

more specialized and detailed presentation for specific users. A survey of public opinion on the operation of the Tropical Cyclone Warning System after cyclone Charley revealed findings such as 1) 85% of the respondents plotted the storm track, 2) 84% found the cyclone advisories easy to understand, and 3) as in the Winifred case, scant positive praise was given to the meteorological bureau's forecasting and warning performance.

KEYWORDS Hurricane, warning systems, warning responses, foreign response, case study.

147. Post-Courier (Charleston). *Hurricane Hugo. Post-Courier*—special reprint. Charleston, S.C. September 22-26, 1989. 64 pp.

With the help of an emergency generator, Charleston's *Post-Courier* was able to continue publishing until conventional power was restored five days after Hugo trashed much of the city. This special reprint edition brings together the paper's coverage of the storm's impact on Charleston during those five days. Activities reported by the newspaper's staff included looting, the evacuation process, availability of food, ice, and water, rescue operations, downed tree removal, restoration of utilities and services, an appraisal of damage caused by the storm, the response of the police force, and disaster assistance efforts.

KEYWORDS Hurricane, emergency response, disaster assistance, damage assessment, local response, evacuation, recovery.

148. Sparks, P.R. *The Risk of Hurricane Wind Damage to Buildings in South Carolina*. Clemson University, Dept. of Civil Engineering, Coastal Hazards Advisory and Mitigation Project. Clemson, S.C. 1990 (revised). 19 pp.

Prepared a year prior to Hurricane Hugo's devastating landfall, this paper (with minor changes) provides a painful demonstration of the accuracy of many points made about the inadequacy of the state's hurricane mitigation measures. Comments are offered on the accuracy of design wind speeds, building codes and their enforcement, the evolution of building design standards in South Carolina, and ways to improve building design and construction standards in the state. Basically, the author contends that 1) mandatory implementation of ANSI A58.1 "Minimum Design Loads for Buildings and Other Structures" would drastically improve the capability of buildings to withstand hurricane winds; 2) there is too much influence exerted by the construction industry on policies related to building code standards; 3) building code enforcement is almost as important as the adoption of stringent building design standards; and 4) the state, in essence, has a population of buildings along its coast that its decentralized laissez-faire system of building control deserves.

KEYWORDS State planning, hurricane, building codes, enforcement, building design, architecture, construction, legislation-regulation, risk assessment.

149. U.S. Dept. of Commerce. *Hurricane Hugo, September 10-22, 1989*. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, Natural Disaster Survey Report. Silver Spring, Md. 1990. 70 pp.

With winds estimated at 135 MPH at landfall, NOAA pronounced Hurricane Hugo the strongest storm to hit the continental U.S. in 20 years. Compiled by a post-disaster survey team, this report chronicles the storm's course, presents pertinent meteorological information, summarizes preparedness actions and NWS warning services, evaluates the interpretation and dissemination of NWS information, and discusses public response to the storm and user benefits from NWS services. Findings and recommendations appearing in the report include 1) a comprehensive evacuation study has not been undertaken for Puerto Rico and the Virgin Islands; 2) in its advisories, the National Hurricane Center (NHC) did not sufficiently emphasize the impacts that inland high winds might have for the Carolinas; 3) construction of future NWS offices in hurricane-prone areas should have hardened hurricane-proofed areas that can preserve foodstuffs, provide temporary sleeping quarters, and provide minimal personal hygiene facilities; 4) the public continues to receive most of its warning information from the media; and 5) in both the Caribbean and the Carolinas, emergency managers coordinated frequently with their

local NWS offices. Hugo's impact caused 49 deaths, 26 in the U.S. and its Caribbean islands; more than \$9 billion in damage and economic losses (\$7 billion on the U.S. mainland); and the evacuation of 216,000 coastal residents.

KEYWORDS Hurricane, damage assessment, federal response, emergency response, warning response-s, warning systems, NWS, meteorology, local response, forecasting.

150. U.S. Dept. of Commerce. *Hurricanes and Tropical Cyclones: January 1974-March 1988* (A Bibliography from Ocean Abstracts). U.S. Dept. of Commerce, National Technical Information Service (NTIS). Springfield, Va. 1990. 133 pp. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161, as PB90-872540/GAR. \$60.00 in both hard copy and microfiche. The update (also \$60.00) is available as PB90-872557/GAR.

This bibliography contains citations concerning the occurrence and physical manifestations of hurricanes and tropical cyclones. Studies of the effects of specific storms, historical data tabulations, forecasting, warning and evacuation procedures, storm tracking, damage surveys and economic impact, associated wind and wave observations and forecasting, and the use of numerical models for forecasting are presented. Physical and chemical effects on bays and contiguous shelf waters, and mechanisms of cyclone formation are also discussed. There are 360 citations in the bibliography. A 44-page update (88 citations) is available for the period April 1988 to December 1989.

KEYWORDS Hurricane, evacuation, warning systems, meteorology, environmental impact, forecasting, damage assessment, economic impact.

151. U.S. Dept. of Defense. *Hurricane Hugo: After-Action Report*. U.S. Dept. of Defense, Army Corps of Engineers, Charleston District. Charleston, S.C. 1990. 75 pp. Single copies available free of charge from the Emergency Management Division, Charleston District Corps of Engineers, P.O. Box 919, Charleston, SC 29402-0919.

The events prior to, during, and after Hurricane Hugo are chronicled in this report, which focuses on the storm's impact on South Carolina and the role of the Corps of Engineers in the recovery effort. Included are summaries of disaster operations and interagency coordination and discussions of the emergency situation, assistance provided, response effectiveness, and the operation's strengths and weaknesses. The report contains 24 lessons learned, from which the following are taken: 1) the Charleston District should revise its Hurricane Plan to address problems encountered during post-disaster response; 2) all TDY personnel coming from outside the District should bring their own transportation and emergency equipment; 3) day-care for dependent children of District personnel presented a problem; 4) future hurricane preparedness exercises should be more comprehensive and include participation at least to the Branch level; 5) it is highly recommended that the policy of not allowing Corps vehicles to be garaged overnight at a private residence be discontinued during an emergency; and 6) a safety checklist should be prepared for all staff (including collectors of visual information) who will be in the field during damage assessment and recovery/assistance operations.

KEYWORDS Hurricane, federal response, emergency response, recovery, reconstruction, damage assessment, disaster assistance, economic impact.

152. U.S. Dept. of Defense. *Hurricane Hugo Assessment: Review of Hurricane Evacuation Studies Utilization and Information Dissemination*. U.S. Dept. of Defense, South Atlantic Division and U.S. Federal Emergency Management Agency. Atlanta, Ga. 1990. 39 pp. Single copies available free of charge from FEMA, Region IV, 1371 Peachtree Street, Atlanta, GA 30309.

In the days preceding Hugo's landfall, an estimated 500,000 people evacuated the coastal reaches of Georgia, South Carolina, and North Carolina. Although the highest storm surge on the east coast in the 20th century was recorded, only about 40 mainland deaths were attributed to the storm. This FEMA and COE report evaluates whether existing evacuation studies were being used by local and state officials, whether the data from the studies

were reliable, and which study products were the most useful to officials. Chapters include information on hazards and vulnerability data, behavioral characteristics of evacuees, shelter issues, transportation and clearance time data, evacuation decision making, and public information. Findings suggest that 1) more than half the evacuees from all areas went to the homes of friends or relatives; 2) very few evacuees went to public shelters; 3) roughly a fifth of all evacuees reached their destinations in less than 30 minutes, indicating very short trips; 4) very few survey respondents interpreted the evacuation notices as being mandatory; and 5) over 90% of the respondents felt that officials had handled the evacuation well.

KEYWORDS Hurricane, evacuation, social impact, emergency response, local response, group behavior, risk assessment, warning responses.

153. U.S. Federal Emergency Management Agency. *Hazard Mitigation Opportunities in the Virgin Islands*. U.S. Federal Emergency Management Agency, Interagency Hazard Mitigation Team, FEMA-841-DR-Virgin Islands. Washington, D.C. December 1989. 46 pp. For availability, contact FEMA, Region II, 26 Federal Plaza, Room 1338, New York NY 10278.

The recommendations in this report are intended to provide the framework for hurricane mitigation during the reconstruction period in order to reduce the potential for future losses due to hurricanes, other high winds, floods, and seismic hazards. Thirteen work elements describe damage caused by Hurricane Hugo and suggest ways to repair facilities in a manner that will minimize damage caused by future hurricanes and other natural hazards. The work elements specifically include electric power and water distributions systems, the sewage system, communication systems, airports and maritime facilities, oil spills, the protection of archival materials, the U.S. government as a disaster response organization, and general disaster preparedness.

KEYWORDS Hurricane, damage assessment, preparedness, federal response, state response, state planning, riverine flood, lifelines, reconstruction.

154. U.S. Federal Emergency Management Agency. *Hurricane Hugo: Interagency Hazard Mitigation Team Report*. U.S. Federal Emergency Management Agency, Report no. FEMA-843-DR-SC. Atlanta, Ga. October 1989. 39 pp. For availability, contact FEMA, Region IV, Disaster Assistance Program Division, Suite 729, 1372 Peachtree Street, Atlanta, GA 30309.

Hurricane Hugo affected an estimated 1.8 million people—20 persons died, 264,500 were evacuated, 270,600 were temporarily unemployed, 60,000 were left homeless, and approximately 54,000 had registered for disaster assistance six weeks after the storm struck. This report contains recommendations for improved recovery and hazard mitigation that were proposed by a regional FEMA mitigation team which investigated the stricken area in the hurricane's aftermath. Basically, the report addresses issues that South Carolina should consider in future emergency plan development. The report offers a general description of the disaster and the response to it, addressing government and regulatory structures, hurricane preparedness, damage, initial reaction, and long-term reconstruction. It recommends improvements in the use of South Carolina's emergency operations centers, in floodplain and coastal zone management procedures, in emergency communications, and in the implementation of a mandatory state-wide building code that provides structural protection from both hurricane-force winds and earthquakes.

KEYWORDS Hurricane, damage assessment, preparedness, federal response, disaster assistance, recovery, warning systems, state planning, coastal zone management, floodplain management, insurance, building codes.

155. United Nations Development Programme. *Hurricane Hugo in Montserrat: Reconnaissance Report on the Structural Damage*. United Nations Development Programme. Bridgetown, Barbados, WI, 1989. 70 pp. For availability, contact Consulting Engineers Partnership, Ltd., P.O. Box 715, Bridgetown, Barbados, WI. Attn: Rolf Stephanson at UNDP.

This report presents the observations of a reconnaissance team that visited Montserrat shortly after Hurricane Hugo devastated the island in September 1989. It describes the types of damage sustained, assesses the extent to which building design, workmanship, materials, and lack of maintenance contributed to the damage, offers advice on improving design and construction standards, and recommends procedures to be followed during the reconstruction period. These recommendations include 1) in future, all buildings and structures must be designed in accordance with the Caribbean Uniform Building Code (CUBIC); 2) electricity and telephone poles must be designed to withstand hurricane force winds, with particular attention being paid to topographic effects; 3) all communication masts must be designed to withstand wind forces appropriate to critical facilities; 4) the Government of Montserrat should pass into law the mandatory use of the CUBIC for the design and construction of buildings; and 5) a formally-structured education programme for all members of the building fraternity should be instituted immediately. Many color photos of damaged structures supplement the text.

KEYWORDS Hurricane, damage assessment, construction, building design, foreign planning, building codes, reconstruction.

156. United Nations Disaster Relief Coordinator (UNDRO), Office of. *Case Report: Caribbean-Hurricane Hugo*. United Nations Disaster Relief Coordinator, Office of, UNDRO Publication no. 89/21 Geneva, Switzerland. 1989. 40 pp.

