their objectives at the lowest possible cost. The GAO found that although none of the three currently available forms of disaster assistance fully satisfies all eight criteria, crop insurance satisfies more measures than the others, and thus can provide assistance more equitably and efficiently than the other programs.

KEYWORDS Disaster assistance, rural areas, agricultural assistance, insurance, federal funding, federal response, recovery.

242. U.S. National Committee for the Decade for Natural Disaster Reduction. *Decade Spotlighter* 1, no. 1 (Summer/Fall 1990): 4 pp. To obtain a free copy, contact the U.S. National Committee for the Decade for Natural Disaster Reduction, National Research Council, 2101 Constitution Avenue, N.W., HA 286. Washington, DC 20418.

The inaugural issue of this newsletter contains articles describing the history and composition of the U.S. Committee for the IDNDR, profiling hazard mitigation efforts already taking place in Utah and California, and outlining a cooperative effort involving the U.S. and Taiwan in the study of mesoscale atmospheric systems that produce heavy precipitation. It also summarizes recent conferences concerning the IDNDR and announces future meetings involving IDNDR interests.

KEYWORDS Multihazards, international planning, federal planning, IDNDR.

243. U.S. National Science Foundation. *Selected Papers from Workshop on Natural Disasters in European Mediterranean Countries*. U.S. National Science Foundation and National Academy of Sciences, National Research Council, Group for Prevention from Hydrogeological Disasters. Washington, D.C. 1989. 488 pp. Available for \$15.00 plus \$1.25 for postage from the Massachusetts Institute of Technology, Room 48-309, Cambridge, MA 02139. Attention: Carol Solomon.

During the last week of June, 1988, delegates from Spain, Yugoslavia, France, Greece, Portugal, Italy, and the U.S. gathered in Colomabella, Perugia, Italy to increase their understanding about natural disasters and to share their experiences in mitigating these disasters. The selected papers from this meeting begin with four essays that discuss the benefits that can be expected from the International Decade for Natural Disaster Reduction. The remaining 26 papers address specific problems associated with earthquakes, floods, drought, and landslides. General conclusions expressed by the participants included 1) the inadequacy of current methods to express risk concepts to the public is common among all hazards; 2) while some methods of analysis are common among certain hazards, there is little cross-disciplinary transfer of information; and 3) hazard phenomena often are not measured by common scales, leading to misconceptions among researchers and the possible misallocation of scarce resources.

KEYWORDS Multihazards, earthquake, drought, riverine flood, landslide, risk assessment, IDNDR, damage assessment, building codes, prediction, structural measures, mapping, agriculture, frequency, flash flood, forecasting, hydrology, remote sensing.

244. U.S. Dept. of State *OFDA Update*. U.S. Dept. of State, Agency for International Development, Office of Foreign Disaster Assistance (OFDA). Washington, D.C. February 1990. 6 pp. For availability, contact the OFDA/AID, State Department, Room 1262-A, Washington, DC 20523-0008.

This newsletter has been initiated to inform individuals and organizations working with the OFDA of its changing procedures and policies in disaster relief and preparedness. The inaugural issue contains articles on Armenia one year after the earthquake, drought mitigation, psychological treatment of displaced children in Mozambique, trends in OFDA disaster assistance, and issues surrounding relief supply donations.

KEYWORDS Multihazards, disaster assistance, preparedness, federal planning, foreign government, emergency planning.

245. United Nations Disaster Relief Coordinator, Office of. *World Launches International Decade for Natural Disaster Reduction*. *UNDRO News* (January/February 1990): 2-35. For availability, contact UNDRO, Palais des Nations, CH-1211 Geneva 10, Switzerland.

This topical issue of the newsletter contains nearly 20 items dealing with global planning for natural disasters under the umbrella of the IDNDR. Brief national reports about participative programs are offered by nine countries and short discussions are given to topics such as insurance matters, integrated disaster reduction, and UNIENET—the United Nations International Emergency Network.

KEYWORDS Multihazards, earthquake, insurance, international planning, data sources, IDNDR, foreign planning, emergency planning, UNDRO, computer application.

246. United Nations Centre for Human Settlements. *Human Settlements and Natural Disasters*. United Nations Centre for Human Settlements (Habitat). Paris, France. 1989. 40 pp. For availability, contact Habitat, Suite 417, 130 Albert Street, Ottawa, Ontario K1P 5G4, Canada.

In many developing or partially industrialized nations, a disaster can lead to grave consequences even when the initial impact of the disaster is not very severe. Since its establishment in 1978, the UNCHS (Habitat) has undertaken a number of research, planning, and training projects in disaster mitigation activities. This publication provides examples of pre-disaster and post-disaster projects implemented by the Centre, with a view to illustrating some of the measures available to mitigate the impacts of future disasters. Some of the 15 examples clearly demonstrate that disasters provide an opportunity for governments to use their emergency powers to acquire sites, assemble land, and rationalize land use patterns. Post-earthquake projects are presented from Yugoslavia, Algeria, Mexico, Ecuador, El Salvador, Nepal, Peru, and Yemen, while post-hurricane/flood projects are presented from Dominica, Viet Nam, Bangladesh, Bolivia, and the Turks/Caicos Islands.

KEYWORDS Earthquake, hurricane, structural fire, lake flood, foreign planning, international planning, reconstruction, economic development, rural areas, urban areas.

247. Urban Search and Rescue, Inc. *The Hidden Disaster: Urban Search and Rescue*. Solana Beach, Calif.: JEMS Publishing Company, Inc. 1990. 138 pp. Available for \$16.75, plus \$3.00 postage, from JEMS Library, P.O. Box 1026, Solana Beach, CA 92075.

This volume reprints eleven items which were part of the materials presented at a workshop held during the EMS Today Conference, March 8-9, 1989, in San Diego, California. Topics discussed include identification of the cause and type of building collapse; search and rescue procedures, together with the accompanying precautions to be taken; command and coordination procedures; medical priorities and victim care during SAR operations; industrial preparedness; and the establishment of an urban search and heavy rescue program at the state level. Standard equipment checklists for 1) heavy rescue vehicles, and 2) heavy rescue strike team support equipment (ten-day supply) complete the volume. Physicians, structural engineers, fire department officers, and paramedics contributed their expertise to the preparation of the volume.

KEYWORDS Search and rescue, survival, urban areas, state planning, emergency medical services, business, earthquake, structural engineering, emergency planning.

248. Walter, Louis S. "The uses of satellite technology in disaster management." *Disasters* 14, no. 1 (1990): 20-35.

Satellite technology, either operational or forthcoming, can make substantial contributions to disaster planning/management/response efforts and to disaster relief situations. This article surveys existing technologies and their potential for adaptation to disaster mitigation, discusses the capabilities of remote sensing, geophysical, meteorological, and communications satellites, and suggests factors that could affect the technological acceptance of these tools by the disaster management community. Criteria for implementing use of the technologies also are discussed, including 1) the determination of mitigation requirements, 2) the testing and training of workers in critical positions, 3) financing the endeavors, 4) the establishment of international agreements, and 5) the establishment of an organizational structure which will expedite the benefits offered by satellites.

KEYWORDS Remote sensing, disaster assistance, international planning, emergency communications, emergency planning.

249. Wright, Kathleen M., et al. "The shared experience of catastrophe: An expanded classification of the disaster community." *American Journal of Orthopsychiatry* 60, no. 1 (1990): 35-42.

Following the crash of a chartered airliner that killed 248 U.S. Army soldiers returning to their base in Kentucky, a research team journeyed to Fort Campbell and Dover Air Force Base to observe and document the responses of affected individuals and groups. This participant-observation study lasted for six months, affording the authors the opportunity to propose a classification of individuals in which the degree of involvement is used to characterize the dynamic nature of the disaster community. The article discusses previous classification models, none of which, in the authors' opinion, fit the extensive and complex postdisaster network of participants. Five

circles of involvement are proposed beginning with the next-of-kin, and continue through the bereaved, service providers, and support providers, to infrastructure persons furthest removed from the postdisaster process. It is felt that this configuration of concentric circles best describes an expanded disaster community that evolves in the aftermath of disaster.

KEYWORDS Taxonomy, transportation accident, social impact, psychological impact, psychology, disaster workers.

MULTHAZARD: HEALTH AND MEDICAL

250. Abrams, Terry. "The feasibility of prehospital medical response teams for foreign disaster assistance." *Prehospital and Disaster Medicine* 5, no. 3 (1990): 241-246.

Should prehospital medical response teams be formed for deployment to selected foreign disasters? Citing reasons drawn from four major considerations—political, training, economic, and effectiveness—the author contends that such teams should not be formed if their primary purpose is an international response. At the political level, it is reasoned that diplomatic red tape, the lack of defined tasking, and the vagaries of authoritarian governments can nullify the response capabilities of the most well-intentioned individuals or groups. Differing standards of medical training and the need for almost instant team mobilization can easily dilute the effectiveness of most medical response teams. Similar arguments are made for economic and team effectiveness considerations. The author suggests that a response team must operate within a 24-hour radius of its home location in order to be effective; that a team must be totally self-sufficient from the community that it is dispatched to assist; that medical equipment providers must be alert to the eventuality that the equipment may not be returned; and that persons selected to be part of a response team should possess a wide range of experience and expertise to maximize their value to the response effort.