Also identified as "Support to National and Regional Emergency Systems (Lessons Learnt from Recent Disasters including Hurricane Hugo)" this document was prepared in conjunction with the Pan-Caribbean Disaster Preparedness and Prevention Project. When Hugo hit Dominica, Montserrat, Antigua/Barbuda, the British Virgin Islands, and St. Kitts/Nevis, the states were still recovering from the widespread and extensive damage produced by Hurricane Gilbert in September 1988. Fourteen lives were lost due to Hugo in these states, together with damages estimated at US \$365 million. Seventy-six comments are offered dealing with hurricane preparedness measures, regional and telecommunications planning, public awareness and the training of emergency personnel, the response to Hugo, the coordination of both internal and external responses, and implications for PCIDPPP activities. The rest of the document contains UNDRO information and situation reports, from which a rough chronology of hurricane impact and disaster assistance events can be ascertained.

KEYWORDS Hurricane, foreign response, emergency response, preparedness, disaster assistance, damage assessment, economic impact, recovery.

VOLCANOES

157. Bernknopf, Richard L., David S. Brookshire and Mark A. Thayer. "Earthquake and volcano hazard notices: An economic evaluation of changes in risk perceptions." *Journal of Environmental Economics and Management* 18, no. 1 (1990): 35-49.

This paper investigates the economic impact of natural hazards information following its introduction into a community market situation. Significant seismic activity prompted the U.S. Geological Survey to issue an earthquake Hazard Watch for the Mammoth Lakes area in May 1980. Two years later the Survey added a Notice of Potential Hazard due to increased volcanic activity in the area. A region noted for its recreational facilities, Mammoth Lake resident property owners and nonresident visitors were surveyed to examine their actual behavior during the period of heightened hazard awareness and to determine consequent impacts upon the recreation industry and investment/property values. Findings from the study include: 1) the hazard notices contributed to a measurable economic loss in property values, at least over the short term, because of the fear of possible property damages; 2) visitation to the area's recreation facilities basically was unaffected; 3) policy makers should realize that hazard warnings can alter behavior; future official notices and warnings in the Mammoth Lake area should have a quantitative content that describes the temporal and spatial nature of expected events; and 4) in

future, the Survey should distinguish between low probability events with extensive and indeterminate time windows and genuine emergency conditions or predictions.

KEYWORDS Earthquake, volcano, risk perception, risk assessment, warning responses, warning methods, property value, economic analysis, economic impact, recreation, tourism, USGS.

158. Carson, Rob. *Mount St. Helens: The Eruption and Recovery of a Volcano*. Seattle, Wash.: Sasquatch Books. 1990. 160 pp. \$19.95.

Ten years after Mount St. Helens erupted, life has returned to the area devastated by the pyroclastic blast of May 18, 1980. Utilizing a set of stunning photos, this book describes the eruptive sequence and the damage it caused, and then chronicles recovery processes slowly being achieved by plants, animals, and human society. Other topics addressed in the book include the many concurrent scientific research projects being conducted at this unique field laboratory, the growing conflict between scientists and recreationalists, and the numerous ways humans have already altered the post-eruptive ecology. Facts stated about the recovery include 1) one bridge on a new \$145 million recreation highway cost \$12.7 million—more than the entire public contribution for biological and geological research on the mountain; 2) beginning in September 1980, Weyerhaeuser recovered 850 million board feet of lumber from its lands in just two years—most of which was shipped to Japan, and 3) snowmobiles can cause irrevocable damage to the recovering terrain.

KEYWORDS Volcano, recovery, federal funding, federal recovery, local recovery, biology, economic impact, COE, volcanology, environmental impact, risk assessment, recreation.

159. Hall, Minard L. "Chronology of the principal scientific and governmental actions leading up to the November 13, 1985 eruption of Nevado del Ruiz, Colombia." *Journal of Volcanology and Geothermal Research* 42, nos. 1/2 (1990): 101-115.

The author begins his chronology almost a year before the eruption when indications of anomalous activity appeared in the Arenas Crater and the first volcano-related earthquakes occurred. The chronology includes references to local, state, and international preparedness and monitoring actions, commentaries on the impending threat from local authorities and the media, and the response to publication of a volcanic hazards map. Conclusions reached include 1) the Ruiz threat was scientifically known, but none of the volcanological studies contained hazard evaluations; 2) skepticism was widespread, in and out of government, concerning the possibility of a catastrophic eruption; 3) differences in culture and tradition of the two threatened provinces played important contrasting roles in pre-eruption preparation and planning, influencing the way that the media covered the crisis, which in turn affected public perception of the risk; 4) the lack of systematic and sustained preparation of the threatened communities was the major shortcoming; and 5) there was strong opposition from economic interests to the publication of a hazards map that predicted that the city of Armero ran a 100% chance of being affected if lahars were generated.

KEYWORDS Volcano, risk perception, risk assessment, foreign planning, emergency planning, warning systems, volcanology, prediction, awareness, preparedness, lahar.

160. *Journal of Volcanology and Geothermal Research*. *Nevado del Ruiz Volcano, Colombia, II*. *Journal of Volcanology and Geothermal Research* 42, nos. 1/2 (1990): 1-224. For availability of the issue, contact the Journal Information Center, Elsevier Science Publishing Co., 655 Avenue of the Americas, New York, NY 10010.

On November 13, 1985, the Nevado del Ruiz volcano erupted catastrophically, killing approximately 24,000 people in the vicinity of Armero, Colombia. This topical issue consists of eight articles which investigate geologic and chemical aspects of the eruption, four articles that examine planning, warning, and mitigation issues raised after the eruption, and a comprehensive bibliography. Of interest to disaster planners and managers are "Chronology of the principal scientific and governmental actions leading up to the November 13, 1985 eruption

of Nevado del Ruiz, Colombia," by M.L. Hall, "Volcanic hazard maps of the Nevado del Ruiz volcano, Colombia," by E. Parra and H. Cepeda; "Monitoring active volcanoes and mitigating volcanic hazards: The need for including simple approaches," by R.E. Stoiber and S.N. Williams; and "The 1985 Nevado del Ruiz volcano catastrophe. Anatomy and retrospection," by B. Voight.

KEYWORDS Volcano, warning systems, prediction, foreign planning, mapping, emergency planning, emergency response, foreign response, risk assessment, risk perception, volcanology.

161. McClelland, Lindsay, et al., eds. *Global Volcanism 1975-1985*. Englewood Cliffs, New Jersey: Prentice Hall, 1989. 655 pp. Available for \$44.00 from the Prentice Hall Book Distribution Center, Route 59 at Brook Hill Drive, West Nyack, NY 10995.

Much of this book is a reorganization of preliminary reports of volcanic activity that has been published in the SEAN Bulletin, a monthly publication of the Smithsonian Institution's Scientific Event Alert Network. The book contains a chronology of events, a summary and statistical recapitulation of the decade's eruptions, and a description of volcanic activity in the earth's 20 major volcanic zones. A typical entry will discuss the volcano's past eruptive history, chronicle the type and intensity of eruptive or seismic episodes over the ten-year period, present graphics of instrumented records, and list the names of authorities who may be contacted for additional information. The concluding chapter explores the atmospheric effects attributed to massive aerosol ejection, particularly that associated with the 1982 eruption of El Chichon. Appendices contain the addresses of information contacts cited in the volume and an extensive index. Primarily a technical book dealing with the science of volcanology, the index nevertheless contains a considerable number of entries under the headings of "destruction and damage" and "hazards," such as evacuation, alert, fatalities, and buildings. Over 130 pages of text deal with the continental US, Alaska, and Hawaii.

KEYWORDS Volcano, damage assessment, volcanology, seismology, historical survey, prediction, climate impact assessment.

162. Miller, C. Dan. *Potential Hazards from Future Volcanic Eruptions in California*. U.S. Dept. of the Interior, Geological Survey, Bulletin no. 1847 Menlo Park, Calif. 1989. 17 pp. and 2 plates. Available for \$4.25 from the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225.

At least 76 of the more than 500 volcanic vents in California have been identified as having erupted, some repeatedly, during the past 10,000 years. Sooner or later, some volcanoes in the state will erupt, undoubtedly causing serious impacts on the health, safety, and economies of significant portions of the state. This report describes the geologic nature and probable distribution of the state's potentially hazardous volcanic phenomena, together with their threat to people and property. The report is accompanied by a map that indicates areas relatively likely to be affected by future eruptions, and by tables that conveniently list 1) potential hazards as a function of different flowage phenomena, and 2) a summary of Holocene eruptive activity and probable greatest hazards from future eruptions at various centers of volcanic activity. In addition to the more well-known areas in California (Mount Shasta, Lassen Peak, Mono Lake/Long Valley region), the map indicates hazards associated with the Clear Lake area, the Owens River/Uphebe Crater area, the Amboy Crater/Lavie Lake area, and the Salton Buttes area.

KEYWORDS Volcano, risk assessment, state planning, prediction, volcanology, geology.

163. Ferry, Ronald W. and Michael K. Lindell. *Living with Mount St. Helens: Human Adjustment to Volcano Hazards*. Pullman, Wash. Washington State University Press. 1990. 230 pp. \$20.00.

Ten years after the May 18, 1980 eruption of Mount St. Helens, people living near the volcano are still learning to cope with its ever-present danger. This book, written by researchers who were studying the social impact of the volcano even before the major eruption, examines how residents of Toutle and Lexington, Washington, have

responded to the hazard during the past decade. The authors used statistical surveys, personal interviews, and hazard management literature to analyze and interpret residents' reactions during and after the eruption. The lessons derived from this longitudinal study are intended for emergency managers who wish to inform, educate, and protect the general public from quick-onset hazards. Some of the many findings summarized in the volume include 1) the greater the proportion of protective information received from relatives, the greater the degree of hazard adjustment; 2) demographic variables (employment status, children in the household, income, and age) were not highly correlated with the number of adjustments adopted; 3) relative to other hazards, survey respondents possessed a reasonably extensive knowledge of threats associated with the volcano; and 4) respondents were more concerned with potential damage to property rather than possible negative outcomes for personal health and safety.

KEYWORDS Risk assessment, local planning, local response, risk perception, volcano, social impact, longitudinal study, emergency management.

164. Simkin, Tom, et al. *This Dynamic Planet: World Map of Volcanoes, Earthquakes, and Plate Tectonics*. U.S. Dept. of the Interior, Geological Survey and the Smithsonian Institution. Menlo Park, Va. 1989. 1 plate. The map can be purchased for \$3.00, plus \$1.00 handling, from the USGS, Map Distribution, Federal Center, Box 25286, Denver, CO 80225.

The USGS and the Smithsonian Institution have jointly published this map as a contribution to the IDNDR. The computer-generated map shows the topography of the land surface and the sea floor, with color and shaded relief to help distinguish important features. Volcanoes that have been active during the past 10,000 years are plotted from the Volcano Reference File of the Smithsonian Institution, along with epicenters of selected large earthquakes from 1897 onward and from instrumentally recorded quakes from 1960 to the present.

KEYWORDS Earthquake, volcano, risk assessment, mapping, seismology, geology, volcanology.

165. Stoiber, Richard E. and Stanley N. Williams. "Monitoring active volcanoes and mitigating volcanic hazards: The case for including simple approaches." *Journal of Volcanology and Geothermal Research* 42, no. 1/2 (1990): 129-149.

The authors contend that less-developed nations can significantly improve volcano monitoring and warnings systems by emphasizing seven simple expedients that have all of the following attributes: 1) only materials that are locally available are required; 2) no extensive installation or training of operators is necessary; 3) they are often labor intensive; 4) they are affordable; 5) no foreign aid funds are necessary (funds which are seldom available before the catastrophe occurs; 6) they do not await the arrival of foreign experts; 7) all of measures 1-6 can be sustained long after spare parts for sophisticated equipment are no longer available or for which funding cannot be obtained. Eleven simple methods of observation and monitoring are discussed at length, three simple means for mitigating volcanic hazards are presented, and specific lessons learned from the Nevado del Ruiz and Guagua Pichincha eruptions are provided. One of the conclusions states that volcanologists with an extensive knowledge of active volcanoes, when acting in an advisory capacity, have not only the option but the duty to suggest that optimum use be made of simple monitoring expedients.

KEYWORDS Volcano, prediction, warning systems, LDCs, foreign planning, foreign response, risk assessment, lava, lahar.

166. Wright, Thomas L. and Taeko Jane Takahashi. *Observations and Interpretation of Hawaiian Volcanism and Seismicity, 1779-1955: An Annotated Bibliography and Subject Index*. Honolulu: University of Hawaii Press. 1989. 270 pp \$30.00.

Investigations conducted on volcano phenomena in Hawaii have contributed significantly to the science of volcanology. This annotated bibliography traces the evolution of ideas regarding such concepts as the source of

heat for volcanic eruptions, the role of volcanic gas in triggering eruptive activity, and the association of earthquakes with eruptions. The 1298 citations refer to a variety of sources, including scientific journals, newspapers, travelogues, and missionary chronicles. The introduction presents an account of the early scientific expeditions that studied Hawaii's volcanoes, discusses the contributions to geology and seismology by prominent Hawaiian volcanologists, and describes the founding and achievements of the Hawaiian Volcano Observatory. From the writings of William Ellis, the first westerner to record a visit to Kilauea (1823), it can be ascertained that the native Hawaiians had a remarkably clear understanding of volcanic activity.

KEYWORDS Volcano, historical survey, volcanology, seismology, earthquake.

TECHNOLOGICAL HAZARDS

167. Houts, Peter S., Paul D. Cleary and The-Wei Hu. *The Three Mile Island Crisis: Psychological, Social, and Economic Impacts on the Surrounding Population*. University Park, Penn.: Pennsylvania State University Press. Pennsylvania State University Studies no. 49. 1988. 118 pp. Available for \$10.00 from the Penn State Press, Suite C., Barbara Building, 820 North University Drive, Pennsylvania State University, University Park, PA 16802.

The TMI nuclear reactor disaster precipitated an extensive evacuation of persons living near the facility, inflicted substantial short-term economic impacts both on individuals and businesses in the area, and caused significant psychological disturbances among persons living in its vicinity. Since the accident occurred (1979), many studies have attempted to assess the psychological, social, and economic impacts of the disaster. This volume compiles and summarizes the results of five such surveys, all aimed at the scientific assessment of the behavior of residents living as far away as 55 miles from the TMI facility. Separate chapters are allocated to 1) an overview of the accident; 2) the evacuation process; 3) economic impacts on individuals and businesses; 4) a review of the level and duration of psychological duress of residents over an eighteen-month period; 5) attitudes and beliefs; and conclusions ascertained by the studies. Findings suggest that fear of possible harm can, by itself, have strong and long-lasting effects on people's feelings and behavior patterns, and that certain coping mechanisms were associated with maintaining high levels of distress rather than with decreasing distress.

KEYWORDS Nuclear power, social impact, economic impact, psychological impact, evacuation, risk perception, federal response, local response, emergency response.

168. Journal of Environmental Psychology *Psychological Fallout from the Chernobyl Nuclear Accident*. *Journal of Environmental Psychology* 10, no. 2 (1990). 91-176.

This special issue contains seven articles that investigate the social and psychological consequences of the reactor failure at Chernobyl. Topics addressed in the papers include risk perception, attitudes toward nuclear power, public responses to the accident, and lingering worries emanating from the disaster. Surveys of postdisaster attitudes are reported from West Germany, Sweden, the Netherlands, Australia, France, and Great Britain. Findings mentioned in the papers include 1) reactions to Chernobyl were strongly related to attitudes on other nuclear issues defined within specific national contexts; 2) supporters of nuclear power appeared to be less stable in their general attitude than their opponents; 3) election results in West Germany indicated that the majority of the population—though critical of nuclear power and concerned about its risks—did not demand clear-cut changes in energy policy; and 4) the accident itself and the policies adopted to cope with the fallout had a major effect on public opinion.

KEYWORDS Nuclear power, risk perception, foreign response, social impact, psychological impact, comparative analysis, politics, awareness, risk communication, nuclear radiation, longitudinal study.

169. Kunreuther, Howard and Rajeev Gowda, eds. *Integrating Insurance and Risk Management for Hazardous Wastes*. Boston: Kluwer Academic Publishers. 1990. 365 pp. \$48.95.

A conference held May 18-19, 1988 at the Wharton School of the University of Pennsylvania brought together representatives from interests concerned with the waste management process. Members from government and the university community joined lawyers, manufacturers, insurers, and environmentalists to address many of the thorny problems associated with reducing and managing hazardous wastes. This book brings together the papers prepared for and presented at the conference, along with discussant comments and reports from group discussions. The 14 papers deal with a variety of important hazardous waste topics: risk management, risk assessment, and insurability issues associated with cleaning up both inactive and active hazardous waste sites; communicating risk information for an integrated waste management strategy; and environmental, legal, industrial, legislative, and insurance perspectives on establishing an integrated waste management strategy. Recommendations offered included 1) people need to be provided with data on the benefits as well as on the limitations of risk assessment; 2) the insurance industry must overcome its reluctance to be an active and direct player in conducting risk assessments and managing risks; and 3) legislative consistency must accompany environmental statutes regardless of the medium involved (land, air, water).

KEYWORDS Hazardous wastes, insurance, law, legislation-regulation, liability, risk assessment, risk management, risk communication, environmental studies, business, intergovernmental.

170. Rogers, G.O., et al. *Evaluating Protective Actions for Chemical Agent Emergencies*. U.S. Dept. of Energy, Oak Ridge National Laboratory, ORNL-6615. Oak Ridge, Tenn. 1990. 300 pp.

In cooperation with FEMA, other federal agencies, and affected state and local governments, the U.S. Army is in the process of implementing an emergency preparedness capability for the accidental release of unitary chemical weapons. The research reported in this document supports that effort by developing a method of evaluation for the basic protective action alternatives—evacuation, in-place shelter, and respiratory protection. Although the report deals almost exclusively with chemical weaponry, many of the principles can apply to emergency planning and emergency response measures related to the accidental release of toxic industrial chemicals. Using a model developed to examine the effect various protective actions have on expected exposure under a variety of release and meteorological conditions, the study analyzes a total of 1134 scenarios—504 evacuation, 378 in-place sheltering, and 252 respiratory protection scenarios. All of the scenarios examined assumed that the protective actions would be implemented in the context of a state-of-the-art emergency response system characterized as being able to 1) detect and assess an accident, communicate that to off-site officials, and make a decision to warn the public in 5 minutes or less; 2) have both indoor and outdoor emergency warning systems; and 3) stimulate public response at a rate that is 25% faster than empirically documented previous disasters.

KEYWORDS Toxic chemicals, emergency planning, local planning, evacuation, warning systems, preparedness, public health, emergency shelter, case study, scenario.

171. Shortreed, John H., ed. *Risk Management for Dangerous Goods*. Waterloo, Ontario, Canada: University of Waterloo Press 1989. 176 pp. Available for \$28.00 (US\$28.00 outside Canada) from the University of Waterloo Press, Dana Porter Library, Waterloo, Ontario, Canada N2L 3G1.

This document is a record of a workshop held at the University of Waterloo during April 26-28, 1986. The purpose of the workshop was to bring together all sectors involved with dangerous goods movements, and to record consensus views; to consider the major achievements in Canada that have made the movement of hazardous materials safer; and to consider new directions for improving risk management for dangerous goods in Canada, including upgrading industry safety plans, and improving areas such as response capability, training, performance standards, insurance, and risk planning. Topics addressed in the 23 papers include 1) lessons for Canada from the Bhopal disaster; 2) insurance and legal fees; 3) the public hearing process in risk management; 4) how regulations have improved response capability, workplace safety, and shipping costs; 5) the role played

by police and firefighters in emergency response; and 6) interprovincial issues rising from the enforcement of hazardous materials transportation regulations.

KEYWORDS Hazardous materials transportation, toxic chemicals, risk assessment, risk management, awareness, local planning, foreign planning, insurance, enforcement, legislation-regulation, example, emergency planning, emergency response, public safety, intergovernmental, emergency planning, training.

172. Zeiss, Chris and James Atwater. "Waste facility impacts on residential property values." *Journal of Urban Planning and Development (ASCE)* 115, no. 2 (1989): 64-80.

This study attempts to provide answers to two questions: Are waste facility impacts accurately reflected in residential property value differences? Does a property value guarantee address a negative perception about facility impacts on host communities? A review of pertinent theory and 13 empirical studies revealed inconsistent and inconclusive results. In this study, physical impact analyses and property value differential analyses were carried out at two municipal facilities—a landfill and an incinerator. Findings indicated that 1) no significant effects of observed physical impacts on property sales prices were noted; 2) property value decreases are inaccurate, and possibly misleading indicators for noxious facility impacts or justification for host community opposition; and 3) community guaranteed property values may reflect unjustified fears rather than compensation for objectively measured property value losses.

KEYWORDS Noxious facility, economic impact, property value, loss estimation, local planning, economic analysis, risk perception.

MULTIHAZARD: GENERAL

173. American Public Works Association. *Emergency Management in Public Works*. American Public Works Association, Chicago, Ill. 1990. Instructor's Guide: 204 pp.; Student Manual: 215 pp. Available from the American Public Works Association, 1313 East 60th Street, Chicago, IL 60637. Instructor's Guide: \$125.00; Student Manual: \$25.00.

The APWA has developed an "in-service packaged program" to acquaint public works supervisors and managers with the basic concepts of emergency management and to prepare them to better handle emergencies. The course is divided into six sessions: 1) emergencies and emergency management defined, 2) public works and emergency management, 3) developing an emergency management plan, 4) managing resources for use during emergencies, 5) dealing with stress during emergencies, and 6) public works response and recovery. Emergency planning guidelines are provided for most of the natural hazards and the major technological or human-caused hazards. The student manual contains essays written by authorities in the emergency management field that supplement the explanatory text and numerous emergency management problems are postulated for students to solve.

KEYWORDS Emergency planning, emergency management, lifelines, multihazards, technological hazards, local planning, disaster workers, preparedness, educational materials.

174. Anderson, Peter S. *Toward an Integrated Australian Disaster-Management Information System: Challenges and Prospects for the 1990s*. Centre for International Research on Communication and Information Technologies (CIRCIT), Policy Research Paper no. 4. Melbourne, Australia. 28 pp. Australian \$25.00; \$5 00 for individuals at educational institutions; free to students; an additional \$10.00 for overseas orders. Order from CIRCIT, First Floor, Riverside Quay, 4 Byrne Street, South Melbourne, Victoria 3205, Australia.

This paper addresses hazard communication needs in a far wider context than that of just Australia. It reviews a broad range of current national and international issues regarding disaster information management, including problems concerning the definition of the field of hazards management, the collection and dissemination of information, the applicability of research, and the ways in which disaster-related information is exchanged and distributed. In particular, it examines the growing use of computer networks and databases and the associated policy issues that must be addressed if such communication and information technologies are to gain greater acceptance and support in disaster management. The paper offers a systematic approach for solving these problems and surveys options and strategies that might encourage better distribution of disaster research using these new communication systems.

KEYWORDS Emergency communications, emergency planning, emergency management, foreign planning, data sources, computer application, international planning, disaster studies, information transfer.