KEYWORDS Emergency medical services, international planning, search and rescue, emergency planning, disaster assistance, volunteers.

251. COPE. *School Intervention Following a Critical Accident*. Counseling Ordinary People in Emergencies (COPE). Santa Cruz, Calif. 1990. 19 pp. Copies are available free of charge from COPE, P.O. Box 962, Santa Cruz, CA 95062.

This publication provides information on and suggestions for dealing with the special problems that children face after a disaster. It contains reference materials and suggestions for classroom activities designed to help students express their feelings about the incident. Topics discussed include debriefing using graphic art, the group process, identifying at-risk children, and how to enlist parents in the coping process. Although this booklet was developed to aid earthquake victims, the activities are readily transferred to other disaster events. COPE also has prepared reference guides for teachers at the pre-school/elementary and the junior/senior high school levels.

KEYWORDS Schools, children, educational materials, psychological impact, education, emergency planning, local planning.

252. de Boer, Jan. "Criteria for the assessment of disaster preparedness." *Journal of Emergency Medicine* 7 (1989): 481-484.

Using his experience in evaluating medical preparedness for disasters on five Caribbean islands, the author presents a simple and objective method for determining the readiness of medical personnel and facilities. Elements incorporated in the method include medical rescue capacity, medical transport capacity, hospital

treatment capacity, and the existence and level of sophistication of disaster plans. While designed with smaller units of government in mind, the method can be extrapolated to larger governmental entities, including national governments.

KEYWORDS Emergency medical services, local planning, emergency planning, foreign planning, preparedness.

253. International Journal of Mental Health. *Coping with Disasters: The Mental Health Component-1: Theory, Research, and Public Health Dimensions. International Journal of Mental Health* 19, no. 1 (1990): 3-120. Back issues of the journal cost \$52.75 if mailed within the U.S., \$57.75 elsewhere. Available from the Order Dept., M.E. Sharpe, 80 Business Park Drive, Armonk, NY 10504.

This topical issue contains nine articles written by authorities in the areas of 1) the psychological impacts of disasters, and 2) the provision of mental health services following disasters. The papers address the following subjects: planning and preparing for differential and long-term effects of disasters; psychosocial processes in disasters; psychosocial aspects in the diagnosis of post-traumatic stress disorders; methodological aspects of research into mental health impacts of disasters; the impact of disaster on mental health, public health dimensions of disasters; programs in disaster mental health in the U.S.; organizational cooperation in community disaster response; and psychiatric consultation as a disaster response strategy.

KEYWORDS Psychology, mental health services, public health, psychological impact, social impact, federal planning, local planning.

254. International Journal of Mental Health. *Coping with Disaster: The Mental Health Component-2: Case Studies and Reviews. International Journal of Mental Health* 19, no. 2 (1990): 3-103. Individual issues of the journal cost \$52.75 if mailed within the U.S., and \$57.75 elsewhere. Back issues are available from the Order Dept., M.E. Sharpe, 80 Business Park Drive, Armonk, NY 10504.

This volume consists of five case studies appraising the problem of psychological dysfunction following disaster, and three reviews of research areas of concern to disaster mental health professionals. The case studies deal with the Colombia (Nevado del Ruiz volcano)/Ecuador (earthquake) project, the Mexico earthquakes of September 1985, the Bhopal industrial accident, the Australian bushfires of 1983, and the Three Mile Island nuclear power disaster of 1979. The remaining essays 1) overview research into bereavement following disaster, 2) review the literature concerning the emotional effects of disaster on children, and 3) summarize the mental health problems encountered by disaster workers during and after the performance of their duties.

KEYWORDS Case study, psychology, psychological impact, volcano, earthquake, toxic chemicals, bushfire, nuclear power, children, disaster workers, mental health services, emergency response, foreign response.

255. Kerns, Donald E. and Paul B. Anderson. "EMS Response to a major aircraft incident: Sioux City, Iowa." *Prehospital and Disaster Medicine* 5, no. 2 (1990): 159-166.

On July 19, 1989, a disabled passenger jet crash landed near Sioux City, Iowa. When the aircraft burst apart and caught fire upon impact, several pre-warned crash rescue services and emergency medical groups were already on the scene. Within one hour and 45 minutes of impact, 39 survivors had been admitted to local hospitals in critical condition, and 124 others were being treated for less severe injuries. This article recounts the prehospital EMS responses, together with emergency response activities such as fire suppression, on-site triage, transportation to hospitals, and off-scene responses. Several observations are made which might improve future responses, including 1) the four-foot colored flags indicating treatment areas should be made at least seven feet tall so that they can be seen above the crowd level, and 2) the incident commander should be provided with an attendant to record when and how events transpired in order to improve the capability to document the incident for later analysis.

KEYWORDS Emergency medical services, transportation accident, emergency response, local response.

256. Moran, Carmen. *Coping Styles in Volunteer Rescue Workers—A Preliminary Report*. Cumberland College of Health Sciences, Disaster Management Studies Centre, Working Paper no. 2 Sydney, Australia. 1989. 26 pp. Available for \$5.00 from the Disaster Management Studies Center, Cumberland College of Health Sciences, P.O. Box 170, Lidcombe, NSW, Australia 2141.

This study reports on a segment of a wide-ranging investigation into stable personality and coping styles of volunteer rescue workers. Hoping to develop a greater understanding of the etiology and treatment of stress disorders, the investigators questioned local volunteer controllers following flooding in New South Wales. The results indicate that, for this group, the coping mechanisms were "normal" in the sense that they were similar to those of the general population. However, the researchers conclude that a wider body of information on personality and coping styles is needed to better understand the nature and course of stress associated with volunteer rescue work. In general, the results indicated a normal set of coping responses, suggesting that these rescue workers are not made up of any "extreme" group, at least as far as coping responses are concerned.

KEYWORDS Disaster workers, riverine flood, psychological impact, emergency response, local response, volunteers.

257. National Fire Protection Association. "A plan for emergency expansion of facilities and disaster preparedness for health care facilities." In: *NFPA 99, Standard for Health Care Facilities: Emergency Preparedness*, pp. 99-189 to 99-199. Quincy, Mass.: National Fire Protection Association. 1990.

This annex addresses the following broad subjects necessary for preparing a viable disaster plan for hospitals and for upgrading emergency care at nursing and limited care facilities: 1) the types of disasters that should be anticipated, 2) factors needed to be taken into account for responding to a disaster, 3) an example of a disaster plan, 4) guidance on implementing an existing disaster plan, and 4) responsibilities of the facility's staff and governing body. The Annex offers concisely worded guidance on many aspects of disaster planning at health care facilities, including personnel notification and recall, patient evacuation, responsibilities of the triage officer, transition from the emergency mode to the normal mode of operation, protocols for volcano eruption and severe storms, and the activation of emergency utility resources.

KEYWORDS Hospitals, disaster plan, local planning, emergency medical services, emergency planning.

258. World Health Organization. *International Health Relief Assistance: A Guide for Effective Aid*. World Health Organization, Pan American Health Organization. Washington, D.C. 1990. 14 pp. The booklet is free and can be obtained from the Editor, Disaster Preparedness for the Americas, PAHO, 525 23rd Street, N.W., Washington, DC 20037

The nations of the Americas have a relatively high level of health disaster preparedness and a sophisticated health infrastructure. However, once a disaster strikes, the high cost of relief operations may drain primary health care and development program resources in a matter of days. To confront this problem, this booklet outlines the principles of successful disaster health relief assistance. The booklet includes "do's" and "don't's" of disaster aid, myths and realities of disasters, and complete contact information for PAHO offices.

KEYWORDS International planning, disaster assistance, public health, IDNDR, emergency medical services.

MISCELLANEOUS HAZARDS

259 Association of State Dam Safety Officials. *Bibliography on Dam Safety Practice*. Association of State Dam Safety Officials (ASDSO) and U.S. Committee on Large Dams (USCOLD). Lexington, Ky. 1989. 50 pp. Available for \$8.00 from ASDSO, P.O. Box 55270, Lexington, KY 40555.

This bibliography cites approximately 500 documents on dam safety. The listings are broken down into 20 categories including: dam safety by U.S. federal agencies, states, and other nations; automated data collection; flood analysis/spillway capacity; rehabilitation of dams; and warning systems/emergency action planning. Other subject categories of interest include risk analysis, seismic behavior and analysis, monitoring/inspections, legal and financial aspects, dam break analysis, and case histories/lessons learned from dam or reservoir induced failures or other incidents.

KEYWORDS Earthquake, dam safety, dam failure flood, structural design, retrofitting, warning systems, emergency planning, federal planning, state planning, foreign planning, hydrology, risk assessment.

260 Berg, Neil H., ed. *Proceedings of the Symposium on Fire and Watershed Management, October 26-28, 1988, Sacramento, California*. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, General Technical Report PSW-109. Berkeley, Calif. 1989. 164 pp.

This volume contains 26 papers and 15 poster papers dealing with management options to make watersheds less susceptible to wildfire and to manage and restore burned areas after a fire. The articles examine topics such as prescribed burning, fuel management, watershed impacts, soil erosion, wildfire risk, and resource restoration. Case studies are presented of fire and watershed management experiences in California, Washington, and Oregon. Also included in the volume are two contributions that utilize demographic analysis as a tool to better understand problems involving the wildland-urban interface.

KEYWORDS Wildfire, soil erosion, water resources management, recovery, state response, state planning, hydrology, case study, demography, land use management, archaeology.

261. Brown, Curtis A. and Wayne J. Graham. "Assessing the threat to life from dam failure." *Water Resources Bulletin* 24, no. 6 (1988). 1303-1309.

The Secretary of the Interior is mandated by law to perform such modifications of Bureau of Reclamation dams as are needed to preserve their structural integrity and safety. This paper overviews the procedures which the Bureau has developed and applied for estimating the loss of life caused by a dam failure, an estimate that plays a primary role in the modification decision making process. The Threat to Life analysis adopted by the Bureau has been broadened from the traditional hydrological studies to include input from meteorologists, social psychologists, engineers, economists, and emergency planning specialists. Variables such as elapsed warning time, evacuation planning, and the identification of an at-risk population have all been entered into the analytical method currently being employed by the Bureau to determine which dams receive funding for the expensive retrofitting procedure.

KEYWORDS Dam failure flood, warning systems, life value, structural design, retrofitting, risk assessment, federal planning, decision making, emergency planning, dam safety.

262. California Office of Emergency Services. *California Dam Evacuation: Draft Planning Guidance*. California Office of Emergency Services. Sacramento, Calif. 1988. 39 pp. Single copies available free of charge from the California Office of Emergency Services, Planning Division, 2800 Meadowview Road, Sacramento, CA 95832.

Dam failures, whether caused by earthquakes, rapidly rising flood waters, erosion, or design flaws, are a potential hazard for any persons living downstream of dam sites. Yet many contingency dam failure plans are no longer adequate as federal and state agencies move toward multi-hazard planning. This guide delineates the major parts of a working dam failure plan, including mapping, dam assessment, and evacuation planning. It incorporates the legal requirements of legislation, such as the California Dam Safety Act, into California's new Multihazard Functional Planning Guidance, thus helping local planners avoid unnecessary duplications.

KEYWORDS Dam failure flood, evacuation, preparedness, state planning, warning systems, local planning, legislation-regulation.

263. Chapman, Clark R. and David Morrison. *Cosmic Catastrophes*. New York: Plenum Press. 1989. 302 pp. \$22.95.

Profound developments in hard science during the 1970s and 1980s have started to moderate or completely displace pseudoscience concepts that have colored the interpretation of catastrophic events and processes. While some of the topics—supernova explosions and colliding worlds—emphasize cataclysms on a cosmic scale, other parts of the book focus on natural and human-caused catastrophes that directly affect the earth. These catastrophes include events such as global warming, collisions with extraterrestrial debris (the Tunguska, Siberia explosion of 1908, for example), climate impacts caused by massive forest fires or volcanic eruptions, nuclear winter, and enormously destructive collisions with extraterrestrial bodies such as asteroids and comets. Significant chapters deal with the extinction of the dinosaurs, a discussion of uniformitarianism and catastrophism as creative processes, and an analysis of the works of Immanuel Velikovsky, one of the early expounders of violent cosmic cataclysms as influences on earth's historical development. The authors attempt to describe the evidence for this new view of the cosmos nontechnically, but with enough philosophical rigor that other scientists may find the information worthy of examination.

KEYWORDS Extraterrestrial objects, climate impact assessment, wildfire, volcano, nuclear weapons, greenhouse effect, ozone depletion.

264. Clayton, Bill, David Day and Jim McFadden. *Wildland Firefighting*. California Resources Agency, Dept. of Forestry and Fire Protection. Sacramento, Calif. 1987 (revised). 136 pp. Copies are available from the State of California, Office of Procurement, Documents Section, P.O. Box 1015, North Highlands, CA 95660. Cost is \$20.00 to California residents, and \$18.87 for non-Californians.

This text has been written for any organization whose firefighters may be required to fight a wildland fire. The book is designed for engine company personnel, hand crew members, equipment operators, air attack crew members, and initial attack fire command officers. It covers the basic physical factors involving wildland firefighting such as fuel, the effect of topography, weather conditions, and resulting fire behavior. Several chapters are devoted to fire attack components and the organizational structure necessary to their effective deployment, and special chapters deal with fuel management and fire-line safety. Other features include an extensive glossary and a review of 13 extremely hazardous situations often encountered by fire fighters.

KEYWORDS Wildfire, local planning, emergency planning, emergency response.

265. Colorado State Forest Service. *Wildfire Hazard Mitigation Plan: Annex III to Colorado Hazards Mitigation Plan*. Colorado State Forest Service, Fort Collins, Colo. 1990. 49 pp. Available from the Colorado State Forest Service, 203 Forestry Building, Fort Collins, CO 80523. Copies are free to Colorado residents and cost \$1.00 for persons out of state.

This report identifies wildfire problems in Colorado; discusses the impacts and costs of such fires, and presents mitigation recommendations for education, preparedness, legislation, and emergency response. The report also

suggests specific reasons for the growth of wildland/urban intermix, discusses fire protection responsibilities, and presents information on the costs involved and who pays for them.

KEYWORDS Wildfire, urban areas, state planning, risk assessment, preparedness, economic impact, emergency planning, education, legislation-regulation.

266. Doyle, James K., et al. *An Evaluation of Strategies for Promoting Effective Radon Mitigation*. U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation, Report no. EPA 230-02-90-075. Washington, D.C. 1990. 184 pp.

Some risks are perceived by the public as being much worse than analysts believe they are; other risks are largely ignored by the public even though analysts believe them to be of major importance. An example of this latter type of risk, this study reports on the relative effectiveness of a broad range of possible strategies for reducing radon risks to the public, with particular emphasis on two approaches: information and awareness campaigns to encourage testing and remediation by the general public and provision of radon information at time of home sale. The report discusses the survey methodology, examines federal and state legal strategies for addressing radon disclosure at time of real estate transfer, and offers suggestions for evaluating the effectiveness of awareness and mitigation strategies. Appendices present 1) the facsimile surveys for both the Washington, D.C. and Boulder, Colorado areas, 2) federal laws addressing radon issues, and 3) constitutional issues relevant to regulatory strategies for radon.

KEYWORDS Radon, awareness, risk perception, federal planning, state planning, legislation-regulation, law, warning methods, warning responses, risk communication.

267. Fischer, William C. and Stephen F. Arno, eds. *Protecting People and Homes from Wildfire in the Interior West: Proceedings of the Symposium and Workshop*. U.S. Dept. of Agriculture, Forest Service, Intermountain Research Station, General Technical Report INT-251. Ogden, Utah. 1988. 213 pp. For availability, contact the U.S. Forest Service, Intermountain Research Station, Publications Office, 324 25th Street, Ogden, UT 84401.

This volume presents the proceedings of a workshop held in Missoula, Montana during October 6-8, 1987. Participants examined problems associated with protecting wildland homes from fire, surveyed the high cost of wildfire damage, presented state-of-the-art approaches to meeting the threat, and developed recommendations for homeowners, government agencies, fire assistance personnel, and the business community. Sessions were held on overcoming political constraints, building cooperative efforts, working with homeowners and developers, utilizing land use planning, employing fire-resistant construction and landscaping techniques, and using successful firefighting techniques. Over 50 papers and panel discussions address a variety of wildland/urban interface problems, such as how to communicate wildfire mitigation methods to homeowners and developers; how insurance premiums are developed for homes in wildlands; and how architects can prepare guidelines for wildland residential developments. Wildfire hazard reduction programs are described for areas in California, Australia, and Canada.

KEYWORDS Wildfire, rural areas, local planning, politics, insurance, federal planning, emergency management, private sector, risk communication, legislation-regulation, media, land use management, structural materials, case study, risk assessment.

268. International Journal of Wildland Fire. *International Journal of Wildland Fire* 1, no. 1 (1991). Subscriptions are \$75.00 for individuals and \$150.00 for agencies and libraries. Order from the Fire Research Institute, P.O. Box 241, Roslyn, WA 93941-0241.

This journal is a forum for the publication of peer-reviewed articles by both researchers and managers involved in wildland fire. The journal features articles on the science, technology, management, ecology, history, and all

other aspects of wildland fire. It strives to address issues of global significance and to strengthen the worldwide network of cooperation, research, and reporting among fire scientists and managers.

KEYWORDS Wildfire, risk assessment, emergency management, environmental studies.

269. National Fire Protection Association. *Black Tiger Fire: Case Study*. National Fire Protection Association, Quincy, Mass. 1990. 40 pp. Single copies are available free of charge from the National Fire Protection Association, Fire Investigation Division, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

On July 9, 1989, a carelessly tossed cigarette ignited a fire in Black Tiger Gulch west of Boulder, Colorado. The blaze rapidly spread through the populated mountains and destroyed 44 homes and other structures within a period of six hours. The fire burned nearly 2,100 acres before it was extinguished four days later. Dollar damage to homes and natural resources was put at \$10 million and the cost of fighting the fire was estimated to be \$1 million. This report discusses the ongoing controversy surrounding the building of homes in wildland areas that are prone to such destructive fires; details the behavior of the Black Tiger Fire and the strategies used to combat it, and outlines recommendations for fire protection agencies, homeowners, and local government officials to follow in order to reduce fire destruction in the future. Other features of the report include a statistical analysis of factors in damaged homes, and tables that provide 1) a home features and loss factors matrix, 2) a fire behavior matrix, and 3) home features rated against fireline intensity measured in Btu/feet/second.