175. Annenberg Washington Program *Communication: When It's Needed Most: How New Technology Could Help in Sudden Disasters*. Northwestern University, Annenberg Washington Program in Communications Policy Studies. Evanston, Ill. 1989. 130 pp. Single copies available free of charge from the Annenberg Washington Program, 1455 Pennsylvania Avenue, N.W., Suite 200, Washington, DC 20004.

Many hazards could be mitigated or even prevented from becoming disasters through better use of satellites and other communication technology, according to the authors of this collection of papers. Assembled as a contribution to the IDNDR, the eleven papers were written by specialists in satellite communications, mass media, and emergency relief. Topics addressed include 1) the coordination of disaster response efforts by national and international agencies; 2) real-time television disaster site assessment; 3) the role played by the media in disaster response and hazard management; 4) satellite technology and remote sensing capabilities for use in disaster relief and emergency communications; 5) legal problems arising from the use of satellite communications in international disasters; 6) a draft convention on telecommunications assistance in disasters; and 7) the formation of an international disaster coordination center.

KEYWORDS Emergency communications, remote sensing, disaster assistance, international planning, media, emergency management, law, legislation-regulation, intergovernmental, IDNDR.

176. Appropriate Technology. *Disaster Management. Appropriate Technology* 17, no. 1 (1990). Back issues of the journal can be purchased for 3.50 English pounds from Intermediate Technology Publications Ltd., 103-105 Southampton Row, London WC1B 4HH, U.K.

This issue of the journal is almost entirely devoted to disaster management and specifically addresses the role of non-governmental organizations at the local level. In sharp contrast to many international periodicals dealing with hazards, the magazine focuses on specific activities that can be undertaken by individuals or small groups to mitigate hazards. It includes a disaster planning bibliography for organizations or individuals seeking further guidance.

KEYWORDS Emergency planning, local planning, private sector.

177. Association of Geoscientists for International Development. *AGID News* no. 61/62 (February/May 1990): 27-33. For information on obtaining this newsletter, contact AGID Headquarters, c/o Asian Institute of Technology, P.O. Box 2754, Bangkok, 10501, Thailand.

In an August 1989 editorial, this newsletter announced a renewed emphasis on natural hazards and committed itself "to ensure the active and effective participation of Third World geoscientists in a truly international and interdisciplinary effort towards understanding natural hazards and combatting the effects of both natural and human-induced disasters." Subsequent issues have contained many articles on natural hazards, and the newsletter now includes a four-page insert, entitled "Natural Hazards Network," as a regular feature. This issue contains

articles on the successful prediction of geological hazards in China, geological hazards in Peru's Cordillera Blanca, and a general discussion of global natural hazards and disasters. Publication of the newsletter began in 1974.

KEYWORDS Geology, geological hazards, LDCs.

178. Australian Overseas Disaster Response Organization. *Proceedings of the AODRO Seminar on Appropriate Overseas Aid for Pacific Island Disasters*. *Australian Overseas Disaster Response Organization (AODRO) Newsletter* 6, no. 3 (September 1988): 2-16. For availability, contact AODRO, P.O. Box K425, Haymarket, NSW 2000, Australia.

This special edition of the newsletter contains the full text of five papers presented at an AODRO seminar held in Sydney on September 6, 1988. Informative and concisely written, the papers address a wide spectrum of issues involving disaster assistance to the governments of island nations plagued by a variety of natural hazards. The papers discuss inappropriate or misguided disaster assistance, cyclone preparedness, socioeconomic disruptions caused by natural disasters in the southwest Pacific, and they also provide a number of general observations on the effectiveness of disaster assistance.

KEYWORDS Hurricane, preparedness, foreign planning, disaster assistance, foreign response, emergency response, emergency planning, multihazards, social impact, economic impact.

179. Britton, Neil R. *Anticipating the Unexpected: Is the Bureaucracy Able to Come to the Party?* Cumberland College of Health Sciences, Disaster Management Studies Centre, Working Paper no. 1. Sydney, Australia, 1989. 37 pp. Available for \$5.00 from the Disaster Management Studies Centre, Cumberland College of Health Sciences, P.O. Box 170, Lidcombe, NSW, Australia 2141.

This report is an initial statement setting out the author's views on the New South Wales government's decision to restructure the state's emergency and disaster rescue services. The paper examines this decision by locating the government's resolve in the context of organizational studies and disaster management literature, and by evaluating the declared intention of the government to create an efficient and effective service. Based in part on empirical studies conducted following several major disaster events in Australia in the last two decades, the author concludes that it will be unlikely that the government will achieve its goals.

KEYWORDS Emergency management, emergency planning, disaster studies, foreign planning, search and rescue, interorganizational.

180. Britton, Neil R. *Field Research in the Context of the Disaster Impact Environment*. Cumberland College of Health Sciences, Disaster Management Studies Centre, Occasional Paper no. 1. Sydney, Australia, 1989. 38 pp. Available for \$10.00 from the Disaster Management Studies Centre, Cumberland College of Health Sciences, P.O. Box 170, Lidcombe, NSW, Australia 2141.

This study examines the factors affecting disaster impact field investigations, summarizes some of important literature on this topic, and thus provides a bibliographic source for disaster researchers, particularly in Asia and the Pacific region, who may not be aware of the diversity of material that is available. The author asserts that one focus of current and future research in the region should be the establishment of a data base of systematic case studies to provide a baseline of empirical information. This can best be achieved, he maintains, through "triangulation"—the application of combined social science research strategies. Insights and observations are offered on analytical tools used in the social sciences, such as quick response studies, longitudinal studies, participant observations, and purposive organizational samplings.

KEYWORDS Sociology, disaster studies, historical survey.

181. Britton, Neil R. *Reflections on Australian Disaster Management: A Critique of the Administration of Social Crisis*. University of Sydney, Cumberland College of Health Sciences, Disaster Management Studies, Working Paper no. 3. Sydney, Australia. 1989. Available for \$5.00 from the Disaster Management Studies Centre, Cumberland College of Health Sciences, P.O. Box 170, Lidcombe, NSW, Australia 2141.

This paper explores an outcome of the counter-disaster movement's early link with civil defense activities and examines implications of the current connection with the Australian Defence Force, especially the impact of the dominant military model of "command and control" on civilian social crisis planning. The paper addresses some key policy questions regarding the development of effective disaster management. Such management, the author points out, is a specific type of social crisis intervention in which both the planning and response processes are intergovernmental. Since intergovernment coordination is the mechanism through which a community obtains the full complement of resources for its disaster response system, it is critical to the effective management of threats. However, this mechanism is seriously lacking in the Australian disaster management system.

KEYWORDS Foreign planning, emergency planning, civil defense, multihazards, emergency management, intergovernmental.

182. Britton, Neil R., Carmea Moran and Ben Correy. *The Permanent Volunteer Emergency Worker: Exploring Relevant Factors in Stress Coping*. University of Sydney, Cumberland College of Health Sciences, Disaster Management Studies Centre, Occasional Paper no. 3. Lidcombe, New South Wales, Australia. 1990. 49 pp. For availability, contact the Disaster Management Studies Centre, Cumberland College of Health Sciences, University of Sydney, East Street, Lidcombe, New South Wales, Australia, 2141.

This paper attempts to expand knowledge on the nature of volunteerism and voluntary associations by focusing on a relatively unstudied group: the permanent volunteer disaster worker. The paper also seeks to identify and model the principal variables which are thought to influence individual capacity to cope with stress. The paper is organized into five parts. Part 1 reviews the Australian disaster management system as it relates to the use of volunteers, particularly with regard to the "self-help" principle and the nation's overwhelming reliance on volunteers. Part 2 presents a selected literature review on volunteerism and on voluntary association groups, while Part 3 emphasizes the distinctive environment within which permanent emergency and disaster volunteers function. Part 4 focuses on the elements which impinge on individual volunteers within the larger social crisis context, and the final section speculates on ways to manage volunteer worker stress during disaster situations.

KEYWORDS Disaster workers, psychological impact, self-help, foreign planning, emergency management, volunteers, psychology, sociology.

183. Brown, Hyacinth, ed. *Disaster Planning in Jamaica: Safeguarding Documents and Vital Data*. Jamaica Library Association. Kingston, Jamaica. 1989. 46 pp. For availability, contact the Jamaica Library Association, P.O. Box 58, Kingston 5, Jamaica.

This volume is comprised 1) of papers on the protection of vital data and documents delivered during a seminar held in Jamaica in 1986, 2) of a study undertaken by Jamaican librarians that attempted to determine the level of preparedness of local libraries, and 3) of emergency planning and management lessons learned from Jamaica's experience with Hurricane Gilbert. Topics addressed include the storage of library materials and cultural records, insurance issues related to document and data protection, and systems for protecting records. Findings from the preparedness survey showed that the libraries surveyed generally were underprepared in all aspects of disaster readiness; training in basic and specialized procedures seems to have been mostly neglected, few libraries had insurance or were underinsured, and supplies of emergency equipment and materials were generally inadequate. It was also discovered that the response of library and information personnel to Hurricane Gilbert showed in general, a surprising lack of knowledge about how to cope with water damaged materials, and that the rapid growth of mold on paper materials was one of the major problems encountered during the post-disaster period.

KEYWORDS Records, cultural preservation, foreign response, local response, hurricane, preparedness, foreign planning, local planning, case study, emergency planning.

184. Business and Industry Council for Emergency Planning and Preparedness. *BICEPP News* (Fall 1990): 1-16. Published four times per year, subscriptions are available for \$12.00 from BICEPP, P.O. Box 57903, Los Angeles, CA 90057.

A nonprofit, private-sector association, BICEPP encourages business organizations to work together to prepare for and deal with emergencies. This issue of the newsletter includes articles on the effects of the Loma Prieta earthquake on the Pacific Gas and Electric Company, the Watsonville Hospital, and Santa Cruz businesses, and offers a look at recovery efforts in Whittier, California, three years after a damaging quake. While the thrust of the publication is general emergency planning and management, it often focuses on earthquake-related planning due to the severe seismic threat in Southern California.

KEYWORDS Earthquake, emergency planning, emergency response, local response, lifelines, local planning, business, recovery, hospitals, reconstruction, economic impact.

185. Champ, Michael A. "Editorial cartoons and public perception." *Oceanus* 33, no. 2 (1990): 45-53.

This article presents and comments on 16 editorial cartoons depicting the pollution of the U.S. coastal zone. Spanning 20 years, the cartoons tacitly emphasize the fact that scientific research cannot be an end unto itself and that informing the public about the dangers and risks of ocean pollution are at least as important as conducting research. An analogous study into the risks, responses, and planning for various meteorologic and geologic hazards could prove instructive to hazards planners and managers who must devise and implement mitigative programs.

KEYWORDS Media, content analysis, ocean pollution, coastal zone management, local response, local planning, risk perception.

186. Clarke, John I., Peter Curson, S.L. Kayastha and Prithvish Nag, eds. *Population and Disasters*. Cambridge, Mass.: Basil Blackwell, Inc. 1989. 292 pp. Purchase for \$49.95 plus \$3.00 shipping from Basil Blackwell, Inc., c/o American International Distribution Corporation, 64 Depot Road, Colchester, VT 05446.

This book looks at natural, biological, and social disasters and their effects on populations. It comprises both case studies and general articles on the causes, immediate impacts, and ultimate effects of population catastrophes. The authors examine these crises in terms of their effects on morbidity, mortality, fertility, and migration, as well as their impacts on social, economic, and political structures. They assess the reasons for, and extent of, human settlement in potentially hazardous areas, identify the potential range of human adjustments to extreme events, examine the ways in which people actually perceive, prepare for, and react to disasters, and evaluate the effectiveness of official relief upon the lives of victims. The case studies, such as the analysis by A.J. Jowett of the devastating famine in China from 1958 to 1961, cover a diverse group of disasters, some previously unknown to most hazards researchers. The book covers virtually every region of the world, examining both short- and long-term demographic consequences of disaster.