KEYWORDS Wildfire, loss estimation, damage assessment, local response, emergency response, economic impact, local planning, emergency planning, case study, risk assessment.

270. Smith, David Ingle. "The worthwhileness of dam failure mitigation: An Australian example." *Applied Geography* 10, no. 1 (1990): 5-19.

This paper investigates the economic implications of low-probability, high-consequence events—in this case, major dam failure. Tangible damages, i.e., building damages, are discussed quantitatively, and indirect damages are considered in qualitative terms. The study focuses on potential failure of the Googong Dam in New South Wales; failure of this dam would severely impact two downstream cities—Queanbeyan and Canberra. While it is assumed that a decision to upgrade the dam will be made on the grounds of potential loss of life to downstream residents, the study demonstrates that the cost of upgrading the structure appears worthwhile even in terms of tangible losses alone. Indirect and intangible losses from a dam failure would only increase the economic viability of proceeding with improving the structure's capability to avert partial or complete failure. The author points out that spillway overtopping only accounts for some 35% of historic dam failures.

KEYWORDS Dam failure flood, loss estimation, economic analysis, foreign planning, cost-benefit analysis, risk assessment.

271. Specialized Publication Services, Inc. *Fire/Emergency Services Sourcebook, 1990-1991*. Specialized Publication Services, Inc., Second Edition. New York, N.Y. 1990. 606 pp. Available for \$79.95 from Specialized Publication Services, P.O. Box 6268, FDR Station, New York, NY 10150.

Firefighters and other emergency responders can locate books, videos, films, slides, periodicals, directories, newsletters, computer software, national and state associations, schools, colleges, academies, special programs and courses, and the services offered by FEMA by referring to this updated and renamed publication. Formerly known as the "Fire Service Directory of Training and Information Sources," the reference book has been expanded to include broader categories of information, including areas of interest to emergency medical personnel, disaster specialists, search-and-rescue personnel, hazardous material handlers, and industrial safety officers. The Sourcebook also provides contact information regarding, among others, National Fire Academy state sponsors, sources and authors of books and periodicals, state emergency management training offices, associations, and schools that offer special training programs.

KEYWORDS Structural fire, wildfire, training, educational materials, computer application, emergency medical services, search and rescue, toxic chemicals, hazardous wastes, data sources

272. Stratton, Ruth M. *Disaster Relief: The Politics of Intergovernmental Relations*. Lanham, Maryland: University Press of America. 1989. 204 pp. \$21.75.

This study examines the response of federal, state, and local governments to three disasters that struck New York State: flooding in Syracuse in 1974, a severe blizzard that hit Buffalo in 1977, and the Love Canal toxic waste disaster that emerged in the late 1970s. It attempts to discover how various levels of government responded to the disasters and how the governments interacted with each other during the impact and response periods. Based on these case studies, the author contends that a generous and expansive federal disaster law has not "nationalized" U.S. disaster relief efforts; that local executive officials do not always respond to disasters in the ways anticipated by federal statutes; and that volunteer agencies, political parties, interest groups, and the media are important extra-governmental actors in the implementation of disaster policy. Other features of the book include an exploration of the dynamics of the American policy process, insights into the power relationships which exist in the American federal system, and an examination of the design and development of U.S. disaster policy.

KEYWORDS Federal response, federal planning, intergovernmental, winter storm, riverine flood, toxic chemicals, case study, politics, political science, disaster assistance, legislation-regulation, public policy.

273. U.S. Dept. of Agriculture. *Proceedings of the Symposium on Wildland Fire 2000*. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, General Technical Report PSW-101. Berkeley, Calif. 1987. 258 pp. For availability, contact the Pacific Southwest Forest and Range Experiment Station, USDA, Forest Service, Publications Distribution Section, P.O. Box 245, Berkeley, CA 94701.

This proceedings volume of a symposium held April 27-30, 1987, at South Lake Tahoe, California, describes a unique approach to the study of wildland firefighting. The symposium gathered scientists, practitioners, educators, and representatives of the general public to consider the status of wildland fire management, education, and research. In addition, nine "futuring" groups outlined issues and strategies related to education and training, urbanization, organization and administration, technology, tactics and equipment, prescribed burning, beneficial use of fire, fire occurrence and behavior, and international concerns. Other subjects discussed included wildfire forecasting, local planning concerns, air pollution, the use of expert systems in wildfire fighting, and the possibility of community fragmentation.

KEYWORDS Wildfire, local planning, regional planning, computer application, forecasting, international planning, prevention, education, training, air pollution.

274. U.S. Dept. of Commerce. *Ground Subsidence Due to Mining Operations, October 1976-November 1989 (Citations from the Compendex Database)*. U.S. Dept. of Commerce, National Technical Information Service. Springfield, Va. 1990. 93 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161, as PB90-855958/GAR. Paper copy: \$60.00; microfiche: \$60.00.

This bibliography contains citations concerning ground subsidence associated with mining operations. Mine subsidence is discussed with reference to mathematical modeling, forecasting extent of cavitation, and rock mechanics and mechanisms of stress relaxation. Damage to above- and below-ground structures as well as agricultural areas, and mining techniques designed to prevent or reduce subsidence are included. Monitoring of subsidence and detection of cavitation for surface, underground, and ocean floor mining areas are discussed and examples are analyzed.

KEYWORDS Subsidence, prediction, geology, local planning, rural areas, damage assessment.

275. U.S. Dept. of Commerce. *Indoor Radon Pollution: Control and Mitigation--June 1978-December 1989 (Citations from the NTIS Database)*. U.S. Dept. of Commerce, National Technical Information Service. Springfield, Va. 1990. 79 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161, as PB90-855230/GAR. Paper copy: \$60.00; microfiche: \$60.00.

This bibliography contains citations concerning the control and mitigation of radon pollution in homes and commercial buildings. Citations cover radon transport studies in buildings and soils, remedial action proposals on contaminated buildings, soil venting, building ventilation, sealants, filtration systems, water degassing, reduction of radon sources in building materials, and evaluation of existing radon mitigation programs including their cost effectiveness. Analysis and detection of radon and radon toxicity are covered in separately published bibliographies. Contains 129 citations fully indexed and including a title list.

KEYWORDS Radon, local response, building materials, retrofitting, emergency response.

276. U.S. Dept. of Commerce. *Radon Detection in Homes and Buildings, January 1970-October 1989 (Citations from the NTIS database)*. U.S. Dept. of Commerce, National Technical Information Service. Springfield, Va. 1989. 166 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161, as PB90-851056/GAR. Paper copy: \$60.00; microfiche: \$60.00.

This bibliography contains citations concerning the detection of radon and radon daughter gases in homes and residential buildings. Topics cover measurement techniques and equipment, the effect of local geology on radon in a building, the effect of home weatherization measures on radon levels, and sources of radon entering buildings, including tapwater. Risk assessment and ways to control the amount of radon in a building are briefly considered. (This updated bibliography contains 312 citations, 80 of which are new entries to the previous edition).

KEYWORDS Radon, building design, risk assessment.

277. U.S. Federal Emergency Management Agency. *Wildland/Urban Interface Fire Protection: A National Problem with Local Solutions*. U.S. Federal Emergency Management Agency. Washington, D.C. 1989. Variable paging. Available for \$30.00 from the National AudioVisual Center, 8700 Edgeworth Drive, Capitol Heights, MD 20743-3701.

Because control of wildland fires falls mainly to volunteer fire departments and rural protection districts--organizations with limited resources for training personnel--FEMA's National Fire Academy has created this training program to help them and their communities prepare for such events. This useful kit contains a 138-page textbook, a 104-page workbook, a multiple-choice exam, and a 46-minute video. It is designed for the committed volunteer with little or no experience in combatting wildland/residential fire hazards. The video is coordinated with the five sections in the textbook and workbook, which 1) provide an overview of the wildland/urban interface; 2) outline techniques for identifying and understanding community interface problems; 3) describe protection solutions and options, such as structural modifications, vegetation management, creation of effective infrastructure, public education, and enforcement of fire codes and burning permits; 4) suggest ways to build and maintain support with key agencies, organizations, and individuals; and 5) recommend basic steps for creating an action plan. Materials are designed to be used either individually, in a classroom, or in a public education campaign.

KEYWORDS Wildfire, local planning, emergency planning, educational materials, training, audiovisuals, volunteers, enforcement.

278. Wiggins, J. H. *Economic Consequences of the Hinsdale, Illinois Bell Fire of May 8, 1988*. Crisis Management Corporation. Redondo Beach, Calif. 1989. 33 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161, as PB90-119777/GAR. Paper copy: \$15.00; microfiche: \$8.00.

On Sunday, May 8, 1988, a fire swept through Illinois Bell's telecommunication switching facility located in Hinsdale, Illinois. The station is the major gateway through which local and long-distance calls are routed to 30 other central stations. The fire left 38,000 people, including 3,500 businesses, without telephone and data communication links and 475,000 more customers with limited service. The results of the disabled hub caused lost revenues, increased costs, inconvenience, and lost confidence in a service hitherto largely taken for granted. Restoring service to full capacity took over a month. Economic losses from a major natural disaster, such as an earthquake, have been estimated only for the primary damage caused to structures. Secondary and higher order economic losses have been estimated only on a sporadic basis so that the total consequences of a major earthquake have never been evaluated. This study offers new perspectives on estimating secondary and intangible economic losses due to both actual and hypothetical disasters.