KEYWORDS Multihazards, demography, case study, mortality, morbidity, social impact, economic impact, politics, risk perception, preparedness, earthquake, riverine flood, drought, famine, disease, nuclear power, toxic chemicals, armed conflict, disaster assistance.

187. Comfort, Louise K., Theresa R. Woods and James E. Nesbitt. *Designing an Emergency Information System: The Pittsburgh Experience*. University of California, Institute of Governmental Studies, Working Paper no. 89-24.

Berkeley, Calif. 1989. 34 pp. Available for \$2.00 plus 20% for postage/handling from the Institute of Governmental Studies, 102 Moses Hall, University of California, Berkeley, CA 94720.

The authors assert that information plays a critical role in the uncertain context of disaster operations among interdependent organizations. This report discusses an interdisciplinary research project to develop a demonstration model of an interactive information system to be used in such a context. The project addresses the problems of interactive communication among multiple organizations and jurisdictions and integration of information from multiple data bases to support multijurisdictional disaster operations in the Pittsburgh metropolitan district. The objective of the project is to incorporate electronic information capabilities, such as hardware/software portability and increased data accessibility in order to create an information system that will function at varying levels of complexity with varying numbers of users, expanding and contracting to fit the information requirements of a particular emergency event.

KEYWORDS Emergency management, information science, data sources, interorganizational, local planning, computer modeling.

183. Contingency Journal. *Contingency Journal—The Magazine for Business Continuity Planning* 1, no. 1 (1990): 1-63. Subscription information available from Contingency Journal, 10935 Estate Lane, Suite 375, Dallas, TX 75238.

This journal is dedicated to the premise of keeping a business operating, no matter what happens, including a natural disaster. Three of the 11 articles in this inaugural issue talk about experiences in real disasters (Hurricane Hugo and the Loma Prieta earthquake), and virtually all the other articles deal with some aspect of disaster planning or recovery. Included are pieces on legal liability in corporate disasters, recovery site strategies, recovery planning, electronic vaulting, and communication. There are also regular columns that review products, list upcoming conferences, and summarize recent events in the industry. A good deal of the information contained in the journal concerns computer and other electronic systems maintenance, protection, and backup, but the central issue remains planning for corporate emergencies. The article about Hurricane Hugo relates how the Robert Bosch Corporation survived a collapsed roof and flooding in its data center, total loss of power, and a dead PBX board through effective contingency planning.

KEYWORDS Business, emergency planning, recovery, emergency response, earthquake, multihazards, hurricane, liability, preparedness, example.

189. Council of State Governments. "Responding to Emergencies." *State Government News* 33, no. 3 (March 1990): 4-33. Copies are available for \$6.00 each from the Order Department, Council of State Governments, Iron Works Pike, P.O. Box 11910, Lexington, KY 40578-1910.

Governments have important roles to play in preparing for and responding to disasters. They can enact legislation and regulations to minimize damage from hazardous human activity, as well as establish effective response programs to help the afflicted when a disaster occurs. This topical issue examines government roles based on the hard lessons of recent disasters. Reaction to Hurricane Hugo and the Loma Prieta earthquake by various levels of government are evaluated, as is the need for governments to prepare for a potentially disastrous earthquake along the New Madrid fault in the central U.S. The problems posed for government officials by and their responses to the Three Mile Island nuclear accident, the Sioux City air disaster, and the Phillips Petroleum refinery explosion in Texas also are discussed. Other articles address the mental health effects of disasters, disaster profiteering, nuclear civil defense, the role of the Red Cross in responding to disasters, and problems coordinating relief efforts.

KEYWORDS State planning, state response, emergency planning, emergency response, hurricane, earthquake, nuclear power, transportation accident, explosion, civil defense, psychological impact, voluntary agencies, disaster assistance, economic impact, FEMA, local response, intergovernmental.

190. de Torres, Amparo R., ed. *Collections Care: A Selected Bibliography*. National Institute for the Conservation of Cultural Property. Washington, D.C. 1990. 119 pp. For availability, contact the National Institute for the Conservation of Cultural Property, 3299 K Street, N.W., Suite 403, Washington, DC 20540.

Part of a project designed to assist museums in developing long-range conservation plans, this bibliography contains a chapter citing 31 documents that address emergency preparedness measures. Over 20 citations refer to materials that deal with topics such as fire protection, risk assessment, security, salvaging water-damaged library materials, emergency planning, earthquake mitigation measures for art objects, and protecting cultural properties and libraries from natural disasters. Twelve chapters contain references to related materials dealing with basic collections care, environmental control, and collections storage. Many organizational and institutional resources are listed throughout the volume.

KEYWORDS Cultural preservation, records, emergency planning, risk assessment.

191. Disaster Recovery Journal. *Disaster Recovery Journal* 1, no. 1 (1988): approximately 75 pp. The journal is free to all qualified personnel involved in preparing and managing organizational contingency plans. Subscription rates for others are \$10.00 in the U.S., \$24.00 in Canada and Mexico, and \$47.00 elsewhere.

Billed as a journal "dedicated to corporate recovery planning," issues appearing in 1990 contain articles dealing with business recovery from Hurricane Hugo, the Philippines earthquake of July 16, 1990, the Loma Prieta and Whittier earthquakes, and structural fire. Primarily a journal dealing with emergency planning and emergency management in the business community, it also contains articles on electronic vaulting (backup) systems and disaster planning for a wide variety of commercial enterprises.

KEYWORDS Hurricane, earthquake, business, recovery, emergency planning, emergency response, private sector, computer application, emergency management, structural fire.

192. Drabek, Thomas E. *Emergency Management: Strategies for Maintaining Organizational Integrity*. New York: Springer-Verlag, Inc. 1990. 291 pp. \$39.00.

This book traces the experiences of 12 successful emergency managers, detailing how these persons were able to maintain effective programs despite severe budgetary constraints and the generally low salience of hazards management within government and society in general. After outlining a theoretical framework for his analysis—the "stress-strain perspective"—the author presents 15 different successful managerial strategies and, using extensive quotations from the managers themselves, documents how these techniques have worked. He then presents the advice offered by those he interviewed, including recommendations to new emergency managers and suggestions for dealing with elected officials, volunteers, and individuals in other agencies. He concludes with a summary of these lessons in a chapter entitled "Maintaining Organizational Integrity." The managerial strategies include committees, joint ventures, innovation, entrepreneurial actions, mergers, regulation, agenda control, co-optation, outside experts, and media relationships.

KEYWORDS Emergency management, case study, local planning, interorganizational.

193. EPA Journal. *The World Economy and the Environment: A New Relationship*. *EPA Journal* 16, no. 4 (1990). 2-63. Back issues of EPA Journal are available for \$2.25 in U.S. (\$2.81 export) from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

This issue presents 21 brief, but informative essays concerning the status of the global environment and the international search to reverse detrimental impacts to planet earth. Perspectives are offered by EPA and the U.S. State Department, the impacts of demography, population growth, and national sovereignty are discussed, and the environmental problems of lesser developed nations are considered. Other topics investigated include national

conflicts over water resources, restoring Eastern Europe's damaged environment, challenges to international law and institutions, and the efforts to save the Arctic from further environmental deterioration.

KEYWORDS Environmental studies, economic development, international planning, LDCs, foreign planning, economic impact, legislation-regulation, law, demography, water resources management.

194 Faulkner, Sue, et al. *The Things We Give: A Critical Look at Donations in Kind*. Henry Dunant Institute, HDI Studies on Development no. 1. Geneva, Switzerland. 1989. 100 pp. For availability, contact the Henry Dunant Institute, 114, rue de Lausanne, 1202 Geneva, Switzerland.

Despite the most altruistic motives, international disaster relief organizations distribute a great deal of highly inappropriate in-kind disaster aid, causing embarrassment, frustration, and sometimes anger among the recipients and bringing discredit to the agencies responsible for the donations. The purpose of this book is to look critically—and constructively—at the donations in kind which are channelled through the International Red Cross and the Red Crescent movement. Following two descriptions of inappropriate disaster assistance (flooding in Bangladesh and the eruption of the Nevado del Ruiz volcano in Colombia) that introduce the volume, discussions are offered on a variety of disaster assistance issues, such as donor motivation, coordination of international relief programs, and problems associated with educating institutional decision makers. Thirty-three conclusions and recommendations provide a framework for improving the efficiency and effectiveness of relief efforts. These include 1) the donation of clothing presents problems at the receiving end in every major disaster; 2) there may be better local alternatives to foreign aid; and 3) food aid necessitates assessment of possible disincentive effects, including disruption of local markets.

KEYWORDS Disaster assistance, economic development, international response, volcano, riverine flood, foreign response, education, voluntary agencies, case study.

195 Gist, Richard and Bernard Lubin, eds. *Psychosocial Aspects of Disaster*. New York: John Wiley & Sons. 1989. 357 pp. \$42.95.

An addition to John Wiley's extensive Series on Personality Processes, this anthology presents essays from both the theoretical and practical sides of disaster research in order to examine the psychological processes that underlie community-level responses to large-scale emergencies, as well as the factors that enhance or inhibit individual adjustments after the disaster. The volume offers an extensive review of the literature, methods, and approaches in the field, along with a new typology of disaster and a new model of help-seeking in a disaster. The first of the book's four organizational sections, "Foundations for the Study of Disaster," covers theoretical foundations for a study of disaster response. Next, "Types of Disaster" examines catastrophes by categories: natural disasters; airline accidents; technological disasters; and violence, crime, and terrorism. The third section overviews disaster research concepts and presents a discussion on the legal and public policy issues associated with the psychology of disasters. Both mental health professionals and community planners should find the book a useful guide to state-of-the-art information on the direct application of mental health principles to disaster planning.

KEYWORDS Psychology, psychological impact, disaster studies, social impact, taxonomy, emergency response, mental health services, emergency planning, law, liability, multihazards, transportation accident, technological hazards, terrorism.

196 Glickman, Theodore S. and Michael Gough, eds. *Readings in Risk*. Resources for the Future. Washington, D.C. 1990. 276 pp. Available for \$24.95 (plus \$3.00 postage/handling) from Resources for the Future, Customer Services, P.O. Box 4852, Hampden Station, Baltimore, MD 21211.

The past few decades have witnessed the emergence of a new field of research concerned with assessing and managing risks to health, safety, and the environment. In an attempt to communicate the progress made in this

field to a broader audience, this volume reprints 19 papers written by authorities in risk-related disciplines. Little reader familiarity with the subjects is presupposed, and the volume contains only papers that are largely self-contained. Mathematical formulas are injected only when absolutely necessary. The papers appear under six subject headings: basic concepts, risk comparisons, regulatory issues, health risk assessment, technological risk assessment, and risk communication. Designed to be read by university faculty and students, governmental policy makers, corporate managers, environmental advocates, and the general public, the volume provides relatively easy access to a topic often obscured by professional jargon. Each of the essays is accompanied by a list of questions designed to stimulate discussion and further inquiry on the part of the reader.

KEYWORDS Risk assessment, risk management, risk communication, mathematics, technological hazards, public health, ethics, cost-benefit analysis, politics, social impact, radon, hazardous wastes, comparative risk, risk perception, decision making, public policy, legislation-regulation.

197. Hadden, Susan G. *A Citizen's Right to Know: Risk Communication and Public Policy*. Boulder, Colorado: Westview Press. 1989. 239 pp. \$27.95.

In October 1986, the U.S. Congress passed the Emergency Response and Community Right-to-Know Act, giving citizens the right to learn about the hazardous materials present in their communities through reports submitted by industry. Part 1 of this study provides insights on the need for right to know (RTK), presents background information about the RTK legislative process, and examines how RTK has been implemented in New Jersey and Texas. Part 2 contains chapters which examine institutional factors affecting RTK, the political economy of RTK, how to deal with both excessive information and imperfect information, and how risk perception and risk communication affect RTK goals. Part 3 presents suggestions for improving the RTK statute and empowering citizens in the public policy process through various participative actions. Appendices discuss the results of four surveys conducted by the researcher.

KEYWORDS Toxic chemicals, hazardous materials, risk communication, risk perception, public policy, politics, federal planning, public participation, legislation-regulation, enforcement.

198. Handmer, John and Edmund Penning-Rowsell, eds. *Hazards and the Communication of Risk*. Brookfield, Vermont: Gower Publishing. 1990. 348 pp. \$69.95.

Identifying new risks, deciding what is acceptable, and minimizing the impact of "unacceptable" risks requires the communication of risk information among those responsible for risk management, the risk bearers, and the wider community. This book is the result of an international workshop held in London in 1987 to consider problems associated with such communication. The authors of the 18 papers consider the communication of many different types of risk—from the natural hazards of floods and earthquakes to the more technological and "lifestyle" risks of toxic spills, transportation accidents, and smoking—and they assess the accompanying difficulties from numerous perspectives (the contributors include academic researchers, practicing risk managers, industry consultants, and government administrators). They particularly deal with the difficulties of raising awareness of risk and eliciting appropriate response to warnings. An introductory chapter establishes a conceptual framework for the papers that follow and a summary chapter offers recommendations for policy and research.

KEYWORDS Risk communication, risk perception, education, psychology, politics, media, case study, foreign response, riverine flood, warning systems, nuclear power, federal planning, disease, earthquake, toxic chemicals, transportation accident, warning responses.

199. Hasson, Timothy F. *FULCRUM Guide to Public Safety Software*. Fulcrum Business Systems. Schwenksville, Pa. 1990. 167 pp. Available for \$36.00 plus \$3.00 postage from Fulcrum Business Systems, P.O. Box 335, Schwenksville, PA 19473.

This volume is an independent guide to computer programs. It is designed to aid public safety professionals who must choose from a wide variety of software vendors and products. Included is software for computer systems ranging from desktop PCs to minicomputers and mainframes. The guide identifies and describes programs available to support communications and dispatch, disaster planning and response, equipment management, hazardous materials management, training and simulation, and a host of additional bookkeeping and office functions. In all, it contains 264 software titles from 78 vendors throughout North America. Each title is accompanied by a description of functions and features, a release history, an explanation of equipment requirements, and vendor contact information. The volume is indexed and cross-referenced.

KEYWORDS Emergency management, computer application, public safety, local planning, training, simulation, emergency communications, hazardous materials.

200. Hennig, Leaura. *Natural Hazards Data Resources Directory*. University of Colorado, Institute of Behavioral Science, Natural Hazards Research Assessment and Information Center, Special Publication no. 21; U.S. Dept. of Commerce, NOAA, NESDIS, NGDC Key to Geophysical Records Documentation no. 23. Boulder, Colo. 1990. 251 pp. Available for \$15.00 from the Publications Clerk, NHRAIC, JBS Bldg. no. 6, Campus Box 482, University of Colorado, Boulder, CO 80309.

Designed for use by researchers and decision makers, the directory lists data resources organized according to natural hazard and hazards-related organizations. It is divided into three topical areas: 1) geological hazards, 2) meteorological hazards, and 3) societal response to hazards. Each listing contains information on the data resource, the organization maintaining the data, the contact person within that organization, the format in which the data is available (printed matter, disks, audiovisual, etc.), and how to acquire or use the data resource. The directory also provides a list of World Health Organization offices, state and federal agencies, sea grant programs, and water resources research institutes that deal with hazard-related issues. Also, the directory is indexed according to agency, subject, and geographic location, and multihazard data resources are cross-referenced.

KEYWORDS Data sources, multihazards, geologic hazards, meteorological hazards, emergency planning, state planning, demography, disaster assistance, information science, mapping, federal planning.

201. Henninger, Sandra, Jack Thompson and Robert Newman. *Rotorcraft Use in Disaster Relief and Mass Casualty Incidents—Case Studies*. U.S. Dept. of Transportation, Federal Aviation Administration, Research and Development Service, Report DOT/FAA/RD-90/10. Washington, D.C. 1990. 114 pp.

The purpose of this report is to document helicopter involvement in disaster response efforts and to gain an understanding of how helicopters can best be utilized during emergency operations. A representative series of 18 case histories are studied that detail disaster situations in which helicopters played a substantial role during the emergency response period. Among the topics addressed for each case history are the disaster circumstances, the extent of rescue and relief efforts, the nature and extent of prior emergency planning measures, the nature of actual rotorcraft involvement, the degree of success achieved during the operation, and lessons learned from the experience. Disasters studied include transportation accidents, structural fires, toxic chemical releases, and severe winter storm, tornado, riverine flood, and earthquake (Loma Prieta) responses. Recommendations are offered under five categories: basic planning concepts, inventory of resources, communications, drills, and landing areas.

KEYWORDS Disaster assistance, local response, emergency response, case study, transportation accident, winter storm, earthquake, tornado, structural fire, riverine flood, toxic chemicals, social violence.

202. Hodges, Carroll Ann, ed. *Geohazards '88: A Symposium Highlighting Research on the Causes, Effects, and Prediction of Geologic and Hydrologic Hazards*. U.S. Dept. of the Interior, Geological Survey, Circular no. 1038.

Washington, D.C. 1989. 22 pp. Single copies available free of charge from the USGS, Book and Open-File Reports Section, Federal Center, Box 25425, Denver, CO 80225.

This symposium, held November 17-18, 1988 in Menlo Park, California, provided an opportunity for USGS scientists and other investigators to engage in dialogue with local, state, and federal officials who utilize the findings of earth science research in public policy decision making. The report consists of abstracts representing USGS research projects in progress that address one of the Survey's basic goals—that of understanding, mitigating, and predicting geologic hazards. The papers are grouped into four general topics: earthquake research, landslide hazards in California and the San Francisco Bay region, water resource issues and research, and volcanoes and volcanic hazards. Subjects range from drought in the western U.S. to probabilities associated with earthquake occurrence in California. Twenty-nine abstracts appear in the volume.

KEYWORDS Multihazards, geological hazards, earthquake, water resources management, volcano, landslide.

203. Hodgkinson, Peter E. "Technological disaster—Survival and bereavement." *Social Science and Medicine* 29, no. 3 (1989): 351-356.

The author delineates the differences between human-caused and natural disasters, and then discusses the psychological impacts of both kinds of disasters, together with the longitudinal persistence of these effects. Observations offered include 1) a newsletter designed for victims by an editorial group of survivors and the bereaved has proven to be a powerful therapeutic tool in at least two disasters; 2) the value of survivors talking about disaster experiences is not to be doubted; 3) psychological effects from technological disasters appear to be longer lasting than those caused by naturally occurring disasters; 4) traumatic stress reactions many times are confused with formal psychiatric disorders; 5) proper multiagency planning is needed to shield victims from unnecessary and redundant intrusions by relief workers during the period of psychological recovery; and 6) many disaster survivors are wary about accepting psychological help.

KEYWORDS Technological hazards, multihazards, psychological impact, mental health services.

204. Horwich, George. "Disasters and market response." *Cato Journal* 9, no. 3 (1990): 531-555.

Classifying the dramatic rise in oil prices in the 1970s as a social disaster, the author utilizes the massive economic literature arising from the situation to comment on disasters in general and to analyze the involvement of governmental entities in recovery and reconstruction activities. Initiatives suggested include 1) seek the services of private sector disaster responders; 2) remove all regulations on insurance companies that prevent them from setting performance standards for their clients; 3) protect the private business sector in disaster-stricken areas from gifts and donations of goods and services; 4) protect the private sector from arbitrary property seizures, including looting; 5) remove all rent controls on residential and commercial structures in urban areas; and 6) avoid imposing price controls of any kind in the disaster aftermath. Basically, it is maintained that, in principle, the economic response to all disasters should entail least-cost supplies that meet consumer preferences, and that the claim that markets cannot equilibrate very large disturbances is belied by the record of postwar recovery in market economies.

KEYWORDS Economic analysis, recovery, reconstruction, private sector, disaster assistance, federal response, insurance.

205. Housner, G.W. *Coping with Natural Disasters: The International Decade for Natural Disaster Reduction—The Second Mallet-Milne Lecture*. Institution of Civil Engineers (Great Britain), Society for Earthquakes and Civil Engineering Dynamics, London, United Kingdom, 1989. 74 pp. Copies available for \$15.00 from the Earthquake Engineering Research Institute, 6431 Fairmount Avenue, Suite 7, El Cerrito, CA 94530. California residents add 7.25% sales tax. Non-U.S. purchasers add 10% for surface shipping.

In this biennial lecture, presented at the Royal Institution in London in May 1989, George Housner of the California Institute of Technology discusses practical ways to make the IDNDR a success. He reviews specific hazards and their potential for causing damage and recommends actions at both the national and international level to reduce their impacts. Also discussed are the general problems of hazard evaluation, preparedness, communication, and education—the solutions of which are perhaps key to the success of the IDNDR.

KEYWORDS Multihazards, IDNDR, earthquake, international planning, risk communication.

206. International Journal of Mass Emergencies and Disasters. *The Boundaries of Disaster Research: Taxonomy and Comparative Study*—topical issue. *International Journal of Mass Emergencies and Disasters* 7, no. 3 (1989): 213-431.

This special issue on disaster taxonomy and comparative study is devoted to discussing the boundaries of the field. Five essays in Part 1 examine what is the essential role of taxonomy in disaster research, discusses which parameters define a disaster, what are the strengths and limitations of taxonomy in disaster research and social science generally, and how can disaster be conceived and studied as a social problem. Part 2 is comprised of five papers that provide substantive discussions on risk and disaster preparedness, emergency warning response, comparative legal studies of disaster, long-term recovery, and hazard mitigation. Part 3 closes the volume with two formal commentaries addressing problems associated with risk analysis in a disaster context, and with the role taxonomy and classification plays in the social sciences. As a whole, the volume provides the reader with both a dialogue on definitional and conceptual issues in disaster research and a series of focused attempts to put a theoretical/comparative perspective to work.

KEYWORDS Disaster studies, comparative analysis, taxonomy, recovery, warning responses, law, reconstruction, political science, risk assessment, preparedness, sociology.

207. International Society for the Prevention and Mitigation of Natural Hazards. *NHS Newsletter* 1, no. 1 (September 1989). 12 pp. A newsletter subscription comes with membership in the ISPMNH. Memberships cost US \$20.00 (\$5.00/students, \$150/corporations); Canadian \$25.00 (\$7.00, \$200.00). Contact the Natural Hazards Society, c/o Environmental Prediction Research Section, Atmospheric Environment Service, 4905 Dufferin Street, Downsview, Ontario, Canada M3H 5T4.

This newsletter is intended as a forum for exchanging information informally on natural hazards, acquainting society members with the activities of the group and promoting, advancing, and chronicling all aspects of natural hazards science and its mitigation. The inaugural issue contains brief reports on recent conferences, notices of upcoming meetings, descriptions of hazard mitigation projects around the world, and lists of new publications, videos, and other information sources.

KEYWORDS Multihazards, international planning, foreign planning.

208. Japan Committee for Disaster Research of the Science Council. *International Decade for Natural Disaster Reduction: Proposals by Japanese Scientists*. Japan Committee for Disaster Research of the Science Council. 1989. 20 pp.