KEYWORDS Structural fire, earthquake, loss estimation, urban areas, economic impact, economic analysis, damage assessment, communication.

279. Wilson, Ramona and John Handmer. *Anticipatory Nuisance and Unsafe Dams*. Middlesex Polytechnic, Flood Hazard Research Centre, Report no. 167. Enfield, Middlesex, United Kingdom. 1990. 20 pp. Available from the Flood Hazard Research Centre, Middlesex Polytechnic, Queensway, Enfield, Middlesex, EN3 4SF, U.K. Cost is 2 English pounds.

Although better engineering standards are generally thought to be decreasing the probability of dam failure, concern for dam safety still exists worldwide. This article examines the legal avenues open to property owners in the dam failure inundation zone who fear for their lives and property and would like the situation rectified. While it is thought that under English Common Law people flooded by a dam failure would be able to recover damages or compensation from the dam owner, common law does not offer avenues to prevent anticipated damages. Other avenues do exist, however, and the paper delineates the circumstances under which equitable jurisdiction of the courts—specifically through the concept of anticipatory nuisance—can be invoked to obtain remediation. It is conceded that anticipatory nuisance law may not be the optimal course of action, but it is discussed as a viable alternative for those seeking to eliminate the threat of unsafe dams.

KEYWORDS Dam safety, legislation-regulation, foreign planning, law, litigation.

280. Ziemer, R.R., C.L. O'Loughlin and L.S. Hamilton, eds. *Research Needs and Applications to Reduce Erosion and Sedimentation in Tropical Steeplands*. International Association of Hydrological Sciences, IAHS Publication no. 192. Wallingford, Oxfordshire, United Kingdom. 1990. 396 pp. Order from Office of the Treasurer, IAHS, 2000 Florida Avenue, N.W., Washington, DC 20009. \$50.00.

During the 1980s a series of symposia discussed the status of erosion and sedimentation research associated with landscapes and conditions characteristic of the Pacific Rim: steep and tectonically active areas comprising a wide range of rock types, and which are subject to heavy rainfall, landslides, volcanic activity, and earthquakes. The influence of land use practices on the frequency and magnitude of such disasters is often a matter of considerable legal and technical controversy. Fifty papers appear under the following categories: erosion and sedimentation problems in the tropics; data, instrumentation, and methods needed for tropical environments; erosion and sedimentation process research and its applicability to the tropics; social, economic, and legislative aspects of erosion and sedimentation in the tropics; role of temporal and spatial scale in erosion and sedimentation; and prevention and rehabilitation. Specific topics addressed include flood and landslide mapping and the economics of soil conservation.

KEYWORDS Soil erosion, land use management, social impact, riverine flood, economic impact, legislation-regulation, landslide, data sources, environmental studies, foreign planning, foreign response.

COASTAL ZONE MANAGEMENT AND PLANNING

281. Center for the Great Lakes. *A Look at the Land Side: Great Lakes Shoreline Management*. Center for the Great Lakes. Chicago, Ill. 1988. 32 pp. For availability, contact The Center for the Great Lakes, 435 N. Michigan Avenue, Suite 1408, Chicago, IL 60611.

This manual is designed to provide practical assistance to private property owners and public officials who want to use shoreline management strategies to cope with fluctuating Great Lakes water levels, flooding, and coastal erosion. Part I describes regional shoreline management strategies, while Part II presents brief case histories of successful examples of shoreline management in the region. Part III offers insights into the constraints that communities face in implementing lakeshore management, and describes opportunities for overcoming them. Planning strategies discussed include zoning, public investment policies, home relocation, and land acquisition projects. An appendix inventories state and provincial shoreline management programs, together with citations to relevant legislation and appropriate contacts.

KEYWORDS Coastal zone management, lake flood, regional planning, state planning, local planning, example, coastal erosion, foreign planning, floodplain management.

282. Gares, Paul A. "Geographers and policy-making: Lessons learned from the failure of the New Jersey dune management plan." *Professional Geographer* 41, no. 1 (1989): 20-29.

The interaction of geographers and government is examined through a case study in which geographers initiated a new shoreline management plan for the State of New Jersey. This paper chronicles the political history of the plan through four steps: identification of a management problem, conceptualization of the dune management plan, preparation of a workable model, and the creation of policy. The fifth step in the policy-making sequence—legalization of the plan—was never reached. Four factors were identified for the failure to adopt the plan: 1) expert scientists and others who faulted the plan failed to understand that valid criticism was part of the process. Tradeoffs and the introduction of new information could be worked into the plan's immediate implementation; 2) the delineation methodology for establishing boundary lines was presented in the technical report but was not used in preparing the enabling legislation; 3) local residents viewed the new legislation as too threatening. The legislation was presented to shorefront owners as a fait accompli, eliciting a negative reaction from them; and 4) property owners felt that their investments would have to be sacrificed without receiving compensation—probably the most sensitive issue of all. The author concluded that many of the problems encountered during the process could have been reduced by involving all those affected by the plan in all phases of policy making.

KEYWORDS Coastal zone management, public participation, state planning, legislation-regulation, politics, local planning, case study, geography, decision making.

283. Hildebrand, Lawrence P. *Canada's Experience with Coastal Zone Management*. Oceans Institute of Canada. Halifax, Nova Scotia. 1989. 118 pp. For availability, contact the Oceans Institute of Canada, 1236 Henry Street, Fifth floor, Halifax, Nova Scotia, Canada B3H 3J5.

The concept of coastal zone management began to emerge as a national concern in the early 1970s. This book chronicles the successes and failures of CZM in Canada, explains why CZM is alive and well in the nation, and points out areas that need continued attention or that need to be addressed in the future. Topics discussed include area-specific CZM approaches (British Columbia, the northwest frontier coasts and islands, the Great Lakes, the St. Lawrence River and its estuary, and the Atlantic coast); a comparison of area-specific CZM approaches to U.S. Coastal Zone Management Act Program requirements; activity-specific approaches, such as water quality management and ocean dumping regulations; supporting tools for coastal planning and management; and policy approaches for marine parks, various conservation strategies, and fish habitat management. Conclusions reached by the author suggest that an integrated national program must be initiated

by government in response to very evident resource degradation and multiple use conflicts, and that national and regional priorities should be used as starting points for the establishment of a comprehensive Canadian CZM plan.

KEYWORDS Coastal zone management, foreign planning, comparative analysis, federal planning, environmental studies, water pollution, historical survey, data sources.

284. Kelley, Joseph T., Alice R. Kelley and Orrin H. Filkey, Sr. *Living with the Coast of Maine*. Durham, North Carolina: Duke University Press. 1989. 174 pp. Available from Duke University Press, 6697 College Station, Durham, NC 27708. Cost is \$32.50 in hardbound, \$10.95 in paperback.

The nation's southern Atlantic and Gulf Coast shorelines are not alone when it comes to being subjected to ill-conceived coastal zone management practices and poorly planned development. The authors point out that although widespread coastal development along the northern tier of Atlantic states has yet to reach the disastrous proportions that beset New Jersey and Florida, the first growing pains of recreation-oriented coastal development are being felt along Maine's once pristine shores. Extensive salt marshes, mud flats, and rocky headlands give Maine a markedly different coastal geomorphology than the shores and barrier islands found south of Cape Cod. Many high bluffs composed of landslide-prone Ice Age mud deposits are attracting the attention of unwary developers. In addition, the state's southern and northern coasts are sinking relatively rapidly and are experiencing earthquakes and landslides in conjunction with this movement. The book contains numerous site diagrams, calls attention to instances of failed structural measures and avoidable environmental damage, offers suggestions for sound development practices, and makes an unspoken plea for prospective Maine residents to live in prudent harmony with the state's many irreplaceable coastal riches.

KEYWORDS Coastal zone management, geomorphology, land use management, structural measures, legislation-regulation, building design, state planning, federal planning, siting.

285. Morales, Leslie Anderson. *Coastal Zone Management: Law and Legislation in the 1980s*. Council of Planning Librarians, Bibliography no. CPL-229, Chicago, Ill. 1988. 12 pp. Available for \$12.00 from the Council of Planning Librarians, American Planning Association, 1313 East 60th Street, Chicago, IL 60637.

Coastal Zone Management State Grants were established in the mid-1970s to help coastal states manage and preserve their coastal environments. The program was never intended to continue indefinitely, since it was expected that states would eventually assume financial responsibility for the programs which the grants brought into being. The program balances public and private needs by checking growth along the coastline at relatively little cost, and by providing technical research and assistance which state governments would not otherwise have access. This bibliography contains over 125 citations drawn mostly from scholarly journals, federal documents, and trade journals. Topics addressed include the taking issue, regulations for offshore oil and gas exploitation, federal legislation, public access to the shore, resource conservation, and coastal law.

KEYWORDS Coastal zone management, legislation-regulation, federal planning, state planning, local planning, law, environmental studies.

286. National Academy of Sciences. *Great Lakes Water Levels: Shoreline Dilemmas*. National Academy of Sciences, National Research Council, Water Science and Technology Board. Washington, D.C. 1989. 174 pp. For availability, contact the NRC, Water Science and Technology Board, 2101 Constitution Avenue, N.W., Washington, DC 20418.

This publication contains the proceedings of a colloquium, held in Chicago March 17-18, 1988, to address hydrometeorological, engineering, land management, and policy issues related to fluctuations in Great Lakes water levels. Presentations dealt with the causes of water level fluctuations; the impacts of these fluctuations; the range of strategies for protecting shoreline development; policy conflicts; legal and institutional issues; response

and decision making roles of individual stakeholders; global climate change and its implications for future Great Lakes water levels and management options; and an overview of coastal erosion control programs as they are practiced in selected Great Lakes, Atlantic Coast, and Pacific Coast states. The colloquium was held contemporaneously with the early phases of a study, conducted by the International Joint Commission (a binational tribunal created in 1909 to negotiate solutions to problems between the U.S and Canada), to examine methods for alleviating adverse consequences of fluctuating water levels in the Great Lakes-St. Lawrence River Basin.

KEYWORDS Lake flood, coastal erosion, coastal zone management, greenhouse effect, climate impact assessment, state planning, hydrology, intergovernmental, private sector, economic impact, legislation-regulation.

287. National Academy of Sciences. *Managing Coastal Erosion*. Washington, D.C.: National Academy Press. 1990. 200 pp. \$24.50 (prepaid) plus \$2.00 for shipping and handling.

In response to a request from FEMA's Federal Insurance Administration in 1988, the Academy's National Research Council established the Committee on Coastal Erosion Zone Management. The committee was asked to provide advice on appropriate erosion management strategies, supporting data needs, and applicable methodologies to administer these strategies through the National Flood Insurance Program. Following an introductory chapter that explains the causes, effects, and distribution of coastal erosion affecting the U.S., the report discusses the types of management options currently available, explains how the NFIP affects coastal management practices, presents an overview of state programs and experiences, and suggests methods by which future shoreline changes can be forecast. Appendices reprint salient legislation and offer a discussion of shore response modeling methods.

KEYWORDS Coastal zone management, coastal erosion, NFIP, federal planning, state planning, insurance, legislation-regulation, forecasting, data sources.

288. National Academy of Sciences. *Opportunities to Improve Marine Forecasting*. Washington, D.C.: National Academy Press. 1989. 125 pp. Available from the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418. \$15.00 in U.S., \$18.00 export.

After listing a number of factors that indicate the growing importance of the coastal zone in America's social and economic life, the report asserts that all activities at sea and on the coasts are sensitive to atmospheric and oceanic conditions. Hurricane winds, waves, and storm tides can inflict losses of life and property on a massive scale. While forecasting the intensity and track of hurricanes is of paramount importance, the coastal zone is increasingly dependent on the forecast of meteorological and oceanic conditions to avoid loss, ensure the safety of life, and maximize the economic well-being of industry and commerce. This report overviews the marine observing and forecasting system, lists the users of marine forecasts, and presents findings of a questionnaire circulated among interested parties utilizing the coastal zone. Recommendations from several topical workshops (tropical and extratropical storms, nearshore forecasting, etc.) also are contained in the document.

KEYWORDS Coastal zone management, hurricane, forecasting, economic impact, information transfer, federal planning.

289. National Academy of Sciences. *Sea Level Change*. Washington, D.C.: National Academy Press. Studies in Geophysics. 1990. 234 pp. \$29.95.

This volume presents 14 technical papers that address the scientific understanding of sea level change—particularly the processes of sea level change, their rates, and the record of past change. The overview points out that average sea level over the oceans has never been constant throughout earth history and that changes in climate, plate tectonics, global ice and snow amounts, and ocean circulation are all indirect causes of changing sea level. Recommendations suggest that improved instrumented monitoring techniques should be implemented for refining

the accuracy of long-term sea level measurements and possible changes in the mass balance of the Antarctic and Greenland ice sheets. While the volume does not provide a discussion of public policy and societal impacts associated with sea level change, it does provide, under one cover, scientific information for understanding the phenomenon.

KEYWORDS Sea level rise, climate impact assessment, oceanography, climatology, greenhouse effect, historical survey, risk assessment.

290. National Committee on Property Insurance. *America's Imperiled Coastlines: A New Concern for the Property Insurance Industry*. National Committee on Property Insurance. Boston, Mass. 1990. 20 pp. For availability, contact the NCPI, Ten Winthrop Square, Boston, MA 02110.

The annual forum of the NCPI, held December 13, 1989, focused on concerns of the insurance industry about continuing development in the nation's high risk coastal areas. Short presentations from forum speakers discuss lakeshore erosion, potential greenhouse effects, intergovernmental/industry partnerships, compliance with coastal building codes, and insurance perspectives on the aftermath of Hurricane Hugo.

KEYWORDS Hurricane, insurance, coastal erosion, lake flood, greenhouse effect, intergovernmental, building codes, enforcement, recovery.

291. Rasid, Harun and James Hufferd. "Hazards of living on the edge of water: The case of Minnesota Point, Duluth, Minnesota." *Human Ecology* 17, no. 1 (1989): 85-100.

A survey conducted among residents of a freshwater/baymouth bar on the southwest shore of Lake Superior found that the majority of respondents perceived that their property hazards were induced primarily by the manipulation of lake levels by the International Joint Commission (IJC). The study area, which is susceptible to shoreline flooding and erosion, suffered considerable property damage during the 1972-1973 and the 1985-1986 high water periods. The study tests the hypothesis that most Great Lakes coastal residents tend to absolve themselves from any responsibility for occupying demonstrably hazardous areas by blaming an entity that has only minimal technical control over the lake level. A corollary of the hypothesis is that a technological fix always exists for those who wish to settle in hazardous zones, and that occupants implicitly assume that science and technology can readily be invoked to deal with every problem arising from natural processes. Respondents perceived that lake levels were primarily dependent upon human regulation systems despite data demonstrating that higher than average precipitation, coupled with lower evaporation rates, were the main causes of the increased lake level.

KEYWORDS Coastal erosion, coastal flood, lake flood, risk perception, local response, structural measures, damage assessment, case study.

292. Rogers, Spencer. *Saving Money on Flood Insurance for Coastal Property Owners*. North Carolina State University, Sea Grant College Program, UNC-SG-89-05. Raleigh, N.C. 1989. 12 pp. Available for \$1.00 from the Sea Grant College Program, 1911 Building, Room 105, Box 8605, North Carolina State University, Raleigh, NC 27695-8605. Bulk discounts can be obtained.

This handy pamphlet provides basic information on flood insurance for coastal property owners: descriptions of the National Flood Insurance Program (NFIP) and Flood Insurance Rate Maps (FIRMs), and definitions of the 100-year storm and A, B, C, and V flood zones. It also presents examples of how to determine insurance premiums and tips on how to secure optimal coverage.

KEYWORDS Coastal flood, insurance, coastal erosion.

293. Smith, Joel B. and Dennis A. Tirpak, eds. *The Potential Effects of Global Climate Change on the United States: Appendix B—Sea Level Rise*. U.S. Environmental Protection Agency, Office of Policy, Planning, and Evaluation, EPA-230-05-89-052. Washington, D.C. 1989. 252 pp.

This volume of EPA's massive global climate change series contains five papers dealing with the effects of possible sea level change occasioned by the greenhouse effect. "The Effect of Sea Level Rise on U.S. Coastal Wetlands" suggests that a half-meter rise by the year 2100 would eradicate more than 4,000 square miles of vegetated wetlands. A rise of one meter would destroy 65% of the coastal marshes and swamps of the contiguous U.S. A "National Assessment of Beach Nourishment Requirements Associated with Accelerated Sea Level Rise" looks at the potential for and cost of replenishing beaches with sand. "The Cost of Defending Developed Shorelines Along Sheltered Waters of the U.S. from a Two-Meter Rise in Sea Level" provides an in-depth analysis of structurally protecting Long Beach Island, New Jersey, from a rising sea. "The Cost of Not Holding Back the Sea—Phase 1: Economic Vulnerability" develops a method by which researchers can catalog and measure the current value of real sources of economic wealth that might be threatened. And "An Overview of the Nationwide Impacts of Sea Level Rise" contends that the long-term survival of coastal wetland ecosystems can be ensured if society takes measures to explicitly declare that developed low lands will be vacated as sea level rises.

KEYWORDS Sea level rise, coastal zone management, economic impact, economic analysis, federal planning, structural measures, wetlands, climate impact assessment, greenhouse effect, simulation, scenario, case study, coastal erosion.

294. Stauble, Donald K., ed. *Barrier Islands: Process and Management*. American Society of Civil Engineers, ASCE Coastlines of the World Series. New York, N.Y. 1989. 338 pp. Available from the Publications Dept., ASCE, 345 East 47th Street, New York, NY 10017. Cost is \$34.00.