Japan has actively supported the initiative behind the IDNDR—a resolution to support the original IDNDR proposal having been passed by the Committee for Disaster Research of the Science Council of Japan in January 1986. An Ad Hoc Committee for the IDNDR was established in June 1986 to search for efficient ways to promote the Decade, and to encourage Japanese scientists to publish articles about the Decade in academic and professional journals. This publication describes how scientists should become involved in IDNDR projects, particularly through basic research and optimizing learning opportunities offered by collaborative international research. Suggestions are made for international collaborative research projects with emphasis directed toward disaster risks in megalopolises.

KEYWORDS IDNDR, international planning, disaster studies, foreign planning.

209. Kanawha Valley Emergency Preparedness Council *Kanawha Valley Emergency Preparedness Council: Plan-Drill-Educate*. Kanawha Valley Emergency Preparedness Council. Charleston, W.V. 1989 (revised). Approximately 200 pp. For availability and cost, contact the K.V.E.P.C., Inc., P.O. Box 3920, Charleston, WV 25339.

The Kanawha Valley Emergency Preparedness Council is a private, non-profit volunteer organization composed of member organizations from business, industry, public utilities, hospitals, news media, volunteer emergency response organizations, and all levels of government. Its role is to act as a "bridging" mechanism whereby emergency preparedness planning, drilling, and education needs in West Virginia's Kanawha Valley can be addressed in a cooperative and coordinated manner. The manual contains comprehensive emergency planning information in areas such as early warning, emergency communications, traffic diversion, provision of emergency equipment and materials, emergency response measures, risk evaluation, evacuation, in-place sheltering, special services, terrorism control, disaster recovery, hazardous materials releases, and civil disturbance control. Thoughtfully conceived and prepared, the manual provides detailed guidelines which will aid emergency response authorities to discharge their duties responsibly and efficiently.

KEYWORDS Emergency planning, regional planning, preparedness, risk assessment, urban areas, recovery, evacuation, warning systems, emergency communications, disaster plan, hazardous materials, terrorism.

210. Kreimer, Alcira and Michele Zador, eds. *Colloquium on Disasters, Sustainability, and Development: A Look to the 1990s*. World Bank, Policy Planning and Research Staff, Environment Dept., Environment Working Paper no. 23 Washington, D.C. 1989. 155 pp. Single copies available free of charge from the World Bank, Environment Department, 1818 H Street, N.W., Washington, DC 20433.

Held at the World Bank on June 6, 1989, the colloquium brought together specialists in international development, natural disasters, and the environment in order to identify the lessons learned from recent efforts in disaster prevention, mitigation, and response. In addition to introductory essays that provide background information on the status of international disaster mitigation efforts, the volume contains a summary discussion, together with the papers presented at each of four panel discussions. Panel I focused on how national and international participation could contribute to the International Decade for Natural Disaster Reduction. Panel II, entitled "Vulnerability: Communications and Technology," explored topics such as international disaster communications, technology transfer in disaster situations, and communications for disaster relief efforts. Panels III and IV deal with, respectively, regional and national efforts to prevent and mitigate natural disasters. Included in the last two panel discussions are papers that deal with mitigation actions being taken in Bangladesh, Nepal, Mexico, and La Paz, Bolivia.

KEYWORDS International planning, disaster assistance, emergency communications, IDNDR, information transfer, LDCs, international funding, public health, emergency planning, remote sensing, foreign planning, local planning, economic development.

211. Kroll-Smith, J. Stephen and Stephen Robert Couch. *The Real Disaster Is Above Ground: A Mine Fire and Social Conflict*. Lexington, Ky.: University Press of Kentucky. 1990. 200 pp. \$24.00.

In 1962 a fire started in a garbage dump located on an abandoned Centralia, Pennsylvania strip mine. The fire spread underground, eventually causing so many physical and social problems that in 1983 the U.S. Congress authorized \$42 million for purchase of Centralians' property. As of 1990, most of the inhabitants had accepted the government's offer to buy their property, and relocation had begun. This book examines a small town's response to an increasingly common type of adversity, the chronic technological disaster. It traces the course of the disaster that has resisted the intervention of expensive, sophisticated, cutting-edge technology, posing unique

problems for legislators, scientists, and, most of all, the affected community. The authors report 1) on the futile efforts of residents to reach a common understanding of the nature of the disaster; on the hazard management strategies of government agencies that, all too often, created additional threats to the community's welfare; and on the birth and demise of community organizations, each with its own solution to the problem.

KEYWORDS Structural fire, local response, federal response, relocation, interorganizational, natural gas, disaster assistance, politics, social impact, longitudinal study, recovery.

212. League of Red Cross and Red Crescent Societies. *Guidelines for Red Cross and Red Crescent Social Welfare Work in Disasters*. League of Red Cross and Red Crescent Societies. Geneva, Switzerland. 1989. 42 pp. For availability, contact the League of Red Cross and Red Crescent Societies, P.O. Box 372, 1211 Geneva 19, Switzerland.

For many years, the League's Social Welfare Unit has been concerned about the minimal role played by the National Red Cross Societies during periods of social stress caused by disasters. The "Guidelines" is a reference document which can be adapted as needed while planning or implementing the social welfare part of a relief operation. Designed for use mainly by disaster professionals, it can also serve as a manual for those who may become inadvertently involved with relief work and who must cooperate with other workers under stressful conditions. The document discusses the changing context of disaster assistance planning, disaster relief responsibilities, the roles played by national governments and the National Society in disaster preparedness, tasks performed during the emergency phase, training programs, and recovery problems which emerge during the post emergency phase.

KEYWORDS Disaster assistance, international planning, emergency planning, preparedness, voluntary agencies, recovery, training.

213. Leiss, William. "Applying risk communication and risk perception research to the understanding of disagreements about risks." *Risk Abstracts* 6, no. 4 (1989): 179-186.

This article deals with "applied" problems in risk perception and risk communication, such as attempts to change public attitudes towards controversial technologies or to change individual behavior. The author outlines two types of risk/benefit tradeoffs that could be revised in the form of hypotheses to be tested in research programs. The first type deals with situations where individuals and groups are motivated to downplay risk and to perceive significant benefits, and where the intuitive risk estimates diverge considerably from expert risk estimates. The second type proposes situations where individuals and groups downplay or ignore benefits, and also perceive risks to be significantly greater than do experts who are working from formal risk estimation protocols. The author suggests that in applied problem areas, the primary objective of new research should be to enhance the ability of interested parties to reflect on the adequacy of their own judgments in the intuitive risk/benefit tradeoffs that are required in everyday life.

KEYWORDS Risk perception, risk communication.

214. Lewis, Tracy and David Nickerson. "Self-insurance against natural disasters." *Journal of Environmental Economics and Management* 16, no. 3 (1989): 209-223.

In this paper the authors examine a model of the individual decision to self-insure when market insurance is unavailable and when expectations of public compensation limit the individual's liability for financial loss. Two important factors are considered with regard to the decision to self-insure: the degree of uncertainty with which the individual perceives the occurrence and severity of a disaster, together with his concomitant attitudes toward risk, and the nature of the technology by which individuals protect their assets. Implications from the model suggest that 1) empirical evidence that individuals overinvest in ordinary improvements to property exposed to the effects of natural disasters and underinvest in measures designed to protect such property from damage is

explained in terms of the maximization of expected utility from wealth by individuals; and 2) whether private expenditures on self-insurance are regarded as excessive or inadequate by the government has been shown to depend on the nature of the technology by which individuals protect their property.

KEYWORDS Insurance, economic analysis, risk perception.

215. Lykes, Richard S. *Are You Ready for Disaster? A Corporate Guide for Preparedness and Response*. Manufacturers' Alliance for Productivity and Innovation (MAPI), Economic Report no. ER-170. Washington, D.C. 1990. 60 pp. Single copies are available to member companies for \$10.00 and to other purchasers for \$15.00. Order from MAPI, 1200 18th Street, N.W., Washington, DC 20036.

This report was prepared with three goals in mind: first, to encourage top corporate management to review the subject of disaster preparedness planning; second, to provide up-to-date guidelines on how to design a disaster contingency plan; and last, to offer advice on how to manage a catastrophic event should it occur. Features of the manual include a discussion of the planning process, an overview of the components of an effective disaster plan, and guidelines for specific hazards (i.e., floods, fires, hazardous material releases). Appendices contain skeleton disaster plans for an earthquake and a hazardous material release. Also included is a list of consultants that provide disaster planning and disaster recovery services to industry.

KEYWORDS Emergency planning, business, multihazards, disaster plan, preparedness, earthquake, hazardous materials.

216 Mitchell, James K., Neal Devine and Kathleen Jagger. "A contextual model of natural hazard." *Geographical Review* 79, no. 4 (1989): 391-409.

Following an examination of the political response to a severe storm that battered southern England in mid-October 1987, the authors found that despite heavy damages in politically strategic areas, improvements in hazard management policies were not discussed or adopted because the storm's impact was overshadowed by other, more pressing problems. Topics discussed include damage caused by the storm to forests, structures, and lifelines; policy issues raised during the response and recovery period; and the design of a contextual model of natural hazards, a little-explored subject that has begun to attract the attention of hazards researchers. The events show that the effects of a natural hazard are strongly modified by the environmental, sociocultural, and political contexts in which it occurs, and that an extreme physical event can inflict a major disaster without prompting significant changes in hazard management programs or policies. Furthermore, it is crucial for analysts and managers to understand the dynamics of hazard contexts, to chart their trends, and to broaden the process of adjustment if the prospects for successful disaster mitigation are to be improved.

KEYWORDS Hurricane, damage assessment, politics, meteorology, disaster studies, recovery, foreign response, emergency response, economic impact.

217. National Academy of Sciences. *Improving Risk Communication*. Washington, D.C.: National Academy Press, 1989. 332 pp. Order from the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418. Hardbound copy: \$39.95; paperback: \$29.95. Add \$2.00 for shipping and handling.

This book is the result of an 18-month study sponsored by the National Research Council, with funding provided by 19 different public and private organizations. Produced by a committee appointed by the NRC, the book reflects insights and contributions from several disciplines, including the physical and social sciences, law, journalism, public health, and communications research. The committee's charge was to offer knowledge-based advice to governments, private and nonprofit sector organizations, and concerned citizens about the process of risk communication, about the content of risk messages, and about ways to improve risk communication in the service of public understanding and better-informed individual and social choice. Several enlightening chapters deal with the purposes of risk communication and risk messages, common misconceptions about risk

communication, and recommendations for improving risk communication. A 109-page essay by Baruch Fischhoff entitled "Risk. A Guide to Controversy," is included as an appendix.

KEYWORDS Risk communication, risk assessment, politics, decision making, risk management.

218. Nehnevajsa, Jiri. *Emergency Preparedness: Reports and Reflections of Local and County Emergency Managers*. University of Pittsburgh, University Center for Social & Urban Research. Pittsburgh, Pa. 1990. 277 pp. For availability, contact the Office of Civil Defense, Room 602, FEMA, 500 C Street, S.W., Washington, DC 20472.

The findings presented in this research document are based on the responses of 2,345 local and county level emergency management officials to an extensive (186-question) survey instrument. While the questionnaire included in the document as an appendix—primarily tries to elicit facts about local/county emergency preparedness and response capabilities, it also attempts to ascertain subjective information concerning attitudes, perceptions, and viewpoints that influence local emergency managers in the design and implementation of emergency programs. Prepared in consultation with FEMA personnel, the questionnaire focuses on both natural and technological hazards and emphasizes issues associated with attack preparedness programs. Elements of emergency management and response that are discussed in the findings include evacuation and the aiding of evacuees, personal disaster experience, the process of obtaining a federal or state disaster declaration, the effectiveness of emergency operations centers, and the use of volunteers during emergency response operations.