This topical volume consists of papers delivered during specialized sessions of Coastal Zone '89, the Sixth Symposium on Coastal and Ocean Management held in Charleston, South Carolina, July 11-14, 1989. Published in the hope that the trend toward the rapid and unwise development of barrier islands eventually may be reversed, the volume's 29 papers appear under four categories dealing with 1) general morphodynamic processes that affect barrier islands and coastal spits; 2) specific examples of barrier shoreline studies at sites from North Carolina to Maine; 3) recent barrier island management problems, together with their potential solutions, that currently concern planners at all levels of government; and 4) specific examples of barrier island research on the coastal reach from South Carolina to Louisiana. Among the subjects addressed in the management-oriented papers are land use issues, the efficacy of stabilization attempts, and the protection of undeveloped or underdeveloped barrier islands.

KEYWORDS Coastal zone management, barrier islands, geomorphology, civil engineering, land use management, coastal erosion, case study, scenario, legislation-regulation, NFIP, state planning, federal planning, structural measures.

295. Ward, Larry G., et al. *Living with Chesapeake Bay and Virginia's Ocean Shores*. Durham, North Carolina: Duke University Press. 1989. 236 pp. Available from Duke University Press, 6697 College Station, Durham, NC 27708. Hardbound: \$35.00; paperback: \$12.95.

The lovely coastline along Chesapeake Bay and Virginia's Atlantic shore is suffering from coastal erosion, storm flooding, excessive development, and various other forms of human pollution. This addition to the "Living with the Shore" series recounts the history of the region, defines the hazards faced by residents and landowners, and provides advice on how to reduce these dangers. Beginning with a careful description of coastal dynamics and geomorphology, the volume then explores the pros and cons of shoreline engineering projects and offers suggestions to prospective homeowners about how to select a safe building site that also is compatible with local ecological conditions. Other chapters provide valuable information on how to construct or buy a house, discuss legal constraints on coastal land use, and describe safety measures needed to survive a hurricane. One of the

most useful features of this book is its detailed information about specific site selection. Chesapeake Bay is divided into 36 segments, each with its own site-analysis map that provides among other useful information, average erosion rates for that specific shoreline reach and the 100-year floodway.

KEYWORDS Coastal zone management, geomorphology, local planning, hurricane, land use management, coastal flood, coastal erosion, barrier islands, legislation-regulation, structural measures, building design, historical survey.

LANDSLIDES AND OTHER MASS EARTH MOVEMENTS

296. Swanston, Douglas N. and Robert L. Schuster. "Long-term landslide hazard mitigation programs: Structure and experience from other countries." *Bulletin of the Association of Engineering Geologists* 26, no. 1 (1989): 109-133. Reprints are available from Robert Schuster, USGS, P.O. Box 25046, Mail Stop 966, Federal Center, Denver, CO 80225.

This article summarizes landslide hazard mitigation programs in major developed nations around the world and analyzes the factors affecting the extent, sophistication, and effectiveness of those efforts. The authors then discuss how the best elements of these programs could be incorporated into a U.S. program of landslide hazard reduction. They contend that the strongest need is for a unified national program to assure equal distribution of information and expertise and adequate application of state-of-the-art techniques, and they list the basic elements of such a system. National and regional programs discussed include Canada, Austria, France, Italy, Switzerland, Scandinavia, Japan, the USSR, Hong Kong, and New Zealand. Observations offered in the article include 1) little research effort has been directed specifically toward urban-landslide hazard reduction; 2) nations with major and continuing landslide losses have incorporated a strong central government role in the direction of mitigation activities to assure consistent standards of practice and application, and to prevent unequal and inadequate performance at provincial, municipal, and private levels; and 3) there is a strong need for a more unified national approach to landslide mitigation in the U.S.

KEYWORDS Landslide, foreign planning, historical survey, legislation-regulation.

297. Wold, Robert L., Jr. and Candace L. Jochim. *Landslide Loss Reduction: A Guide for State and Local Government Planning*. Colorado Dept. of Natural Resources, Geological Survey, Special Publication no. 33 (also Publication FEMA-182). Denver, Colo. 1989. 50 pp. Copies available free of charge upon written request to FEMA, P.O. Box 70274, Washington, DC 20024. Also available for \$8.00 from the Colorado Geological Survey, 1313 Sherman Street, Room 715, Denver, CO 80203.

Landslides in the U.S. cause an average of 25 to 50 deaths and \$1 to \$2 billion in losses annually, and these losses continue to grow despite the availability of successful techniques for landslide management and the overwhelming evidence that landslide hazard mitigation programs serve both public and private interests by saving many times the cost of implementation. This guidebook provides a practical, politically feasible guide for state and local officials involved in landslide hazard mitigation. It presents a method for preparing state and local landslide hazard mitigation plans, defines and describes basic terms and concepts, provides information on available resources, and suggests how to form an interdisciplinary mitigation planning team and a permanent statewide natural hazards mitigation organization.

KEYWORDS Landslide, mapping, land use management, structural measures, local planning, state planning, information transfer, risk assessment.

WATER RESOURCES AND WETLAND MANAGEMENT

298. Burke, David G., et al. *Protecting Nontidal Wetlands*. American Planning Association, Planning Advisory Service Report no. 412/413. Chicago, Ill 1988. 76 pp Available for \$38.00 from the American Planning Association, 1313 E. 60th Street, Chicago, IL 60637. Subscribers to the APA's Planning Advisory Service can obtain the report for \$18.00.

Since nontidal wetlands comprise about 95% of the wetlands in the conterminous U.S., and probably an even higher percent in Alaska, it is important for planners, other officials, and citizens to learn more about nontidal wetlands and the array of protection techniques available to help minimize their loss. This excellent report is designed to help local government officials, public interest groups, landowners, and other citizens to preserve nontidal wetlands. It describes wetland types and values and includes a look at the current status of wetlands in the U.S.; it discusses how to create a wetland protection program; and it reviews federal, state, and local regulations designed to protect these valuable resources. The report features discussions about Section 404 and Section 10 permits, state wetland regulatory programs, the "takings" issue, wetlands zoning, the elements of a wetland protection ordinance, and other regulatory techniques involving floodplains, subdivisions, and sanitary codes. A detailed model nontidal wetland protection ordinance completes the volume.

KEYWORDS Wetlands, wetland management, legislation-regulation, state planning, federal planning, public participation, local planning.

299. Gardiner, John L. "Environmentally sound river engineering: Examples from the Thames catchment." *Regulated Rivers: Research and Management* 2 (1988): 445-469.

Both the theory and practice of river engineering is rapidly changing in the United Kingdom. This paper reviews new approaches to river basin management and examines the problems that need to be resolved before environmentally compatible structural measures are implemented. The author contends that while in past years structural measures basically served a single purpose and were exploitative in character, current river management schemes need to assume an interdisciplinary approach where environmental and ecological factors are given equal consideration. A complementary planning and appraisal methodology is discussed that includes expertise drawn from fields such as archaeology, landscape architecture, agriculture, and wildlife management. The paper reviews the legislative and regulatory history of the multidisciplinary methodology as it applies to parts of the Thames catchment and proposes means by which an interactive teamwork approach can improve the social and economic components of river basin management schemes.

KEYWORDS Water resources management, floodplain management, structural measures, environmental studies, civil engineering, geomorphology, foreign planning, riverine flood.

300. Jorgensen, Eric P., ed. *The Poisoned Well: New Strategies for Groundwater Protection*. Covelo, Calif.: Island Press 1989. 422 pp Available from the Island Press, Box 7, Coveto, CA 95428. Hardback: \$31.95; softbound: \$19.95.

Nearly half of the population of the U.S., and over 90% of the population in rural areas, depend on groundwater as their primary source of water. But groundwater contamination has become a national problem: leakage from as many as 10 million underground chemical storage tanks and from 100,000 landfill sites threaten groundwater quality. Prepared with the cooperation of the Sierra Club Legal Defense Fund, this book is split into four parts, each with a different purpose. Part I contains basic information about groundwater, how it becomes contaminated, and how to find out whether it is polluted. Part II explains how to obtain relevant information from governmental agencies, how to work with administrative agencies, and how to utilize the power of the courts. It also provides basic advice about organizing and using nonlegal political tools as part of an overall mitigation strategy. Part III provides specific suggestions for action and gives step-by-step advice about using

specific federal programs. Part IV contains general information about state and local programs and explains how citizens can use them. Numerous lists of information sources add to the volume's usefulness.

KEYWORDS Groundwater pollution, federal planning, state planning, local planning, environmental studies, legislation-regulation, hazardous materials transportation, toxic chemicals, hazardous wastes, public health, mapping, litigation, hydrology.

301. Kusler, Jon A. and Mary E. Kentula, eds. *Wetland Creation and Restoration: The Status of the Science—Volume I: Regional Reviews*. U.S. Environmental Protection Agency, Environmental Research Laboratory, EPA 600/3-89/038a. Corvallis, Oreg. 1989. 473 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 as PB90-149758. Paper copy: \$45.00; microfiche: \$8.00.

Attempts to compensate for wetlands losses by creating new wetlands or restoring degraded ones have greatly increased in recent years. This report (in 2 volumes) is the first major EPA publication describing research on wetlands creation and restoration, and it also provides an analytical framework for making Clean Water Act Section 404 permit decisions and setting priorities for future research in the field. Volume I presents a series of reviews that summarize wetlands creation and restoration experiences in broadly defined wetlands "regions" (e.g. Pacific coastal wetlands or wooded wetlands of the Southeast). Authors of the 17 papers summarize available data and information, identify what has and has not been learned about the procedures, and recommend research priorities. Other U.S. regions discussed are the agricultural midwest, the prairies states, coastal wetlands of the Southeast, southwestern semi-arid zones, the Great Basin and the Snake River, Puerto Rico and the Virgin Islands, and the northeastern U.S. states.