KEYWORDS Local planning, emergency planning, evacuation, emergency management, volunteers, disaster declaration, nuclear weapons, survival, preparedness, civil defense.

219. Oliver, John and Neil R. Britton, eds. *Natural Hazards and Reinsurance*. Cumberland College of Health Sciences, Disaster Management Studies Centre, Lidcombe, New South Wales, Australia. 1989. 203 pp. Available for \$25.00 from the Disaster Management Studies Centre, Cumberland College of Health Sciences, P.O. Box 170, Lidcombe, NSW, Australia 2141.

A seminar was held in late August 1989 in Australia to examine the role of insurance in assisting the public to cope with the effects of a natural disaster. Fifteen papers trace the dimensions of natural hazard threats in Australia, describing human attitudes and responses to these threats, presenting the position of the insurance and reinsurance industry regarding hazards risks, and outlining future trends in hazards and hazards management in Australia. Insurance matters are addressed with regard to floods, cyclones, hail, earthquake, extreme wind conditions, and wildfire. Approximately one-half the papers discuss general problems associated with insuring the public against damages caused by natural hazards.

KEYWORDS Insurance, multihazards, hurricane, hail, riverine flood, earthquake, wind, data sources, forecasting, wildfire, foreign planning, loss estimation, risk assessment, risk perception.

220. Palm, Risa I. *Natural Hazards: An Integrative Framework for Research and Planning*. Baltimore, Md.: Johns Hopkins University Press. 1990. 196 pp. \$52.50.

Despite years of research, more Americans are susceptible to natural hazards than ever before. The author argues that researchers and planners need to understand not only the physical environment, societal structure, and the processes of individual decision making, but also how each of these factors interacts with the others. The book presents a detailed account of how specific hazards affect human settlements—and how human settlements sometimes help bring about or exacerbate natural hazards. After surveying theoretical approaches from the 19th century to the present, the author offers a new integrative framework for hazards study, along with examples of how to apply it to the study of a wide range of environmental and technological hazards. Subjects examined at length include micro- and macro-level approaches to an integrated research framework, problems in risk assessment, location theory as applied to environmental hazards, hazards research design, and the author's own extensive experience in earthquake hazards research in California.

KEYWORDS Disaster studies, geography, sociology, earthquake, multihazards, risk assessment, risk perception, realtors, lenders, historical survey.

221. Peterson, Lorna. *Disaster Relief: A Bibliography*. Vance Bibliographies, Public Administration Series no. P-2902. Monacaello, Ill. 1990. 8 pp. Available for \$3.00 from Vance Bibliographies, P.O. Box 229, Monticello, IL 61856.

The bibliography contains 109 citations to books, government documents, Congressional hearings, and articles from popular magazines, newspapers, and scholarly and professional journals. Materials cited deal with the overall concepts behind the provision of domestic and international disaster relief, government enabling legislation, bureaucratic responsibilities, disaster relief planning, and actual relief efforts, such as those following Hurricane Hugo and the Loma Prieta earthquake.

KEYWORDS Disaster assistance, federal planning, emergency response, federal response, recovery, reconstruction.

222. Public Management. *The Value of Emergency Preparedness*. *Public Management* 71, no. 12 (December 1989): 2-27. Copies are available for \$4.00 from Public Management, ICMA, 1120 G Street, N.W., Washington, DC 20005.

Aware of the central role of local government in controlling disaster impact, the International City Management Association (ICMA) publishes monographs and other guides on hazards management, and, from time to time, devotes an entire issue of its monthly journal to concerns surrounding disaster preparedness, response, and mitigation. This issue contains five articles by local officials on their experiences in actual disasters (the Loma Prieta earthquake, a chemical explosion and fire in Texas, Hurricane Hugo, and the Valdez oil spill), as well as shorter descriptions of emergency preparedness programs in 10 locations around the nation. Most practitioners know that insightful, first-hand descriptions of real disaster operations can be extremely valuable, pointing out lessons that officials in other locations might not learn until it is too late. These articles contain not just descriptions, but analyses and critiques of the various response operations, as well.

KEYWORDS Earthquake, hurricane, explosion, emergency planning, local response, local planning, preparedness, oil spill, multihazards, recovery, example.

223. RAI Communications, Inc. *Corporate Emergency Management*. Research Alternatives, Inc. Rockville, Md. 1990. 6 pp. Subscriptions cost \$395 a year (24 issues) from RAI Communications, Inc., P.O. Box 9493, Washington, DC 20016.

This newsletter is targeted toward corporations and their emergency management needs. The inaugural issue contains articles on avoiding environmental litigation, oil tanker hazards, hazardous materials response drills, workers' rights to act on safety and health issues in the workplace, corporate social responsibility, an emergency exercise program, and development of a corporations's emergency operations center.

KEYWORDS Business, private sector, technological hazards, emergency management, emergency planning.

224. Raphael, Beverley. "A research method for the study of psychological and psychiatric aspects of disaster." *Acta Psychiatrica Scandinavica* 80-Supplementum, no. 353 (1989): 1-75.

Despite numerous studies on the psychological impacts of disasters, the author argues that it is difficult 1) to reach general conclusions applicable to all disasters; 2) to disentangle the effects of specific stressor components of the disaster experience; and 3) to determine the degree to which pre-existing vulnerabilities, co-existing problems and post disaster experience correlate with the mental health outcome of disasters and accidents.

Following an extensive literature review, a core methodology is proposed that involves comparable methods for the study of different disasters in different nations. Nearly three-fourths of the paper is given to the reprinting of 15 questionnaires or inventories of disaster experience such as the Beck Depression Inventory, the Disaster Behavioural Responses inventory, and the Texas Inventory of Grief. It is suggested that disaster research often has a starting point in an atmosphere of crisis and therefore can lack the careful development of hypothesis and methodology typical of other areas of research endeavor. The adoption of a collaborative approach would help minimize the potential for disaster research to be ill-conceived and repetitive.

KEYWORDS Psychology, psychological impact, disaster studies.

225. Roth, Emilie, et al. "What do we know about making risk comparisons?" *Risk Analysis* 3 (1990): 375-387.

A tempting way to describe the risks of hazardous technologies is by comparison with other, better known risks. Despite their appeal, such comparisons have come in for considerable criticism. One criticism is that comparisons reduce risks to a single dimension (e.g., loss of life expectancy), whereas many risks are multidimensional. A second, often-heard criticism is that risk comparisons are used not just to communicate how large the risks are, but also to persuade listeners about the magnitude of risk associated with a action virtually unrelated to the first action. This article comments on 14 commonly used types of risk comparisons initially presented in a manual developed for the Chemical Manufacturers Association. The manual presents an analysis of the different ways that risk comparison statements have traditionally been employed, and offers a framework for evaluating them. Besides discussing the manual's content, the article offers a point of departure for analyzing the context of the manual's theoretical proposals.

KEYWORDS Comparative risk, risk communication, technological hazards, taxonomy, risk assessment.

226. Russell, Gordon W. and Robert K. Mentzel. "Sympathy and altruism in response to disasters." *Journal of Social Psychology* 130, no. 3 (1990): 309-316.

Over 250 university students attending an introductory-level psychology course were surveyed in an attempt to identify the aspects of disasters that evoke a sympathetic personal response. Twenty disasters were chosen to ensure variability along all possible dimensions that conceivably could emerge in a multivariate analysis. Attributes of the disasters included the agent (human-caused vs. natural), duration (short vs. protracted), familiarity (unknown vs. famous), locale (foreign vs. local), date of occurrence (recent vs. historical), and magnitude (large vs. small). Among the dimensions represented were the age, gender, race, and affluence of the victims. The participants also were measured for an altruistic component by providing them with the option as taxpayers of recommending that a percentage of the total relief funds be withdrawn and used for other government purposes such as military funding or transportation. Findings revealed that a significant relationship existed between the women's overall ratings of sympathy and their percentage of allocations from the disaster fund, while for men, the relationship was not significant. Moreover, women expressed greater sympathy for the plight of victims and recommended that less money be diverted from the disaster relief fund than did men. Culpability, or the deliberate exposure of victims to hazardous situations, was also measured.

KEYWORDS Multihazards, sociology, gender, attitudes, disaster assistance, psychology, ethics

227. Santos, Susan L. "Developing a risk communication strategy." *American Water Works Association (AWWA) Journal* 82, no. 11 (1990): 45-49.

While the contamination of water supplies by toxic chemicals is the primary hazard addressed in this article, the author basically is concerned with the development of an effective risk communication program that can be applied to all hazards, natural or technological. The article describes a risk communication program that incorporates the following steps: 1) determining goals and objectives; 2) identifying the audience and its concerns; 3) understanding risk perception issues that will influence the audience; 4) designing risk communication

messages and testing those messages; 5) selecting the proper communication media and channels; 6) implementing the plan; and 7) evaluating the program. The article also briefly discusses why management in both the public and private sectors are finding that a need exists to communicate effectively with the general public in our increasingly complex society.

KEYWORDS Risk communication, risk perception, local planning, lifelines.

228. Shepherd, Melanie and Peter E. Hodgkinson. "The hidden victims of disaster: Helper stress." *Stress Medicine* 6, no. 1 (1990): 29-35.

This paper reviews the research literature that investigates the psychological impact of catastrophes on disaster workers. Topics reviewed include the classification of types of victims, symptomology, the short- and long-term emotional effects of disasters, and the individual and situational/environmental variables that can affect disaster workers. Conclusions drawn by the authors suggest that a significant proportion of disaster workers exhibit symptoms of short-term stress, while a lesser number of workers will suffer disaster-related stress over a longer period of time. It is also noted that symptom patterns of disaster workers often mirror those experienced by primary victims.

KEYWORDS Psychological impact, disaster workers.

229. Simmonds, Terry R. *Disaster Assistance Manual*. Washington State Dept. of Community Development, Division of Emergency Management. Olympia, Wash, 1989. 36 pp. For availability, contact the Washington State Division of Emergency Management, 4220 E. Martin Way, Olympia, WA 98504.

The manual provides a concise guide to disaster assistance available from various levels of government, presents a generalized chronology of a typical emergency/disaster, surveys eligibility requirements for certain types of recovery measures, and provides examples of damage assessment and disaster administration forms. Disaster assistance publications available from various federal agencies also are listed.

KEYWORDS Disaster assistance, federal response, emergency response, intergovernmental, recovery.

230. Smith, D.K. *Natural Disaster Reduction: How Meteorological and Hydrological Services Can Help*. World Meteorological Organization, WMO Publication no. 722. Geneva, Switzerland, 1989. 43 pp. For availability, contact the World Meteorological Organization, P.O. Box 5, CH-1211 Geneva 20, Switzerland.

This booklet was prepared to commemorate two WMO milestones: the fortieth anniversary (on March 23, 1990) of the transformation of the International Meteorological Organization—a non-governmental organization which had existed since 1873—into the present intergovernmental WMO, and secondly, recognition of WMO's participation as a leading player in the International Decade for Natural Disaster Reduction. The booklet begins by describing the services that meteorologists and hydrologists provide and how those services can reduce the effects of natural disasters by means of the coordinated efforts of many people working at national, regional, and global levels. It provides several examples of these activities and outlines the programs through which the WMO plans to contribute to the IDNDR.

KEYWORDS Meteorological hazards, international planning, IDNDR, hydrology, meteorology, hurricane.

231. Smith, P.J. "Redefining decision: Implications for managing risk and uncertainty." *Disasters* 14, no. 3 (1990): 230-240.

The standard risk analysis paradigm is one of choice among alternative actions, each with a defined list of possible outcomes which can be compared on a probability-weighted cost basis. The author contends that this