KEYWORDS Wetlands, wetland management, federal planning, regional planning, hydrology, water resources management, environmental studies.

302. Kusler, Jon A. and Mary E. Kentula, eds. *Wetland Creation and Restoration: The Status of the Science—Volume II: Perspectives*. U.S. Environmental Protection Agency, Environmental Research Laboratory, EPA 600/3-89/038b. Corvallis, Oreg. 1989. 172 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161 as PB90-149766. Paper copy: \$23.00; microfiche: \$8.00.

A companion publication to Volume I, "Regional Reviews," the 12 papers of Volume II focus more on larger environmental, public policy, and administrative issues than does the review document. Topics addressed include mitigation planning and evaluation, the Section 404 Program as a mitigation tool, waterfowl management techniques, wetland dynamics, the urban waterfront environment, evaluation techniques, the restoration of wetlands in areas subjected to mining, and long-term evaluation of restored wetlands.

KEYWORDS Wetlands, wetland management, environmental studies, water resources management, hydrology, federal planning, local planning, urban areas.

303. Kusler, Jon A., Sally Daly and Gail Brooks, eds. *Urban Wetlands: Proceedings of the National Wetland Symposium*. Association of State Wetland Managers. Berne, N.Y. 1989. 401 pp. Available from the ASWM, Box 2463, Berne, NY 12023-9746. \$23.00 to members, \$19.00 to members. Add \$3.00 for postage and handling.

The 67 papers in this proceedings volume address the special problems associated with protecting and managing wetlands in urban and urbanizing environments where: 1) wetland hydrology is often substantially altered by urbanization processes, 2) land values often are very high, 3) wetlands are not considered of great value as natural habitats, and 4) wetland management policy rests primarily in the hands of local government. The volume is a valuable resource for urban land use planners, wetland and floodplain regulators, water resource planners, ecologists, developers, environmental agencies, and private interest groups which focus on environmental problems. Major topics addressed in the papers include urban wildlife and habitat values; flood control and stormwater management; aesthetic and scenic values of wetlands; pollution control; boundary delineation;

specialized planning considerations for the identification of problems arising from Section 404 regulations; acquisition and other nonregulatory approaches; the restoration and creation of urban wetlands; and vernal pools. Essays on the future of urban wetlands and several case histories on the local regulation of these ecologically valuable resources complete the volume.

KEYWORDS Wetlands, wetland management, water resources management, urban areas, stormwater management, legislation-regulation, case study, water pollution, environmental studies, floodplain management, local planning, state planning, COE.

304. Lang, H. and A. Musy eds. *Hydrology in Mountainous Regions—Volume I: Hydrological Measurements, the Water Cycle*. International Association of Hydrological Sciences, IAHS Publication no. 193. Wallingford, Oxfordshire, United Kingdom. 1990. 810 pp. Available from the IAHS, Office of the Treasurer, 2000 Florida Avenue, N.W., Washington, DC 20009 for \$70.00.

This volume contains 95 technical papers that deal with measuring the hydrological cycle, particularly the variety of water processes and the wide spectrum of catchment characteristics that occur in mountainous terrain. Accurate hydrological data gathering can improve flood forecasting at lower altitudes and can provide a better tool for estimating water availability in non-mountainous areas.

KEYWORDS Water resources management, hydrology, data sources, computer modeling.

305. Michaud, Joy P. *At Home with Wetlands: A Landowner's Guide*. Washington State Dept. of Ecology, Publication no. 90-31. Olympia, Wash. 1990. 41 pp. For availability, contact the Washington State Department of Ecology, Publications Office, Olympia, WA 98504-8711.

This guidebook describes how wetlands function, explains their significance in local watersheds and in the hydrological cycle, and shows how human activities have come to threaten wetlands. By emphasizing the term "stewardship"—the individual's responsibility to manage his life and property with proper regard to the rights of others—the handbook suggests that individual involvement with wetland maintenance and supervision can be as much an opportunity as a responsibility to involve oneself in environmental issues. Separate chapters deal with wetland identification, the values and limits of wetlands, the interaction of humans with wetlands, wetland protection, enhancement techniques, regulations concerning wetlands preservation, and how to explore wetlands without damaging them. A family-oriented publication, the guidebook offers information about the wetland food chain, the effects of water pollution on wetlands, and ways to create non-destructive human access to wetlands.

KEYWORDS Wetland management, wetlands, local planning, environmental studies.

306. National Academy of Sciences. *Groundwater and Soil Contamination Remediation: Toward Compatible Science, Policy, and Public Perception*. National Academy of Sciences, National Research Council, Commission on Geosciences, Environment, and Resources, Commission on Engineering and Technical Systems, Water Science and Technology Board, Colloquium 5 of a Series. National Academy Press, Washington, D.C. 1990. 261 pp. Available from the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418. Cost is \$15.00.

On April 20-21, 1989, the NRC's Water Science and Technology Board organized and hosted a colloquium which focused on how science influences policy and public perception where cleanup of groundwater and soil contamination is concerned. Authors of the 12 papers in this volume and other colloquium participants were invited not only for their technical knowledge about the subject, but also for their experience with public perception of water/soil contamination issues and the statutes and laws that regulate how state and government agencies respond to the situation. Papers address topics such as 1) scientific limits to proposed and practiced remediation measures; 2) the success or failure of current remediation practices; 3) policy issues and perspectives that need to be considered for tangible future remediation measures; 4) scientific decision making used in the

remediation process; 5) the efficacy of new remedial technologies; and 6) how to make science, policy, and public perception compatible within a legal/policy-making context.

KEYWORDS Groundwater pollution, soil pollution, decision making, public policy, legislation-regulation, law, enforcement, hazardous wastes, risk perception, chemistry, public health.

307. Salvesen, David. *Wetlands: Mitigating and Regulating Development Impacts*. Urban Land Institute, Washington, D.C. 1990. 117 pp. Available from the Urban Land Institute, 625 Indiana Avenue, N.W., Washington, DC 20004-2930. \$30 per copy for ULI members, \$38.00 for nonmembers. Add \$2.50 for shipping charges.

Following an introduction that chronicles society's changing perception of wetlands from nuisances to indispensable ecological necessities, the book reviews the various types of wetlands, their value to the environment, and the losses they have undergone over past decades. Separate chapters are allotted to the legislation and regulation of wetlands from both the state and federal perspectives. Issues examined in the context of federal regulations include federal laws, permitting under Section 404 of the Clean Water Act, and the takings issue. Indirect and direct state regulatory programs are discussed and six examples of state wetlands programs are examined in detail. The concluding chapter on mitigation strategies presents several case histories of successful projects that involve the avoidance or minimization of damage to wetlands due to development, the restoration or enhancement of previously damaged wetlands, and the creation of entirely new wetlands. The book contains considerable information about how concerned groups or agencies can implement existing regulations to save endangered wetlands, while heightening public awareness of wetlands values during the process.

KEYWORDS Wetlands, wetland management, legislation-regulation, enforcement, local planning, state planning, federal planning, law, case study, example, biology, environmental studies.

308. Shamir, Uri and Chen Jiaqi, eds. *The Hydrological Basis for Water Resources Management*. International Association of Hydrological Sciences, IAHS Publication no. 197. Wallingford, Oxfordshire, United Kingdom. 1990. 502 pp. Available for \$60.00 from the IAHS, Office of the Treasurer, 2000 Florida Avenue, N.W., Washington, DC 20009, USA, or from the IAHS Press, Institute of Hydrology, Wallingford, Oxfordshire OX10 8BB, U.K.

This volume presents the proceedings of a conference held in Beijing, China, during October 23-26, 1990. The 53 published papers are grouped under six categories: "Movement of Surface and Ground Waters and Their Interaction in Water Resources Exploitation" (12 papers); "Water Quality Assessment and Management" (11 papers); "Hydrological Data Collection and Processing, Information Systems, and Data Bases" (9 papers); "Decision Support and Expert Systems for Water Resources Management" (5 papers); "Hydrology and Water Resources in a Changing Environment" (8 papers), and "Water Resources Management, Planning, and Exploitation" (8 papers). Topics addressed include the anticipated impacts of climate change on water resources, flood forecasting, and the development of a flood data base.

KEYWORDS Water resources management, water quality, hydrology, computer application, climate impact assessment, riverine flood, forecasting, data sources, foreign planning, groundwater depletion, LDCs.

309. Sinniger, Richard O. and Michel Monbaron, eds. *Hydrology in Mountainous Regions—Volume II: Artificial Reservoirs, Water, and Slopes*. International Association of Hydrological Sciences, Publication no. 194. Wallingford, Oxfordshire, United Kingdom. 1990. 446 pp. Available for \$50.00 from the IAHS, Office of the Treasurer, 2000 Florida Avenue, N.W., Washington, DC 20009.

Thirty-seven papers in this proceedings volume address topics associated with 1) sediment transport prediction, sediment deposit formation, and problems related to flushing; 2) consequences of modified flow regime downstream of reservoirs; 3) ecological effects and fishery problems related to reservoirs; 4) runoff processes